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Strategies to Include Underserved Communities

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Strategies to Include Underserved Communities

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ABSTRACT

The Strategic Management literature has long been interested in how organizational action impacts stakeholders and how firms contribute to dealing with social issues through their corporate social responsibility strategies. While early studies primarily focused on the benefits that firms themselves may gain from engaging in these activities, a more recent body of literature has delved into how different types of organizations contribute to value creation beyond profits, and to tackling societal grand challenges. In particular, a fluorescent research stream examines how organizations adapt their strategies when aiming to include stakeholders from underserved communities –i.e., low-income and vulnerable groups from remote locations facing constraints in terms of access to essential public and private goods and services. In this dissertation, I intend to advance current understanding of how organizations engage with underserved groups, how these interactions reshape organizational strategies, and the consequences of such relationships to the creation and allocation of value. The research is structured into three studies, each employing a different level of analysis, as well as various methodological approaches to contribute uniquely to distinct strands of literature. The first study adopts an entrepreneur-level perspective, focusing on the effects of business training on stakeholders from underserved communities, and the importance of individuals' digital literacy levels in mediating the effectiveness of such programs. Overall, this study questions the efficacy of digital technologies in bolstering business activities, proposing that, in contexts of vulnerability, those tools should be approached with caution and via the implementation of designs that are specifically adapted to the needs of the target populations. The second study takes a firm- and market-level approach, engaging with the comparative governance literature, to examine how stakeholder participation in organizational decision-making processes affects firms' entry-and-exit decisions under uncertainty. Specifically, we compare the physical presence in vulnerable markets from credit cooperatives –organizations in which clients (borrowers) are also owners— with that of for-profit and state-owned banks in the context of accelerated digitalization of the banking sector. The third study undertakes an institutional perspective while also examining firm-level heterogeneities, aiming to dialogue with the literature on corporate philanthropy. In this solo-authored project, I analyze the outcomes of the introduction of a public policy aimed at reducing search costs and increasing the scale and equitable distribution of philanthropic investments and the importance of firm-level attributes in influencing organizational response to this institutional transition. Through these diverse methodological and theoretical lenses, this dissertation aims to deepen the overall understanding of the multiple dimensions related to the social impact generated by organizations.

Keywords: CSR, social impact, value creation, stakeholder management, underserved groups

RESUMO

A literatura de Gestão Estratégica há muito se interessa pelas consequências de ações organizacionais sobre stakeholders, e pelas contribuições de empresas para a resolução de problemas sociais por meio de suas estratégias de responsabilidade social corporativa. Enquanto os estudos iniciais deste campo focam principalmente nos benefícios que as próprias empresas podem obter ao se engajar nessas atividades, uma vertente mais atual da literatura explora como diferentes tipos de organizações contribuem para a criação de valor para além de lucro, bem como para o enfrentamento de grandes desafios sociais. Em particular, uma nova corrente de pesquisa tem examinado a maneira como as organizações alteram suas estratégias ao focar na inclusão de stakeholders de comunidades desfavorecidas –definidos como grupos vulneráveis e de baixa renda, usualmente localizados em regiões remotas, e que enfrentam uma série de restrições em termos de acesso a bens e serviços essenciais, tanto públicos quanto privados. Nesta dissertação, visio avançar o entendimento atual sobre como se dá o engajamento de organizações com grupos desfavorecidos, como tais interações remodelam estratégias organizacionais, e quais as consequências destas relações para a criação e alocação de valor. A pesquisa é estruturada em três estudos, cada um empregando um nível de análise e uma abordagem metodológica diferentes, de forma a contribuir com diversas vertentes da literatura. O primeiro estudo adota uma perspectiva no nível do empreendedor, analisando os efeitos de programas de treinamento em gestão focados em stakeholders de comunidades desfavorecidas e a relevância dos níveis de alfabetização digital dos indivíduos para sua efetividade. Este estudo questiona a eficácia de tecnologias digitais em impulsionar as atividades empresariais, propondo que, em contextos de vulnerabilidade, tais ferramentas devem ser utilizadas com cautela e por meio da implementação de designs especificamente adaptados às necessidades das populações-alvo. O segundo estudo adota uma abordagem em nível empresarial e de mercado, dialogando com a literatura de governança comparativa, para examinar como a participação de stakeholders no processo de tomada de decisão organizacional afeta decisões de entrada e saída das empresas sob cenários de incerteza. Mais especificamente, é comparada a presença física em mercados vulneráveis de cooperativas de crédito –organizações nas quais os clientes (mutuários) também são proprietários— com a de bancos privados e estatais, no contexto de digitalização acelerada do setor bancário. O terceiro estudo, por sua vez, adota uma perspectiva institucional, mas também examina heterogeneidades no nível da empresa, e visa dialogar com a literatura de filantropia corporativa. Neste projeto de autoria solo, analiso os resultados da introdução de uma política pública destinada a reduzir os custos de busca para aumentar a escala e a distribuição equitativa de investimentos filantrópicos. Além disso, observo como características das empresas afetam suas respostas a essa transição institucional. Por meio do uso destas diversas lentes metodológicas e teóricas, a presente dissertação visa aprofundar o entendimento geral quanto às múltiplas dimensões associadas ao impacto social gerado por organizações.

Palavras-chave: RSC, impacto social, criação de valor, gestão de stakeholders, grupos desfavorecidos

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1. INTRODUCTION

The Strategic Management literature has long been interested in how organizational action impact stakeholders (Donaldson & Preston, 1995; Freeman, 1984; Harrison & Wicks, 2013; Mitchell et al., 1997; Parmar et al., 2010) and how firms collaborate in dealing with social issues through their corporate social responsibility (CSR) strategies (Barnett, 2007; Dorobantu, Kaul et al., 2017; Eccles et al., 2014; Flammer, 2015). Early studies primarily focused on the benefits that firms themselves may gain from engaging in these activities, such as reputation enhancement, legitimization, and increases in firm-specific investments from engaged employees (Barney, 2018; Dorobantu & Odziemkowska, 2017; Flammer, 2013; Flammer & Luo, 2017; Jones et al., 2018; Portocarrero & Burbano, 2023). According to this body of work, firms should prioritize support for causes and initiatives that resonate with their most influential stakeholders, aiming to generate benefits for these groups that can, in turn, be leveraged to boost firm performance (Bosse et al., 2009; Dorobantu, Henisz, et al., 2017; Mitchell et al., 1997; Parmar et al., 2010).

However, a more recent stream of literature has delved into how different types of organizations contribute to value creation beyond profits, including social and public value (Cabral et al., 2019; Hart & Milstein, 2003; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019; Porter & Kramer, 2006) and to tackling societal grand challenges (Barnett et al., 2020; George et al., 2016). This perspective manifests in two primary approaches: an altruistic view (Carroll, 1999; Kaplan, 2023; McGahan, 2023), where firms prioritize enhancing social value creation by targeting the most critical issues and localities; and a comparative efficiency approach (Kaul & Luo, 2018; Lazzarini, 2020), where firms concentrate on areas where they can make the most substantial impact compared to other organizations and actors. In both scenarios, the aim of CSR efforts extends beyond performance enhancement to alleviating pressing needs.

A natural and fluorescent extension of this literature involves analyses of how organizations adapt their strategies when aiming to include stakeholders from underserved communities (Durand & Huysentruyt, 2022; Karnani, 2007; Pongeluppe, 2022)—namely, low-income and vulnerable groups in remote locations facing constraints in terms of access to essential public and private goods and services,

including inadequate access to credit (Boulongne et al., 2024; Singh et al., 2022) and insufficient public services related to education, health and infrastructure (Gatignon & Capron, 2023; Jeong et al., 2020; McGahan & Pongeluppe, 2023).

Drawing on this extensive body of literature, this dissertation delves into the potential for social and public value creation by organizations, analyzing how their interactions with underserved groups generate social impact (either positive or negative), and how these engagements reshape organizational strategies. The research is structured into three studies, each employing different level of analysis, as well as various methodological approaches to contribute uniquely to distinct strands of literature. The first study adopts an individual-level perspective, analyzing the results of a field experiment focused the effects of a business training program on the performance of entrepreneurs from underserved communities. The second study takes a firm- and market-level approach, engaging with the comparative governance literature, to investigate the influence of stakeholder-ownership within credit cooperatives on their strategic decision-making processes and their approach toward underserved localities. The third study undertakes an institutional perspective to assess the outcomes of a policy focused on enhancing inclusion of underserved groups in the philanthropic sector, and examines how firm-level attributes allows for heterogeneous forms of generating value in the public interest. Through these diverse methodological and theoretical lenses, this dissertation aims to deepen the overall understanding of the multiple dimensions related to the social impact generated by organizations. Further details on each of these projects are outlined in the subsequent paragraphs.

In the first study, co-authored with my supervisors (Sandro Cabral and Sergio Lazzarini) and Professor Leandro Nardi (HEC-Paris), we assess the impact of the automation of business training on knowledge acquisition and performance outcomes of small entrepreneurs from underserved regions. We question the common assertion that digitalization can help overcome constraints in underserved regions through increased access to products and services that are unfeasible at in-person contact, and at lower costs (Halme et al., 2012; Kistruck & Shulist, 2021; Prahalad, 2005). Our research posits that, while the potential of digital technologies is often celebrated, their effectiveness is intricately tied to the audience's capacity to

engage with the presented content and the type of support extended to these individuals (Lazzarini, 2020; Van Dijk, 2020). To address these gaps, we conducted a field experiment to investigate the role of the mode of delivering these programs in enhancing both knowledge transfer and business performance. The mode of delivery varies from fully automated online tools to human-assisted interaction of users with algorithms.

The study encompasses data from 461 Brazilian small entrepreneurs spread across the whole country who participated in a real-world training program on financial literacy in 2022. Our findings did not reveal a significant impact of the business training, whether in standalone modules or in conjunction with human and/or chat-based support. However, the digital literacy of these entrepreneurs emerged as a critical moderator of this effect: participants with higher digital proficiency were better equipped to derive benefits from the training than the rest. Additionally, we also find that small entrepreneurs with higher levels of engagement with the training program—measured in terms of the number of modules accessed—increased their Sales in the presence of human support. In other words, it seems that, while digital programs enhance access for small entrepreneurs in such areas, the presence of substantial constraints and vulnerabilities significantly impede individuals' ability to fully harness the advantages stemming from such initiatives.

This paper contributes to the nascent literature on how to craft strategies to overcome business constraints in underserved regions (Boulongne et al., 2022; Durand & Huysentruyt, 2022; Pongeluppe, 2022; Teodorovicz et al., 2023). Focusing on the potential of digital technologies (Berg et al., 2023), we add to the recent discussion on the role of digital technologies in addressing social inequalities and enhancing opportunities for individuals from underserved regions (Björkegren, 2023; Burbano et al., 2023; Otis et al., 2023). Second, we add to the literature on the effects of business training on the practices and performance of small entrepreneurs (Anderson et al., 2018; Brooks et al., 2018; de Mel et al., 2014; McKenzie & Woodruff, 2014). Moving beyond the emphasis on the content of the training, we empirically assess the effect of alternative modes of provision (Dammert & Nansamba, 2023; Drexler et al., 2014; McKenzie et al., 2021), which can potentially affect how participants understand and benefit from the transferred skills. Overall, our study questions the efficacy of digital technologies in bolstering business

activities within underserved regions, proposing that, in such contexts, the use of those tools should be approached with caution and tempered eagerness, and via the implementation of designs that are specifically adapted to the needs of the target populations.

In the second dissertation study, co-authored with my supervisors, we adopt a comparative governance approach (Cabral et al., 2013; Cabral et al., 2019; Kaul & Luo, 2019; Klein et al., 2019; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019; Williamson, 1999) to examine how stakeholder participation in organizational decision-making processes affects firms' entry-and-exit decisions under uncertainty. Specifically, we compare the strategic behavior of credit cooperatives – organizations in which clients (borrowers) are also owners— with that of for-profit and public (state-owned) banks in the context of accelerated digitalization of the banking sector. We theorize that client (member) ownership amplifies the importance of in-person relational channels, thereby prompting cooperatives to comparatively keep more physical branches even in the face of accelerated digitalization. We also posit that this effect is moderated by the nature of the target markets, especially with respect to the presence of vulnerable, low-income clients, and by the organizational structure of cooperatives (single vs federation).

We test our hypotheses in the context of credit provision in Brazil, where cooperatives have gained substantial market share in recent years. Using two-step fixed effects logit models, we observe the entry and exit decisions of over 44,168 bank branches dispersed across the country from 2010 and 2021, and their reactions to a regulatory change that accelerated digitalization in the financial sector. In line with our predictions, we find that credit cooperatives are associated with increased physical presence compared to other organizational forms following the regulatory change. However, despite their expected emphasis on client benefits, cooperatives do not target the most vulnerable areas, which are mainly served by state-owned banks. This tendency to focus on less vulnerable areas is driven mainly by federated cooperatives, which tend to operate like corporations. Additionally, non-credit cooperatives that provided credit services prior to the digitalization shock decreased their propensity to maintain physical units after the transition.

The contributions of this study are threefold. First, we dialogue with recent literature that evaluates different organizational forms based on outcomes that go beyond economic returns or governance costs by shedding light on cooperatives, a relatively understudied but relevant organizational form where clients presumably have a more pronounced strategic influence, compared to other forms that compete in the same markets (Cabral et al., 2019; Lazzarini, 2020; Luo & Kaul, 2019; Quélin et al., 2017). Despite their emphasis on clients and the potential community-based benefits that their local presence can generate (Ingram & Simons, 2000; Núñez-Nickel & Moyano-Fuentes, 2004), cooperatives seem to target areas in which client engagement can generate sufficient economic value. Second, we add to the literature on property rights and stakeholder management (Foss & Klein, 2018; Klein et al., 2012) by showing that, although ownership in the hands of clients themselves plays a fundamental role in shaping organizational strategy, the effects arising from this ownership are highly dependent on internal characteristics of the organization, such as structure and scope. Finally, we contribute to the subfield within Strategy that investigates the behavior of cooperatives (Boone & Özcan, 2014; Chatterji et al., 2021; Jeong et al., 2020; Slade Shantz et al., 2020) by showing how this unique organizational form adopts a distinct competitive strategy when dealing with accelerated digitalization in comparison to rival governance structures.

The third dissertation paper is a solo-author project. In this working paper, I analyze how an institutional-level transition affects firms' decisions about resource allocation through corporate philanthropy (Ballesteros & Gatignon, 2019; Gatignon & Bode, 2023; Gautier & Pache, 2015; Luo et al., 2018; Marquis & Lee, 2013; Marquis & Tilcsik, 2016; Seo et al., 2021; Tilcsik & Marquis, 2013; Wang et al., 2008). Specifically, I analyze the outcomes of the introduction of a public policy aimed at reducing search costs to increase the scale and equitable distribution of philanthropic investments. I hypothesize that the policy affects the distribution of philanthropic giving across various localities, leading to increases in philanthropic giving to underserved localities compared to commercially concentrated ones. Additionally, I analyze how firm-level attributes –namely, performance level and organizational form— interact with the policy effects (Mahoney et al., 2009).

I test the proposed hypotheses in the context of philanthropic giving to cultural projects in Brazil, leveraging the introduction of a public, online system that drastically reduced search and matching costs for sponsors looking for initiatives to invest in. Using data from a series of public sources, I analyze how the introduction of this policy affected the corporate philanthropic giving decisions of 148 public companies towards 5,616 cultural projects dispersed across the country from 2011 to 2021, with a particular emphasis on differences between adequately served and underserved localities in terms of access to cultural equipment. The final sample comprises 7,916 observations, encompassing 334 Brazilian municipalities with projects that received any funding from the firms in the sample during the analyzed time series. Contrary to the baseline hypothesis, however, I find no significant effect of the policy in attracting new investments or shifting them towards projects from underserved localities. Therefore, from an institutional perspective, the policy apparently did not achieve its main goal of promoting equitable philanthropic distribution across the country. A more nuanced picture emerges, however, upon examining how firm-level attributes interact with the institutional transition: both high-performance firms (compared to low-performance ones) and state-owned enterprises (compared to private firms) increase their investments in projects from underserved regions following the policy change.

This paper contributes to the literature on corporate philanthropy that analyzes the consequences of institutional change to the value creation and allocation resulting from firms' philanthropic giving (Ballesteros & Magelssen, 2022; Gatignon & Bode, 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016; Tilcsik & Marquis, 2013; Wang & Qian, 2011). By shifting focus from the effects of unforeseen institutional changes to examining the impact of deliberate policies aimed at reshaping incentives within the corporate philanthropic sector, I am able to show that, despite the policy's null aggregate effects, firm-level attributes such as performance and ownership play pivotal roles in how firms adapt strategies to enhance value creation relative to their competitors (Kaul & Luo, 2018; Marquis & Lee, 2013). Second, I contribute to the broader literature on CSR that focuses on value allocation to distinct stakeholder groups and the inclusive potential these actions possess (Klein et al., 2019; Mahoney et al., 2009; Wickert, 2021). Rather than focusing on the impact of CSR on firm performance, I explore firms'

responses to policy interventions and their consequences on the allocation of philanthropic giving to projects from underserved localities (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Pongeluppe, 2022; Teodorovicz et al., 2023). Overall, the study reveals that examining firm-level responses is crucial to understanding how policies intended to generate social value can be not only effective but also inclusive in their intended original objectives.

The three studies described above are detailed in chapters 2 to 4 of this dissertation. Following these papers, a concluding chapter synthesizes the main contributions of the dissertation to the literature in Strategy that analyzes the social and public value creation potential of organizations, as well as suggests possible avenues for future research.

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2. LOST IN AUTOMATION: THE IMPACT OF TECHNOLOGY-SUPPORTED TRAINING ON THE PERFORMANCE OF SMALL ENTREPRENEURS IN UNDERSERVED REGIONS

2.1 INTRODUCTION

Small entrepreneurs from underserved regions—i.e., low-income and vulnerable communities in remote locations—often face severe constraints in terms of credit availability (Boulongne et al., 2022; Chatterji & Seamans, 2011; Singh et al., 2022), deficient public services (Gatignon & Capron, 2023; Jeong et al., 2020; McGahan & Pongeluppe, 2023), and lack of basic skills and capabilities to run a business (Berge et al., 2015; Bloom & Van Reenen, 2010; Bruhn et al., 2010; Teodorovicz et al., 2023). In those conditions, entrepreneurs must deal with substantial transactional and operational costs (Kaul & Luo, 2023; Olsen & Boxenbaum, 2009), resulting in severe locational and socioeconomic disadvantages (Durand & Huysentruyt, 2022; Pongeluppe, 2022). Digital technologies have emerged as alternatives for attenuating these disadvantages, providing solutions that encompass a wide array of approaches, including text and voice messages (Cole et al., 2023; De Oliveira, 2022), digital managerial tools (Acimovic et al., 2022), and online business training and mentoring (Jin & Sun, 2021; Lall et al., 2023; Otis et al., 2023). Indeed, online training activities can be particularly useful for developing new skills and capabilities in cases where traditional in-person education is absent, costly, or even unfeasible (McKenzie et al., 2021).

Although some advocate the potential of digital technologies as a mean to enhance access while reducing operational and implementation costs (Barnett et al., 2020; George et al., 2021; International Finance Corporation, 2017), there are reasons to believe that their success is highly contingent on the ability of the target audiences to successfully engage with digital tools (Brynjolfsson & Hitt, 2000). For instance, in underserved communities, access to the internet and digital technologies remains highly constrained and inconsistent (Greenstein & Prince, 2006), resulting in difficulties for small entrepreneurs to operate and understand digital tools— a situation referred to as “digital illiteracy” (Choudhury et al., 2020; Van Dijk, 2020). Additionally, vulnerable entrepreneurs may also be skeptical about the utility of new technologies initially intended to benefit them, or even reject these tools due to an inherent aversion to digital platforms

(Allen & Choudhury, 2022; Burbano et al., 2023). Thus, whereas digital technologies may have the potential to reach and enhance knowledge provision to small entrepreneurs in underserved regions, the constraints faced by these individuals may limit their ability to fully harness those benefits (Björkegren, 2023; Lazzarini, 2020; Karnani, 2007). Consequently, to leverage the potential of these technologies in promoting entrepreneurial and managerial capabilities, it is crucial to understand how they can be designed to better address the needs of the target audiences, and under which configuration they can effectively alleviate inherent constraints (Berg et al., 2023; Cabral et al., 2019; DiMaggio et al., 2004; Voegtlin et al., 2022).

This paper addresses this debate by studying how small entrepreneurs in underserved regions respond to a digital training program intended for developing managerial skills. Complementing prior work focused on the *content* of business trainings (i.e., *what* is offered; e.g., Brooks et al., 2018; Drexler et al., 2014; McKenzie & Woodruff, 2014), we examine the impacts of the *mode of provision* (i.e., *how* the training is offered; e.g., Estefan et al., 2023). Examining the mode of provision is particularly relevant considering the difficulties entrepreneurs in underserved areas usually face to access and benefit from the content of online training. Specifically, we investigate the effects of a digital business training program aimed at enhancing the financial literacy of small entrepreneurs, and compare three distinct modes of provision of the same program content: the *content-only group*, in which small entrepreneurs receive the whole content of the training, but without any sort of interaction with digital algorithms; the *chatbot group*, that provides that same content as in the previous mode, but also allows for interactions with automated chatbots; and the *chatbot and human support group* (hereafter referred to as *chatbot+human support group*), an interactive module that combines content and interactions with automated chatbots and human agents. To shed light on the potential advantages (or drawbacks) of introducing automated interactions into the learning process, and how they can complement or substitute human support, we assess the impact of the training program in its different modes on two outcome variables: the *financial literacy* and *performance* (Sales and Profits) of small entrepreneurs.

Our study encompasses administrative and survey data derived from a four-arm randomized controlled trial involving 461 small entrepreneurs from Brazilian underserved regions, who participated in a real-world training program on financial literacy during July 2022. We randomly assigned participants to one of four experimental groups: three treatment groups, each employing a distinct mode of provision; and a control group that did not receive any training. The program was offered by a for-profit firm to its small business partners in underserved regions, primarily comprising self-employed workers and small businesses with just one employee. The content was delivered through a messaging application (WhatsApp) by a non-profit organization specialized in digital learning and financial mentoring. Data collection occurred in four distinct periods: a pre-intervention phase in June, followed by three post-intervention observations in July, August, and November. The dataset includes information on financial literacy and business practices, performance indicators, and participant engagement with the training. Furthermore, following the final data collection in December, we conducted a round of interviews to validate our findings and identify potential mechanisms underlying the observed effects.

In our main findings, we fail to detect a significant effect of the business training program on financial literacy, either in the standalone module, or in its association with human and/or chat-based support. However, a detailed examination of these effects provides a more nuanced picture about how small entrepreneurs accumulate knowledge through online training programs. In this vein, we find that the training program *reduced* financial literacy of small entrepreneurs when in the treatment involved interactions with only the chatbot, compared to the other modes of provision. This finding suggests that the chatbot performed less effectively than other methods in conveying best practices to the participants. Our primary explanation for this phenomenon is related to what we mentioned before: even if digital technologies are intended to supplant the lack of adequate in person training in underserved regions, entrepreneurs in those regions face a myriad of additional constraints, including limited digital literacy, which hinders their ability to engage effectively with online applications (DiMaggio et al., 2004; Van Dijk, 2020). In fact, using a measure on digital literacy based on the daily use of digital platforms, we find that more digitally literate entrepreneurs who interacted exclusively with the chatbot demonstrated an

improvement in financial literacy compared to the content-only group. We also examined the effect of the training on the performance of entrepreneurs and failed to detect consistent effects across the treatments. Nevertheless, we found that small entrepreneurs with higher levels of engagement with the training program—measured in terms of the amount of modules accessed during the program—increased their Sales in the presence of human support. These results highlight the importance of considering heterogeneous individual traits to assess the effectiveness of digital training initiatives in underserved regions.

The contributions of this study are twofold. First, we contribute to the nascent literature on how to craft strategies to overcome business constraints in underserved regions (Boulongne et al., 2022; Durand & Huysentruyt, 2022; Pongeluppe, 2022; Teodorovicz et al., 2023). Focusing on the potential of digital technologies (Berg et al., 2023), we add to debate on how their introduction might affect entrepreneurs facing structural and locational disadvantages (Gatignon & Capron, 2023; Jeong et al., 2020; McGahan & Pongeluppe, 2023). More specifically, our results add to recent discussion on the role of digital technologies in addressing social inequalities and enhancing opportunities to individuals from underserved regions (Björkegren, 2023; Burbano et al., 2023; Otis et al., 2023). Second, we add to literature on the effects of business training on the practices and performance of small entrepreneurs (Anderson et al., 2018; Brooks et al., 2018; de Mel et al., 2014; McKenzie & Woodruff, 2014). Moving beyond the emphasis on the content of the training, we empirically assess the effect of alternative modes of provision (Dammert & Nansamba, 2023; Drexler et al., 2014; McKenzie et al., 2021), which can potentially affect how participants understand and benefit from the transferred skills. Overall, our study questions the effectiveness of digital technologies in supporting business activity in underserved regions and demonstrates the importance of heterogeneous individual traits (e.g., digital literacy and engagement) in explaining the ability of small entrepreneurs to reap the benefits arising from such initiatives. Therefore, it is crucial to establish a more comprehensive and nuanced understanding of the role of digital technologies in supporting training programs.

2.2 RELATED LITERATURE

Strategy research has been increasingly interested in understanding the conditions under which organizations generate societal impact (Flammer, 2015; George et al., 2016; Kaul & Luo, 2018; Lazzarini, 2020; McGahan et al., 2013; Portocarrero & Burbano, 2023). In particular, prior work has studied how firms engage with stakeholders from underserved regions (Halme et al., 2012; Kistruck & Shulist, 2021; Prahalad, 2005)—that is, individuals who often grapple with various market and institutional challenges, such as insufficient infrastructure, low education levels, highly volatile labor supply and unstable institutional environments (Duflo & Banerjee, 2011; Karnani, 2007; Kistruck et al., 2015; Pissarides et al., 2003). Recent contributions have recognized the significance of these locational disadvantages in shaping firm strategies, pointing out to the potential necessity for firms to adapt their decision-making and operations when catering to populations residing in these regions, including changes in communication (Durand & Huysentruyt, 2022) and pricing strategies (Pongeluppe, 2022), and channels for providing financial capital (Boulongne et al., 2022). Similar adaptations should also be relevant for small entrepreneurs based in these locations, who face credit constraints (Bates & Robb, 2014; Boulongne et al., 2022; Singh et al., 2022) and increased transaction and operational costs that hinder business growth (Olsen & Boxenbaum, 2009), and undermine the development of managerial capital (Berge et al., 2015; Bloom & Van Reenen, 2010; Bruhn et al., 2010).

Business training programs have long been praised as potential solutions to the lack of managerial capital among small entrepreneurs (de Mel et al., 2014; Drexler et al., 2014; Giné & Mansuri, 2014; Field et al., 2010; McKenzie & Woodruff, 2021). Early research in this area focused on the broad impact of training on entrepreneurs' capabilities, practices, and overall performance (Bruhn & Zia, 2013; Giné & Mansuri, 2014; Karlan & Valdivia, 2011). Findings indicate that these training programs do enhance business knowledge and practices, but these improvements are not consistently translated into better performance (Arraiz et al., 2019; Berge et al., 2015; de Mel et al., 2014; McKenzie & Woodruff, 2014). In reality, the effectiveness of such training is heavily contingent upon the fit of program content with the

specific needs of the participants (Anderson et al., 2018), the expertise of the program providers (Avdeenko et al., 2021; Brooks et al., 2018), and the initial levels of performance of the participants (Otis et al., 2023).

Recent research has also identified a range of digital technologies that have emerged as innovative channels for delivering business training (McKenzie et al., 2021), including the use of text and voice messages as reminders for basic managerial tasks such as savings (Cole et al., 2023), inventory control (Acimovic et al., 2022), and record keeping (De Oliveira, 2022). In parallel, online platforms have become the primary channels for comprehensive business training courses (Jin & Sun, 2021) and the provision of business mentoring (Lall et al., 2023).

While digital technologies have the potential to facilitate outreach to individuals in remote and underserved regions (Barnett et al., 2020), and to generate positive social impact (Berg et al., 2023; George et al., 2021), existing constraints widespread in these localities also make it more difficult for residents to harness the benefits arising from increased access (DiMaggio et al., 2004). For instance, in these communities, access to the internet is highly inconstant, broadband availability is scarce (Greenstein & Prince, 2006; McKenzie et al., 2021; Van Dijk, 2020), and individuals tend to exhibit digital illiteracy—i.e., they lack the ability to understand and properly use information gathered via digital means (Jin & Sun, 2021; Zahoor et al., 2023). A particular challenge is, therefore, to understand how the introduction of digital technologies to assist small entrepreneurs may either mitigate or exacerbate existing disadvantages, depending on the ability of these individuals to leverage the provided services (Otis et al., 2023; Voegtlin et al., 2022). Hence, determining how knowledge is transmitted and defining the appropriate level of support to targeted populations are pivotal decisions that can either enhance or hinder the potential of digital technologies to create value. For instance, the media used for content transmission (e.g.: video, audio, text), the choice of platform (e.g.: computer or mobile phone), or the level of automation of an interactive system (e.g.: human support, chatbots, AI) may be fundamental in explaining the effectiveness of different programs, contingent on their alignment with the preferences and habits of the participants. Therefore, disentangling the effects stemming from program content and automation is essential for gaining a deeper understanding of the impact of digital programs tailored for underserved communities.

In light of this debate, in the next section we describe an experiment focused on assessing the effects of varying the mode of provision of a digital business training program on knowledge acquisition and performance outcomes of small entrepreneurs from underserved regions. In a nutshell, we analyze whether the level of automation of the training program influences the learning and application of new practices by small entrepreneurs, as well as how these results translate into tangible changes in performance outcomes, such as sales and profits. Additionally, we observe the role of human support as a complementary resource alongside fully automated tools in providing benefits to the users. Finally, in extension and post-hoc analyses, we explore the potential mechanisms underlying those relationships, including the importance of digital literacy and engagement with the program. The experiment is described in detail in the following sections.

2.3 CONTEXT AND EXPERIMENTAL DESIGN

2.3.1 Context

Our empirical context involves small entrepreneurs based in underserved communities across all Brazilian regions, as exhibited in Figure 1. Small entrepreneurs constitute a significant portion of the Brazilian economy, comprising over 13.5 million formally registered businesses (as of 2022) which account for approximately 70% of all firms in the country. Our sample comprises small entrepreneurs who are partners of a local fintech firm (hereinafter referred to as “Fintech”) focused on offering basic financial services to low-income communities, such as bill payments, sale of public transportation tickets, phone recharges, etc. The entrepreneurs are mostly self-employed workers or small business owners who operate small shops in these communities. The partnership operates on a revenue-sharing model whereby entrepreneurs receive a fixed percentage of the total monthly sales that they generate for the Fintech.

INSERT FIGURE 1 ABOUT HERE

The primary mission of the Fintech is to reduce transaction costs for the poor, including both their end-users and their partners, with a special aim at helping small entrepreneurs diversify their revenue sources. In line with this goal, in 2022, the company promoted an online training program on financial literacy for its partners, which focused on enhancing the entrepreneurs' basic financial skillset as a way of increasing the performance of their businesses. Financial literacy is identified as a particularly relevant subject, given the low level of managerial capital extant among entrepreneurs (Anderson, Chandy, & Zia, 2018; Bloom & Van Reenen, 2010; Bruhn, Karlan, & Schoar, 2010). In fact, our baseline results indicate a noticeable absence of basic financial skills within our sample. For instance, 54.7% of the participants express that their current income falls short of covering their monthly expenses. Also, at baseline, 75.0% of the entrepreneurs cannot distinguish between their personal and business finances, indicating widespread poor financial practices. Hence, a targeted training program centered on financial literacy is expected to yield positive results in terms of participants' behavior, enhancing their knowledge of essential skills that may directly impact business practices and overall performance (McKenzie & Woodruff, 2017).

2.3.2 Experimental design and baseline balance

We evaluate the impact of this financial literacy training using a randomized controlled trial (RCT)¹. Entrepreneurs were invited to participate in the study by the Fintech, who promoted an internal advertisement campaign of the training to its 18,108 most active partners. Out of these partners, 1,832 responded to the call and agreed to participate in our baseline survey. However, only 461 of them effectively took part in the experiment and completed the post-treatment survey.

Following our baseline survey in June 2022, and in line with our discussion in the previous section, participants were randomly assigned to one of four experimental groups: the *content-only group*, the *chatbot group*, the *chatbot+human support group*, and the *control group*. Participants from the *content-only group* were granted access to a free online course on financial literacy but were not able to interact with content

¹ To ensure the credibility of our study, we pre-registered the main analyses and variables used in the experiment, as described in Appendix D.

providers in any way. Given that our objective is to compare the effectiveness of distinct modes of provision, the content of the training program was held constant across all treatment groups to ensure comparability. In contrast, the mode of provision varied cumulatively across groups. Participants in the *chatbot group* received the same content as the content-only group but with an additional layer of treatment that allowed them to interact with an automated chatbot throughout the training, enhancing engagement and customization in how they accessed the content. Similarly, entrepreneurs in the *chatbot+human support group* also interacted with the chatbot and had the additional option of engaging with human agents who were available to provide support. Entrepreneurs in the *control group* did not receive any treatment during the study. Figure 2 depicts our experimental design.

INSERT FIGURE 2 ABOUT HERE

The randomization process was stratified based on socioeconomic characteristics of the participants' municipalities —GDP per capita and population density— and the aggregate number of transactions with the Fintech within each locality over the three-month period preceding the intervention. To avoid cross-contamination, we stratified the sample at the municipality level, ensuring that entrepreneurs from the same locality were placed in the same experimental group. We then randomized municipalities into one of the four experimental groups. Table 1 contains summary statistics from the baseline survey, as well as checks for balance across groups (ANOVA-F). We find no systematic differences in observable baseline characteristics between groups, except for the distribution of gender (ANOVA-F: $p < 0.05$). However, this discrepancy does not undermine our analyses for two main reasons: first, the key outcomes we observe in the study (Financial Literacy and Profit) are stable across all groups, which increases the reliability of their comparisons; and second, to ensure that gender does not affect the estimations, we include it as a control variable in extension analyses and find no significant change to our main findings (Appendix A). Through this process, we guarantee that our experimental groups are balanced in relevant attributes

(Bruhn & McKenzie, 2009), including income and business performance, which are particularly significant in determining financial literacy levels (Lusardi & Mitchell, 2011).

The intervention started in July 2022, two weeks after the initial survey, and lasted for seven days. Following the training, three rounds of data collection were implemented, corresponding to one week, one month and three months after the intervention (July, August and November 2022, respectively). Additionally, one month after the endline survey (December 2022), we conducted interviews with the participants to gather insights into their perceptions of the treatment. This additional step aimed to enhance our understanding of potential mechanisms underlying the main results. The complete timeline of the interactions with participants is presented in Figure 3.

INSERT FIGURE 3 ABOUT HERE

2.3.3 The program

The program consisted of an online financial course focused on basic financial literacy concepts, delivered through WhatsApp by a partner non-profit organization with expertise in digital financial and economic training. The entire training spanned one week, running from Wednesday to Tuesday, with a daily time commitment of approximately 30 minutes. Interactions initiated around 7 pm to avoid overlapping with the participants' regular business hours. The choice of the starting time was based on the Fintech's experience and aligned with the preferences of the entrepreneurs, who favored engaging in the activities after their workday. To maintain engagement without compromising the homogeneity of the treatment, reminders were sent to all treated groups at the same time of the day during the mornings following each module.

The activities encompassed short videos, text materials, and supplementary files designed to guide homework exercises (for detailed program content and examples of the materials, please refer to Appendix B). Throughout the entire training, the language used was deliberately simple and straightforward, aimed at ensuring accessibility for all entrepreneurs. Furthermore, real-life examples were integrated into the

materials, including a video series narrating the journey of a couple confronting financial challenges and the strategies they employed to overcome them. Finally, short audio testimonials from past participants in earlier editions of the training were shared to foster a sense of community among the group.

Prior to our experiment, similar versions of the intervention had been previously implemented by our non-profit partner through in-person programs targeting various audiences. An early study (Chiavenato et al., 2023) evaluated the impact of these trainings through a randomized controlled trial and found a positive effect on participants' financial literacy levels (coef = 0.13 s.d., $p < 0.05$). Importantly, this effect remained consistent across groups from different socioeconomic strata. These results corroborate with the idea that the *content* delivered through the training was capable of positively influencing learning outcomes. However, it's worth noting that this previous study did not include any analysis regarding variations in the mode of provision or outcomes related to the business performance of small entrepreneurs.

As our primary focus is to investigate the distinctions between *modes of provision*, we kept the content consistent across all treatment groups, while varying the provision method. For instance, participants in the content-only group received all the information in concise text blocks via WhatsApp, once a day, with interactions disabled. In contrast, entrepreneurs in the chatbot group had interactions enabled, giving them the flexibility to personalize the order in which they accessed the content and chose the timing that suited them best. Consequently, despite the fixed starting time, participants in the chatbot group could customize when they accessed the information during the day. Furthermore, due to the delivery mode, they had the option to select which contents they did not want to access, a choice not available to content-only participants. Finally, entrepreneurs in the *chatbot+human support group* were informed in the beginning of the first module that they would be able to interact not only with the chatbot, but also with a human agent responsible for support regarding technical and content issues, whenever they chose to. Every training day, participants were reminded of this possibility and received an introductory message from the human agent, but the decision to utilize this support was entirely at the discretion of the entrepreneurs.

2.4 DATA AND METHOD

2.4.1 Data

We use three datasets in our study: two administrative datasets and a survey. Complementary data were obtained via post-hoc interviews (for detailed information on the interview questionnaire, see Appendix C). The first administrative dataset comprises basic geographic and socioeconomic information about the participants, in addition to monthly sales data generated by each entrepreneur through their partnership with the Fintech (total sales and quantity of sales). These data were used as the basis for the stratification of our sample and were further employed in our main analyses as proxies for performance. The Fintech granted us access to sales data for three months prior to and including the intervention (March-June 2022), as well as for the six months post-intervention (July-December 2022). To facilitate the combination of information from different sources, we grouped the data into two- or three-month blocks, providing average sales figures for each entrepreneur around each survey period.

The second dataset encompasses responses from entrepreneurs collected during our baseline and three ex-post surveys, covering a wide range of information including managerial capacity, profit, financial behavior, and financial literacy. The survey comprised 17 questions divided into four sections: basic information, business details, preferences and habits, and financial knowledge. The full questionnaire employed in the survey is available in Appendix C. The response rate was approximately 90% for each question, and this rate was consistent across treatment groups, ensuring that our results are truly representative of our sample.

The third dataset was provided by the non-profit organization responsible for implementing the training program and contains detailed information on the interactions with the chatbot, specifying the activities and modules accessed by each participant. This dataset enables us to gauge the level of engagement among users who somehow interacted with the chatbots. Additionally, we can also estimate the number of modules accessed by the content-only group, although this is a less accurate proxy.

2.4.2 Baseline data, attendance and attrition

The average entrepreneur in our dataset is a 37-year-old male (77%) who has completed at least secondary education (88%). They have been operating their business for over two years (66%) and also have additional income sources aside from their partnership with the Fintech (84%). Table 1 presents basic information on entrepreneurs' characteristics.

INSERT TABLE 1 ABOUT HERE

Attendance

Attendance in the training program was notably high, with 86.5% of participants engaging with at least one module of the training and remained balanced across all four experimental groups. Table 2 presents both the average number of modules accessed by participants in the treatment groups (Panel A) and the share of individuals who reached 100% of the course activities (Panel B). As shown in the table, participants, on average, accessed 2.27 out of the 7 modules provided in the training, and approximately 15% of them completed the entire course. These figures are fairly stable across the treatment groups (ANOVA F: $p > 0.05$ in both cases), suggesting a balanced attendance across the program.

INSERT TABLE 2 ABOUT HERE

Survey attrition

Survey attrition was relatively high, resulting in a response rate of approximately 23% of the participants for the endline survey. This situation raises two significant concerns. The first relates to the potential variation in attrition across treatment groups, which could indicate issues with the treatment itself leading participants to exit prematurely. We address this concern by testing for attrition balance across groups through an ANOVA comparison of mean attrition among all four experimental groups, and find that attrition remained relatively stable, with no statistically significant difference (ANOVA-F: $p > 0.05$)

between the groups with higher attrition rates (82.8% for the chatbot+human support group) and lower attrition rates (71.5% for the content-only group). This result is presented in Table A1 (Appendix A). The second concern relates to how attrition impacts the stability of group characteristics over time, which can render our dynamic analyses invalid. To assess this, we test the stability of baseline characteristics between the baseline and endline surveys, and the results are presented in Table A2 of Appendix A. As indicated in the table, the baseline attributes of the 147 entrepreneurs who responded to our endline survey are not statistically different from the initial sample of 461 participants, except for the representation of female entrepreneurs, which decreased from 23% in the initial survey to 14% in the endline. To address this imbalance, we introduce a gender control variable in our dynamic estimations, but acknowledge that this variation may pose challenges to the potential causal inference of our long-term comparative results.

2.4.3 Measures

Dependent Variables

We observe two blocks of outcome variables. The first block focuses on assessing the acquisition of knowledge by small entrepreneurs, including their learning and adoption of practices after participating in the training program, while the second block measures entrepreneurs' economic performance across various dimensions. To assess knowledge outcomes, our primary variable is an aggregate index of *Financial Literacy*², which follows specialized literature on literacy measurement (Holzmann et al., 2013; Kempson et al., 2013; OECD, 2018; Xu & Zia, 2012) and accounts for knowledge acquisition on both financial concepts and best practices. The index is measured as an average of the answers to 13 questions covering financial preferences, habits, and basic concepts. These questions do not require mathematical calculations but instead rely on participants' intuitive comprehension about three fundamental dimensions of financial literacy: inflation, interest compounding, and risk diversification (Lusardi & Mitchell, 2011).

² We calculate our Financial Literacy variable by aggregating the answers provided by participants to the questionnaire presented in Appendix C, sections 3 and 4. This procedure follows traditional financial literacy measures as adopted by existing literature (Holzmann, Mulaj, & Perotti, 2013; OECD, 2018). These same questions are utilized to formulate the sub-indices on Financial Behavior and Financial Knowledge, which correspond to aggregations of answers to questions from sections 3 and 4, respectively.

To be able to disentangle the specific effects of each one of the mechanisms—namely, financial literacy on basic knowledge and best practices—we disaggregate the main index into two sub-indices that serve as additional dependent variables in our models: *Financial Literacy – Basic Knowledge* (hereafter referred to as *Financial Knowledge*), which measures the capacity of the entrepreneurs to understand the meaning of the three basic financial concepts mentioned earlier; and *Financial Literacy – Behavior* (hereafter referred to as *Financial Behavior*), which accounts for daily habits and average behavior towards finance both in the workplace and at home. The entire questionnaire draws from the instruments employed by organizations such as the OECD and the World Bank (Holzmann et al., 2013; OECD, 2018) for measuring financial literacy across the world, and can be found at Appendix C.

We are also interested in understanding how the business training might have affected the performance of the small businesses. To that end, we use three dependent variables accounting for different performance dimensions. First, we measure *Profit* by calculating the difference between Earnings and Costs for the most recent month (and winsorizing it at the 0.01 level in both tails). Despite potential issues associated with this measure, such as omissions in responses or limited precision in the estimates (Anderson & Zia, 2016), it offers a broad perspective on how treatment may have impacted performance outcomes. Alternatively, we introduce $\log(\text{Sales})$, which accounts for the total sales generated by each entrepreneur via their partnership with the Fintech in the preceding three months. This measure is also winsorized at the 1st and 99th percentiles prior to the log-transformation. While this variable does not encompass the overall business performance, it is derived from an administrative dataset that is automatically computed by the Fintech, and therefore, is not subject to potential biases stemming from self-reported data (Wooldridge, 2010) or bad accounting practices.

Finally, we also consider *Debt*, a binary variable indicating whether entrepreneurs carried debt in the past month, based on their self-reported information in the survey. While Debt alone does not necessarily imply poor performance, as entrepreneurs may be leveraging their business through financing, examining the interplay between Debt, Sales, and Profit can provide a more nuanced perspective on how their businesses are evolving in terms of finance—if treatment promotes a positive effect on financial

literacy, entrepreneurs can be expected to better acknowledge the implications of long-term debt and reduce risky behavior, while simultaneously enhancing the focus on efficiency gains and cost-cutting, which consequentially increase their profits (Anderson et al., 2018).

Treatment Variables

To operationalize the analysis of distinct treatment groups, we define six dummy variables to account for pairwise comparisons. For instance, *Treatment_Content_x_Chatbot* is a dummy variable that takes the value of 1 if participants belong to the content-only group and 0 if they belong to the chatbot group. Similar dummy variables were created for each pairwise comparison, including those involving the control group: *Treatment_Content_x_Control*, *Treatment_Content_x_HumanSupport*, *Treatment_Chatbot_x_Control*, *Treatment_Chatbot_x_HumanSupport*, and *Treatment_HumanSupport_x_Control*. We also set a *Post* dummy variable, which indicates observations in the post-intervention period.

Control Variables

In robustness tests aimed at enhancing the statistical power of our estimates and addressing potential biases associated with the imbalance in our randomization method, we incorporate the following time-invariant control variables into our main model: a dummy variable indicating the participant's gender, a categorical variable transformed into a set of dummy variables representing the entrepreneurs' education levels, a dummy variable indicating whether participants have supplementary sources of income apart from their partnership with the Fintech, and a continuous variable capturing the participants' ages.

2.4.4 Econometric specification

We take advantage of the random assignment to estimate the intention-to-treat (ITT) effects of the training program. Our main model specification is given by:

$$Y_{i,t=1} = \beta_{ITT}D_i + \boldsymbol{\theta}X_i + \epsilon_{i,1},$$

where $Y_{i,t=1}$ is the outcome variable for entrepreneur i at the post-treatment survey ($t = 1$), and can represent either *Financial Literacy* measures, including both *Financial Knowledge* and *Financial Behavior*, or performance measures: *Profit*, $\ln(\text{Sales})$ and *Debt*. D_i is a dummy variable indicating treatment status (i.e., assignment to any of the three treatment groups), and β_{ITT} is the parameter of interest, which captures the intention-to-treat effect. X_i is a vector of covariates that are controlled for in robust versions of all regressions, and includes the strata to which entrepreneurs were allocated, alongside gender, age, schooling, and extra rent variables.

2.5 RESULTS

We start by analyzing the treatment effect (ITT) of each one of the provision modes on entrepreneurs' financial knowledge, practices, and business performance. This initial assessment allows us to preliminarily visualize how distinct modes of provision affected the entrepreneurs, laying the foundation for understanding the individual effects of each mode of provision. Then, we compare the results *between treatment groups*. Since treatment is additive—i.e., each treatment adds a new layer of support to the users, while maintaining content stable—, we are able to disentangle the effects of *modes of provision* from the impact of *content* itself by contrasting the content-only group with the remaining treatment groups. Furthermore, by comparing the results of the chatbot group with those of the human support group, we can identify potential complementarities (or tradeoffs) in using automated tools alongside human support.

2.5.1 Effects on managerial capital: knowledge and practices

We first evaluate whether training programs were capable of improving entrepreneurs' financial knowledge and practices. Table 3 presents the treatment effects of each mode of provision on entrepreneurs' financial literacy, with each column reporting the results for a distinct dependent variable: column [1] indicates the results of the full financial literacy index, while columns [2] and [3] relate to the sub-indices on financial behavior (or practices) and financial knowledge on basic skills, respectively. Panel A contains the treatment effects (ITT), which involve pairwise comparisons between each treatment group and the control group. Panel B focuses on the effects of the modes of provision, as we compare the content-only group with each of the other two treatment groups. Finally, Panel C provides the effects of introducing human support, presenting comparisons between the chatbot group and the chatbot+human support group.

INSERT TABLE 3 AND GRAPHS 1, 2 & 3 ABOUT HERE

Overall, the treatment neither impacts the financial literacy of the participants, nor enhances their capacity to understand basic financial concepts³, as indicated by the null effects from columns [1] and [2] in all panels ($p > 0.10$ for all treatment groups) and illustrated in Graphs 1 and 2. This finding goes in line with the mixed results documented in the existing literature on business training (Berge et al., 2015; de Mel et al., 2014; McKenzie & Woodruff, 2014), which suggests a lack of consistent impact on the financial literacy levels of small entrepreneurs, possibly due to variations in the content providers' ability to assess the needs of their target audiences (Avdeenko et al., 2021)⁴. However, by delving deeper into the results

³ The null effects over the absorption of knowledge on financial concepts were anticipated, since the treatment focused specifically on best practices, rather than discussing inflation, interest compounding and risk diversification in depth.

⁴ An alternative explanation to the null results encountered in our tests is the low statistical power available due to the size of our sample (461 individuals). To increase the credibility of our estimates, it is possible to compare the estimates with the minimum detectable effect (MDE) available in the current study. The MDE considering 80% power, 5% rejection rate, and the lowest pairwise subsample ($n = 178$, for comparing the content-only and the chatbot groups; mean = 8.09 and standard deviation = 2.19) has an MDE of 0.211 (Imbens and Rubin, 2015). This power calculation was carefully considered when estimating the required sample size for the study. Comparing the current MDE with the post-intervention estimates indicates that the null results reported in Table 3 are indeed reflective of the actual lack of effects of the program, instead of a consequence of low statistical power, since the observed effects are higher than the 0.211 standard deviations threshold.

and analyzing variations in financial behavior, a more nuanced picture emerges: while the *content* of the treatment doesn't affect any of the outcomes (panel A: $p > 0.10$ in both cases), the *mode of provision* varies the effectiveness of the training, actually yielding a negative effect of introducing the chatbot over the financial behavior of the entrepreneurs (coef = -0.450, $p < 0.05$), as illustrated in column [3] from panel A and in Graph 3. Additionally, results from panel B are consistent with the idea that the negative impact is driven by the mode of provision instead of the content itself (coef = -0.628, $p < 0.05$).

The inclusion of human support appears to attenuate this effect, as indicated by the null results from this group across panels A and B (coefs = -0.180 and -0.358, $p > 0.10$) and the positive coefficient—although not statistically significant—in column [3], panel C (coef = 0.270, $p > 0.10$). Together, these results suggest that, despite the content having a null effect, the chatbot may actually disrupt the learning experience, leading to a detrimental effect on participants' acquisition of best practices. Incorporating human agents as a complement to the automated device, however, counterbalances this knowledge transfer deficit, albeit not to a degree that generates a positive impact. In other words, the mode of provision is not only an important channel in explaining the ineffectiveness of business trainings in transferring knowledge to small entrepreneurs, but it can also be responsible for *negatively influencing* knowledge absorption outcomes.

2.5.2 Effects on business performance

Table 4 describes the treatment effects of each mode of provision on performance outcomes. Column [1] presents the results of our estimations using debt as the dependent variable. Columns [2] and [3], in turn, describe the effects on profits and sales, respectively. The structure of the table mirrors that of the previous one: panel A reports the treatment effects (ITT), panel B presents the modes of provision effects, and panel C exhibits the complementarity effects of integrating human support into the treatment.

INSERT TABLE 4 AND GRAPHS 4, 5 & 6 ABOUT HERE

In terms of profits, the analyses do not reveal any differential effect, irrespective of the mode of provision, as indicated by the null results in column [1] for all panels ($p > 0.10$ for all treatment groups) and

in Graph 4. This preliminary finding is also consistent with extant research on business training, which suggests that these programs are usually not effective in enhancing business performance (Berge et al., 2015; de Mel et al., 2014). In contrast, both sales and the level of indebtedness of the entrepreneurs were *negatively affected* by the intervention, specifically for participants from the chatbot+human support group. The treatment effect on sales exhibits a negative trend in both pairwise comparisons between the chatbot+human support group with the control group (panel A: coef = -0.458, $p < 0.05$) and with the chatbot group (panel C: coef = -0.553, $p < 0.05$), as illustrated in Graphs 5 and 6. That is, the inclusion of human agents as a complement to the chatbot appears to *decrease* the sales of the small entrepreneurs, and the results are driven by this additional layer of treatment rather than by the chatbot itself, which presents null effects across all panels ($p > 0.10$). It should be noted, however, that the effects of the human support treatment seem indistinctive from the content-only group, both in terms of statistical significance and in effect size (panel B: coef = -0.078, $p > 0.10$). These results suggest that it may be harder to dissociate the negative effects of human support from the content, than distinguishing human support from chatbot interactions.

Finally, when considering the indebtedness of the small entrepreneurs, the analyses show no direct treatment effect (ITT) (panel A: $p > 0.10$ for all treatment groups). However, pairwise comparisons between treated groups reveal that the probability of having debt is *higher* after the intervention among participants from the chatbot+human support group in comparison to the other two experimental groups (panel B: coef = 0.148, $p < 0.05$; and panel C: coef = 0.160, $p < 0.05$). These results support the idea that interacting with a human *increased* indebtedness, a finding that is also supported by the positive but not statistically significant coefficient of debt in panel A (coef = 0.096, $p > 0.10$). This means that joining two forms of interaction does not lead to favorable performance outcomes; instead, it creates a tradeoff in how knowledge acquisition is converted into performance. Once again, the mode of provision emerges as a pivotal factor in explaining the effectiveness of the business training, and a relevant moderator of program content effects.

In sum, our results indicate that neither the baseline non-interactive training, nor its combination with human and/or chatbot-based consistently impact knowledge acquisition, with the exception of an

adverse effect on practice adoption: participants who exclusively engaged with the chatbot exhibited *lower* levels of financial practice knowledge after the training program, compared to those in other modules. This suggests that the chatbot was less effective than other methods in conveying best practices to participants, and while human support did partially alleviate this negative effect, it did not lead to significantly greater learning than in other groups. In terms of performance, our analyses indicate that the program had no impact on business profits, but both sales and the level of indebtedness of the entrepreneurs were negatively affected by the intervention, particularly among participants in the chatbot+human support group. These findings emphasize the importance of exercising caution when employing digital technologies to assist small entrepreneurs in underserved communities, as the intended outcomes may not materialize as initially planned.

2.5.3 Additional analysis: the role of digital literacy

Given the phenomenological nature of our study, a set of open questions remain concerning the empirical mechanisms underlying our main results. In an effort to better explain such channels, we conduct a series of heterogeneity tests incorporating alternative variables as moderators of the main effects. In the following cases, as the intervention was not specifically designed to analyze the effects stemming from individual traits but rather from the treatment itself, it is important not to interpret the coefficients as causal estimates; instead, they should be regarded as correlational analyses. In those cases, we include interaction terms between the treatment dummies and alternative entrepreneurs' individual traits, such that our specification becomes:

$$Y_{i,t=1} = \beta_{ITT}D_i + \beta_2 Indep_Variable_i + \beta_3 D_i * Indep_Variable_i + \theta X_i + \epsilon_{i,1}$$

The parameter of interest is β_3 , which indicates the effect of the interaction between the treatment status variable and the chosen independent variable. The remainder of the model follows the same structure as the baseline specification, as explained in section 4.4.

In line with our previous discussion, it is possible that our detected null and/or negative results derive from the severe constraints that our target population faces, limiting their ability to understand and/or apply the provided content, even with the added digital or human support. In particular, participants' varying levels of digital literacy may have affected their ability to engage with the automated platform. The activities and interactions from our training were intentionally designed to be as simple as possible and took place only through WhatsApp, a platform that all participants already used daily. However, since the entire training effort was transmitted via a digital platform and the chatbot treatment required participants to interact with an algorithm, several digital literacy-related obstacles could be relevant. First, each time an activity concluded, entrepreneurs in the chatbot group had to request the algorithm to advance to the next module. This requirement did not apply to the content-only group, where participants received the content irrespectively of any interaction; and may have been alleviated for participants in the chatbot+human support group, who could seek assistance if they noticed that the course had stopped. Second, participants interacting with the chatbot also needed to customize how they received the content by selecting from a menu of options provided by the algorithm. While this customization offered practical benefits in tailoring the content to each user's needs, understanding how to proceed without human assistance may have posed challenges for entrepreneurs with lower levels of digital literacy. Finally, even when participants were successful at navigating through the content, some of them may have been averse to engaging with a chatbot, and this aversion could be more pronounced among individuals with limited digital literacy (Allen & Choudhury, 2022).

In sum, we posit that participants with lower levels of digital literacy may have faced a series of additional challenges when dealing with the chatbot than the other treated groups. We test for this mechanism by adding a proxy of *Digital Literacy* as an interaction with the treatment dummy in a model considering financial literacy as the dependent variable. This proxy consists of an index representing the average value among five dummy variables derived from participants' responses to questions related to

their use of mobile payment methods, online banking, and digital business registration⁵. Table 5 reports the results for each pairwise comparison between experimental groups. Our findings are consistent with the proposed mechanism, indicating that participants in the chatbot group with higher levels of digital literacy exhibit greater financial literacy improvement after the treatment compared to those in the content-only group (column [4]: coef = 0.972, $p < 0.05$). All remaining interactions yield null results ($p > 0.10$), further corroborating the channel described above, which should only apply for the chatbot group. Graph 7 illustrates that these results primarily stem from a significant difference in Financial Literacy levels among individuals *with lower levels of Digital Literacy* post-treatment, rather than those with higher literacy levels, who appear to be less compromised in absorbing the content of the program. Essentially, a lack of digital literacy appears to hinder learning among participants in the chatbot group compared to the content-only group (Graph 7, panel D). Ex-post interviews with participants support this idea, suggesting that the negative impact of the chatbot may have stemmed from a more confusing learning experience compared to straightforward transmission or guidance from human agents, who can help clarify the content, also supporting our argument on digital illiteracy as a determinant factor.

INSERT TABLE 5 AND GRAPH 7 ABOUT HERE

2.5.4 Post-hoc analysis: the heterogeneous effects of individual engagement

A second puzzling effect that emerged in the main results is related to the decline in sales among participants from the chatbot+human support group in the period following treatment. While no clear theoretical mechanism was able to provide explanations on the potential mechanisms underlying this relationship, a provisional interpretation emerged during the interviews. When asked about the importance of human support during the training, participants highlight the assistance in explaining the content, solving

⁵ For a detailed discussion of the calculation and the reliability of this measure, please refer to Appendix E.

technical issues, and creating a feeling embracement and understanding, which is absent in interactions with the chatbot. The following excerpts from the interviews illustrate these perceptions:

“[With the chatbot,] I don’t feel understood. I have to talk a lot and explain a lot to be understood. A human allows for easier explanations.” (Participant A from the chatbot+human support group.)

“They [human support] made a difference in terms of providing support. They didn't affect engagement, but they helped provide complete confidence in learning.” (Participant B from the chatbot+human support group.)

“I think it [human support] is important because we don't have much experience with new systems and technologies. There's so much innovation and the possibility of fraud that often we don't know what to do. So, it gives us more confidence and credibility for those who are giving us an opportunity.” (Participant C from the chatbot+human support group.)

Building upon these insights, we propose that participants that are more engaged with the program are better able to leverage the support provided by humans in comparison to less attentive entrepreneurs (Estefan et al., 2023; Mehmood, 2023). In other words, we propose that engagement might be affected by treatment and, consequentially, influence its effects on sales. To empirically examine this channel, we tested the mediating effect of participants’ level of engagement with the training on sales. *Engagement* is measured by directly accounting for entrepreneurs’ progress in the course using a continuous variable that reflects the percentage of activities accessed during the training. It’s worth noting that engagement measures are consistently comparable only between the chatbot group and the chatbot+human support group, as these are the only two groups for which data on engagement is available. Thus, the estimations presented in Table 6 account for pairwise comparisons among those two groups.

INSERT TABLE 6 ABOUT HERE

Results suggest that engagement does not mediate the impact of treatment on sales, as indicated both by the null effects from treatment on engagement (row [1], coef = -0.121, $p > 0.10$) and the null effects of engagement on sales (row [2], coef = 0.055, $p > 0.10$). Additionally, and most importantly, the mediation analysis indicates that the effects from engagement represent 0.08% of the total effect from treatment on sales (row [3], % of total effect mediated = 0.008).

Alternatively, instead of observing engagement as a mediator, we propose that it may act as a moderator of the treatment effects, because it might be capturing fixed individual traits related to participants' propensity to learn and engage with the training –that is, engagement is not affected by treatment, and actually consists of an intrinsic characteristic of the entrepreneur. We empirically test the moderating effect of participants' level of engagement with the training on sales by including *Engagement* as an interaction term in our main regression, as specified in section 5.3. We also integrate two alternative measures of engagement in our analyses: *High Engagement*, a dummy variable identifying participants who accessed at least 75% of the modules in the business training; and *Low Engagement*, a dummy variable that takes value 1 if participants accessed less than 25% of the modules, and 0 otherwise. The results are presented in Table 7.

INSERT TABLE 7 ABOUT HERE

The results are consistent with the proposed mechanism, indicating that the higher the level of engagement among participants from the chatbot+human support group, the higher their sales in comparison to the chatbot group (column [1], coef = 0.695, $p < 0.05$), reversing the negative result obtained in the main analyses. Alternative measures of engagement also support this argument: entrepreneurs with the lowest engagement exhibit lower sales figures post treatment (column [2], coef = -1.466, $p < 0.05$), while

the most engaged ones experience an increase in their sales in the same period (column [3]: coef = 1.279, $p < 0.05$).

To circumvent the restrictions posed by the lack of engagement data for the control and content-only groups, which renders the use of interaction terms impractical, we deploy a series of alternative tests comparing the most engaged individuals from either the chatbot group or the chatbot+human support group with both their less active counterparts and participants from the other experimental groups. The results are presented in Table 8, where columns [1]-[5] depict pairwise comparisons between groups, and columns [6]-[7] present the results of comparing the most engaged individuals from the chatbot group or the chatbot+human support group with the rest of participants from their respective groups. The findings are consistent with our proposition, indicating that being more engaged has a *positive effect* on sales among participants in the chatbot+human support group (column [2]: coef = 0.789, $p < 0.01$; column [4]: coef = 0.511, $p < 0.10$; column [7]: coef = 0.792, $p < 0.05$). In contrast, varying engagement does not affect the sales of entrepreneurs from the chatbot group, as evident from the null results from columns [1], [3], [5] and [6]. This latter result further reinforces the idea that the engagement mechanism applies solely for entrepreneurs in the chatbot+human support group, who can leverage a human assistance during the training program that is not present among the other participants.

INSERT TABLE 8 ABOUT HERE

Evaluating the effects of the training over time

In a final step, we examine the long-term effects of the intervention, focusing on determining whether the adverse impact of the chatbot on the practices adopted by the entrepreneurs, as well as the declines in sales levels and increases in indebtedness resulting from the addition of human support, persist over time. The results are presented in Table 9, where Panel A displays the dynamic results related to knowledge acquisition and Panel B reports the dynamic performance outcomes. The modelling approach follows an event study design, with the interactions between each treatment and each period detailed in the

rows. These results are more conservative than the main findings, indicating that, when dynamically comparing units with the baseline survey, the negative effects of the human support on sales dissipate (column [5], coef = -0.037, $p > 0.10$). On the other hand, the negative impact on debt remains (column [6], coef = 0.151, $p < 0.05$), as does the reduction in financial literacy levels –now identified in the financial literacy index instead of the financial behavior sub-index—generated by the chatbot (column [1], coef = -0.753, $p < 0.05$). In all cases, however, the effects are only observable in T=1, and tend to disappear in the subsequent periods. This reinforces the idea that, after recognizing a performance decline, entrepreneurs revert their actions to a more cautious perspective and stabilize the operations.

INSERT TABLE 9 ABOUT HERE

In sum, based on these additional analyses, we conclude that a potential explanation to our null or negative results has to do with the limitations imposed by the lack of digital literacy among participants, which presents challenges in navigating automated platforms and consequentially results in a more disturbed learning experience compared to the straightforward guidance provided by human agents who can clarify the content. Moreover, the level of engagement of the participants also emerges as a crucial factor in moderating the negative effects on performance associated with the human support: less attentive entrepreneurs were found to incur in a temporary decline in sales after the training. However, this effect is not sustained over time. Upon recognizing this performance downturn, entrepreneurs quickly revert to a more cautious perspective, stabilizing the operations, as indicated in our long-term results.

Apart from the presented mechanisms, a bundle of additional exploratory tests was implemented, considering demographic and socioeconomic attributes of the entrepreneurs, as well as characteristics of the businesses, as potential explanatory variables. None of the tests yielded any significant result. A summary of those analyzes can be found in Table A4 from Appendix A, and more detailed results can be shared by the authors upon request.

2.6 DISCUSSION AND CONCLUSION

There has been growing interest in strategies to address the constraints that firms and entrepreneurs face in underserved regions (Boulongne et al., 2022; Burbano et al., 2023; Durand & Huysentruyt, 2022; George et al., 2016; Lazzarini, 2020; McGahan et al., 2013; Pongeluppe, 2022; Singh et al., 2022). Particular enthusiasm has been put on the potential of digital technologies to enhance access to populations in remote and underserved regions while reducing operational and implementation costs (Barnett et al., 2020; George et al., 2021; International Finance Corporation, 2017). However, the inherent effectiveness of digital technologies must be seen with caution: their success may be highly contingent upon the ability of the target audiences to engage with the presented content and on the type of support provided to these individuals (DiMaggio et al., 2004; Karnani, 2007; Lazzarini, 2020). This paper investigates the responses of small entrepreneurs in underserved regions to variations in the mode of provision of digital business training programs. Specifically, it explores the effect of digital content transfer and the interplay between automated tools and human support, as well as the underlying mechanisms at play. To empirically examine these phenomena, we conducted a randomized controlled trial involving 461 Brazilian small entrepreneurs from underserved regions who participated in a business training program focused on improving their financial literacy skills. Our results suggest that, in contexts where small entrepreneurs struggle to operate or even understand digital platforms, the outcomes arising from business trainings can actually yield a negative impact. Thus, in such cases, the use of digital technologies should be approached with caution and tempered enthusiasm.

Our findings contribute to the literature that explores how firms adjust their strategies when engaging with individuals from underserved regions (Boulongne et al., 2022; Durand & Huysentruyt, 2022; Pongeluppe, 2022), that pertains to the broader field in Strategy that investigates the conditions under which organizations create social value (Flammer, 2015; George et al., 2016; Kaul & Luo, 2018; Lazzarini, 2020; McGahan et al., 2013; Portocarrero & Burbano, 2023). Specifically, we identify a circumstance in which the use of algorithms leads to a negative impact on knowledge acquisition, and the combination of algorithms and human support results in reduced business performance. When combined, these findings

suggest that the effectiveness of algorithms and digital technologies may be *context-specific*, depending on the contingencies in which they are deployed and the characteristics of their target audience (Allen & Choudhury, 2022). Thus, firms seeking to engage with individuals from these communities may need to adapt their strategies accordingly.

We also add to the literature that investigates the effects of business training on the practices and performance of small entrepreneurs (Anderson et al., 2018; Brooks et al., 2018; de Mel et al., 2014; McKenzie & Woodruff, 2014; Otis et al., 2023). By empirically demonstrating the significance of the mode of provision as a moderator of the effects of training program content (Dammert & Nansamba, 2023; Drexler et al., 2014; McKenzie et al., 2021), we illustrate that the effectiveness of digital technologies in transferring knowledge is not homogeneous across different platforms and is contingent upon the characteristics of the target audience. Moreover, these effects may not necessarily align with expectations, as the adoption of technology remains limited in developing countries, making underserved groups and communities less prone to adopt automated tools (Van Dijk, 2020). Additionally, we contribute to the research by identifying the partial success of incorporating human support in mitigating confusion effects that may arise when introducing users from underserved regions to new technologies. However, we also highlight the limitations of this assistance, particularly due to participants' lack of engagement (Cole et al., 2023; Mehmood, 2023; Nguyen et al., 2023).

Our study also has implications for practice, particularly for organizations aiming to enhance the capabilities of small entrepreneurs in underserved regions, who often lack high-quality human and financial capital, while also facing various institutional and market challenges in their operations (Berge et al., 2015; Bloom & Van Reenen, 2010; Bruhn et al., 2010; Duflo & Banerjee, 2011; Karnani, 2007; Kistruck et al., 2015; Pissarides et al., 2003). Digital platforms have been lauded as cost-effective alternatives to reach these underserved customers, potentially increasing their businesses' prosperity and contributing to the reduction of inequalities and poverty alleviation. This study contributes to both the cost and the effectiveness sides of this discourse. From an effectiveness standpoint, we extend the discussion by demonstrating that, under specific circumstances of low digital literacy, digital platforms are not only

ineffective but can actually hinder the absorption of content in real-world applications. Therefore, it is crucial to exercise caution when selecting the appropriate mode of provision and level of automation, with a keen focus on the needs and initial endowments of the target audience (Anderson et al., 2018; Avdeenko et al., 2021; Otis et al., 2023). On the other hand, from a cost perspective, we reveal that although human support can be beneficial in mitigating issues related to content absorption confusion, it does not necessarily lead to improvements in engagement or increased profitability. Therefore, depending on the situation, training programs can be designed to promptly address the technical challenges faced by users without the necessity of maintaining a full staff of human tutors. This not only conserves financial resources but also provides the flexibility to allocate these funds for alternative purposes, such as enhancing program content or expanding its scope to accommodate more participants.

Given the empirical nature of our study, it carries a series of limitations that should be acknowledged. First, while implementing a randomized controlled trial enhances internal validity by reducing endogeneity issues and improving causal identification (Angrist & Pischke, 2009), this increased internal validity comes at the expense of external validity. As a result, our findings may apply primarily to the specific population under observation, making it challenging to extrapolate to distinct contexts. In fact, while our study covers a great portion of entrepreneurs across Brazil, we recognize that the circumstances faced by small entrepreneurs from other underserved regions may be significantly different. For instance, some populations may have even less access to digital platforms than Brazilians have to WhatsApp, potentially yielding adverse outcomes not covered by our findings. Secondly, although we can access administrative data on the sales of the entrepreneurs through their partnership with the Fintech, this measure does not encompass their entire sales volume during the specified period. Moreover, our alternative measurements of performance –profits and debt— rely on self-reporting and are not cross-referenced with other data sources, which could result in inconsistencies in post-treatment reports as a consequence of the intervention itself. Thus, despite the consistency of our findings, some of the long-term null effects may be partly influenced by data collection issues and attrition, instead of treatment effects. Finally, the explanatory variables we employ to test for mechanisms are not subject to randomization, so the explanations we offer

for the underlying channels should be regarded as provisional and call for further investigation. It's also worth noting that these mechanisms could undergo drastic transformations with the introduction of emerging technologies like generative AI (Otis et al., 2023), which can profoundly reshape the interaction capabilities of chatbots, but these aspects remain unexplored in our current study.

Despite the technical limitations of our study, we believe that our efforts to position the mode of provision at the forefront of the discussion regarding the effectiveness of digital business training programs can act as a catalyst for future research. A first natural extension would be to study the effectiveness of alternative modes of provision in attending underserved populations. For instance, factors such as the medium used for content transmission (e.g., video, audio, text, SMS), the choice of platform (e.g., PC or mobile phone), or the degree of automation within an interactive system (e.g., human support, chatbots, AI) may play pivotal roles in elucidating the effectiveness of various programs, depending on the preferences and habits of the participants. Furthermore, the complementarity between different modes of provision and distinct types of content may also be a determining factor. For example, mentoring programs may benefit more from incorporating human support sessions than other types of training (Lafortune et al., 2018). Conversely, marketing programs might derive greater advantages from utilizing visual tools focused on enhancing sales strategies, as opposed to financial training programs (Anderson et al., 2018). Hence, future research could delve deeper into the advantages and trade-offs of combining various types of content with alternative modes of provision, as this represents an area that warrants further investigation.

Lastly, our study shows the importance of context-specific factors and the preferences of target audiences as pivotal determinants of success of firm action in underserved regions (Boulongne et al., 2022; Durand & Huysentruyt, 2022; Pongeluppe, 2022). For instance, some groups may exhibit lower levels of digital illiteracy due to their increased interest in accessing social media content and sharing it with their respective communities and families. Conversely, in situations where access to digital platforms is nearly absent, there may be a cultural resistance to technology that hampers the effectiveness of digital tools. Future research should aim to further investigate the intricate interplay between distinct modes of provision and diverse contexts, as this endeavor has the potential to yield valuable insights into the conditions under

which current digital advancements can be harnessed to create social value (Berg et al., 2023). We hope our present study will serve as a catalyst for future inquiries in this field, ultimately contributing to improving the lives of small entrepreneurs from underserved regions worldwide.

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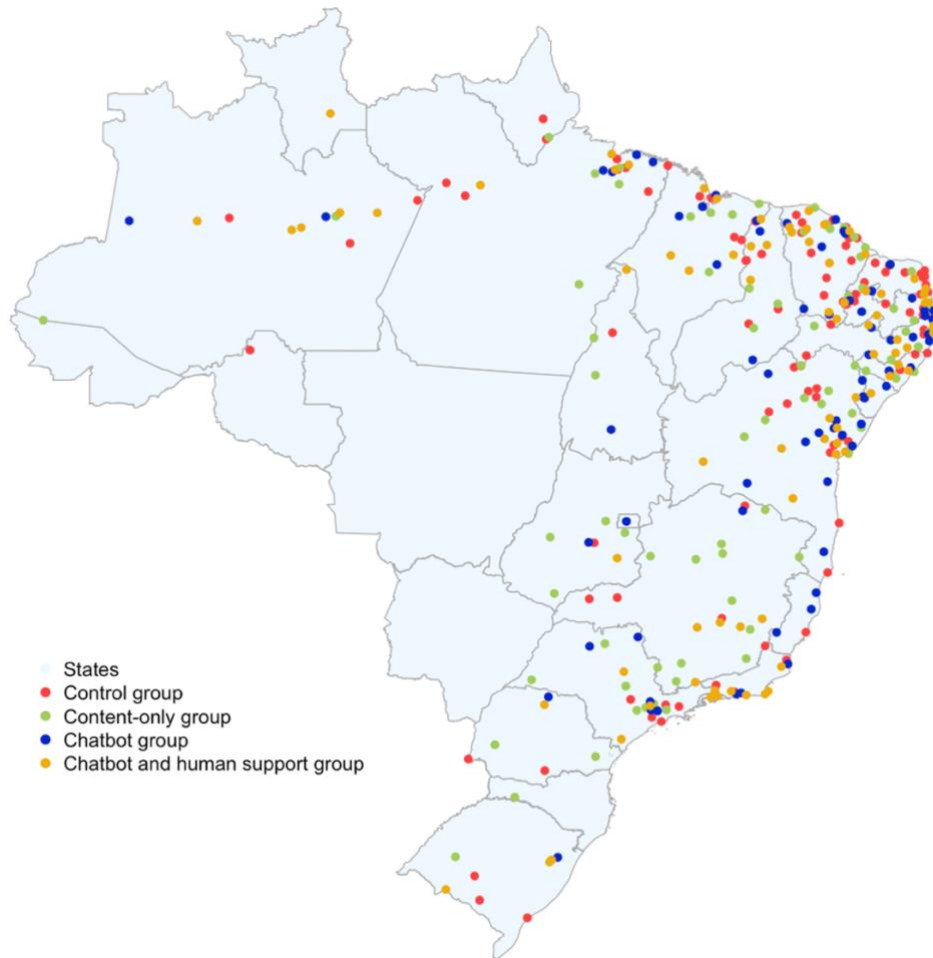
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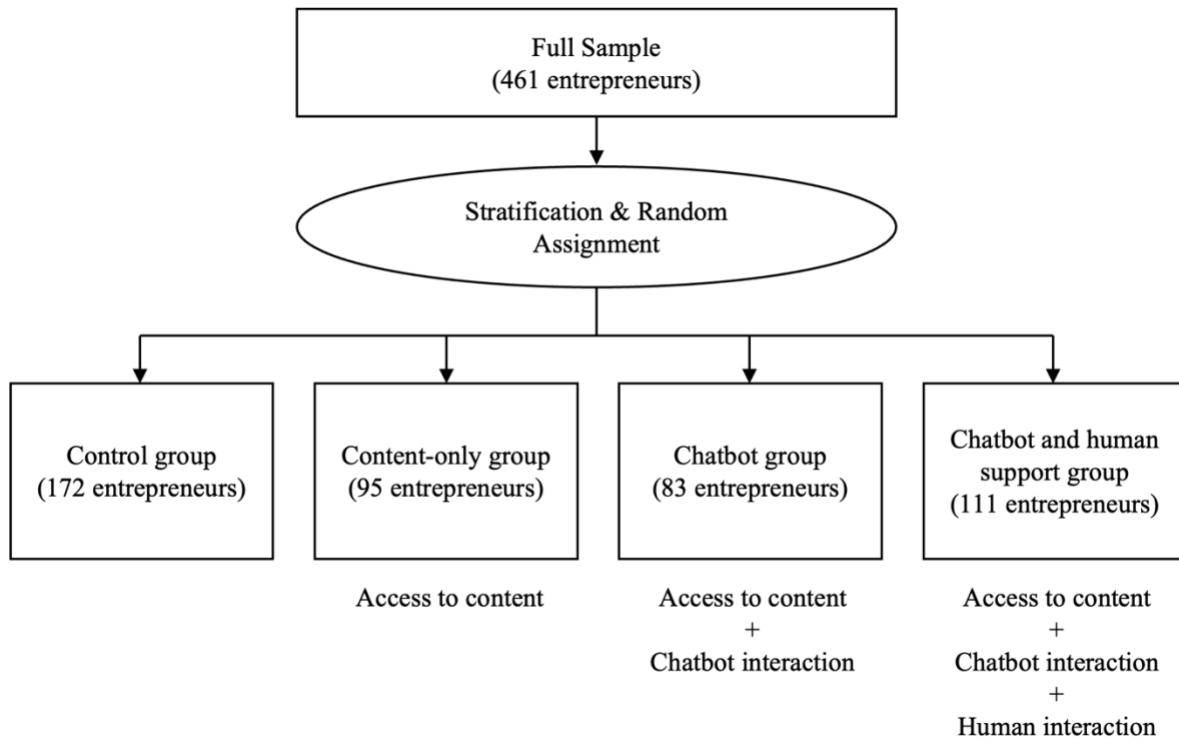
FIGURES AND TABLES

Figure 1 – Location of the participants



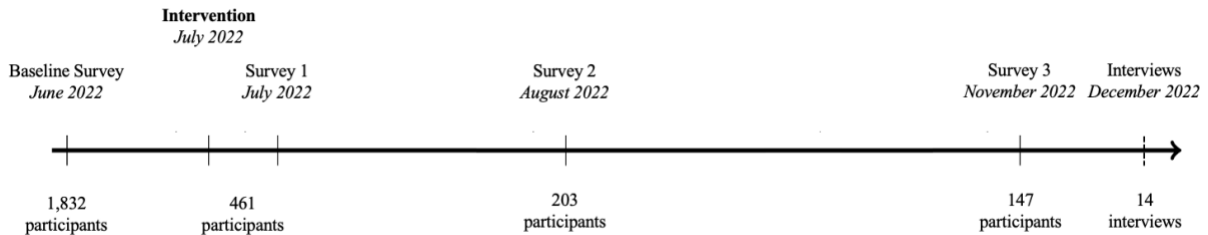
Note: This figure shows the distribution of participants throughout Brazil. A notable concentration of participants can be observed in coastal areas, reflecting the higher population density in these regions. Additionally, there are no participants from select states in the North and Midwest regions due to the Fintech's lack of operations in these locations.

Figure 2 – Experimental design



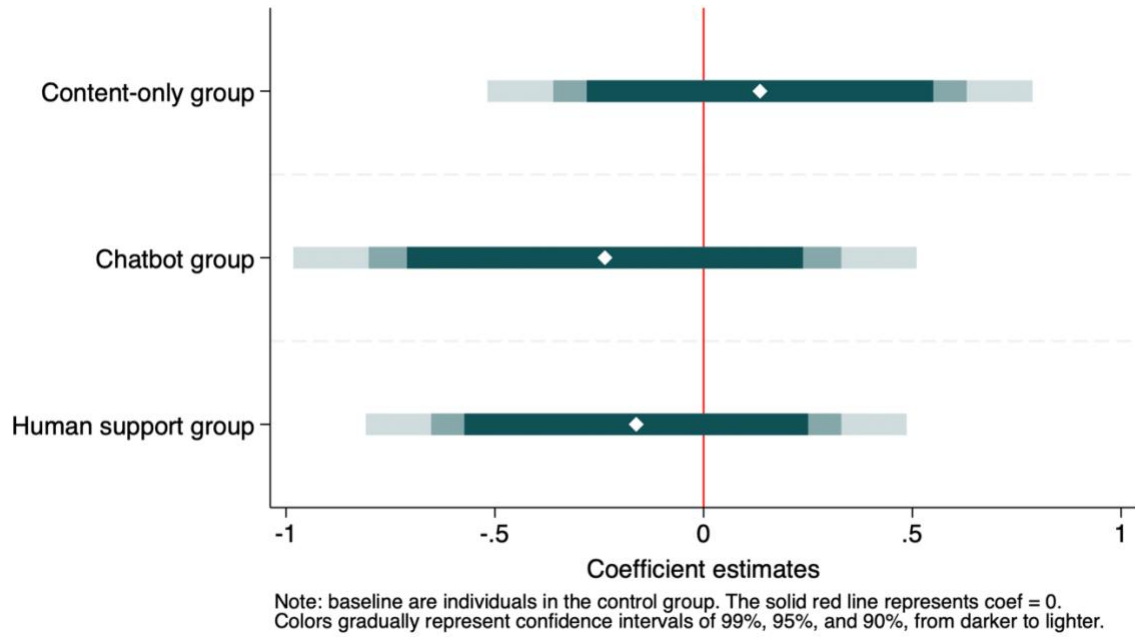
Note: This figure shows the experimental design of the study. The values in parentheses indicate the number of participants in each experimental group during the intervention and the post-treatment survey. Below each experimental group, we briefly describe the layers of treatment participants were subject to.

Figure 3 – Timeline: intervention and data collection

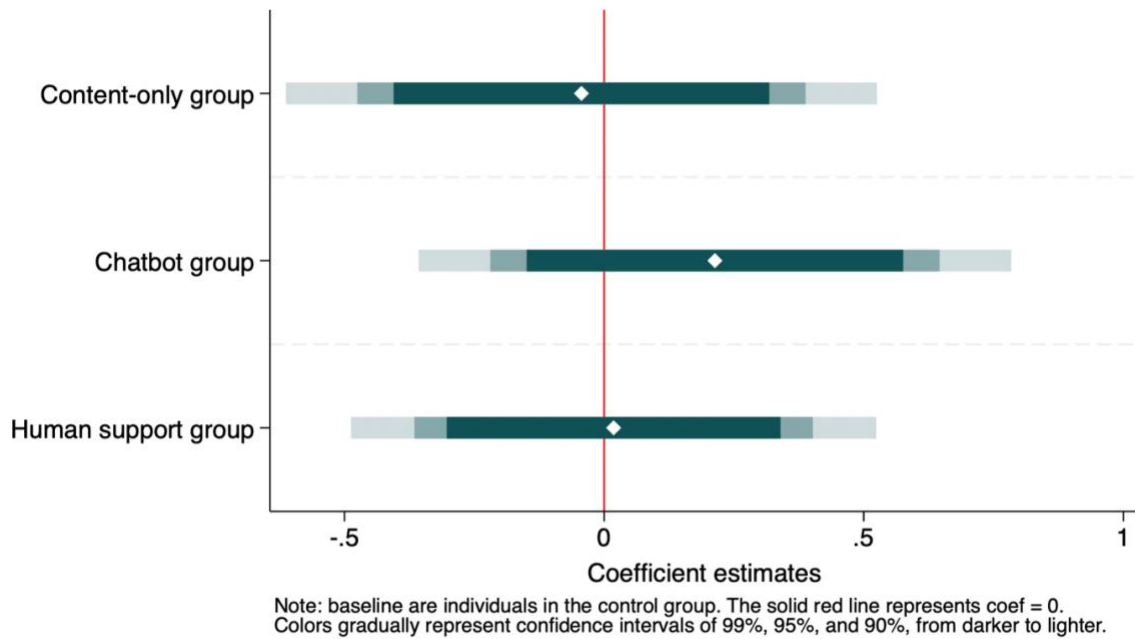


Note: This figure shows the timeline of the intervention and data collection. We conducted four surveys: baseline, post-treatment (survey 1), midline (survey 2) and endline (survey 3). Following the endline survey, we also conducted a series of interviews with participants from the treated groups. The number of participants in each round is displayed at the bottom of the figure.

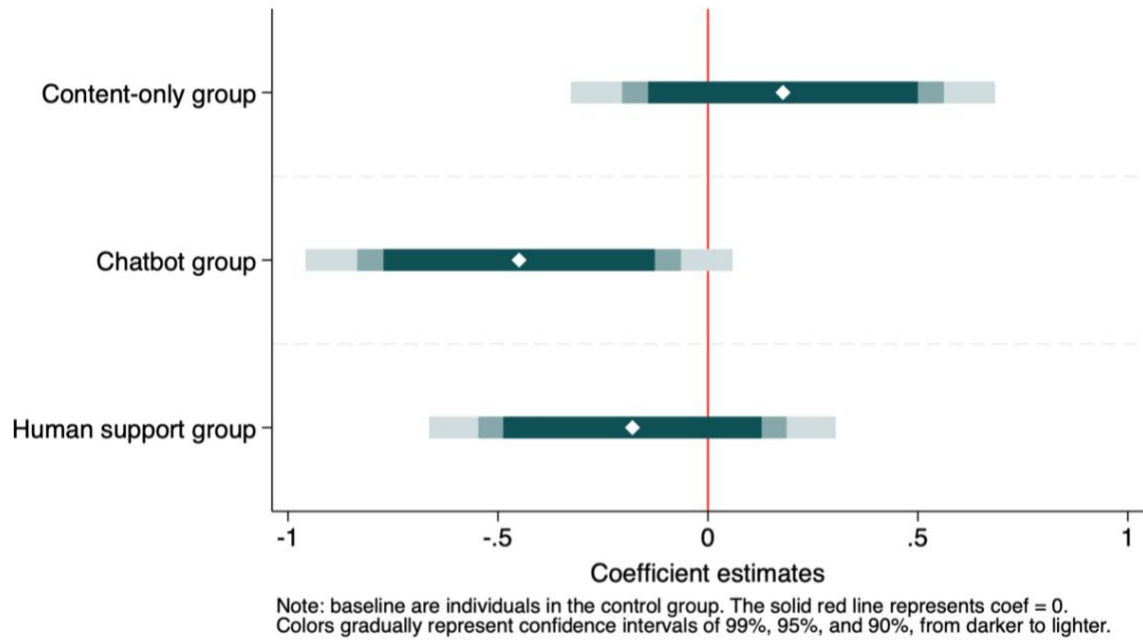
Graph 1 – Treatment Effects over Financial Literacy



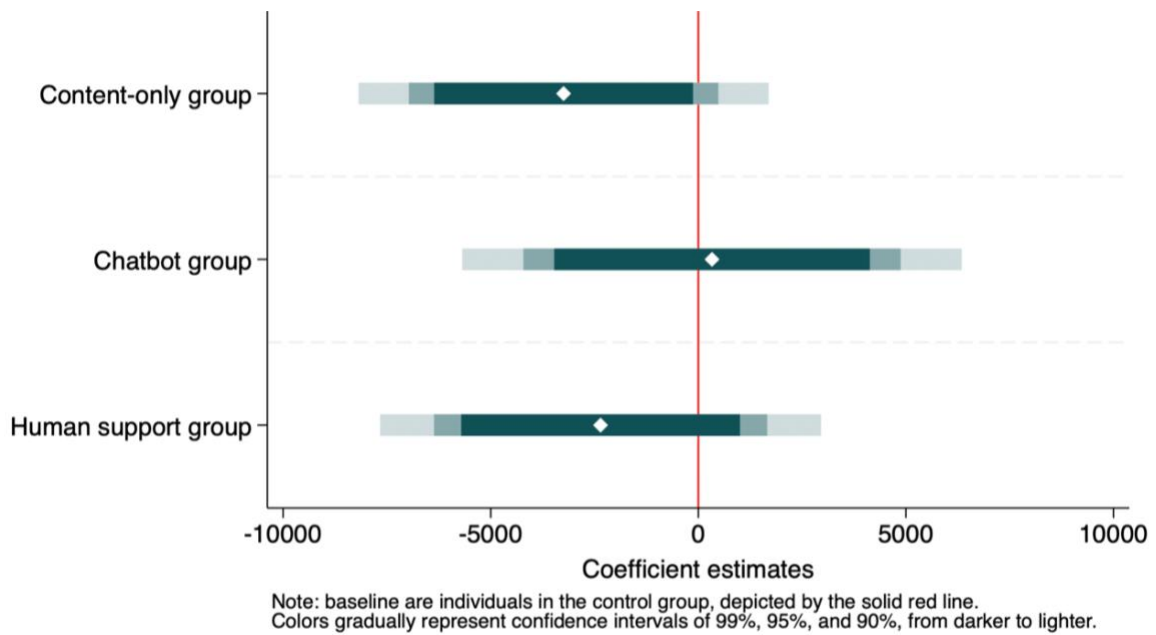
Graph 2 – Treatment Effects over Financial Knowledge



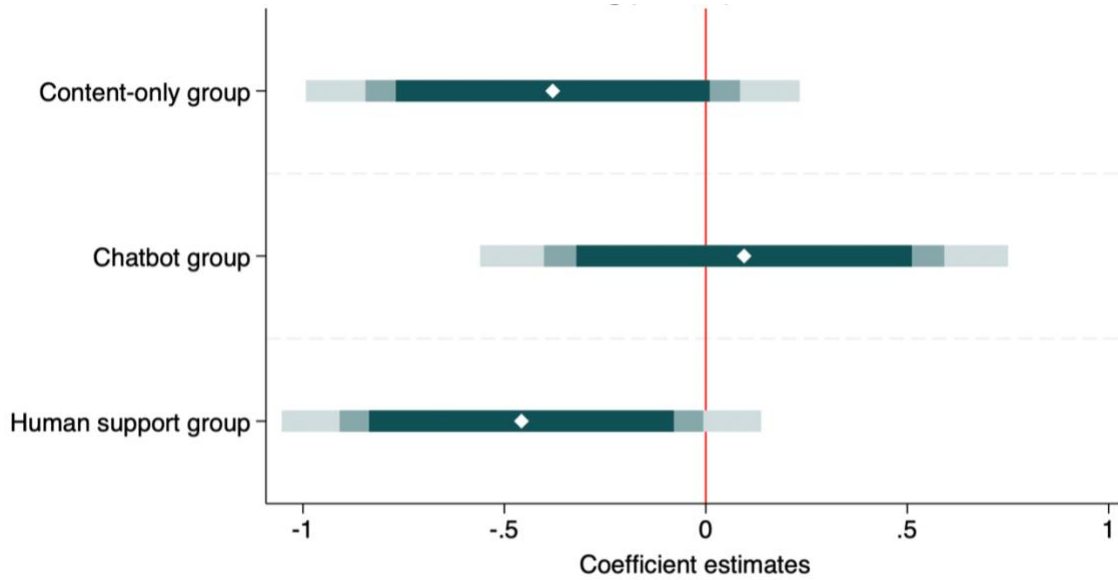
Graph 3 – Treatment Effects over Financial Behavior



Graph 4 – Treatment Effects over Profit

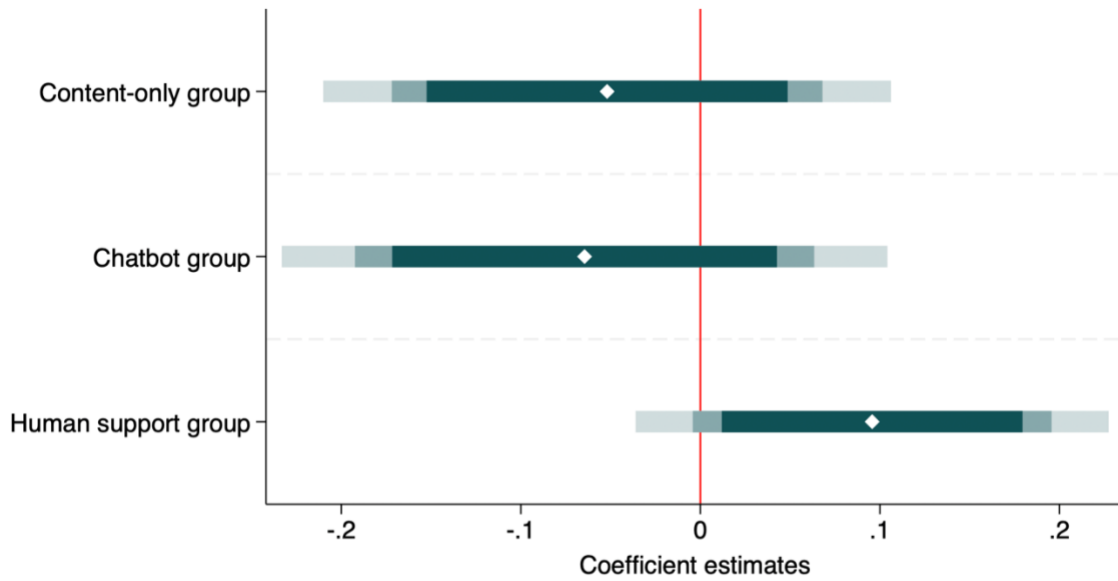


Graph 5 – Treatment Effects over log(Sales)



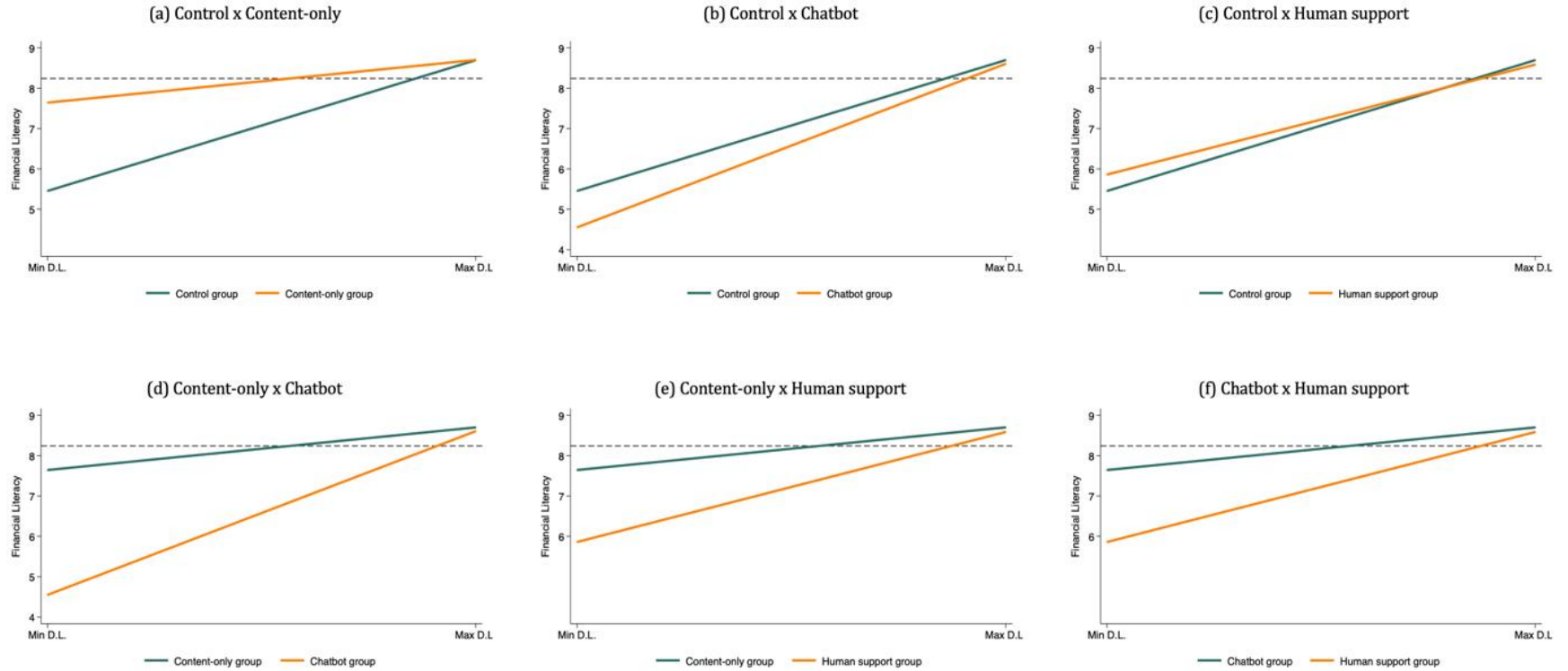
Note: baseline are individuals in the control group, depicted by the solid red line. Colors gradually represent confidence intervals of 99%, 95%, and 90%, from darker to lighter.

Graph 6 – Treatment Effects over Indebtedness



Note: baseline are individuals in the control group, depicted by the solid red line. Colors gradually represent confidence intervals of 99%, 95%, and 90%, from darker to lighter.

Graph 7 – Moderation Effect: Digital Literacy



Note: This graph presents the effects of including Digital Literacy as a moderator of the treatment effects over Financial Literacy, in regressions that follow the specification described in Section 5. Each panel represents the marginal effects (at the lowest and highest Digital Literacy levels) of the interaction term between Digital Literacy and the Treatment Dummy over Financial Literacy. All pairwise comparisons between experimental groups are considered.

Table 1 – Baseline characteristics

	Mean	S.D.	Min	Max	ANOVA F
Panel A: Entrepreneur characteristics					
Age	37.40	8.69	18.00	68.00	0.94
Female	0.23	0.42	0.00	1.00	0.05
Share of entrep. with secondary education	0.88	0.31	0.00	1.00	0.79
Share of entrep. with additional income source	0.84	0.36	0.00	1.00	0.86
Panel B: Financial behavior					
Share of indebted entrepreneurs	0.75	0.43	0.00	1.00	0.50
Share of entrep. keeping business and HH finances separately	0.75	0.43	0.00	1.00	0.21
Financial Behavior Index	5.33	1.71	0.00	9.00	0.74
Financial Knowledge Index	2.72	1.33	0.00	5.00	0.14
Financial Literacy Index	8.05	2.03	1.00	13.00	0.12
Panel C: Business characteristics					
Average amount of transactions (3-months)	333.35	735.33	8.00	9211.00	0.62
Average sales (in Reais, 3-months)	49475.8	101550.8	198.00	535460.4	0.33
Profit (last month)	5048.73	12184.06	-21000.0	95000.00	0.35

Note: This table contains summary statistics from the baseline survey (June 2022), including all small entrepreneurs that took part in the intervention (N = 461). Column ANOVA-F presents the F-statistic from an ANOVA testing the balance of baseline characteristics across the four experimental groups.

Table 2 – Business Training Attendance

Group	Panel A: Average attendance (n. of modules attended)		Panel B: Share of participants with 100% attendance	
	Mean	S.D.	Mean	S.D.
Content-only group	2.28	1.65	0.11	0.32
Chatbot group	2.35	1.61	0.15	0.36
Chatbot+human support group	2.23	1.54	0.17	0.37
Average between groups	2.27	1.58	0.14	0.35
ANOVA-F	0.931		0.525	

Note: This table presents the outcomes of ANOVA tests conducted on attendance balance across the experimental groups in the business training program.

Table 3 – Effects on knowledge and practices

Panel A: Treatment Effects (ITT - Treated vs Control Group)			
	Financial Literacy (1)	Financial Knowledge (2)	Financial Behavior (3)
Content-only group	0.135 (0.251)	-0.044 (0.219)	0.179 (0.194)
Chatbot group	-0.236 (0.287)	0.213 (0.219)	-0.450* (0.196)
Chatbot+human support group	-0.161 (0.249)	0.018 (0.195)	-0.180 (0.186)
Mean Control group	8.296	2.738	5.558
S.D. Control group	2.048	1.691	1.495
Observations	461	461	461

Panel B: Mode of Provision Effects (Treated vs Content-only Group)			
	Financial Literacy (1)	Financial Knowledge (2)	Financial Behavior (3)
Chatbot group	-0.371 (0.325)	0.257 (0.265)	-0.628* (0.241)
Chatbot+human support group	-0.296 (0.283)	0.062 (0.236)	-0.358 (0.231)
Mean Content-only group	8.431	2.694	5.736
S.D. Content-only group	1.949	1.804	1.592
Observations	289	289	289

Panel C: Human Support Effects (Chatbot vs Chatbot+human support Group)			
	Financial Literacy (1)	Financial Knowledge (2)	Financial Behavior (3)
Chatbot+human support group	0.075 (0.309)	-0.195 (0.233)	0.270 (0.229)
Mean Chatbot group	8.060	2.951	5.108
S.D. Chatbot group	2.193	1.710	1.530
Observations	194	194	194

Note: This table presents the treatment effects of being assigned to a treatment group (ITT). Panel A reports the results of comparisons between each treated group and the control group. Panel B displays the coefficients of comparisons between the content-only group and the remaining treatment groups. Panel C presents the results from comparing the outcomes from the chatbot group with the chatbot+human support group. The Mean and the Standard Deviation of the base comparison group are presented in the bottom of each panel. We follow the specification described in Section 4, and all models include controls for strata. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 4 – Effects on business performance

Panel A: Treatment Effects (ITT - Treated vs Control Group)			
	Profit (1)	log(Sales) (2)	Debt (3)
Content-only group	-3.245 (1.875)	-0.380 (0.236)	-0.052 (0.061)
Chatbot group	0.330 (2.289)	0.095 (0.252)	-0.065 (0.065)
Chatbot+human support group	-2.354 (2.022)	-0.458* (0.229)	0.096 (0.051)
Mean Control group	6.080	9.594	0.715
S.D. Control group	15.253	1.860	0.452
Observations	237	459	461

Panel B: Mode of Provision Effects (Treated vs Content-only Group)			
	Profit (1)	log(Sales) (2)	Debt (3)
Chatbot group	3.575 (1.848)	0.475 (0.273)	-0.013 (0.073)
Chatbot+human support group	0.891 (1.584)	-0.078 (0.247)	0.148* (0.064)
Mean Content-only group	2.835	9.214	0.663
S.D. Content-only group	6.367	1.907	0.475
Observations	148	288	289

Panel C: Human Support Effects (Chabot vs Chatbot+human support Group)			
	Profit (1)	log(Sales) (2)	Debt (3)
Chatbot+human support group	-2.684 (2.047)	-0.553* (0.269)	0.160* (0.065)
Mean Chatbot group	6.410	9.689	0.650
S.D. Chatbot group	12.065	1.804	0.479
Observations	108	193	194

Note: This table presents the treatment effects of being assigned to a treatment group (ITT). Panel A reports the results of comparisons between each treated group and the control group. Panel B displays the coefficients of comparisons between the content-only group and the remaining treatment groups. Panel C presents the results from comparing the outcomes from the chatbot group with the chatbot+human support group. The Mean and the Standard Deviation of the base comparison group are presented in the bottom of each panel. We follow the specification described in Section 4, and all models include controls for strata. The Sales and the Profit are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 5 – Moderation effects of digital literacy on financial literacy

Dependent variable: Financial Literacy

	Control group x Content-only	Control group x Chatbot	Control Group x Human Support	Content-only x Chatbot	Content-only x Human Support	Chatbot x Human Support
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	3.151 (2.554)	-1.609 (2.372)	1.772 (2.617)	-4.822 (2.258)	-2.648 (2.544)	2.432 (2.364)
Digital Literacy	1.059** (0.377)	1.072** (0.364)	1.119** (0.378)	0.497 (0.370)	0.441 (0.366)	1.424** (0.321)
Treatment x Digital Literacy	-0.621 (0.535)	0.312 (0.500)	-0.392 (0.539)	0.972* (0.484)	0.516 (0.527)	-0.501 (0.501)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.13	0.19	0.13	0.22	0.18	0.23
Observations	226	216	237	152	173	163

Note: This table presents the effects of including Digital Literacy as a moderator of the treatment effects over Financial Literacy. Robust standard errors are presented in parentheses. We follow the specification described in Section 5, and all models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 6 – Mediation analysis: engagement as a mediator of the treatment effect on sales

Treatment effects on Engagement	
	(1)
Chatbot+human support group	-0.121 (0.318)
R-squared	0.001
Observations	116

Treatment and Engagement effects on Sales	
	(2)
Chatbot+human support group	-0.949* (0.409)
Engagement	0.055 (0.120)
R-squared	0.04
Observations	116

Mediation analysis	
	(3)
Average Causal Mediated Effect	-0.008
Direct Effect	-0.948
Total Effect	-0.957
% of Total Effect mediated	0.008

Note: This table presents the results of a mediation analysis that considers Engagement as a mediator of the effects of Treatment on Sales. Engagement is measured as the number of modules accessed by the participants during the business training. The Sales variable is winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Robust standard errors are presented in parentheses. We follow the specification described in Section 5. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 7 – Moderation effects of engagement on sales

	log(Sales) (1)	log(Sales) (2)	log(Sales) (3)
Chatbot+human support group	-2.511** (0.698)	0.052 (0.336)	-1.115** (0.398)
Engagement	-0.341 (0.211)		
Chatbot+human support group x Engagement	0.695* (0.211)		
Low Engagement		0.596 (0.445)	
Chatbot+human support group x Low Engagement		-1.466* (0.604)	
High Engagement			-0.530 (0.408)
Chatbot+human support group x High Engagement			1.279* (0.576)
Control variables	Yes	Yes	Yes
R-squared	0.20	0.13	0.12
Observations	101	170	170

Note: This table presents the effects of including Engagement as a moderator of the treatment effects over Sales. Engagement is measured as the number of modules accessed by the participants during the business training. Low engagement (high engagement) consists of a dummy variable taking value 1 if participants accessed less (more) than 25% (75%) of the content and 0 otherwise. The Sales variable is winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Robust standard errors are presented in parentheses. We follow the specification described in Section 5, and all models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 8 – Moderation effects of high engagement on sales

Dependent variable: log(Sales)

	Control group x Chatbot HE (1)	Control Group x Human Support HE (2)	Content-only x Chatbot HE (3)	Content-only x Human Support HE (4)	Chatbot x Human Support HE (5)	Chatbot x Chatbot HE (6)	Human Support x Human Support HE (7)
Treatment	-0.239 (0.374)	0.789** (0.293)	-0.0177 (0.292)	0.511+ (0.281)	0.338 (0.270)	-0.573 (0.425)	0.792* (0.359)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.05	0.07	0.09	0.07	0.08	0.22	0.09
Observations	228	250	161	183	170	74	96

Note: This table presents the effects of including High Engagement as a dummy independent variable that takes value 1 if participants from the chatbot group or the chatbot+human support group accessed more than 75% of the content and 0 otherwise. The Sales dependent variable is winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. We follow the specification described in Section 5, and all models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 9 – Dynamic effects

	Panel A: Knowledge and Practices Outcomes			Panel B: Performance Outcomes		
	Financial Literacy	Financial Knowledge	Financial Behavior	Profit	log(Sales)	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
Content-only group x T1 dummy	0.154 (0.273)	0.053 (0.210)	0.101 (0.258)	-2.273 (2.764)	0.049 (0.074)	-0.014 (0.055)
Content-only group x T2 dummy	-0.326 (0.367)	0.153 (0.243)	-0.479 (0.318)	-30.234 (21.281)	0.025 (0.157)	-0.064 (0.064)
Content-only group x T3 dummy	-0.152 (0.370)	-0.087 (0.265)	-0.065 (0.334)	26.487 (25.268)	-0.098 (0.144)	0.025 (0.091)
Chatbot group x T1 dummy	-0.753* (0.321)	-0.316 (0.240)	-0.437 (0.261)	11.063 (23.858)	-0.047 (0.087)	0.051 (0.058)
Chatbot group x T2 dummy	-0.859 (0.465)	-0.199 (0.336)	-0.660 (0.415)	174.114 (193.775)	-0.193 (0.257)	-0.039 (0.072)
Chatbot group x T3 dummy	-0.197 (0.443)	-0.485 (0.283)	0.288 (0.388)	783.267 (730.219)	-0.222 (0.201)	-0.004 (0.110)
Chatbot+human support group x T1 dummy	0.251 (0.287)	0.298 (0.202)	-0.047 (0.235)	-2.937 (2.811)	-0.037 (0.085)	0.151* (0.064)
Chatbot+human support group x T2 dummy	0.055 (0.484)	0.464 (0.274)	-0.409 (0.373)	-10.336 (29.988)	-0.047 (0.216)	0.038 (0.074)
Chatbot+human support group x T3 dummy	-0.112 (0.451)	0.259 (0.288)	-0.371 (0.389)	18.581 (26.158)	-0.043 (0.134)	-0.27 (0.109)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	461	461	461	237	459	461

Note: This table presents the dynamic effects of being assigned to a treatment group. Panel A reports the results on Knowledge and Practices Outcomes; Panel B displays the results on Performance Outcomes. All models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. The Sales and the Profit are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

APPENDIX

APPENDIX A – ADDITIONAL ANALYSES

Table A1 – Attrition across groups

Group	Mean	S.D.
Content-only group	0.73	0.44
Chatbot group	0.71	0.45
Chatbot+human support group	0.83	0.37
Average between groups	0.82	0.37
ANOVA-F	0.089	

Note: This table presents the outcomes of ANOVA tests conducted on attrition balance across the experimental groups in the business training program.

Table A2 – Endline (T=3) attrition

	Mean T=1	Mean T=3	Diff [T3-T1]	S.D.	T-test (p-value)
Age	37.40	37.29	0.11	0.80	0.88
Female	0.23	0.14	0.09	0.03	0.00
Share of entrep. with secondary education	0.88	0.89	-0.01	0.02	0.65
Share of entrep. with additional income source	0.84	0.86	-0.02	0.03	0.49
Share of indebted entrepreneurs	0.71	0.73	-0.02	0.04	0.65
Share of entrep. keeping business and HH finances separately	0.81	0.85	-0.03	0.03	0.28
Observations	461	147			

Notes: This table presents summary statistics for the subsample that completed the endline survey (T=3, N=147) compared with the sample from the post-treatment survey (T=1, N = 461) via t-tests of the difference in means. The differences in means are presented in column Diff, and the p-values for the tests are presented in the last column.

Table A3 – Robustness: treatment effects including control variables

Panel A: Treatment Effects (ITT - Treated vs Control Group)						
	Financial Literacy	Financial Knowl.	Financial Behavior	Profit	log(Sales)	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
Content-only group	0.158 (0.251)	0.063 (0.221)	0.095 (0.203)	-3.732 (2.210)	-0.360 (0.240)	-0.047 (0.063)
Chatbot group	-0.377 (0.307)	0.100 (0.228)	-0.478* (0.209)	0.698 (2.213)	0.026 (0.266)	-0.043 (0.066)
Chatbot+human support group	-0.126 (0.252)	0.102 (0.192)	-0.228 (0.193)	-1.843 (2.247)	-0.464+ (0.253)	0.114* (0.056)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Mean Control group	8.296	2.738	5.558	6.080	9.594	0.715
S.D. Control group	2.048	1.691	1.495	15.253	1.860	0.452
Observations	461	461	461	237	459	461
Panel B: Mode of Provision Effects (Treated vs Content-only Group)						
	Financial Literacy	Financial Knowl.	Financial Behavior	Profit	log(Sales)	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
Chatbot group	-0.469 (0.344)	0.104 (0.266)	-0.573* (0.248)	3.281 (1.691)	0.329 (0.265)	-0.003 (0.074)
Chatbot+human support group	-0.238 (0.282)	0.023 (0.246)	-0.261 (0.221)	1.479 (1.931)	-0.069 (0.259)	0.160* (0.064)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Mean Content-only group	8.431	2.694	5.736	2.835	9.214	0.663
S.D. Content-only group	1.949	1.804	1.592	6.367	1.907	0.475
Observations	289	289	289	148	288	289
Panel C: Human Support Effects (Chatbot vs Chatbot+human support Group)						
	Financial Literacy	Financial Knowl.	Financial Behavior	Profit	log(Sales)	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
Chatbot+human support group	0.310 (0.344)	-0.024 (0.243)	0.333 (0.237)	-1.264 (2.421)	-0.489+ (0.278)	0.145* (0.069)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Mean Chatbot group	8.060	2.951	5.108	6.410	9.689	0.650
S.D. Chatbot group	2.193	1.710	1.530	12.065	1.804	0.479
Observations	194	194	194	108	193	194

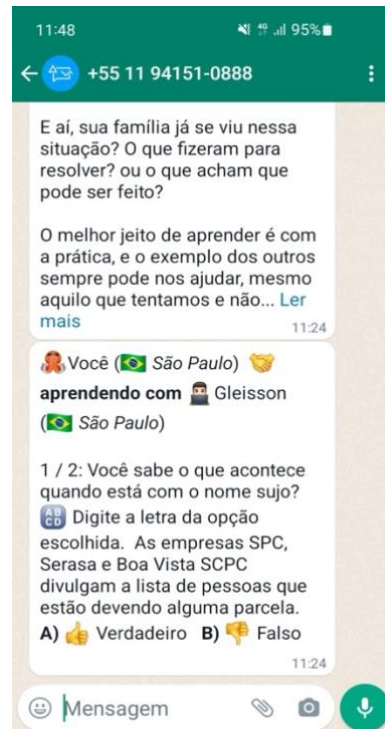
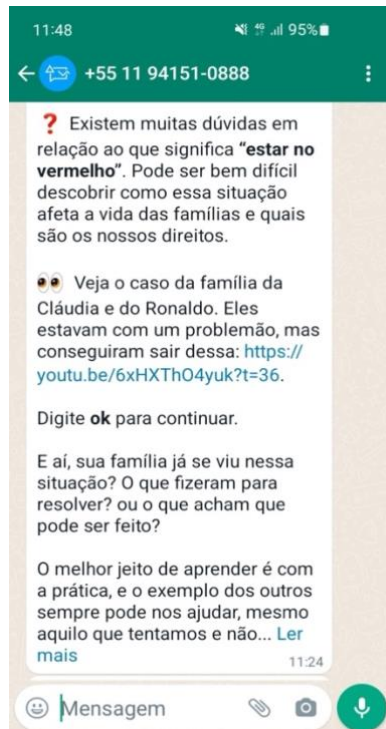
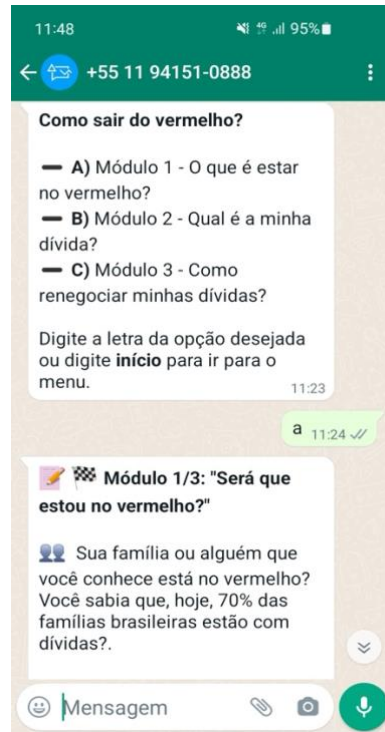
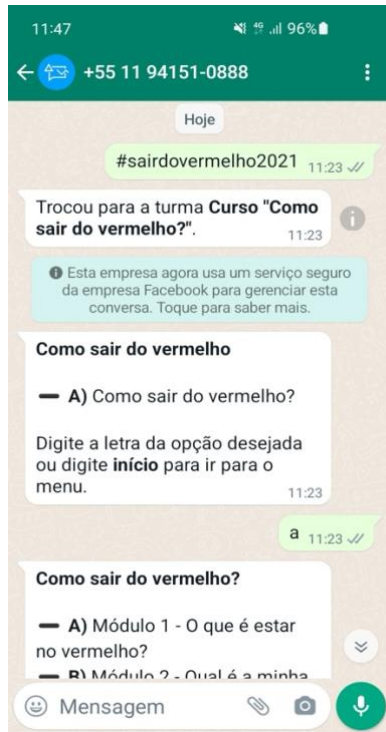
Note: This table presents the treatment effects of being assigned to a treatment group (ITT). Panel A reports the results of comparisons between each treated group and the control group. Panel B displays the coefficients of comparisons between the content-only group and the remaining treatment groups. Panel C presents the results from comparing the outcomes from the chatbot group with the chatbot+human support group. The Mean and the Standard Deviation of the base comparison group are presented in the bottom of each panel. We follow the specification described in Section 4. All models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. The Sales and the Profit are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table A4 – Alternative heterogeneity tests yielding null results

Interaction variable	Variable description	Effect
Low Financial Literacy	Individuals in the bottom decile of financial literacy level at t0.	Null
Low Profit	Individuals in the bottom decile of profit level at t0.	Null
Best Sales	Individuals in the top decile of sales at t0.	Null
Completed Training	Individuals who completed 100% of the program.	Null
Education	Individuals' self-reported schooling level.	Null
Extra Rent	Possessing an extra source of income for the family.	Null
Administrative Literacy	Administrative literacy refers to the capabilities required to effectively navigate within administrative systems and procedures. This includes proficiency in tasks such as filling out forms, understanding bureaucratic language, and interacting with administrative authorities.	Null

Note: This table presents the effects of including a series of variables as moderators of the treatment effects over Financial Literacy. In all cases, results were null for any pairwise comparison between experimental groups. We follow the specification described in Section 5, and all models include controls for strata and other covariates at the individual level: gender, education, age and additional sources of income. Detailed information on the tests can be shared by the authors upon request.

APPENDIX B – BUSINESS TRAINING DELIVERY (WHATSAPP)



APPENDIX C – SURVEY QUESTIONNAIRE

SECTION 1 – BASIC INFORMATION

- What is your age?

(write your age)

- What is your gender?
(choose 1 option below)

1. Female
2. Male
3. Non-binary
4. Other

- What is your level of education?
(choose 1 option below)

1. No education
2. Incomplete elementary school
3. Completed elementary school
4. Incomplete high school
5. Completed high school
6. College
7. Postgraduate
0. I do not know/Prefer not to answer

- How often do you and your family make decisions about expenses and savings?
(choose 1 option below)

1. Every day
2. Every week
3. Every two weeks
4. Once a month
0. I do not know/Prefer not to answer

- What is the monthly family income?
(choose 1 option below)

1. From R\$0.00 to R\$700.00
2. From R\$700.00 to R\$1,200.00
3. From R\$1,200.00 to R\$2,500.00
4. From R\$2,500.00 to R\$4,000.00
5. More than R\$4,000.00
0. Prefer not to answer

- When it comes to managing finances, do you separate money for your business and for your household?
(choose 1 option below)

1. Yes
2. No
0. Prefer not to answer

- Currently, do you or anyone in your household have any debts?
(choose 1 option below)
1. Yes
 2. No
 0. Prefer not to answer

SECTION 2 – BUSINESS INFORMATION

- How long have you had your business?
(choose 1 option below)
1. Less than 6 months
 2. From 6 months to 1 year
 3. From 1 to 2 years
 4. More than 2 years
 0. I do not know/Prefer not to answer
-
- Do you have any source of income besides the Celcoin machine?
(choose 1 option below)
1. Yes
 2. No
 0. Prefer not to answer
-
- How much does your business earn per month?
(for example, write how much your company earned last month)
-
- How much do you spend per month to maintain your business?
(for example, write how much you spent on your business last month)

SECTION 3 – PREFERENCES AND HABITS

- How much do you agree with the following statements?
(Scale: 1 – strongly disagree to 5 – strongly agree)
1. Money is meant to be spent.
 2. You are satisfied with the amount of money you have.
 3. It is more satisfying to spend money than to save it for the future.
 4. You keep track of how much money you earn and spend.
 5. You use your mobile phone to transfer or receive money.
 6. You use your mobile phone for shopping or payments.
 7. The amount of money you have is not enough to do everything you would like.
 8. You set long-term goals for your money.
 9. It is difficult to achieve long-term dreams that require money.
 10. If you borrow money, it is your responsibility to pay it back.
-
- Do you know how to:
- (Yes or No scale)
1. Check your FGTS balance.
 2. Apply for Bolsa Família or Emergency Aid.
 3. Create a MEI (Individual Microentrepreneur Registry).

4. Register in CadUnico (Unified Registry for Social Programs).
5. Declare your Income Tax.
6. Obtain the Gas Aid.
7. Issue an invoice.
8. Create a savings account.
9. Make or receive a PIX payment.
10. Access a bank account through a mobile app.

• How much do you agree with the following statements?
(Scale: 1 – strongly disagree to 5 – strongly agree)

1. You can easily communicate with other people.
2. You can express yourself well when speaking.
3. You can express yourself well in writing.
4. You can understand what other people say.

SECTION 4 – FINANCIAL KNOWLEDGE

• If you deposit R\$1,000 into a bank account with an 8% annual interest rate and do not touch that money, how much will you have in 2 years?

(choose 1 option below)

1. More than R\$1,800
2. Exactly R\$1,800
3. Less than R\$1,800
0. I do not know/Prefer not to answer

• Imagine you saw the same television that costs R\$2,000 in two different stores. One store offers a discount of R\$300, while the other offers a 10% discount. Which option is better – R\$300 or 10% discount?

(choose 1 option below)

1. R\$300
2. The discounts are the same
3. 10% discount
0. I do not know/Prefer not to answer

• If you borrow R\$200 for one year and have to pay back R\$12 in interest at the end, what is the interest rate applied to the loan?

(choose 1 option below)

1. 3%
2. 6%
3. 9%
4. 12%
0. I do not know/Prefer not to answer

INTERVIEW QUESTIONNAIRE

1. What were your overall impressions of the course?
2. During the guidance, did you complete the offered activities (Serasa, financial spreadsheet, etc)?
 - 2.1 Did you feel engaged to continue participating? Why?
3. Were you able to access all of the materials?
 - 3.1 If yes, was it helpful?
 - 3.2 If not, why? to identify whether there were time constraints, difficulties in comprehension, or lack of interest.
4. Did the method of content delivery via WhatsApp contribute to your understanding?
 - 4.1 Why?
 - 4.2 Did you like this format?
5. Treatment 2: Did you feel the need for human support during the guidance?
 - 5.1 Why? to determine if you believe it would have helped address questions and increase engagement.
6. Treatment 2: What is your overall perception of the chatbot?
 - 6.1 Why?
7. Treatment 3: In your opinion, how important is the support of tutors during the guidance?
 - 7.1 And how did it affect (contribute/hinder) your participation? to determine if it led to increased engagement, technical support, confidence/security in learning, and/or a "supervision effect."
8. Did you implement any of the activities?
 - 8.1 If yes, how?
 - 8.2 If not, why?
9. How did your participation affect your relationship with Celcoin?

Optional: Do you prefer a complete course via WhatsApp, or would you prefer it to be interactive with humans? Why?

APPENDIX D – OVERVIEW OF PRE-REGISTRATION

We pre-registered our study design and analysis on aspredicted.org before the baseline survey. Pre-registration includes information on:

Research question:

Complementing algorithmic skill-transfer to small business owners with human interactions will increase content absorption and, consequentially, improve business performance.

Key dependent variables:

1. Firm performance, measured as revenue minus costs, one month after the intervention;
2. Financial literacy, measured using basic indicators of financial knowledge;
3. Sales using fintech's app;
4. Characteristics of the interactions, including volume and response time between interactions.

Experimental groups:

- (a) Treatment group A that is exposed to financial literacy content, but has no interaction;
- (b) Treatment group B, that receives the same content as A, and also interacts with a chatbot;
- (c) Treatment group C, that is similar to B, but instead of interacting only with a chatbot, also receives support from a human being;
- (d) Control group, which receives no treatment.

Main analyses:

Linear regression with a dummy indicating whether the individual was part of a specific treatment group or not (to obtain the average treatment effect). Analyses consider all pairwise comparisons between experimental groups, considering their average business performance one month after the intervention and their baseline performance levels (collected pre-intervention).

Additional regressions are also deployed controlling for age, education, location, household income, and financial & administrative literacy levels.

APPENDIX E – DIGITAL LITERACY MEASUREMENT

We developed a digital literacy measure by analyzing participants’ responses to five questions from our baseline survey. Each question focuses on a unique dimension of their digital skills, encompassing navigation of digital systems and engagement with online banking and public bureaucracy. Our measure consists specifically of the aggregation of participants’ responses to the following questions:

S3.1.5) You use your mobile phone to transfer or receive money.

S3.1.6) You use your mobile phone for shopping or payments.

S3.2.3) Do you know how to: Create a MEI (Individual Microentrepreneur Registry) – online process.

S3.2.9) Do you know how to: Make or receive a PIX payment – online transfer method.⁶

S3.2.10) Do you know how to: Access a bank account through a mobile app.

The aggregation method follows a simple procedure: for individual i , the Digital Literacy index is given by the sum of dummy variables that take value 1 if the participant adopts the practices or has the necessary skills to perform the proposed actions; and 0 otherwise. The final index is as follows:

$$\text{Digital Literacy}_i = S3.1.5_{i,t0} + S3.1.6_{i,t0} + S3.2.3_{i,t0} + S3.2.9_{i,t0} + S3.2.10_{i,t0}$$

Due to the simplicity of our measure, we conducted a series of analyses to ensure that no single variable disproportionately influences the results, which would compromise the interpretability of our findings. To do so, we deployed a series of regressions considering each factor in isolation as a moderator of the treatment effect over Financial Literacy. This way, we were able to determine whether any single factor was driving the results. Additionally, we performed a set of Leave-one-out regressions using the same dependent variable and recomposing the Digital Literacy index while omitting each one of the dummy variables at a time. Arguably, each one of the variables comprising the Digital Literacy index captures a distinct dimension of digitalization, so the Leave-one-out approach helps in providing insights into which dimensions are most influential in explaining the observed effects. The results of these analyses are presented in Tables A5 and A6.

⁶ Our initial intent was to consider S3.2.10 as a dimension in our measure. However, all responses to this question were bunched at 1, resulting in no variability for this particular variable. Consequently, as there is no variation to contribute to enhancing the Digital Literacy measure, we have opted to remove it without compromising interpretability. Importantly, this measure evaluates participants' ability to make transfers via PIX, a recent innovation by the Brazilian Central Bank (Bacen), streamlining online banking transfers significantly. PIX was designed by Bacen to promote digitalization in the banking sector and enhance financial inclusion, as outlined on their website: <https://www.bcb.gov.br/estabilidadefinanceira/pix>. Therefore, it's not surprising that all participants in our sample were already proficient in handling this type of transfer, while some still faced challenges with other forms of bank transfers (as indicated in S3.1.5).

Table A5 – Single Component Analysis: Digital Literacy

Dependent variable: Financial Literacy

		Control group x Content-only	Control group x Chatbot	Control Group x Human Support	Content-only x Chatbot	Content-only x Human Support	Chatbot x Human Support
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A: S3.1.5 (mobile phone transfer)	Treatment	0.000 (1.491)	-1.000 (1.104)	-0.917 (1.381)	-1.000 (1.442)	-0.917 (1.656)	0.083 (1.295)
	S3.1.5	2.738* (0.864)	2.738** (0.862)	2.738** (0.860)	2.799** (1.273)	2.799** (1.257)	3.663** (0.730)
	Treatment x S3.1.5	0.062 (1.510)	0.926 (1.126)	0.753 (1.394)	0.864 (1.482)	0.691 (1.656)	-0.173 (1.312)
Panel B: S3.1.6 (mobile phone shopping)	Treatment	1.227 (1.305)	-0.580 (1.113)	-1.273 (1.327)	-1.808 (1.159)	-2.500 (1.354)	-0.692 (1.136)
	S3.1.6	2.162** (0.944)	2.162** (0.946)	2.162** (0.942)	1.017 (0.998)	1.017 (0.979)	2.808** (0.652)
	Treatment x S3.1.6	-1.145 (1.338)	0.646 (1.145)	1.184 (1.335)	1.790 (1.203)	2.329 (1.364)	0.538 (1.177)
Panel C: S3.2.3 (creating a microenterprise)	Treatment	0.260 (0.274)	-0.310 (0.322)	-0.028 (0.267)	-0.500 (0.354)	-1.500 (1.061)	-1.000 (1.112)
	S3.2.3	0.598** (0.216)	0.528 (0.444)	1.810 (1.076)	0.598** (0.222)	0.598** (0.219)	0.528 (0.440)
	Treatment x S3.2.3				-0.069 (0.496)	1.212 (1.090)	1.282 (1.139)
Panel D: S3.2.10 (mobile banking)	Treatment	0.231 (0.655)	-0.191 (0.765)	0.379 (0.543)	-0.422 (0.783)	0.148 (0.695)	0.570 (0.807)
	S3.2.10	0.468 (0.398)	0.468 (0.396)	0.468 (0.392)	0.476 (0.606)	0.476 (0.603)	0.253 (0.750)
	Treatment x S3.2.10	0.008 (0.713)	-0.215 (0.842)	-0.579 (0.611)	-0.223 (0.875)	-0.587 (0.746)	-0.363 (0.900)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	234	224	253	156	185	175	

Note: This table presents the effects of including each component of the Digital Literacy index as a moderator of the treatment effects over Financial Literacy, as indicated in the first column. Robust standard errors are presented in parentheses. We follow the specification described in Section 5, and all models include controls for strata. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table A6 – Leave-one-out Analysis

Dependent variable: Financial Literacy

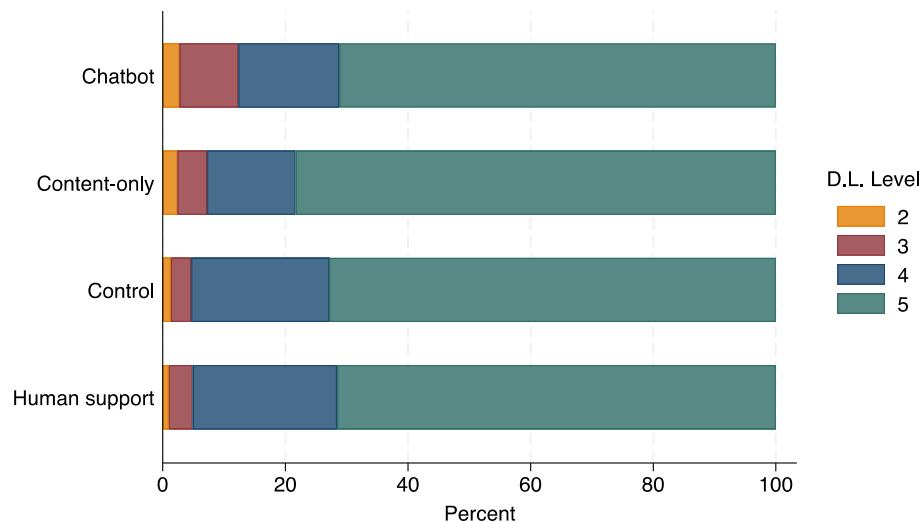
		Control group x Content-only	Control group x Chatbot	Control Group x Human Support	Content-only x Chatbot	Content-only x Human Support	Chatbot x Human Support
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Left-out S3.1.5 (mobile phone transfer)	Treatment	2.669 (2.152)	-2.242 (2.204)	1.016 (2.163)	-4.911* (2.177)	-1.653 (2.239)	3.258 (2.354)
	Digital Literacy	0.970* (0.382)	0.970** (0.383)	0.970** (0.384)	0.322 (0.424)	0.322 (0.424)	1.507** (0.440)
	Treatment x Digital Literacy	-0.648 (0.564)	0.538 (0.577)	-0.285 (0.559)	1.185* (0.581)	0.362 (0.578)	-0.823 (0.622)
	Treatment	2.023 (2.331)	-2.347 (2.594)	1.488 (2.135)	-4.369 (2.561)	-0.534 (2.297)	3.835 (2.605)
Panel B: Left-out S3.1.6 (mobile phone shopping)	Digital Literacy	1.083** (0.404)	1.083** (0.403)	1.083** (0.400)	0.601 (0.467)	0.601 (0.466)	1.621** (0.549)
	Treatment x Digital Literacy	-0.482 (0.609)	0.538 (0.672)	-0.412 (0.553)	1.019 (0.675)	0.070 (0.589)	-0.950 (0.677)
	Treatment	2.956 (1.848)	-1.646 (1.743)	0.481 (2.148)	-4.602** (1.672)	-2.475 (2.105)	2.126 (2.092)
	Digital Literacy	1.080** (0.348)	1.080** (0.348)	1.080** (0.348)	0.341 (0.343)	0.341 (0.343)	1.472** (0.319)
Panel C: Left-out S3.2.3 (creating a microenterprise)	Treatment x Digital Literacy	-0.740 (0.485)	0.392 (0.461)	-0.150 (0.559)	1.132* (0.454)	0.589 (0.545)	-0.542 (0.557)
	Treatment	5.086 (3.134)	0.467 (3.028)	-0.736 (3.280)	-4.619 (2.480)	-5.823* (2.749)	-1.204 (2.679)
	Digital Literacy	1.726** (0.642)	1.726** (0.642)	1.726** (0.639)	0.482 (0.471)	0.482 (0.471)	1.603** (0.432)
	Treatment x Digital Literacy	-1.244 (0.795)	-0.123 (0.773)	0.173 (0.827)	1.121 (0.647)	1.417* (0.694)	0.296 (0.690)
Control variables		Yes	Yes	Yes	Yes	Yes	Yes
Observations		234	224	253	156	185	175

Note: This table presents the effects of including Digital Literacy as a moderator of the treatment effects over Financial Literacy, implementing a left-out-out analysis in the composition of the Digital Literacy index, as indicated in the first column. Robust standard errors are presented in parentheses. We follow the specification described in Section 5, and all models include controls for strata. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

The findings from the Single Component Analysis (Table A5) indicate that none of the proposed measures exhibit a significant moderation effect in isolation. Thus, none of the variables independently drives the observed effects, and all digitalization dimensions appear to be aggregately important in explaining the results. However, Table A6 offers a nuanced interpretation of the Digital Literacy index: while excluding variables related to mobile phone transfers and microenterprise creation (Panel A: S3.1.5 and Panel C: S3.2.3) has no impact on the results, the same is not true for variables related to mobile phone shopping and mobile banking (Panel B: S3.1.6 and Panel D: S3.2.10). In these cases, the resulting analysis becomes nonsignificant, suggesting that these outcomes are likely more crucial from a digital literacy standpoint. Arguably, both interactions are more complex than simple bank application money transfers or online microenterprise formalization, a process that was meticulously outlined by the government to cater to individuals in remote and underserved areas. Nonetheless, caution is warranted in interpreting the outcomes from the Digital Literacy index, given their varying correlations with the different measures.

In addition to examining the consistency of our measure, we explore the stability of the Digital Literacy index distribution across experimental groups to ensure the reliability of our comparisons. Conducting Chi-squared tests reveals no statistical difference between the distributions ($p < 0.01$), aligning with the visual inspection of the measure across groups depicted in Graph A1 below.

Graph A1 – Distribution of Digital Literacy (D.L.) by Group



3. WHEN CLIENTS ARE OWNERS: HOW COOPERATIVES COMPETE WITH PRIVATE AND STATE-OWNED FIRMS IN HETEROGENEOUS MARKETS

3.1 INTRODUCTION

A burgeoning literature in strategy has examined how distinct organizational forms comparatively generate social or community-based benefits beyond profits (Cabral et al., 2019; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019). While early contributions focus on comparisons between private and public (state-owned) organizations (Cabral et al., 2013; Inoue, 2020; Klein et al., 2013), more recent studies comprise a broader array of alternative organizational forms, such as non-profits (Chatain & Plaksenkova, 2019), self-organized communities (Dorobantu & Odziemkowska, 2017), and cooperatives (Boone & Ozcan, 2014; Chatterji et al., 2021; Jeong et al., 2020). Cooperatives, in particular, are considered well-suited for generating community-based benefits due to their shared ownership and decision-making structures, in which clients, workers, and/or suppliers are members-owners and can therefore more directly influence organizational strategies (Hansmann, 2000; Ingram & Simons, 2000). Consequently, cooperatives can pursue a range of non-pecuniary objectives for their members and are able to operate in areas that may not be financially attractive to for-profit firms (Davis, 2016; Jeong et al., 2020).

Although the extant literature acknowledges the pro-community orientation of cooperatives (Costa & Delbono, 2023; Muñoz et al., 2020) and analyzes how the pursuit of member-centered objectives affects their behavior and performance (Núñez-Nickel & Moyano-Fuentes, 2004), a critical question is how cooperatives behave in a comparative perspective. This comparative analysis is fundamental because cooperatives usually compete in markets populated by alternative organizational forms, such as for-profit firms and public (state-owned) organizations (Cheney et al., 2014), which may also be interested in generating community benefits (Luo & Kaul, 2019). For instance, state-owned firms usually have a mandate to generate public or social gains beyond profitability, such as keeping prices low or investing in remote localities with vulnerable populations (Musacchio et al., 2015) –i.e., low-income communities in remote locations which often face severe constraints in terms of credit availability (Boulongne et al., 2022; Chatterji

& Seamans, 2011; Singh et al., 2022) and deficient public services (Gatignon & Capron, 2023; Jeong et al., 2020; McGahan & Pongeluppe, 2023). Alternatively, for-profit organizations may engage in pro-social activities aligned with their distinct purpose (Kaplan, 2023; McGahan, 2023) or leverage them to gain a competitive edge through the engagement of local stakeholders (Barney, 2018; Jones et al., 2018). The coexistence and interaction of cooperatives with these alternative organizational forms have crucial implications for key strategic decisions, such as entering or exiting heterogeneous consumer segments, and create an opportunity to examine how distinct organizational forms differ in their ability to benefit the communities they serve.

In this paper, we advance this topic by comparatively assessing the strategies employed by cooperatives to cope with pressures from the presence of rival organizational forms and changes in the competitive environment. Specifically, we investigate the case of credit cooperatives, where members are both clients (borrowers) and owners of the organization (Hansmann, 2000). Credit cooperatives have witnessed a significant rise in their relevance as credit providers on a global scale, with an expanding market presence. For instance, as of 2022, over 82,000 credit cooperatives were operating in 98 countries, collectively serving more than 403 million members worldwide (WCCU, 2022). While credit cooperatives can target specific markets where the potential for profitability is lower, such as those in isolated locations or with low-income populations, they also face competition from traditional banks in overlapping areas, including both for-profit and state-owned banks (Chatterji et al., 2021).

Our study focuses on the Brazilian credit and banking industry, a highly competitive sector in which various organizational forms compete for clients—chiefly for-profit banks, state-owned banks, and credit cooperatives (Sanchez et al., 2018). In recent decades, cooperatives have become increasingly influential in this industry, experiencing significant growth in market share for loans. According to the Brazilian Central Bank, this share rose from 8.2% in 2012 to 15.5% in 2017 (Banco Central, 2018). In 2023, credit cooperatives represented over 11.6% of the country's total loans, accounting for 22% of the credit to small businesses and 21% of the nation's rural credit. Moreover, they serve a vast clientele of over 18 million individuals (Sicoob, 2023). This evolution occurred amidst a period of rapid digitalization of the credit

sector, resulting from the introduction of a normative instruction by the Brazilian Central Bank (Bacen) that regulated the creation of customer electronic accounts by financial institutions (Instruction 4,480, sanctioned on April 25, 2016). We assess how this exogenous change affected the entry and exit decisions of cooperatives in 2,991 localities and compare their behavior to that of for-profit banks and state-owned banks. We also leverage this market transformation to understand how it heterogeneously affected the strategic decisions of each organizational form. Our sample comprises 44,168 branches of 407 alternative credit providers spanning from 2010 to 2021, and geographically dispersed across the country.

We hypothesize that accelerated digitalization results in heterogeneous organizational responses: while for-profit firms are expected to capitalize on new technologies to enhance productivity and reduce operational costs by closing physical branches and focusing on digital systems (Bouncken et al., 2021), state-owned banks and cooperatives are likely to adopt a more gradual pace of digitalization. For instance, cooperatives may choose to maintain their physical presence whenever it is valued by their members, as a way to preserve relational interactions and community support (Chatterji et al., 2021). Likewise, state-owned banks may keep their physical presence in areas where clients lack access to information technology or network connectivity, particularly if those communities are part of their mandate to include more vulnerable communities, such as low-income and underdeveloped localities (Lazzarini, 2020). Consistent with our hypotheses, we find that cooperatives tend to maintain their physical presence in the market for a longer period after the digitalization shock, compared to for-profit and state-owned banks. However, this choice is not driven by the prioritization of vulnerable communities (Boone & Ozcan, 2014; Cheney et al., 2014; Novkovic, 2008). While cooperatives respond to members' demands by maintaining their physical presence, they also tend to focus on *less* vulnerable areas, where there is more potential to generate economic activity and/or reduce credit risk. In our context, underdeveloped and low-income locations are primarily served by state-owned banks.

We also explore the moderating effect of heterogeneous traits across cooperatives, such as their organizational structure –i.e., whether they are single or federated—and activity scope in moderating the effects of digitalization over entry. Specifically, we observe whether being a single cooperative or a part of

a cooperative federation affects the decision to target vulnerable regions. We find that, compared to cooperative federations, single cooperatives are more likely to keep physical units active in vulnerable localities in comparison to other organizational forms, while cooperative federations usually defect from those localities. This analysis reveals that, contrary to theory, there are specific types of cooperatives with strategies that are more focused on economic rents than social value, in comparison to alternative organizational forms. Additionally, we analyze whether being fully focused on credit provision increases or decreases the propensity of cooperatives to keep their physical units active, in comparison to other worker or producer cooperatives that also provide credit, but where the core activities lie elsewhere –such as in agricultural, law and medical cooperatives. We find that accelerated digitalization of financial services leads non-credit cooperatives to a lower propensity to keep their credit units active, probably due to the increased ease to access credit by their members via digital means.

The contributions of this study are threefold. First, we dialogue with recent literature that evaluates different organizational forms based on outcomes that go beyond economic returns or governance costs by shedding light on cooperatives, a relatively understudied but relevant organizational form where clients presumably have a more pronounced strategic influence, compared to other forms that compete in the same markets (Cabral et al., 2019; Lazzarini, 2020; Luo & Kaul, 2019; Quélin et al., 2017). Despite their emphasis on clients and the potential community-based benefits that their local presence can generate (Ingram & Simons, 2000; Núñez-Nickel & Moyano-Fuentes, 2004), cooperatives seem to target areas in which client engagement can generate sufficient economic value. Second, we add to the literature on property rights and stakeholder management (Foss & Klein, 2018; Klein et al., 2012) by showing that, although ownership in the hands of clients themselves plays a fundamental role in shaping organizational strategy, the effects arising from this ownership are highly dependent on internal characteristics of the organization, such as structure and scope. Finally, we contribute to the subfield within Strategy that investigates the behavior of cooperatives (Boone & Özcan, 2014; Chatterji et al., 2021; Jeong et al., 2020; Slade Shantz et al., 2020) by showing how this unique organizational form adopts a distinct competitive strategy when dealing with accelerated digitalization in comparison to rival governance structures.

3.2 THEORY

A growing body of research has analyzed the social benefits beyond economic profits generated by distinct organizational forms (Cabral et al., 2019; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019). The primary focus of this literature has been to examine the merits and costs of alternative organizational forms in performing socially oriented activities, assessing their comparative efficiency in improving the well-being of their target audiences (Cabral et al., 2013; Kaul & Luo, 2019; Klein et al., 2019). Most studies adopt a comparative organizational perspective (Williamson, 1999), i.e., they observe how distinct organizational forms deal with contractual and governance problems when deploying activities involving public good features or myriad externalities (Dacin et al., 2011; Jeong et al., 2020; Kaul & Luo, 2018; Teodorovicz et al., 2022). More recent work extrapolates the analysis of performance outcomes to examine the conditions under which alternative organizational forms arise to address social and community-based demands (Battilana & Lee, 2014; Bruce et al., 2019; Chatterji et al., 2021; Lazzarini, 2020; Rangan et al., 2006).

The main reasoning underlying this literature is that organizational forms vary in a series of attributes that affect their decision to engage with social issues (Luo & Kaul, 2019). For instance, state-owned firms are usually associated with lower-powered incentives and increased influence from bureaucratic rules and political pressures, leading to diminished organizational performance compared to private counterparts (Cuervo-Cazurra et al., 2014; Dixit, 2002; Inoue, 2020). At the same time, these organizations usually have a legal mandate to generate public or social gains beyond profitability that for-profit organizations are not required to, such as keeping prices low or investing in remote areas with vulnerable populations (Musacchio et al., 2015). Consequently, they tend to prioritize creating social value, even if it comes at the expense of operational efficiency. In contrast, in private firms, organizational strategy and structure are focused on maximizing organizational performance, presenting clear financial goals alongside greater managerial discretion, and incorporating monitoring practices and tools aimed at reducing agency problems (Fama & Jensen, 1983; Jensen & Meckling, 1976). However, the exclusive pursuit of profits has increasingly demonstrated to be pervasive for private firms (Barnett & Salomon, 2012;

Dorobantu & Odziemkowska, 2017). Neglecting social issues can result in a lack of stakeholder engagement and firm-specific investments (Portocarrero & Burbano, 2023), leading to potential losses in terms of legitimacy, reputation, and negative impacts on firm market value (Flammer, 2013). As a result, for-profit organizations have increasingly embraced pro-social activities that are either aligned with their distinct purpose (McGahan, 2023; Kaplan, 2023) or that leverage them to gain a competitive edge through the engagement of stakeholders (Barney, 2018; Jones et al., 2018).

Analyzing these two traditional polar forms reveals that, on the one hand, irrespectively of the organizational form, organizations have incentives to engage in social activities (Cabral et al., 2013; Kaul & Luo, 2018; Teodorovicz et. al, 2022), and, on the other hand, that economic rents and social benefits can be expected to vary considerably depending on the specific organizational form undertaking those activities, depending on the matching between organizational characteristics and social issue attributes (Lazzarini, 2020; Luo & Kaul, 2019; Williamson 1996). Comparing the roles of public and private organizations is, however, insufficient to capture all the variance of structures found in the markets. Therefore, it is crucial for comparative governance research to consider alternative organizational forms that have been addressed in previous literature but in isolation, such as non-profits (Chatain & Plaksenkova, 2019), cooperatives (Chatterji et al., 2021; Jeong, Kaul & Luo, 2020), public-private partnerships (Bruce et al., 2019; Kivleniece & Quelin, 2012; Rangan et al., 2006), community benefit agreements (Dorobantu & Odziemkowska, 2017), and social enterprises (Battilana & Lee, 2014; Zahra et al., 2009). Taking a broader perspective allows for a more nuanced understanding of how these alternative structures can simultaneously create private and social value while thriving in highly competitive markets.

3.2.1 The role of cooperatives

Cooperatives have garnered increased attention from strategy scholars due to their involvement in commercial activities in which various community actors can be directly engaged (Boone & Özcan, 2014; Costa & Delbono, 2023; Slade Shantz et al., 2020). Their governance structures, however, diverge significantly from those of for-profit and state-owned organizations. While cooperatives are profit-oriented,

the pecuniary and non-pecuniary benefits resulting from their activities are distributed among stakeholder-owners who also possess control rights over the organization, often under a democratic logic of "*one person, one vote*" (Hansmann, 1996; Hart & Moore, 1996). In other words, in cooperatives, clients, workers, and/or suppliers themselves not only are the owners but also potentially influence critical decisions under a shared ownership and shared decision-making structure. These stakeholders have greater clarity about their preferences, leading to organizational decisions that are intrinsically aligned with their own pecuniary and non-pecuniary targets. Furthermore, since these stakeholders are usually part of the community that receives both the direct products and services from the cooperative, and the indirect effects arising from this provision, cooperatives are able to internalize the externalities arising from activities that would not be interesting for alternative organizational forms, such as choosing to operate in areas where the potential for creating economic value is restricted (Davis, 2016; Jeong et al., 2020). Hence, cooperatives are considered particularly well-suited for generating direct benefits to their respective communities via pursuing a range of non-pecuniary goals beyond profits (Hansmann, 2000; Ingram & Simons, 2000).

Despite the comparative advantage in identifying the needs of their customers and internalizing benefits that are not necessarily the primary focus of their activities, cooperatives may also face a series of threats to profitability that, in the long run, end up hindering their activities (Cook, 2018). For instance, agency issues related to self-centered managerial behavior and free-riding risks are particularly high in these organizations, particularly because it is common for cooperative members to lack the necessary competencies to efficiently manage the organization (Foss et al., 2021), and the tools for effective agent monitoring (Kaya & Vereshchagina, 2014; Nilsson & Svendsen, 2011). Additionally, although all members receive dividends from the cooperative's residue and have equal voting rights in organizational assemblies, the effectiveness of this decision-making structure heavily relies on the level of cohesion among the members. In cases where cooperates have divergent preferences, conflicts may arise, leading to decision delays and performance setbacks (Hansmann, 2000; Slade Shantz et al., 2020), and potentially resulting in failures. Nevertheless, cooperative members typically have deep relational ties with the community and possess extensive experience in the organization's core activities and practices. As a result, problems arising

from the lack of monitoring can be mitigated by strong relational and cultural bonds (Boone & Özcan, 2014; Hansmann, 2000), and a sense of worker empowerment (Quandt et al., 2017). Furthermore, even when agency problems or disagreements persist, the cooperative's objective function is never skewed solely towards economic rents, as is the case with for-profit organizations (Foreman & Whetten, 2002). Instead, it is primarily focused on maximizing value appropriation by the members themselves, a goal that usually encompasses the generation of community benefits (Cook & Chaddad, 2004; Jeong et al., 2020).

3.2.2 Credit provision and credit cooperatives

Credit provision is a fundamental activity with a profound effect on regional and community development levels (Greenwood et al., 2010; Minton et al., 2024), and engendering numerous societal spillover effects (Bruhn & Love, 2014; Burgess & Pande, 2005; Fonseca & Matray, 2022). Despite being heavily dominated by for-profit and state-owned banks, this sector is also permeated by alternative organizational forms, such as development banks and agencies, credit unions, and mutualistic banks. Prominently among these, credit cooperatives have become increasingly more present in various markets across the world, including Canada, Brazil, and a series of European countries, where they vie with traditional banking institutions in highly competitive environments (Di Febo & Angelini, 2019; Perez-Saiz & Xiao, 2019). Credit cooperatives have gained significant prominence as a global source of credit provision, consistently expanding their market presence. For instance, by 2022, a network of more than 82,000 credit cooperatives had proliferated across 98 countries, collectively serving more than 403 million members worldwide (WCCU, 2022).

While for-profit banks, state-owned banks, and credit cooperatives share commonalities in terms of activities and service provision, they differ substantially in terms of residual income and control rights (Foss & Klein, 2018), in a way that affects both the costs of ownership and their strategic decisions (Hansmann, 2000). For instance, while for-profit and state-owned banks possess characteristics in line with their depictions above, credit cooperatives are distinguished for their shared ownership and shared decision-making structures, where members are owners and borrowers and/or lenders at the same time. This

combination of roles allows credit cooperatives to implement lower interest rates to their customers than other organizational forms (Angelini et al., 1998; McKillop & Wilson, 2011; Minton et al., 2024) and makes them more prone to attend lower-income and vulnerable markets where profitability may seem unfeasible (Amess & Howcroft, 2001).

3.3 HYPOTHESES

In this section, we analyze the strategic entry and exit behavior of credit cooperatives in comparison to for-profit and state-owned banks and explain the expected differences in outcomes, as well as the mechanisms underlying those effects. We argue that differences in ownership and objective function play an important role in defining the strategic movements of each organizational form and propose a series of hypotheses covering both the competitive interplay of governance forms in the market and the conditions under which heterogeneous effects can be expected to appear. Rather than formulating general hypotheses, we focus on context-specific ones that are especially pertinent in our empirical setting: the digitalization of credit provision.

3.3.1 Entry and exit decisions under digitalization

Digitalization plays a pivotal role in enhancing organizational competitiveness by improving operational efficiency and accelerating decision-making processes (Knudsen et al., 2021). Particularly within the technology-intensive financial services sector, digitalization has the potential to largely improve efficiency by replacing human-performed tasks with algorithms and digital systems (Beccalli, 2007; Martín-Oliver & Salas-Fumás, 2008). For example, basic customer services like account management and support can be seamlessly shifted to digital platforms, including online and mobile banking. These platforms empower users to perform various financial transactions such as opening and closing accounts, making deposits and withdrawals, paying bills, and even accessing support information through chatbots or AI-powered virtual assistants, eliminating the need for physical branch visits. Furthermore, even more

complex banking tasks such as customizing financial portfolios, fraud detection, and loan application evaluation can be either substituted or complemented by algorithms, boosting efficiency and minimizing the reliance on human interactions and physical facilities. Therefore, digitalization not only enhances customer services (Jayachandran et al., 2004; Slater & Narver, 2000) but also improves cost efficiency for credit providers (Banker et al., 2009; Benner & Waldfogel, 2020; Kriebel & Debener, 2020).

The convenience and improved communication associated with digitalization make it generally beneficial from a consumer perspective (Brynjolfsson & Hitt, 2000; Jayachandran et al., 2004; Slater & Narver, 2000). Consequently, as digitalization increases, customers are more likely to conduct financial transactions through digital channels (Carbó-Valverde et al., 2020). However, digitalization can also have adverse effects on trust and stakeholders' willingness to exhibit pro-social behavior towards firms, potentially reducing engagement and motivating the persistence of traditional, relationship-based approaches (van Houwelingen & Stoelhorst, 2022). Furthermore, digitalization affects different customer groups unevenly, contingent upon their access to the organization's products and services (Karnani, 2007; Lazzarini, 2020). As a result, different behaviors towards digitalization may emerge based on the organizational forms' objectives and focus on meeting stakeholders' needs.

For instance, for-profit banks have significant incentives to embrace digitalization and replace physical branches with digital services. First, digitalization processes enable cost-cutting and operational efficiency improvements (Abou-foul et al., 2021; Niemand et al., 2021), ensuring they remain competitive or even become more capable than their rivals. Moreover, substituting human employees with algorithmic systems minimizes the need for monitoring devices to control potential agency and gaming issues (Fama & Jensen, 1983; Frank & Obloj, 2014; Jensen & Meckling, 1976). Finally, given the increased managerial discretion and high-powered incentives prevalent in these organizations, managers can be expected to leverage digital systems capable of enhancing cost efficiency without compromising sales efficiency, as a way to maximize performance and private value creation (Banker et al., 2009). Therefore, for-profit banks are inclined to prioritize transitioning from physical branches to a robust online presence, capitalizing on the performance gains associated with this shift (Benner & Waldfogel, 2023).

In contrast, while state-owned banks and credit cooperatives recognize the efficiency benefits of digitalization, the pace of their transition depends on internal structures and external relationships that often diverge from the digitalization trajectory. Both organizational forms exhibit consistently lower managerial autonomy compared to for-profit banks due to external pressures from political entities and member-owner groups, respectively (Dixit, 2002; Hansmann, 2000). Additionally, state-owned banks face increased bureaucratic regulations that slow down decision-making processes, while credit cooperatives, with their assembly-type decision-making structures, tend to postpone decisions, especially when there is greater heterogeneity among members (Slade Shantz et al., 2020). Furthermore, the maintenance of strong relational ties among members requires the preservation of relational channels, often facilitated through physical units that allow for in-person meetings and foster trust among members. Consequently, these two organizational forms are expected to adopt digitalization at a slower pace compared to for-profit counterparts. This motivates the following baseline hypothesis:

Hypothesis 1: Facing environment changes that foster digitalization, credit cooperatives and state-owned banks (compared to for-profit banks) are associated with a higher propensity to keep their physical presence in local markets.

3.3.2 Low-income and vulnerable markets

A critical factor determining the success of digital transformations is the access by the target population to the products and services provided by organizations (Karnani, 2007; Lazzarini, 2020), and as banks become more digital, customer preferences undergo substantial changes. Digital financial services are adopted when perceived as safe and convenient (Casaló et al., 2007; Huang et al., 2003; Laukkanen, 2016; Yoon & Steege, 2013). However, if the process of learning how to use digital services is complex or costly, customers may choose to stick with their existing physical options (Gerrard et al., 2006; Mallat, 2007; Sathye, 1999). In regions with higher vulnerability, where populations face constraints in accessing technology, credit, and public services, users encounter more challenges in adopting technological tools (DiMaggio et al., 2004; Robinson et al., 2020; Van Dijk, 2020). Consequently, in those localities, the

potential benefits arising from online and mobile banking can be undermined, and the reliance on physical branches tends to be higher compared to other regions with lower vulnerability. Therefore, the entry and exit decisions of different types of banks following digitalization may vary based on the vulnerability level of the communities where their physical branches are located, influenced by differing stakeholder and customer preferences, as well as the social mission or mandate of each organization.

During periods of rapid digitalization, for-profit banks face a profitability tradeoff. On one hand, they may prioritize markets that are already more prepared to embrace digital platforms to avoid profitability losses resulting from limited access (Roodman, 2012). On the other hand, by implementing digital strategies uniformly across regions, they may lose market share, particularly in more vulnerable regions where profitability can be achieved only through the presence of physical units. In contrast, state-owned banks have a legal mandate to generate public or social benefits alongside profitability, with a specific focus on underserved regions lacking access to bank services, where private institutions are absent (Gerschenkron, 1962; Levy-Yevaty et al., 2004; Musacchio et al., 2015). Consequently, state-owned banks are often associated with a greater presence in low-income and vulnerable markets in comparison to for-profits, even prior to digitalization.

Lastly, credit cooperatives inherently prioritize meeting the non-pecuniary needs of their members due to their shared ownership and shared decision-making structures. In some cases, credit cooperatives emerge as a response to the lack of access or difficulties in obtaining bank and credit services, which is often closely tied to income vulnerability and digital disenfranchisement (Caves & Petersen, 1986). As such, credit cooperatives are typically associated with serving vulnerable regions, particularly where relational ties play a significant role in defining connections between members and the organization (Amess & Howcroft, 2001). Hence, even in the presence of the profitability tradeoff among for-profit banks, as digitalization accelerates, state-owned banks and credit cooperatives are comparatively more likely to maintain their physical branches, either to prioritize social welfare creation or as a way to preserve relational ties among member-owners.

Hypothesis 2: Facing environment changes that foster digitalization, credit cooperatives and state-owned banks (compared to for-profit banks) are associated with a higher propensity to keep their physical presence in vulnerable markets.

3.3.3 Heterogeneities among cooperatives: structure and scope

Regardless of the expected higher suitability of cooperatives to embrace community needs, there might be heterogeneities within this type of organizational form leading to varying responses to digitalization (Cook & Chaddad, 2004). For instance, given the reliance of credit cooperatives in relational bonds among members as a way to both engage these groups to participate in the decision-making profit, and to function as methods of agency issue mitigation (Amess & Howcroft, 2001; Boone & Özcan, 2014), cooperatives with stronger bonds with their respective communities can be expected to differ from more professionalized, market-driven ones in terms of market entry and exit decisions (Majee & Hoyt, 2011). We argue that both the structure of the cooperative –i.e., whether they are single-unit or multiunit organizations— and the scope of their portfolio play a role in explaining their strategic movements in comparison to other organizational forms.

In terms of structure, cooperatives can be separated into two main organizational types: single cooperatives and systems of cooperatives, also known as cooperative federations. Single cooperatives are small, single-unit organizations, usually focused on serving the needs of members within a specific community and primarily relying on their own resources to operate and invest (Ingram & Simons, 2000). In contrast, a cooperative federation consists of multiple individual cooperatives that unite in pursuit of common objectives. These individual cooperatives retain their own ownership and control, but the system as a whole may have a separate governance structure –as depicted in Figure 1—, with specific objectives and goals, and the possibility of pooling resources between units, enhancing efficiency and economic growth, but at the expense of part of the focus on non-pecuniary goals stemming from local members' needs (Dias et al., 2019). Additionally, cooperative federations tend to possess a broader geographical focus, encompassing individual cooperatives from several regions (Cuevas & Buchenau, 2018). As a result,

federated cooperatives face increased odds of competing with large banks, which makes them act more like a corporation than singular cooperatives. In parallel, their expanded operations potentially reduce the importance of internalizing benefits in the form of externalities from credit provision to local communities—such as increases in investment levels, entrepreneurship, and economic development (Minton et al., 2024)—, especially in comparison to single cooperatives (Jeong et al., 2020). Thus, while the expansionary approach can lead to increased profitability and economic value creation, it may also dilute the essential connection between the cooperative and its members, both in terms of culture and target goals.

INSERT FIGURE 1 ABOUT HERE

Given these differences, single cooperatives and cooperative federations are likely to exhibit distinct strategic behaviors. In the case of single cooperatives, their strong relational ties with the community take on a significantly greater importance compared to federated cooperatives. This emphasis on community relations leads to a heightened focus on the social goals of the community, which are likely to be more densely interconnected compared to multiunit organizations (Amess & Howcroft, 2001). Consequently, during periods of increased digitalization, single cooperatives are expected to be particularly more prevalent in vulnerable communities than alternative organizational forms, as they serve to preserve the valued relational channels demanded by their members and address the social needs of the local population in terms of credit provision (Hansmann, 2000; Núñez-Nickel & Moyano-Fuentes, 2004). Conversely, federated cooperatives may exhibit behaviors that align more closely with other multiunit organizations, emphasizing efficiency gains resulting from the better use of resources, but at the expense of catering to the specific needs of the communities where individual cooperatives are situated. Consequently, they are anticipated to be less prevalent in vulnerable locations compared to other organizational forms.

Hypothesis 3a: Facing environment changes that foster digitalization, single credit cooperatives (compared to rival organizational forms) are associated with a higher propensity to keep their physical presence in vulnerable markets.

Hypothesis 3b: Facing environment changes that foster digitalization, credit cooperatives federations (compared to rival organizational forms) are associated with a lower propensity to keep their physical presence in vulnerable markets.

Apart from their internal structures, cooperatives exhibit variations in their portfolio of products and services. While most credit cooperatives fully focus on credit provision, there are cases where this is a secondary service, offered as a complement to the core purpose of the organization. For example, producer cooperatives, such as agricultural cooperatives where producers come together to negotiate better prices with clients or engage in collective sales (Cook & Chaddad, 2004), and worker cooperatives, such as law or medical cooperatives, that form to facilitate collective marketing, and knowledge and resource sharing (Cheney et al., 2014), may opt to also organize themselves to be credit cooperatives. In those cases, credit provision is restricted to member-owners, and works in the same way as in credit-only cooperatives. However, the presence of an alternative purpose may generate strategic movements that are distinct from other organizational forms, especially when facing rapid digitalization pressures.

On the one hand, during the digitalization of credit services, cooperatives with alternative focuses can leverage their physical units dedicated to their primary activities to maintain a physical presence. This allows both the core activities and credit services to benefit from the complementary relational channels that both require, sustaining physical operations (Helfat, 1997; Teece, 1986). On the other hand, as financial services become increasingly digitalized, access to alternative credit lines becomes easier through digital means (Bollaert et al., 2021). As a result, the need for non-credit cooperatives to engage in credit activities diminishes, as members can now seek access credit alternatives digitally. Consequently, these units may

phase out more rapidly than other organizations. Since mechanisms in this regard are unclear, we propose two competing hypotheses:

Hypothesis 4a: Facing environment changes that foster digitalization, non-credit cooperatives with credit activities (compared to rival organizational forms) are associated with a higher propensity to keep their physical presence in local markets.

Hypothesis 4b: Facing environment changes that foster digitalization, non-credit cooperatives with credit activities (compared to rival organizational forms) are associated with a lower propensity to keep their physical presence in local markets.

3.4 DATA AND METHODS

3.4.1 Empirical context

We analyze the Brazilian credit provision sector, which encompasses for-profit banks, state-owned banks, and credit cooperatives. These entities compete in highly competitive markets throughout the country and operate under a common regulatory framework provided by the Bacen (Bittencourt et al., 2017; FIPE, 2019; Trindade et al., 2010). These three organizational forms dominate the Brazilian credit market, accounting for over 99% of the industry. Among them, for-profit banks are the most prevalent, with 20,842 branches (47.9%) in 2020, followed by state-owned banks with 16,456 branches (37.8%), and credit cooperatives with 5,834 branches (13.4%). The remaining 0.9% consists of securitization firms that do not provide credit to the general public. Figure 2 exhibits the spread of each organizational form across the country.

INSERT FIGURE 2 ABOUT HERE

The roots of Brazilian credit cooperatives trace back to 1889 when initial efforts were made to organize members into small groups for mutual benefits (Pineiro, 2006). These early cooperatives primarily focused on credit intermediation between borrowers and suppliers, restricting membership to community members. This emphasis on community bonds highlights the significance of local connections already in the establishment of these organizations (Pinho & Palhares, 2004). However, it was not until June 2003 that credit cooperatives were officially recognized as legal institutions belonging to the Brazilian financial sector. In that month, the Bacen introduced Resolution 3,106, which enabled credit cooperatives to accept requests from any Brazilian citizen, lifting the territorial restrictions that were in place until then (Brazilian Central Bank, 2003).

Since then, the cooperative system has experienced substantial growth in Brazil. By the end of 2022, cooperatives represented over 11.6% of the country's total loans, accounting for 22% of the credit to small businesses and 21% of the country's rural credit, maintained a presence in approximately 52% of Brazilian municipalities, and served more than 18 million active members (Sicoob, 2023). Their primary consumers are individuals, micro, small, and medium-sized enterprises, attracted by the lower interest rates compared to other financial institutions. For-profit banks charge an annual interest rate of 47.6%, whereas credit cooperatives charge 32.4%. Consequently, credit cooperatives experience a delinquency rate of 5.9%, which is significantly lower than the 7.4% faced by private banks (FIPE, 2019). Thus, the Brazilian cooperative system represents a wide and relevant alternative organizational form to the traditional banking system, particularly for serving vulnerable populations where traditional organizations struggle to provide accessible financial services and credit.

3.4.2 Digitalization shock

To analyze the acceleration of digitalization in the Brazilian credit sector, we examine the impact of a regulatory change introduced by the Bacen that increased pressures towards digitalization across the entire financial industry. In April 2016, the Bacen implemented a normative instruction aimed at regulating the creation of electronic customer accounts by all financial institutions operating in the country (Instruction

4,480, enacted on April 25, 2016). This regulatory shift had a significant influence on the Brazilian credit sector, addressing previous uncertainties surrounding electronic account management and, consequently, stimulating organizations to expedite their digitalization processes. We assess how this exogenous digitalization change affected the entry and exit decisions of credit cooperatives in 2,991 localities, comparing their behavior to that of for-profit banks and state-owned banks.

3.4.3 The evolution of cooperative presence in Brazil

There is a pronounced and consistent surge in the growth of cooperatives compared to other organizational structures during the last decade in Brazil (2010-2021). Beginning with 315 branches in 2010, cooperatives expanded to 6,792 branches by 2021, spanning 2,638 municipalities – a substantial increase from their initial presence in 185 municipalities. In contrast, for-profit banks experienced much more modest growth, increasing from 18,509 to 20,898 branches in the same timeframe, with market coverage remaining relatively stable, fluctuating only from 4,228 to 4,236 municipalities. Similarly, state-owned entities followed a pattern of stability, with branches increasing from 14,135 to 16,478 and market coverage slightly expanding from 3,370 to 3,448 municipalities. Arguably, both for-profit and state-owned banks were already firmly established in most markets, while the remarkable expansion of cooperatives gained momentum only in the 2010s. Nevertheless, this accelerated growth serves as a significant indicator of how cooperatives have begun to claim a more substantial market share in Brazil, with promising prospects for continued growth in the coming years. This increase in cooperatives' market share is presented in Figure 3, which depicts the growth of credit portfolio (Panel A) and deposits (Panel B) market shares of cooperatives compared to other organizational forms. Credit cooperatives increased their participation in the country's total credit portfolio from 1.83% in 2012 to 6.00% in 2021, and deposits grew from 2.36% to 7.00% in the same period according to the Brazilian Central Bank official data.

INSERT FIGURE 3 ABOUT HERE

Digitalization appears to have played an important role in the definition of organizational forms' physical entry strategies. Notably, the rate of expansion among cooperatives has undergone a significant transformation with the acceleration of digitalization in the sector, setting it apart from the other two organizational forms. Before digitalization (2010 to 2015), for-profit and state-owned banks exhibited relatively slower annual growth rates in the number of physical branches, averaging 0.19% and 0.3%, respectively. During the period of increased digitalization (2016 to 2021), their expansion rates dwindled to 0.03% and 0.02%, respectively. In stark contrast, cooperatives not only maintained their momentum but actually intensified their annual expansion rate post-2016. They shifted from an average rate of 4% between 2010 and 2015 to 24% between 2016 and 2021. This shift underscores a clear expansion strategy that remained robust even in the face of increased digitalization—which tends to reduce the incentives for the installation of new physical branches—, as evidenced by the 16% growth rate from 2020 to 2021. Not surprisingly, physical presence in this industry is largely influenced by organizational form, which represents about 47% of the variation in entry choices. Table 1 presents the results of a Variance Component Analysis (Bowman & Helfat, 2001), which assesses the contribution of the organizational form variance and the individual firm effects to the total variance of the physical presence variable. This analysis highlights the substantial impact of organizational form on the choice for establishing a physical branch (coef = 0.316) compared to individual firm effects (coef = 0.142).

INSERT TABLE 1 ABOUT HERE

The anecdotal evidence presented above suggests two important points: first, credit cooperatives have been increasing their presence in physical markets very rapidly in the past decades, and second, various organizational forms employ notably different entry strategies. In the subsequent subsections, we will elaborate on the methodology utilized in this paper to address endogeneity concerns and achieve a more robust causal identification, such that we can properly address the hypotheses proposed earlier.

3.4.4 Data and variables

We combine multiple publicly available datasets to examine the entry and exit decisions of financial institutions in each municipality in Brazil, as well as the characteristics of those municipalities. First, we utilize data from the Credit Information System (SIC) organized by the Bacen, which provides monthly information on the presence or closure of branches for each financial institution in Brazilian municipalities. Second, we incorporate data from the 2010 Brazilian Census, compiled by the Brazilian Institute of Geography and Statistics (IBGE), which includes relevant demographic and socioeconomic information for each municipality, such as population size, Gross Domestic Product (GDP), GDP per capita, educational levels, and employment data. To gain a dynamic view of economic activities in each municipality, we complement this dataset with additional data from the Institute of Geography and Statistics (IBGE) regarding the annual GDP for each municipality. Third, we include information from the Atlas of Social Vulnerability, developed by the Brazilian Institute of Applied Economic Research (IPEA). This dataset provides the Social Vulnerability Index (SVI), which measures the level of vulnerability in each Brazilian municipality based on three dimensions: income and employment, urban infrastructure, and human capital. Last, we gather data on Internet Access for each municipality from the National Telecommunications Agency (Anatel). This data is used to create proxies for the demand for digital services and is implemented in our robustness tests and extension analyses. Our final dataset consists of a panel sample from 2010 to 2021, encompassing 44,168 branches spread across the country (20,898 from for-profit banks, 16,478 from state-owned banks, and 6,792 from credit cooperatives).

Dependent variable: Physical market presence

Our key dependent variable captures the physical presence (or absence) of each organization in each market during each period. To measure these effects, we create a dummy variable that takes a value of 1 if the branch was present in the market during the corresponding year and 0 otherwise. This variable allows us to observe the presence or absence of branches in the market, but it does not provide insights into

the underlying reasons behind organizations' exit decisions. We utilize data from the SIC database, provided by the Bacen, to construct this variable.

Main independent variable: Organizational form

We use a set of three dummy variables to identify different organizational forms. This approach is necessary because binary variables can only capture comparisons between two groups, whereas we need to consider three distinct organizational forms. Each dummy variable allows us to compare one organizational form against the other two. For example, to analyze credit cooperatives, we create a dummy variable that takes a value of 1 if the organization is a credit cooperative and 0 otherwise. By doing so, we simultaneously compare credit cooperatives with the other two organizational forms, rather than conduct pairwise comparisons. This approach enables a comprehensive examination of the differences between the organizational forms. We determine the classification of each organizational form based on the information provided by the Bacen in the SIC database.

Digitalization pressure

We assess the pressures towards digitalization by examining the timing of the implementation of the Regulatory Norm introduced by the Bacen, which began in 2016. To distinguish and compare different periods, we create a binary dummy variable. This variable takes a value of 1 for the period after 2016, representing a time when digitalization pressure is higher, and 0 otherwise. By employing this dummy variable, we can effectively distinguish between periods characterized by greater emphasis on digitalization, following the implementation of the norm, and periods prior to its enactment.

Vulnerability level

We utilize the SVI as a variable representing the vulnerability level in each Brazilian municipality during the baseline period of our dataset, 2010. The SVI ranges between 0 and 1, with 0 indicating the lowest vulnerability level and 1 representing the highest. While the SVI is recognized for its reliability in

identifying vulnerability, it does not provide specific details on the underlying mechanisms that contribute to vulnerability. Although vulnerable populations often encounter similar challenges across dimensions such as poverty, limited access to credit, healthcare, and employment (Banerjee & Duflo, 2007), we aim to delve further into these effects, particularly in terms of digital inclusion and economic development. To investigate these aspects, we incorporate data on digital access and create a dummy variable that identifies the 10% of municipalities with the lowest levels of digital access. Additionally, we apply a similar approach with GDP per capita to identify the bottom 10% of municipalities in terms of economic development. Finally, we also consider alternative measures of vulnerability, such as the widely recognized Human Development Index, to ensure the validity of our results. By exploring these different measures, we ensure the reliability and validity of our results while also providing a more comprehensive analysis of the mechanisms underlying the effects of vulnerability.

Cooperatives' structure

We categorize cooperatives into single cooperatives or cooperative federations using dummy variables that identify each type. Since we intend to compare different cooperative structures with all other organizational forms, rather than solely within the cooperative category, we create two dummy variables. The first one takes a value of 1 if the cooperative is categorized as single, and 0 if it is either part of a cooperative federation, a state-owned bank, or a private bank. In a similar vein, the second dummy variable takes value 1 if the cooperative is part of a system, and 0 otherwise. The classification process relies on the official taxonomy provided by the Bacen in the SIC database, with further verification of the affiliation of each organization with any cooperative confederation based on information available on their respective websites.

Credit-only cooperatives

We construct a dummy variable to distinguish between cooperatives that engage in credit provision as their sole focus and those that have credit operations as complementary activities, such as agricultural,

legal, medical cooperatives, and more. This dummy variable takes a value of 1 if the cooperative is not solely focused on credit provision and 0 if it is fully dedicated to credit operations, or if the organization is a for-profit or state-owned bank. By employing this dummy variable, we compare non-credit cooperatives with all other organizational forms, providing insights into the unique characteristics and behaviors of cooperatives that have diversified activities beyond credit provision. The classification process is based on the official descriptions of the core activities of each organization, as documented in their registry with Receita Federal, the Brazilian agency equivalent to the U.S. Internal Revenue Service.

Control variables

We add a series of control variables at the market level to ensure that our results are not driven by economic factors heterogeneously affecting different regions (Sanchez et al., 2018). We consider markets to be correspondent to municipalities. In that sense, we use data from IBGE to control for income per capita, GDP, and agricultural production in each municipality. Controlling for income and GDP allows us to mitigate potential confounding effects related to variations in the demand for credit across municipalities. Additionally, by including agricultural production, we isolate effects arising from variations in income obtained from this production, an important effect, given that many municipalities heavily rely on agriculture as their primary economic activity.

Furthermore, we consider controls for market size and market concentration. Market size is measured as the total number of branches, regardless of organizational form, per municipality per year. This control variable accounts for the scale of the credit market within each municipality. Market concentration is measured using the Herfindahl-Hirschman Index, which captures the representativeness of each conglomerate of banks within the market. This control helps us examine the potential impact of market structure on credit provision.

3.4.5 Econometric approach

To test our hypotheses, we deploy a two-step fixed effects logit approach (2SFEL), as a way to control for unobserved heterogeneity in the panel (Collard-Wexler, 2013; Lin, 2015; Sanches et al., 2018). In the first step, we estimate a linear probability model (LPM) using fixed effects estimators that account for individual, market (municipality), and year fixed effects. Then, in the second stage, we use these estimated fixed effects as control variables in a logit model⁷.

The first stage LPM is given by:

$$entry_{imt} = \beta_1 orgform_i + \beta_2 digit_t + \beta_3 orgform_i * digit_t + \boldsymbol{\theta}'\mathbf{X}_{mt} + \alpha_i + \alpha_m + \alpha_t + \epsilon_{imt}$$

For each municipality m , period t , and organization i , the dependent variable, $entry_{imt}$, takes value 1 when the organization was active and 0 otherwise; $orgform_i$ is a dummy variable taking value 1 for representing the organizational form of interest (for-profit bank, state-owned bank or credit cooperative) and 0 for the remaining two organizational forms; $digit_t$ is a dummy variable representing periods pre=0 or post=1 the digitalization shock; $orgform_i * digit_t$ is the interaction between the two previous dummy variables, providing the main effect of interest to our analyses; \mathbf{X}_{mt} is a vector of observable municipalities' characteristics; and α_i , α_m and α_t are individual, municipality, and year fixed effects, respectively. In the second stage, we compute a logit model using the individual fixed effects (α_i) obtained in the first step. To test Hypothesis 1 and 4, the coefficient of interest is β_3 .

To test the remaining hypotheses, we implement slight changes to the previous equation and include one interaction term to $orgform_i * digit_t$, as a way to account for the relevance of vulnerability in our results. In the following specification, β_7 is the coefficient of interest for testing Hypotheses 2 and 3:

⁷ The Logit step is unfeasible when independent variables present low variability, generating increases in standard-errors that harm the interpretation of the coefficients. This is the case for Hypothesis 3 and 4, in which single cooperatives and non-credit cooperatives represent very small portions of the sample (less than 2%). In both situations, we rely on the results generated by the LPM with fixed effects to control for unobserved heterogeneity.

$$\begin{aligned}
entry_{imt} = & \beta_1 orgform_i + \beta_2 digit_t + \beta_3 vuln_m + \beta_4 orgform_i * digit_t + \beta_5 orgform_i * vuln_m \\
& + \beta_6 vuln_m * digit_t + \beta_7 orgform_i * digit_t * vuln_m + \boldsymbol{\theta}'\mathbf{X}_{mt} + \alpha_i + \alpha_m + \alpha_t + \epsilon_{imt}
\end{aligned}$$

To address concerns regarding potential confounding effects, we perform a series of robustness analyses, including the use of alternative variables to ensure the consistency of our findings, as well as econometric exercises that validate our expected mechanisms. First, we validate the channel of digitalization posed in our baseline hypothesis by deploying an Instrumental Variable (IV) approach, where we use internet access within each municipality as an instrument to the digitalization shock. Second, we insert alternative measures of vulnerability to disentangle the mechanisms leading to the entry and exit decisions. Finally, we re-implement all main analyses excluding municipalities with a higher concentration of bank branches, to ensure that our findings are consequences of strategic movements that incorporate the importance of community-based interests, which can be better observed in smaller markets⁸. Table 2 presents the descriptive statistics of our main variables alongside pairwise correlations.

INSERT TABLE 2 ABOUT HERE

3.5 RESULTS

3.5.1 Main results

Table 3 presents the results from our baseline analyses, examining the effects of digitalization pressures on entry and exit decisions, and the heterogeneous effects arising from the vulnerability level of the localities. We first report the results from the baseline LPM, followed by a more robust version of the same tests using the 2SFEL approach to control for unobserved heterogeneity. For example, columns [1]-[3] display the results of the LPM specification for each of the three main organizational forms (credit cooperatives, for-profit banks, and state-owned banks respectively) compared to the other two forms. Subsequently, columns [4]-[6] preserve the same structure but include the results from the 2SFEL

⁸ For more information on these approaches, refer to the session Robustness tests below.

specification. In all cases, the dependent variable is entry, and the coefficient of interest is the interaction between organizational form and the digitalization shock dummy. Throughout columns [7]-[12], a third interaction term is included, accounting for the level of vulnerability of the markets. Other than that, everything else remains the same. We examine the adherence of the results to Hypothesis 1 (digitalization pressures heterogeneously affecting entry and exit decisions of each organizational form) by analyzing the coefficient associated with the interaction term between organizational form and digitalization shock. As for Hypothesis 2 (vulnerability of the markets as a moderator of the effects of digitalization pressure over entry and exit decisions), we examine the coefficient related to the triple interaction term between organizational form, digitalization shock, and vulnerability level. All specifications account for individual, municipality, and year fixed effects, and include control variables to account for observed heterogeneity in terms of economic activity and competition in each market.

INSERT TABLE 3 ABOUT HERE

Hypothesis 1 suggests that in the face of digitalization pressures, credit cooperatives, and state-owned banks are associated with a higher propensity to keep their physical presence than for-profit banks. The coefficients reported in columns [1]-[6] are consistent with this hypothesis: credit cooperatives are associated with a higher physical presence after the digitalization shock than the other two organizational arrangements ($p < 0.01$), while both state-owned banks and for-profit are associated with a comparatively lower physical presence ($p < 0.01$). However, when comparing the results of for-profit banks [2 and 5] with those of state-owned banks [3 and 6], the coefficients consistently indicate a lower physical presence for for-profit banks ($-0.140 < -0.105$), and unpaired t-test comparisons of means between these two coefficients are statistically significant ($p < 0.01$). Thus, although state-owned banks are comparatively associated with a reduction in physical presence following the digitalization shock, this result appears to be driven by the positive effect observed in credit cooperatives (0.393), rather than by comparisons with for-profit banks, which are actually associated with an even lower presence after the shock. These results find further support

in complementary analysis considering pairwise comparisons between organizational forms, which are presented in Table A1 from the Appendix. While credit cooperatives are associated with an increased presence in physical markets post-digitalization shock compared to both alternative organizational forms (panels A and B, columns [1] and [2]), for-profit banks are indeed associated with a lower market presence after the shock, in comparison to state-owned banks (panel C, columns [1] and [2]).

According to Hypothesis 2, the level of vulnerability of the markets heterogeneously affects organizations' decision to keep physical units: credit cooperatives and state-owned banks are associated with a higher propensity to maintain physical branches in vulnerable localities than for-profit banks. The estimates presented in columns [7]-[12] do not provide support for this hypothesis. While state-owned banks are associated with a higher physical presence in vulnerable locations after the digitalization shock ($p < 0.01$), credit cooperatives are actually less prone to remain in those markets (coef = -0.232, $p < 0.01$). Comparatively, for-profit banks demonstrate a similar trend to state-owned banks, with an increased presence in markets with higher vulnerability after the digitalization shock ($p < 0.01$). By juxtaposing the coefficients of for-profit banks [8 and 11] with those of state-owned banks [9 and 12], we find that state-owned banks are more highly associated with physical presence in vulnerable markets than for-profit banks ($0.340 < 0.561$, $p < 0.01$ under unpaired t-tests comparisons of means). In pairwise comparisons between organizational forms (Table A1, in the Appendix), we found further support to these results: post-digitalization shock, the higher the vulnerability of the market, the higher the probability of remaining with physical presence among state-owned banks in comparison to both for-profit banks and credit cooperatives (panels B and C, columns [3] and [4]). However, despite the partially consistent findings related to state-owned banks, Hypothesis 2 is falsified due to the inconsistent results regarding credit cooperatives.

3.5.2 Heterogeneities on credit cooperatives

Table 4 provides the results examining how the characteristics –structures and scope—of the credit cooperatives influence their entry and exit decisions in vulnerable markets under periods of increased digitalization. Columns [1] and [2] (Table 4) report the results from the LPM specification, considering

each cooperative structure (single cooperatives and cooperative federations, respectively) compared to all other organizational forms. In these models, used for analyzing Hypothesis 3 (cooperative structure as a moderator of the effects of digitalization pressure over entry and exit decisions in vulnerable markets), the coefficient of interest is the one related to the triple interaction term between organizational form, digitalization shock, and vulnerability level. The remaining columns, [3] and [4] (Table 4), report the LPM estimates for comparing non-credit cooperatives and credit-only cooperatives, respectively, with all other organizational forms. To analyze the adherence to Hypothesis 4 (cooperative's scope as a moderator of the effects of digitalization pressure over entry and exit decisions), the coefficients related to the interaction between cooperative type and digitalization shock are examined. Throughout the entire table, the dependent variable is entry, and the estimations incorporate the same control variables and fixed effects as in the main model.

INSERT TABLE 4 ABOUT HERE

Hypothesis 3a poses that single cooperatives are associated with a higher propensity to keep their physical presence in vulnerable and low-income markets compared to rival organizational forms in response to digitalization pressures. Conversely, Hypothesis 3b suggests that cooperative federations are associated with a lower propensity to keep their physical presence in those markets. The coefficients reported in columns [1] and [2] (Table 4) are consistent with H3b, and H3a is falsified: single cooperatives are associated with a higher physical presence after the digitalization shock in higher vulnerability markets than all other organizational forms, but the coefficients are non-significant ($p > 0.10$). At the same time, cooperative federations are associated with a lower physical presence under the same conditions ($p < 0.10$). Hence, the importance of internal structures proposed in Hypothesis 3 finds partial support in the results. Finally, Hypothesis 4 relates the entry and exit decisions of cooperatives post-digitalization shock with their scope of activities but imposes no clear direction to the results. For instance, Hypothesis 4a suggests that non-credit cooperatives engaged with credit activities are associated with a higher propensity to keep their physical presence, while the competing Hypothesis 4b proposes the opposite, indicating a lower propensity

of these cooperatives to keep their physical presence. Unpaired t-test comparisons of means between the interaction coefficients from columns [3] and [4] (Table 4) lend support to Hypothesis 4b, suggesting that the scope of activities within the cooperative plays a crucial role in its strategic decisions. Specifically, when a cooperative's main activity is adverse to credit provision, it is associated with lower maintenance of physical units during periods of increased digitalization ($0.271 < 0.391$, $p < 0.01$).

3.5.3 Robustness tests

Our first robustness test aims to broaden the evidence on the differential effect that the accelerated digitalization period has had on distinct organizational forms within the Brazilian credit sector. To do so, we employ a duration model to assess the time-to-exit of each organizational form, i.e., their hazard ratios, after the digitalization surge (Perkins, 2014). The results of this analysis are presented in Table 5. During the period of accelerated digitalization (2016 to 2021), market exit appears to be lower among cooperatives compared to for-profit (column 1, coef = 0.34, $p < 0.10$ and column 2, coef = 1.69, $p < 0.01$, respectively) and state-owned banks (column 3, coef = 0.72, $p > 0.10$), although the coefficient for the latter is not statistically significant. This outcome implies that, on average, credit cooperatives were 76% less likely to exit the market than the other two organizational forms, aligning with the idea that while for-profit banks leverage digitalization to access new customers and reduce transaction and operational costs, credit cooperatives opt to maintain their physical branches for extended periods to cater to the relational demands of their customer-members.

INSERT TABLE 5 ABOUT HERE

Our second robustness test seeks to validate the digitalization channel suggested in the baseline hypothesis. We aim to rule out competing explanations for the observed variations, such as macroeconomic or political changes that might have occurred in Brazil during the same period when the Regulatory Norm was implemented. To do so, we adopt an Instrumental Variable approach, which is widely recognized for

its ability to address endogeneity issues and reinforce the causality between independent and dependent variables (Angrist & Pischke, 2008). We model a two-stage least squares (2SLS) regression using internet access by the population in each municipality as an instrument to the digitalization shock in the first stage. To guarantee the validity of the IV approach, we need to ensure two critical conditions. First, the instrument must be relevant in explaining the instrumentalized variable; and second, the exclusion restriction must hold –i.e., the instrument should affect the dependent variable solely through its impact on the independent variable, without exerting any direct effect on the main outcome.

We argue that the volume of internet access in municipalities is highly associated with the creation of electronic bank accounts since the former is a prerequisite for the latter. Consequently, as the implementation of the Regulatory Norm unfolds, its effects on banks' entry and exit can be expected to be more pronounced in municipalities where internet access is more widely available. Also, we sustain that municipal internet access affects banks' entry and exit decisions only from a demand-side perspective, that is, there's no channel other than the digitalization of bank accounts that explains the effects of internet access on organizational decisions. For instance, we test for the correlation between those two variables to find a coefficient of 0.068 ($p < 0.01$), which indicates a very weak relationship. Finally, the volume of internet access is likely determined by factors independent of the local banking market, such as infrastructure availability, governmental policies, and demographic factors. This makes it a potentially exogenous variable not directly influenced by the entry and exit of banks in the market. Hence, both restrictions hold in our setting, thus supporting the validity of the IV approach.

Table 6 presents the results from the IV tests for Hypothesis 1. Columns [1]-[3] report the results for the comparisons of each organizational form (credit cooperatives, for-profit banks, and state-owned banks respectively) with the other two. Except for the 2SLS procedure, all other variables and fixed effects are the same as in the baseline models. The coefficients are in line with the main findings ($p < 0.01$), thus lending further support to Hypothesis 1 and validating the digitalization mechanism.

Our third set of robustness tests focuses on alternative measures of vulnerability. Despite the wide acknowledgment and adoption of the IVS in Brazil, the index is an aggregate measure, limiting the interpretation of the mechanisms driving the observed effects. To address this issue, we create three new variables that disentangle the channels proposed in Hypothesis 2. The first one is a dummy variable that identifies the 10% of municipalities with the lowest levels of digital access, thus serving as a proxy for digital disenfranchisement. The second one is also a dummy variable, and accounts for the 10% of municipalities with the lowest GDP per capita, thus providing a measure that more clearly identifies localities with economic underdevelopment. Finally, we use a municipal version of the Human Development Index (HDI), which instead of measuring economic aspects, focuses on social dimensions such as health, education, and standard of living.

Table 7 presents these robustness tests' using the LPM approach. Columns [1]-[3] report the estimates for the low digital enfranchisement variable; columns [4]-[6] are related to the low GDP per capita variable; and columns [7]-[9] present the findings regarding the HDI. In all cases, entry is the dependent variable and the coefficient of interest is the one associated with the triple interaction term between organizational form, digitalization shock, and vulnerability level. The results indicate that irrespective of the type of vulnerability, cooperatives are always associated with lower physical presence under any type of vulnerability (columns [1], [4], and [7]). The extreme opposite happens with state-owned banks, which are associated with an increased physical presence in less developed localities compared to the other two organizational forms (columns [3] and [9]). On the other hand, the strategic behavior of for-profit banks varies depending on the characteristics of the market: while they are comparatively less physically present in digitally disenfranchised regions (column [2]), there is a negative association between HDI and entry by for-profit banks ($p < 0.01$, column [8]), indicating an increased presence in municipalities with low human development.

Our final robustness test accounts for the potential impact of high market competitiveness on organizational strategizing. In highly competitive markets, competition plays a more dominant role in shaping entry and exit decisions than deliberate strategic choice and social preferences. Therefore, it is important to check whether our results hold in markets where there is more room for planning and implementing economic and social value creation strategies. To address this point, we re-conduct all main tests using a subsample of our dataset that excludes metropolitan areas and state capitals. This results in the exclusion of 13,503 branches (30.5% of our sample). Consequently, we focus our analysis on 30,665 units located in less concentrated areas where strategizing and social ties are more relevant. Our final estimates can be found in the Appendix (Tables A2 and A3). Notably, all results are consistent with the baseline estimations, thus reinforcing the validity of our conclusions and affirming the broader generalizability of our research outcomes.

3.5.4 Extension analyses: the roles of vulnerability and demand for digital services

To further investigate the impact of community vulnerability levels on the strategic choices of different organizational forms, we employ a series of event-study models, each focusing on a specific organizational form in isolation. In this context, we replicate the models previously used to test Hypotheses 1 and 2, but instead of comparing organizational forms, we assess how the interaction of digitalization shock with the level of vulnerability in each market influences the entry choices of each specific organizational form. This approach aims to provide a comprehensive understanding of how these organizational forms adapt their strategies during the digitalization period compared to the pre-shock period, with variations based on market vulnerability levels –and, consequentially, on the level of vulnerability of the customers served by each organization. Furthermore, this analysis reinforces our primary arguments by demonstrating that the observed effects are not contingent on selected dummy variables; rather, they are heterogeneous across organizational forms, even when examined in isolation.

Table 8 presents these results considering both the LPM (column [1]) and the 2SFEL (column [2]) approaches. Panel A exhibits the results related to the effects on credit cooperatives, while Panels B and C present the impact on for-profit and state-owned banks, respectively. In all cases, entry is the dependent variable and the coefficient of interest is the one associated with the interaction term between digitalization shock and vulnerability level. The results from panel A lend further support to the idea that credit cooperatives reduce their physical presence in vulnerable markets after the digitalization shock (column [1], $p < 0.01$), or at least do not differentiate markets depending on their vulnerability levels (column [2], $p > 0.10$), in line with the findings from Table 3. For-profit banks follow a similar trend to credit cooperatives, with a diminished presence in vulnerable markets after the digitalization shock (panel B: column [1], $p < 0.01$). This result clarifies the effects found in Table 3, suggesting that for-profit banks are only associated with an increased presence in vulnerable markets when compared to credit cooperatives. When considered in isolation, the effect of vulnerability over the entry choice of for-profits is actually negative, staying in line with the theoretical propositions that for-profits would choose to leave less digitally prepared markets in order to prioritize those where the potential for economic value creation is higher. Finally, results from panel C indicate that, when considered in isolation, state-owned banks are largely associated with an increased physical presence in vulnerable markets after the digitalization shock in comparison to earlier periods (columns [1] and [2]). Hence, the findings from Table 3 are further supported, as well as the theoretical notion that state-owned organizations are inherently predisposed to attend to the needs of vulnerable communities.

INSERT TABLE 8 ABOUT HERE

Finally, we conduct an additional test focused on gaining deeper insights into the nuances of digitalization and to separate the effects arising from the institutional reform that accelerated the creation of electronic accounts from potential variations in the demand for digital services across different markets. This test examines the interplay between the level of internet access in municipalities (demand-side) and

the digitalization shock (supply-side). The model specification is similar to the one used in the main models, incorporating a triple interaction that considers the organizational form, the digitalization shock, and the log of internet access within each market. As in previous cases, the dependent variable is entry. Through this test, we expect to be able to observe whether the preferences towards digitalization within each municipality influence the strategic entry decisions of each organizational form. In that sense, we anticipate that credit cooperatives will exhibit a stronger presence in markets with higher levels of internet access after the shock, given the proposed importance that the members place on relational channels that can only be accessed through physical interactions.

The results are presented in Table 9, which considers LPM (columns [1]-[3]) and the 2SFEL (columns [4]-[6]) approaches. The findings suggest that, following the digitalization shock, credit cooperatives are associated with an increased physical presence in markets with higher internet access levels, in comparison to the alternative organizational forms, as indicated by the coefficients from the triple interaction terms in columns [1] and [4] ($p < 0.01$). In contrast, there's no statistically significant effect in the cases of for-profit banks ($p > 0.10$, columns [2] and [5]) and although there seems to be a positive effect of digitalization on the physical presence of state-owned banks according to the LPM (coef = 0.008, $p < 0.01$, column [3]), the results do not hold under the more rigorous test imposed by the 2SFEL ($p > 0.10$, column [6]). Therefore, it appears that the demand-side effects predominantly influence credit cooperatives, reinforcing the idea that, since the members are owners, and they might possess an inherent preference for in-person interactions, then cooperatives will set strategic entry choices that encompass maintaining physical branches for longer periods, even when faced with accelerated digitalization. This underscores the significance of relational channels as pivotal mechanisms driving the key findings related to Hypothesis 1.

INSERT TABLE 9 ABOUT HERE

3.6 DISCUSSION

This paper contributes to the literature that analyzes how distinct organizational forms generate social benefits beyond economic profits (Cabral et al., 2013; Cabral et al., 2019; Inoue, 2020; Kivleniece & Quelin, 2012; Klein et al., 2013; Lazzarini, 2020; Luo & Kaul, 2019), by examining the strategic decisions of cooperatives compared to for-profit and state-owned counterparts in highly competitive markets, with a particular emphasis on their efforts to create social and community value. Traditionally, cooperatives have been portrayed as organizational arrangements that generate direct community benefits due to their shared ownership and shared decision-making structures (Ingram & Simons, 2000; Núñez-Nickel & Moyano-Fuentes, 2004). We challenge this conventional perception and propose that credit cooperatives, instead of prioritizing the creation of social value, primarily seek to reinforce their local presence to generate greater economic gains. As a result, these organizations may not necessarily prioritize serving clients with critical needs or vulnerable populations, but actually concentrate their efforts in regions with increased economic development, positioning themselves as a relationship-based alternative to the more traditional for-profit and state-owned banks.

Specifically, our findings reveal that during periods of increased pressures toward digitalization, credit cooperatives rely more heavily on physical channels than the other two organizational arrangements, indicating a preference among their target audiences for in-person services rather than digital platforms. However, this preference is not reinforced in more vulnerable localities, characterized by digital disenfranchisement and socio-economic underdevelopment, and where the preservation of relational channels with clients is more crucial (Luo & Kaul, 2019). Instead, credit cooperatives are found to be less physically present in these localities after periods of accelerated digitalization than the other two organizational forms. Consequently, vulnerable regions end up being served either by state-owned banks, which due to their legal mandate are more present in underdeveloped regions, irrespective of the type of vulnerability (Musacchio et al., 2015); and for-profit banks, which tend to avoid economically underdeveloped regions where the potential for economic rent appropriation is lower, but are comparatively

more present in socially vulnerable regions, where access to banking services is likely achieved primarily through physical means.

Our results also account for potential heterogeneities in cooperatives' strategic behavior depending on organizational attributes such as structure and scope, which notably affect their external relationships with the community (Hansmann, 2000) and internal capabilities (Teece, 1986). In that sense, we assert that multiunit credit cooperatives with external governance structures, pursuing economic gains beyond the interest of member-owners, tend to exhibit behavior more aligned with for-profit banks. In contrast, smaller, single-unit cooperatives where relational bonds with the community are more prevalent and preferences tend to be more homogeneous across stakeholder groups (Amess & Howcroft, 2001; Slade Shantz et al., 2020) are not averse to vulnerable regions, despite the lower potential for extracting economic rents in such areas. Furthermore, the scope of the cooperatives also plays an important role in determining their strategic actions. When faced with increased external pressures towards digitalization, non-credit cooperatives tend to discontinue their physical credit services to concentrate on core activities. Thus, our insights point to the importance of disentangling heterogeneities between different types of cooperatives to better explain how ownership in the hands of stakeholders allows for diverse forms of combining social and economic value creation (Foss & Klein, 2018; Klein et al., 2012).

Finally, we also contribute to the literature in management examining the behavior of cooperatives (Boone & Özcan, 2014; Chatterji et al., 2021; Jeong et al., 2020; Slade Shantz et al., 2020), by showing how this organizational form uniquely behaves in comparison to their rivals —i.e., for-profit and state-owned firms—, especially in markets facing rapid changes to the competitive landscape. We argue that in spite of the traditional view on cooperatives as comparatively more suited to address social issues than other organizational arrangements, in the case of credit cooperatives, decision-making is more driven by potential profits and product differentiation than by social purpose or community benefits.

Due to the empirical nature of our study, it has certain limitations that should be acknowledged. First, despite our best efforts to address unobserved heterogeneity through the implementation of 2SFEL models and various robustness tests, our evidence is strictly correlational. Although the Regulatory Norm

was probably unanticipated by managers, some organizations might have already begun the transition before the regulation was implemented, allowing customers to access banks' online and mobile platforms even without a clear regulation on the creation of electronic accounts. Therefore, at best, our shock accelerates digitalization, rather than causes it. Second, our measures of vulnerability consist of aggregate indices and proxies, which may limit our ability to fully understand the underlying channels driving the proposed relationships. We do find consistency in the results across a series of different specifications, but relying on secondary data restricts our ability to interpret the reasoning behind the strategic decisions in each organizational form. Third, although theoretical propositions support our main arguments regarding organizational choices driven by social purposes or the maintenance of relational channels with customers and incorporating their needs within the decision-making process, our results may be driven by alternative mechanisms that are not observable through our variables, such as low economic performance or decreases in demand for credit. Unfortunately, our datasets lack financial information and data on the specific motivation for market entry or exit. A critical next step for research would be to incorporate these measures as a way to interpret organizations' strategic movements in more depth.

Moreover, our empirical setting may present idiosyncrasies that restrict the generalizability of our findings. For instance, while the credit provision sector is competitive, it is also heavily dominated by major players, which can constrain the strategic choices of new entrants with lower market power. As a result, economic performance often takes precedence over community-based needs in shaping their decisions. Additionally, the presence of state-owned banks with a social mandate can alleviate the pressure on market organizations to prioritize social purposes. This dynamic may not hold true in other types of cooperatives, such as worker cooperatives, which are formed with different motivations and may have distinct considerations beyond competition. Moreover, the credit provision sector is highly technology-intensive, enabling organizations to swiftly reallocate resources and close physical units. This rapid adaptability may not apply to other sectors, such as energy cooperatives, where physical installations play a critical role, making relocation or resource redeployment more challenging. Lastly, it is important to note that the structure of incentives varies significantly across different types of cooperatives. For example, producer-

owned cooperatives may have a primary focus on sharing tools, resources, and knowledge, differing considerably from consumer cooperatives such as credit ones, where product exchange creates a tense dynamic between buyers (borrowers) and sellers (lenders).

Despite the technical limitations of our study, we believe that our efforts to position cooperatives in a comparative discussion with other organizational forms can serve as a catalyst for future research. A first natural extension would be to explore how cooperatives from other sectors and types comparatively behave with alternative organizational forms. For example, investigating whether producer cooperatives in the agricultural sector prioritize entry into higher profitable markets, similar to credit cooperatives, could provide valuable insights into the decision-making processes of different cooperative types. Such studies would contribute to our understanding of the contexts in which cooperatives are most effective in generating social value. Furthermore, it is important to recognize that factors beyond structure and scope can influence cooperatives, such as the heterogeneity of preferences among members, particularly when dealing with vulnerable localities (Slade Shantz et al., 2020). Future research could delve deeper into these intrinsic and unique mechanisms within cooperatives and explore how they interact with other organizational attributes from a complementarity versus substitution perspective. Understanding the interplay between cooperative entry choices and market characteristics is another area that requires further investigation. Qualitative studies could shed light on whether cooperatives choose to enter specific localities as alternatives to existing organizational forms that are unable to provide access, or if entry decisions are part of deliberate expansion strategies set by the organizations themselves.

Finally, following calls from literature, a promising line of research is to examine the relationship between different organizational forms and social value creation, as well as how these organizations contribute to addressing societal grand challenges (Cabral et al., 2019; George et al., 2016). Particularly in the case of cooperatives, it remains unclear whether their presence in the market leads to positive effects on society or if the democratic ideals promoted within the organization struggle to transcend its boundaries and reach external audiences. Therefore, further exploration of the presence and contingencies of this effect

is critical to gaining a deeper understanding of the social role of this peculiar and extremely relevant organizational form.

3.7 CONCLUSION

In this paper, we assess how distinct organizational forms heterogeneously create community-based benefits by comparing the strategic choices made by credit cooperatives with those of for-profit banks and state-owned banks. We argue that the unique member-ownership trait of credit cooperatives amplifies the importance of relational channels within those organizations, leading them to prioritize in-person relationships with their customers even in the face of increased pressures toward digitalization. In contrast, for-profit banks are expected to leverage the more efficient tools and processes provided by digitalization and discontinue their physical activities as a way to reduce costs and improve economic gains. However, these trends are not homogeneous across markets, being subject to variations depending on the level of vulnerability and digital disenfranchisement of the targeted localities. Furthermore, internal attributes of the credit cooperatives, such as structure and scope, are key to their market entry strategies. Testing our theory in the context of accelerated digitalization of the financial sector, we find that credit cooperatives do rely more heavily on physical channels than the other two organizational arrangements, but this preference is less prominent in more vulnerable localities, which end up being attended by either state-owned or for-profit banks. Moreover, we provide evidence that cooperatives' structure and scope matter, such that single cooperatives are more likely to retain physical units in vulnerable regions, while cooperative federations tend to withdraw from such areas. Also, non-credit cooperatives decrease their propensity to maintain credit services active during periods of accelerated digitalization in comparison to other organizational forms. Thus, we show that alternative organizational forms, and cooperatives included, respond differently to competition and digitalization, and both external factors related to target audiences and internal attributes of the organization play an important role in leading to heterogeneous social value creation.

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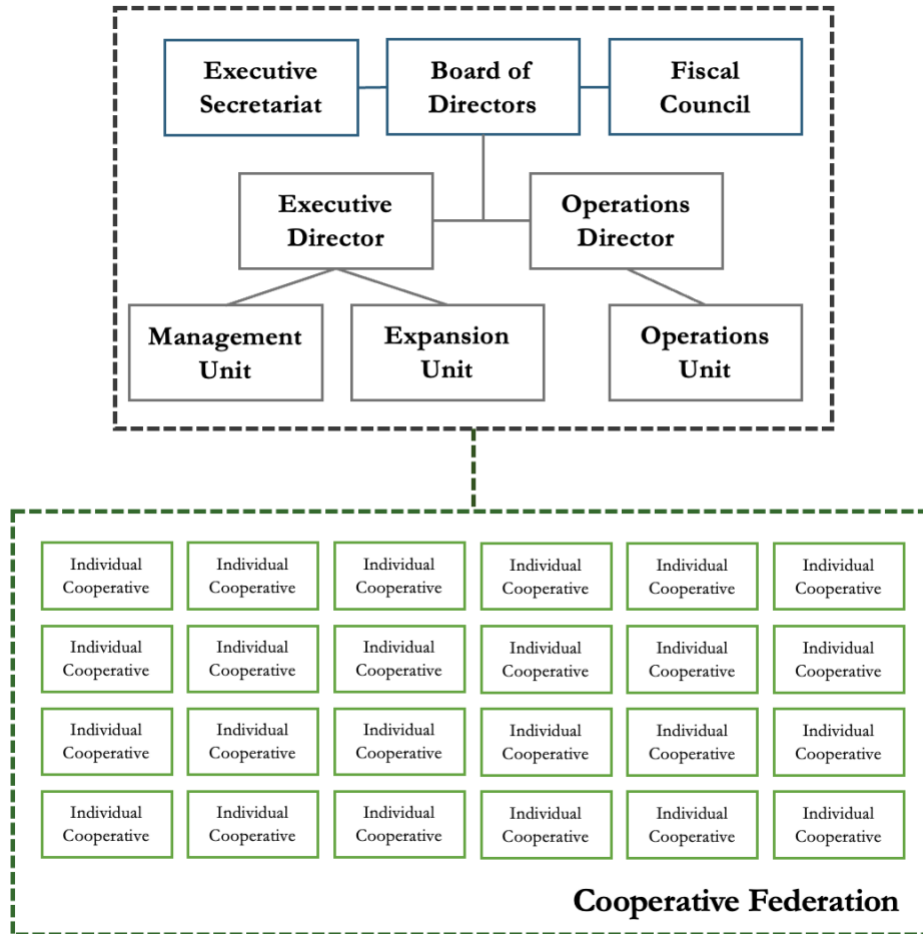
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FIGURES AND TABLES

Figure 1 – Governance Structure of Cooperative Federations



Note: The figure was elaborated by the authors based on the analysis of documents and meetings with executives from Brazilian credit cooperatives.

Figure 2 – Branches of each organizational form across the country

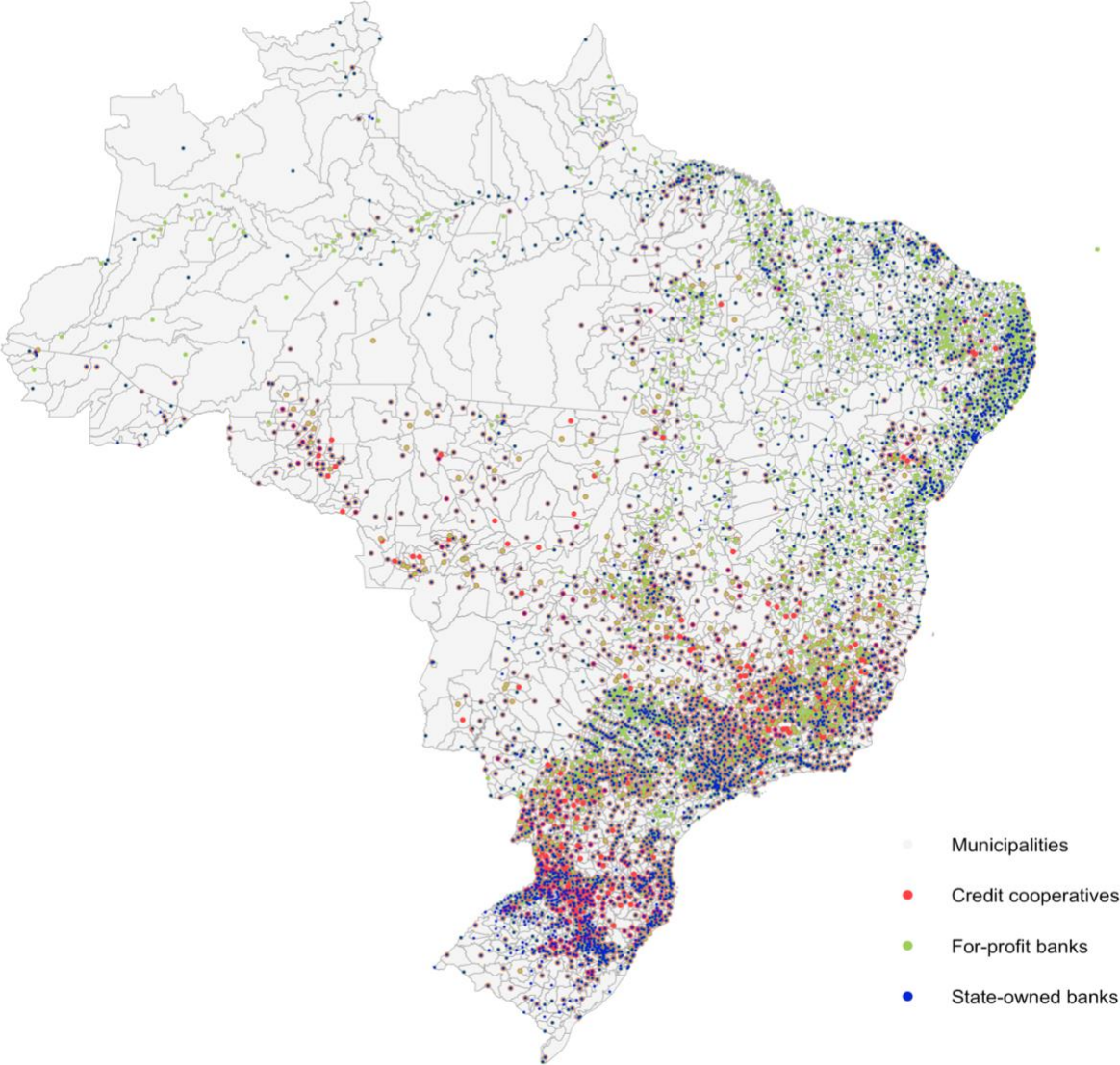
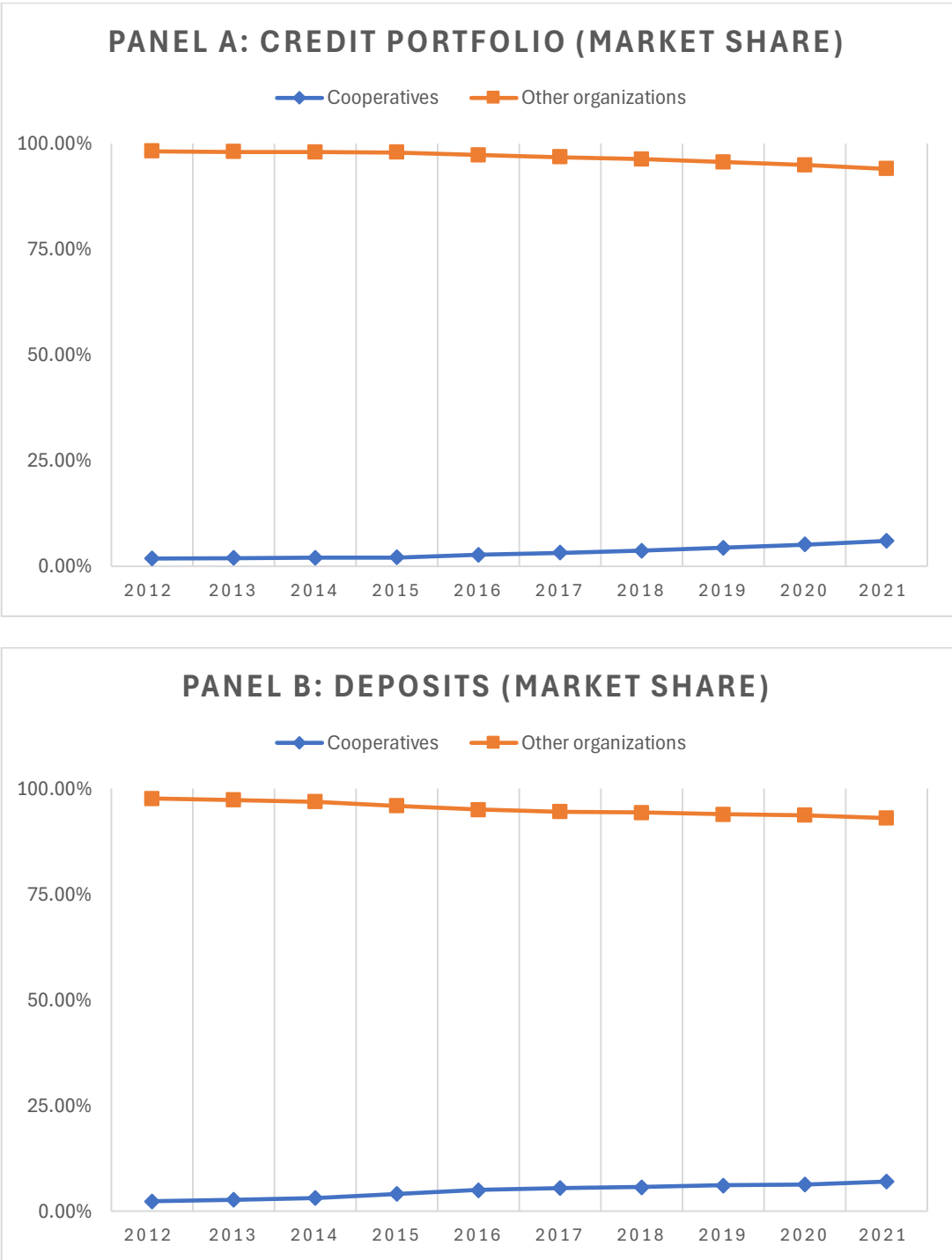


Figure 3 – Evolution of Cooperatives market share over time



Note: The figures were elaborated by the authors based on Bacen data from 2021.

Table 1 – Variance Component Analysis

Variance Component Analysis	
	Physical Presence (1)
Organizational Form	0.316 (0.129)
Individual Organization Effects	0.142 (0.001)
Residual	0.209 (0.001)
Year Fixed Effects	Yes
Log-likelihood	35,394.21
Observations	553,680

Note: The Variance Component Analysis assumes random effects for both organizational form-level and individual-level characteristics. Optimization is implemented using mixed-effects maximum likelihood functions, with physical market presence as the dependent variable.

Table 2 – Summary statistics and correlations

Variable	Summary statistics				Correlations											
	Mean	Std. Dev.	Min	Max	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	
[1] Entry	0.831	0.374	0	1	1											
[2] Market Size	2.801	7.147	1	2888	0.048*	1										
[3] Herfindahl-Hirschman Index	3.719	1.127	0.000	8.800	0.062*	0.825*	1									
[4] Income per capita	834.288	424.683	107.14	2043.74	-0.028*	0.577*	0.446*	1								
[5] Ln(Agricultural Production)	1,038.55	1,466.48	0.000	1,472.47	-0.046*	-0.006*	0.007*	0.038*	1							
[6] Ln(GDP)	1,478.53	2,713.26	8,342.83	20,453.82	0.043*	0.678*	0.541*	0.832*	0.096*	1						
[7] Vulnerability Index	0.2961097	0.1029381	0.09	0.773	0.134*	-0.035*	-0.006*	-0.531*	-0.105*	-0.261*	1					
[8] Internet Access	1,215.448	3,218.586	1,098.612	1,832.744	0.059*	0.623*	0.495*	0.829*	0.070*	0.961*	-0.343*	1				
[9] Low Internet Access	0.092111	0.2891828	0	1	-0.002	-0.123*	-0.082*	-0.338*	-0.150*	-0.410*	0.364*	-0.465*	1			
[10] Low GDP	0.0902543	0.286546	0	1	-0.037*	-0.122*	-0.083*	-0.298*	-0.249*	-0.482*	0.216*	-0.453*	0.540*	1		
[11] Human Development Index	0.7255611	0.0746929	0.418	0.862	-0.063*	0.393*	0.295*	0.889*	0.055*	0.743*	-0.758*	0.781*	-0.443*	-0.350*	1	

Note: This table presents the summary statistics and correlations for each pair of variables. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 3 – Increased digitalization effects over organizational physical presence and heterogeneities at the market vulnerability level

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
	Linear Probability Model			Two-stage Fixed Effects Logit			Linear Probability Model			Two-stage Fixed Effects Logit		
[H1] Cooperative X Digital Shock	0.393** (0.007)			3.399** (0.194)			0.453** (0.020)			4.733** (0.640)		
[H1] For-profit X Digital Shock		-0.140** (0.005)			-3.052** (0.183)			-0.239** (0.010)			-3.257** (0.718)	
[H1] State-owned X Digital Shock			-0.105** (0.007)			-1.829** (0.239)			-0.268** (0.010)			-4.027** (0.730)
[H2] Cooperative X Digital Shock X Vulnerability Index							-0.232** (0.071)			-4.727* (2.256)		
[H2] For-profit X Digital Shock X Vulnerability Index								0.340** (0.027)			0.777 (2.581)	
[H2] State-owned X Digital Shock X Vulnerability Index									0.561** (0.023)			7.150** (2.540)
Digital Shock				2.694** (0.113)	5.553** (0.125)	4.992** (0.102)				1.197** (0.397)	5.340** (0.391)	4.833** (0.346)
Vulnerability Index							-0.039 (0.036)	0.029 (0.057)	0.170** (0.047)			
Digital Shock X Vulnerability Index							0.008 (0.049)	-0.448** (0.062)	-0.602** (0.059)	5.336** (1.417)	0.772 (1.355)	0.606 (1.245)
Market Size	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	-0.253* (0.107)	-0.251* (0.106)	-0.254* (0.106)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.249* (0.107)	-0.249* (0.106)	-0.253* (0.106)
Herfindahl-Hirschman Index	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.009** (0.002)	0.009** (0.002)	0.009** (0.002)	0.000** (0.000)	0.000* (0.000)	0.000** (0.000)	0.009** (0.002)	0.009** (0.002)	0.009** (0.002)
Income per capita	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)				-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)			
Ln(Agricultural Production)	0.000 (0.003)	-0.005 (0.004)	-0.002 (0.004)	2.618** (0.071)	2.692** (0.070)	2.656** (0.070)	0.001 (0.003)	-0.003 (0.004)	-0.001 (0.004)	2.642** (0.072)	2.698** (0.070)	2.673** (0.070)
Ln(GDP)	0.002 (0.003)	0.001 (0.004)	0.002 (0.004)	9.776** (0.156)	9.617** (0.153)	9.464** (0.150)	0.002 (0.003)	0.003 (0.004)	0.003 (0.004)	9.767** (0.156)	9.613** (0.153)	9.469** (0.150)
Individual Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	411,836	411,836	411,836	76,742	76,742	76,742	411,836	411,836	411,836	76,742	76,742	76,742

Note: This table presents the coefficients of regressions focused on analyzing hypotheses 1 and 2. Columns [1]-[3] and [7]-[9] display the coefficients from Linear Probability Models, while columns [4]-[6] and [10]-[12] relate to Two-stage Fixed Effects Logit models following the specifications proposed in the Econometric Approach section. Variables Market Size and Herfindahl-Hirschman Index are lagged to account for competition in the period prior to the decision to enter/exit the market. Standard errors are clustered at the municipality level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 4 – Heterogeneities at the cooperative level: structure and scope

	[1]	[2]	[3]	[4]
Single Cooperative X Digital Shock	0.343** (0.052)			
Cooperative Federation X Digital Shock		0.393** (0.023)		
[H3] Single Cooperative X Digital Shock X Vulnerability Index	0.224 (0.186)			
[H3] Cooperative Federation X Digital Shock X Vulnerability Index		-0.138+ (0.074)		
Vulnerability Index	0.048 (0.045)	-0.022* (0.038)		
Digital Shock X Vulnerability Index	-0.360** (0.056)	-0.073 (0.052)		
[H4] Non-credit cooperatives X Digital Shock			0.271** (0.022)	
[H4] Credit-only cooperatives X Digital Shock				0.391** (0.007)
Market Size	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)
Herfindahl-Hirschman Index	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)
Income per capita	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)
Ln(Agricultural Production)	-0.002 (0.004)	0.001 (0.003)	-0.004 (0.004)	0.000 (0.003)
Ln(GDP)	0.003 (0.004)	0.003 (0.003)	0.002 (0.004)	0.002 (0.003)
Individual Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES
Observations	411,836	411,836	411,836	411,836

Note: This table presents the coefficients of regressions focused on analyzing hypotheses 3 and 4. Columns [1]-[4] display the coefficients from Linear Probability Models, following the specifications proposed in the Econometric Approach section. Variables Market Size and Herfindahl-Hirschman Index are lagged to account for competition in the period prior to the decision to enter/exit the market. Standard errors are clustered at the municipality level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 5 – Duration models (time-to-exit by organizational form during digitalization)

	Cooperative	For-profit	State-owned
	(1)	(2)	(3)
Organizational Form	0.346 ⁺	1.696 ^{**}	0.728
	(0.203)	(0.365)	(0.159)
Control variables	YES	YES	YES
Log-likelihood	-980,19	-979.35	-981,40
Observations	44,072	44,072	44,072

Note: This table presents the hazard rates of Cox proportional hazard models deployed independently for each organizational form. Variables Market Size, Herfindahl-Hirschman Index, Ln(Agricultural Production) and Ln(GDP) are included as controls in the specification.
Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 6 – Robustness tests: Instrumental Variable estimation for H1

	[1]	[2]	[3]
Cooperative X Digital Shock	0.387** (0.004)		
For-profit X Digital Shock		-0.148** (0.003)	
State-owned X Digital Shock			-0.048** (0.003)
Cooperative	0.000 (0.000)		
For-profit		0.000 (0.000)	
State-owned			0.000 (0.000)
Digital Shock	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Control variables	YES	YES	YES
Individual Fixed Effects	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES
Observations	411,862	411,862	411,862

Note: This table presents the coefficients of a 2SLS model using internet access by the population in each municipality as an instrument to the digitalization shock in the first stage. Variables Market Size (lag=1), Herfindahl-Hirschman Index (lag=1), Income per capita, Ln(Agricultural Production), and Ln(GDP) are included as controls in the specification. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 7 – Robustness tests: Alternative measures of Vulnerability for testing H2

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Cooperative X Digital Shock	0.398** (0.007)			0.400** (0.007)			-0.053 (0.088)		
For-profit X Digital Shock		-0.138** (0.005)			-0.138** (0.005)			0.030 (0.053)	
State-owned X Digital Shock			-0.107** (0.007)			-0.105** (0.007)			0.104 (0.081)
Digital Shock X Low Internet Access	0.019 (0.023)	0.049 (0.033)	-0.018 (0.034)						
Cooperative X Digital Shock X Low Internet Access	-0.086** (0.019)								
For-profit X Digital Shock X Low Internet Access		-0.030** (0.013)							
State-owned X Digital Shock X Low Internet Access			0.040** (0.013)						
Low GDP				0.001 (0.015)	-0.025 (0.020)	0.017 (0.018)			
Digital Shock X Low GDP				0.019 (0.019)	0.036 (0.028)	-0.026 (0.025)			
Cooperative X Digital Shock X Low GDP				-0.137** (0.018)					
For-profit X Digital Shock X Low GDP					-0.022 (0.015)				
State-owned X Digital Shock X Low GDP						-0.011 (0.015)			
Human Development Index							-0.008 (0.081)	-0.103 (0.114)	-0.194 (0.104)
Digital Shock X HDI							0.146 (0.087)	0.681** (0.110)	0.814** (0.114)
Cooperative X Digital Shock X HDI							0.605** (0.124)		
For-profit X Digital Shock X HDI								-0.231** (0.079)	
State-owned X Digital Shock X HDI									-0.285** (0.121)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
Individual Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	411,836	411,836	411,836	411,836	411,836	411,836	411,836	411,836	411,836

Note: This table presents the coefficients of regressions considering alternative measures of Vulnerability. Columns [1]-[9] display the coefficients from Linear Probability Models, following the specifications proposed in the Econometric Approach section. Variables Market Size (lag=1), Herfindahl-Hirschman Index (lag=1), Income per capita, Ln(Agricultural

Production), and Ln(GDP) are included as controls in the specification. Standard errors are clustered at the municipality level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 8 – Extension analysis: event study within each organizational form

Panel A: Credit cooperatives		
	Linear Probability Model	Two-stage Fixed Effects
	(1)	Logit
	(1)	(2)
Digital Shock X Vulnerability Index	-0.296** (0.069)	0.669 (1.569)
Digital Shock		5.575** (0.440)
Control variables	YES	YES
Individual Fixed Effects	YES	YES
Municipality Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	78,502	41,724
Panel B: For-profit banks		
	Linear Probability Model	Two-stage Fixed Effects
	(1)	Logit
	(1)	(2)
Digital Shock X Vulnerability Index	-0.117** (0.009)	0.519 (2.202)
Digital Shock		2.221** (0.608)
Vulnerability Index		0.298* (0.087)
Control variables	YES	YES
Individual Fixed Effects	YES	YES
Municipality Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	187,952	16,425

Panel C: State-owned banks

	Linear Probability Model (1)	Two-stage Fixed Effects Logit (2)
Digital Shock X Vulnerability Index	0.048** (0.013)	7.916** (2.149)
Digital Shock		0.467 (0.625)
Vulnerability Index		0.048 (0.064)
Control variables	YES	YES
Individual Fixed Effects	YES	YES
Municipality Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	147,803	19,106

Note: This table presents the coefficients of event studies analyzing the effects of the digitalization shock on the decision of each organizational form to maintain physical presence in vulnerable markets compared to non-vulnerable ones. Panels A, B, and C report the results concerning credit cooperatives, for-profit banks, and state-owned banks, respectively. Columns [1] displays the coefficients from Linear Probability Models, while column [2] relates to Two-stage Fixed Effects Logit models following the specifications proposed in the Econometric Approach section. Variables Market Size (lag=1), Herfindahl-Hirschman Index (lag=1), Income per capita, Ln(Agricultural Production), and Ln(GDP) are included as controls in the specification. Standard errors are clustered at the municipality level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 9 – Extension analysis: internet access (demand-side)

	Linear Probability Model			Two-stage Fixed Effects Logit		
	[1]	[2]	[3]	[4]	[5]	[6]
Cooperative X Digital Shock	0.262** (0.035)			-2.178** (0.920)		
For-profit X Digital Shock		-0.153** (0.018)			-2.478* (1.204)	
State-owned X Digital Shock			-0.221** (0.031)			-0.619 (1.106)
Cooperative X Ln(Internet Access)	0.022** (0.005)			-4.350** (0.237)		
For-profit X Ln(Internet Access)		-0.032** (0.003)			2.813** (0.317)	
State-owned X Ln(Internet Access)			0.025** (0.003)			3.340** (0.287)
Ln(Internet Access)	-0.014** (0.005)	0.004 (0.006)	-0.030** (0.007)	6.975** (0.196)	3.996** (0.116)	3.706** (0.121)
Digital Shock				5.340** (0.732)	6.233** (0.427)	7.219** (0.387)
Digital Shock X Ln(Internet Access)	0.004 (0.004)	0.002 (0.006)	0.007 (0.005)	-0.243** (0.046)	-0.133** (0.034)	-0.236** (0.028)
Cooperative X Digital Shock X Ln(Internet Access)	0.010** (0.003)			0.421** (0.069)		
For-profit X Digital Shock X Ln(Internet Access)		0.002 (0.002)			-0.010 (0.078)	
State-owned X Digital Shock X Ln(Internet Access)			0.008** (0.003)			-0.094 (0.072)
Control Variables	YES	YES	YES	YES	YES	YES
Individual Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	414249	414249	414249	77254	77254	77254

Note: This table presents the coefficients of regressions focused on analyzing the demand-side effects for digital products and services on organizations' decisions to enter/exit markets. Columns [1]-[3] display the coefficients from Linear Probability Models, while columns [4]-[6] relate to Two-stage Fixed Effects Logit models following the specifications proposed in the Econometric Approach section. Variables Market Size (lag=1), Herfindahl-Hirschman Index (lag=1), Income per capita, Ln(Agricultural Production), and Ln(GDP) are included as controls in the specification. Standard errors are clustered at the municipality level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

APPENDIX

Table A1 – Main effects considering pairwise comparisons between organizational forms

Panel A: Credit cooperatives vs For-profit banks				
	Linear Probability Model (1)	Two-stage Fixed Effects Logit (2)	Linear Probability Model (3)	Two-stage Fixed Effects Logit (4)
[H1] Cooperative X Digital Shock	0.409** (0.007)	3.351** (0.202)	0.471** (0.022)	3.513** (0.770)
Digital Shock		2.585** (0.132)		2.077** (0.598)
Vulnerability Index			-0.101 (0.068)	
Digital Shock X Vulnerability Index			-0.017 (0.075)	1.883 (2.187)
[H2] Cooperative X Digital Shock X Vulnerability Index			-0.238** (0.077)	-0.603 (2.785)
Control variables	YES	YES	YES	YES
Individual Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES
Observations	261,018	56,763	261,018	56,763
Panel B: Credit cooperatives vs State-owned banks				
	Linear Probability Model (1)	Two-stage Fixed Effects Logit (2)	Linear Probability Model (3)	Two-stage Fixed Effects Logit (4)
[H1] Cooperative X Digital Shock	0.391** (0.007)	2.939** (0.267)	0.449** (0.021)	4.226** (0.813)
Digital Shock		3.077** (0.215)		1.334* (0.640)
Vulnerability Index			-0.028 (0.073)	
Digital Shock X Vulnerability Index			0.076 (0.080)	5.735** (2.135)
[H2] Cooperative X Digital Shock X Vulnerability Index			-0.224** (0.073)	-4.024 (2.788)
Control variables	YES	YES	YES	YES
Individual Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES
Observations	221,571	58,877	221,571	58,877

Panel C: For-profit banks vs State-owned banks				
	Linear Probability Model (1)	Two-stage Fixed Effects Logit (2)	Linear Probability Model (3)	Two-stage Fixed Effects Logit (4)
[H1] For-profit X Digital Shock	-0.014** (0.002)	-0.584* (0.250)	0.029** (0.005)	1.699 (0.867)
Digital Shock		2.878** (0.213)		0.571 (0.621)
Vulnerability Index			-0.019 (0.030)	
Digital Shock X Vulnerability Index			0.080* (0.033)	7.674** (2.128)
[H2] For-profit X Digital Shock X Vulnerability Index			-0.145** (0.015)	-7.587* (3.047)
Control variables	YES	YES	YES	YES
Individual Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES
Observations	331,741	35,279	331,741	35,279

Note: This table presents the coefficients of regressions focused on pairwise comparisons between organizational forms. Columns [1] and [3] display the coefficients from Linear Probability Models, while columns [2] and [4] relate to Two-stage Fixed Effects Logit models following the specifications proposed in the Econometric Approach section. Panel A reports comparisons between credit cooperatives and for-profit banks (baseline); panel B reports comparisons between credit cooperatives and state-owned banks (baseline); and panel C reports comparisons between for-profit banks and state-owned banks (baseline). Variables Market Size (lag=1), Herfindahl-Hirschman Index (lag=1), Income per capita, Ln(Agricultural Production), and Ln(GDP) are included as controls in the specification. Standard errors are clustered at the municipality level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table A2 – Robustness tests: main effects for a subsample excluding metropolitan regions and state capitals

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
	Linear Probability Model			Two-stage Fixed Effects Logit			Linear Probability Model			Two-stage Fixed Effects Logit		
[H1] Cooperative X Digital Shock	0.388** (0.007)			2.176** (0.242)			0.446** (0.021)			4.747** (0.718)		
[H1] For-profit X Digital Shock		-0.155** (0.004)			-2.291** (0.282)			-0.251** (0.010)			-4.867** (1.093)	
[H1] State-owned X Digital Shock			-0.127** (0.003)			-1.517** (0.338)			-0.283** (0.008)			-3.877** (0.868)
[H2] Cooperative X Digital Shock X Vulnerability Index							-0.232** (0.072)			-9.394** (2.712)		
[H2] For-profit X Digital Shock X Vulnerability Index								0.334** (0.027)			11.139* (4.757)	
[H2] State-owned X Digital Shock X Vulnerability Index									0.539** (0.024)			6.977* (2.980)
Digital Shock				3.340** (0.199)	5.339** (0.126)	5.223** (0.121)				0.852 (0.580)	5.216** (0.367)	4.853** (0.380)
Vulnerability Index							-0.046 (0.038)	0.019 (0.061)	0.170** (0.050)			
Digital Shock X Vulnerability Index							0.021 (0.050)	-0.430** (0.062)	-0.592** (0.057)	9.114** (2.278)	0.463 (1.274)	1.425 (1.394)
Market Size	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.224 (0.121)	-0.224 (0.120)	-0.229 (0.121)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.220 (0.121)	-0.222 (0.120)	-0.227 (0.121)
Herfindahl-Hirschman Index	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.309** (0.051)	0.307** (0.051)	0.314** (0.051)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.310** (0.051)	0.310** (0.051)	0.315** (0.051)
Income per capita	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)				-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)			
Ln(Agricultural Production)	0.001 (0.004)	-0.004 (0.004)	-0.001 (0.005)	2.706** (0.101)	2.719** (0.102)	2.702** (0.101)	0.002 (0.004)	-0.002 (0.004)	-0.001 (0.004)	2.733** (0.103)	2.727** (0.102)	2.731** (0.102)
Ln(GDP)	0.001 (0.004)	0.001 (0.005)	0.002 (0.005)	7.740** (0.162)	7.731** (0.161)	7.699** (0.160)	0.002 (0.004)	0.003 (0.005)	0.003 (0.004)	7.768** (0.162)	7.749** (0.162)	7.713** (0.161)
Individual Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	290,430	290,430	290,430	49,661	49,661	49,661	290,430	290,430	290,430	49,661	49,661	49,661

Note: This table presents the coefficients of regressions focused on providing robustness to the results obtained in testing hypotheses 1 and 2 by observing a subsample of the data in which metropolitan regions and state capitals are excluded. Columns [1]-[3] and [7]-[9] display the coefficients from Linear Probability Models, while columns [4]-[6] and [10]-[12] relate to Two-stage Fixed Effects Logit models following the specifications proposed in the Econometric Approach section. Variables Market Size and Herfindahl-Hirschman Index are lagged to account for competition in the period prior to the decision to enter/exit the market. Standard errors are clustered at the municipality level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table A3 – Robustness tests: heterogeneities on cooperatives for a subsample excluding municipalities and state capitals

	[1]	[2]	[3]	[4]
Single Cooperative X Digital Shock	0.353** (0.053)			
Cooperative Federation X Digital Shock		0.384** (0.023)		
[H3] Single Cooperative X Digital Shock X Vulnerability Index	0.202 (0.182)			
[H3] Cooperative Federation X Digital Shock X Vulnerability Index		-0.139+ (0.079)		
Vulnerability Index	0.046 (0.048)	-0.026 (0.040)		
Digital Shock X Vulnerability Index	-0.357** (0.055)	-0.068 (0.053)		
[H4] Non-credit cooperatives X Digital Shock			0.251** (0.028)	
[H4] Credit-only cooperatives X Digital Shock				0.384** (0.007)
Market Size	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Herfindahl-Hirschman Index	0.002 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)
Income per capita	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)
Ln(Agricultural Production)	-0.002 (0.004)	0.001 (0.004)	-0.004 (0.005)	0.001 (0.004)
Ln(GDP)	0.003 (0.005)	0.002 (0.004)	0.001 (0.005)	0.001 (0.004)
Individual Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Municipality X Year Fixed Effects	YES	YES	YES	YES
Observations	290,430	290,430	290,430	290,430

Note: This table presents the coefficients of regressions focused on providing robustness to the results obtained in testing hypotheses 3 and 4 by observing a subsample of the data in which metropolitan regions and state capitals are excluded. Columns [1]-[4] display the coefficients from Linear Probability Models, following the specifications proposed in the Econometric Approach section. Variables Market Size and Herfindahl-Hirschman Index are lagged to account for competition in the period prior to the decision to enter/exit the market. Standard errors are clustered at the municipality level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

4. NAVIGATING PHILANTHROPY ALLOCATION AMIDST CHANGE: BALANCING INSTITUTIONAL AND FIRM-LEVEL DRIVERS OF GIVING

4.1 INTRODUCTION

The literature in strategy extensively examines how firms make decisions about resource allocation through corporate philanthropy (Gatignon & Bode, 2023; Gautier & Pache, 2015; Luo et al., 2018; Marquis & Lee, 2013; Marquis & Tilcsik, 2016; Seo et al., 2021; Tilcsik & Marquis, 2013; Wang et al., 2008) as part of their corporate social responsibility (CSR) strategies (Barnett, 2007; Dorobantu, Kaul, et al., 2017; Eccles et al., 2014; Flammer, 2015), and their actions towards the creation of public value (Cabral et al., 2019; Kaul & Luo, 2018; Lazzarini, 2020; Luo & Kaul, 2019; McGahan et al., 2013). Extant research adopts either a firm-level approach, exploring how philanthropic and CSR investments stem from the pursuit of private gains (Barney, 2018; Bénabou & Tirole, 2010; Bode & Singh, 2018; Burbano, 2016; Wang & Qian, 2011) and from firms' altruistic purpose (Carroll, 1999; Kaplan, 2023; McGahan, 2023); or an institutional perspective, analyzing how different institutional environments produce distinct incentives and consequentially shape corporate giving and CSR strategies across various organizational contexts (Ballesteros & Gatignon, 2019; Dorobantu, Kaul, et al., 2017; Gatignon et al., 2023; Ioannou & Serafeim, 2019; Jain et al., 2017).

However, while the literature on corporate philanthropy acknowledges the interplay between firm action and the institutional framework, and the potential consequences of this interface on firm performance (Ballesteros & Gatignon, 2019; Breeze et al., 2011; Flammer & Ioannou, 2021; Marquis & Battilana, 2009; Marquis & Tilcsik, 2016), there remains a crucial and partly unfulfilled effort to analyze the outcomes of these interactions from the perspective of value allocation to distinct stakeholders –i.e., rather than focusing on the outcomes over private value creation, actually considering how changes in the institutional landscape affect who benefits from corporate philanthropy, and how different groups are prioritized (Gautier & Pache, 2015; Klein et al., 2019; Luo & Kaul, 2019). Philanthropic actions are inherently dynamic and complex, involving intricate relationships among investors, investees, and beneficiaries. Depending on their attributes

and preferences, these interactions can significantly impact the creation of social value from investments (Berger et al., 2004; Chatain & Plaksenkova, 2019; Feilhauer & Hahn, 2021). Therefore, analyzing the interplay between institutional-level transitions aimed at improving value distribution to a broader set of actors (Candeias & Sarkar, 2024; Caulfield & Lynn, 2024), and firm-level strategies in selecting beneficiaries of their prosocial investments can enhance our comprehension of how firms' participation within the philanthropic ecosystems contribute to the allocation of value and to address pressing social issues (Gautier & Pache, 2015; Hornstein & Zhao, 2018; Wickert, 2021).

In this paper, I advance this topic by assessing the impact of an institutional-level determinant of corporate philanthropy, in the form of a public policy implemented by the Brazilian government with the aim of increasing the scale and the equitable distribution of philanthropic investments in the cultural sector. Specifically, the policy involved the introduction of a public, online system that provided extensive information on projects seeking funding, including detailed budget breakdowns, schedules, descriptions, activity plans, technical specifications, marketing materials, counterparties, and legal documentation (Brasil, 2017). As a result, the system substantially reduced search, selection, and monitoring costs for firms interested in investing in cultural projects through deductible donations. With the policy, the government expected to attract new sponsors and promote a more balanced distribution of philanthropic contributions across various localities, shifting the focus from heavily commercialized areas towards the inclusion of regions lacking cultural equipment and initiatives.

Using data from a series of public sources, I analyze how the introduction of this policy affected the corporate philanthropic giving decisions of 148 public companies towards 5,616 cultural projects dispersed across the country from 2011 to 2021, with a particular emphasis on differences between adequately served and underserved localities in terms of access to cultural equipment. The final sample comprises 7,916 observations, encompassing 334 Brazilian municipalities with projects that received any funding from the firms in the sample during the analyzed time series. Drawing on insights from the literature on corporate philanthropic investment and institutional change (Ballesteros & Magelssen, 2022; Dorobantu, Kaul, et al., 2017; Gatignon & Bode, 2023; Luo et al., 2018; Marquis & Tilcsik, 2016; Seo et al., 2021;

Tilcsik & Marquis, 2013), I assess the consequences of the policy on two levels: first, at the institutional level, I examine whether it allowed for the inclusion of previously disregarded municipalities with low levels of access to culture. Second, given the availability of public information for the firms in the sample, I investigate how firm-level attributes interacted with the introduction of the policy (Mahoney et al., 2009).

I hypothesize that the policy's reduction in search and matching costs leads to increased philanthropic giving to underserved localities compared to commercially concentrated ones. From an instrumental perspective, this effect is likely driven by firms seeking to engage new stakeholders from previously overlooked areas at lower costs, as well as leveraging their giving to pressing issues to obtain reputational gains with influential stakeholders (Bénabou & Tirole, 2010; Elfenbein & McManus, 2010; Seo et al., 2021). For instance, firms may boost employee motivation by focusing on critical issues, thus increasing private value creation and appropriation (Bode et al., 2015). Alternatively, from an altruistic perspective, firms may choose to relocate giving to pressing causes and localities, so as to increase the cost-efficiency of the investments in terms of social value creation (Gatignon & Bode, 2023; Kaul & Luo, 2018). Contrary to this hypothesis, however, I find no significant effect of the policy in attracting new investments or shifting them towards projects from underserved localities. Therefore, from an institutional perspective, the policy apparently did not achieve its main goal of promoting equitable philanthropic distribution across the country.

Upon examining how firm-level attributes interact with the institutional transition, a more nuanced picture emerges: while there is no significant aggregate effect on reallocating resources to projects from underserved localities, both high-performance firms in the consumers' market (compared to low-performance ones) and state-owned enterprises (compared to private firms) increase their investments in these initiatives following the policy change. High performers leverage their enhanced resource availability, as well as their improved capabilities to absorb new information from the external market to swiftly expand into new localities and engage a broader range of stakeholders, maintaining a differentiated strategy from their competitors (Andersén, 2015; Dasgupta et al., 2009; Makadok, 1998; Nardi et al., 2022; Wiggins & Ruefli, 2005). Meanwhile, low performers tend to replicate previous strategies by entering concentrated

markets where reaching a larger number of stakeholders is more cost-effective (Greve, 1998; Rashid & Said, 2024). A similar dynamic can be observed in the case of state-owned enterprises (SOEs), which use the policy to bolster investments in projects from underserved areas, aligning with their mandate to promote social value creation besides profits (Dixit, 2002; Inoue, 2020; Musacchio et al., 2015). In contrast, private organizations, driven primarily by private value appropriation, prioritize concentrated markets, taking advantage of the policy to strengthen their presence in such localities. On balance, market equilibrium remains largely unchanged due to competitive dynamics: while high performers and SOEs increase their focus on underserved localities, competitors seize the opportunity to capture the remaining share of the philanthropic market, hindering a complete ecosystem shift towards more equitable distribution.

The contributions of this paper are twofold. First, I engage with the literature on corporate philanthropy that analyzes the consequences of institutional change to the value creation and allocation resulting from firms' philanthropic giving (Ballesteros & Magelssen, 2022; Gatignon & Bode, 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016; Tilcsik & Marquis, 2013; Wang & Qian, 2011). By shifting focus from the effects of unforeseen institutional changes to examining the impact of deliberate policies aimed at reshaping incentives within the corporate philanthropic sector, I am able to show that, despite the policy's null aggregate effects, firm-level attributes such as performance level and ownership play pivotal roles in how firms adapt strategies to enhance value creation relative to their competitors (Kaul & Luo, 2018; Marquis & Lee, 2013). Second, I contribute to the broader literature on CSR that focuses on value allocation to distinct stakeholder groups and the inclusive potential these actions possess (Klein et al., 2019; Mahoney et al., 2009; Wickert, 2021). Rather than focusing on the impact of CSR on firm performance, I explore firms' responses to policy interventions and their consequences on the allocation of philanthropic giving to projects from underserved localities (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Pongeluppe, 2022; Teodorovicz et al., 2023). Overall, the study reveals that examining firm-level responses is crucial to understanding how policies intended to generate social value can be not only effective but also inclusive in relation to their original objectives.

4.2 THEORY AND HYPOTHESES

The literature on Corporate Philanthropy has gained increasing relevance in the field of business strategy (Gatignon & Bode, 2023; Gautier & Pache, 2015; Luo et al., 2018; Marquis & Lee, 2013; Marquis & Tilcsik, 2016; Seo et al., 2021; Tilcsik & Marquis, 2013; Wang et al., 2008), particularly within the broader domain of corporate social responsibility (CSR) strategies (Barnett, 2007; Dorobantu, Kaul, et al., 2017; Eccles et al., 2014; Flammer, 2015). Early studies examine how firms strategically utilize philanthropic giving to enhance private value appropriation (Bénabou & Tirole, 2010; Lev et al., 2010; Wang et al., 2008), thus assuming an instrumental perspective. This approach suggests that firms prioritize philanthropic causes and initiatives that are salient to their most influential stakeholders, with the aim of generating benefits for these groups that can subsequently be leveraged by the firm to enhance its performance (Bosse et al., 2009; Dorobantu, Henisz, et al., 2017; Freeman et al., 2010; Mitchell et al., 1997).

Private benefits derived from corporate philanthropy stem from strategic choices, such as advertising CSR action toward influential customers (Wang & Qian, 2011), safeguarding reputation against future corporate social irresponsibility (Brammer & Millington, 2005; Godfrey, 2005; Luo et al., 2018), and diversifying investments to encompass a broader array of stakeholders (Seo et al., 2021). In that sense, various stakeholders beyond the direct beneficiaries of corporate giving, but who actually care about the targeted causes, may influence a firm's ability to capitalize on these investments, including customers supportive of charitable actions (Elfenbein & McManus, 2010; Fosfuri et al., 2015; Lev et al., 2010), employees who increase their motivation in the face of firm CSR (Bode et al., 2015), regulators responding to sociopolitical legitimacy gained from philanthropy (Gatignon & Bode, 2023; Wang & Qian, 2011), and the community of beneficiaries itself (Hornstein & Zhao, 2018; Muller & Kräussl, 2011).

An alternative and more recent stream from the literature on corporate philanthropy emphasizes value creation in the public interest (Cabral et al., 2019; Luo & Kaul, 2019; McGahan et al., 2013), such that firms deploy their CSR strategies in the pursuit of social value creation rather than ultimately targeting private benefits. This approach can take two main forms: an altruistic perspective (Carroll, 1999; Kaplan,

2023; McGahan, 2023), where firms prioritize maximizing social value by addressing the most critical issues and localities; or a comparative efficiency lens (Kaul & Luo, 2018; Lazzarini, 2020), in which firms focus on areas where they can make the most significant contributions compared to other organizations and actors. In both scenarios, philanthropic efforts are directed towards alleviating pressing needs, such that firm action is largely influenced by the demands of communities and beneficiaries (Marquis & Tilcsik, 2016), as well as by institutional partners such as local governments and NGOs who are committed to social value creation (Ballesteros & Magelssen, 2022; Gatignon & Bode, 2023).

Therefore, when firms decide on their corporate philanthropic investments, they typically consider various factors related to the potential of private and public value creation of their actions. Among those are social causes, geographical locations, implementation methods (non-profit, public intervention, etc.), resource availability, portfolio size, and owners' personal preferences (Oehlsen, 2024). Of particular importance is the sensitivity of the targeted audience to these investments — essentially, how underserved the community is regarding the focal cause. For firms pursuing altruistic motives, approaching underserved causes or localities may be a way of enhancing the potential of transformation stemming from the investments, while for those more aligned with an instrumental reasoning, engaging with underserved groups may require adaptations to the current strategy (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Pongeluppe, 2022; Teodorovicz et al., 2023). This adaptability is critical not only for effectively reaching these populations and ensuring the viability of operations but also for building trust and legitimacy with local stakeholders to foster the creation of social benefits that extend beyond mere profitability (Dorobantu & Odziemkowska, 2017; Flammer, 2013).

However, the decision on the amount and allocation of resources within a philanthropic portfolio usually precedes direct engagement with the community, which typically occurs post-investment. At this early stage, firms consider the expected utility of their giving, which integrates both preferences and a cost-benefit analysis of available options and potential outcomes, regardless of whether they are pursuing private or social value creation (Choi et al., 2023; Lev et al., 2010). This analysis encompasses not only private benefits like economic profits but also non-pecuniary gains such as enhanced reputation, the potential price

premium associated with CSR, or increased attractiveness to high-skilled workers (Burbano, 2016; Flammer, 2013; Nardi, 2022). Then, for institutional changes to effectively influence the aggregate amount and distribution of philanthropic giving, they must be able to either reshape firms' preferences or alter the cost-benefit relationship associated with investment opportunities. For example, environmental policies that impose emissions standards directly impact firms' cost-benefit assessments by internalizing environmental costs (Husted & de Jesus Salazar, 2006), while shifts in issue salience from the perspective of the stakeholders can alter societal norms and thereby influence firms' preferences regarding which causes to support (Mohliver et al., 2023).

4.2.1 Institutional change, inclusive policies and the consequences to underserved groups

CSR action, whether driven by private incentives or aimed at social value creation, is notably strategic and significantly influenced by changes in the institutional environment (Ballesteros & Gatignon, 2019; Dorobantu, Kaul, et al., 2017; Gatignon et al., 2023; Ioannou & Serafeim, 2019; Jain et al., 2017), and corporate philanthropy follows the same pattern (Husted & de Jesus Salazar, 2006; Tilcsik & Marquis, 2013). Philanthropic action involves intricate relationships among investors, beneficiaries, and partners that can profoundly impact the social value accruing from these investments (Berger et al., 2004; Chatain & Plaksenkova, 2019; Feilhauer & Hahn, 2021). As a result, institutional transitions that modify issue salience, or alter the incentive structures of any of those groups may require firms to adapt their strategies accordingly, thus affecting the trajectory of philanthropic giving (Marquis & Battilana, 2009; Marquis & Tilcsik, 2016). Hence, understanding the interplay between institutional transitions and firm-level actions is essential for properly identifying the nuances within philanthropic ecosystems, where policy changes often play a crucial role in redirecting firms' attention towards societal goals valued by a broader set of stakeholders, highlighting the dynamic nature of philanthropic strategies in response to evolving societal and regulatory landscapes (Candeias & Sarkar, 2024; Caulfield & Lynn, 2024; Gupta et al., 2024).

While existing literature on corporate philanthropy acknowledges the interplay between philanthropic action and the institutional framework, and the consequences to firm performance, the

potential of those investments to affect the distribution of outcomes beyond profits remains to be better understood. In that sense, it is important to assume an issue of distribution perspective –rather than of an issue of allocation (Arrow, 1985; Buchanan, 1968; Luo & Kaul, 2019)— to analyze how institutional changes influence philanthropic giving, particularly in terms of creating value in the public interest. This perspective emphasizes how resources are distributed with an increased focus on inclusion, observing who gets what from such investments, rather than prioritizing private value appropriation (Berrone et al., 2016; Gatignon & Bode, 2023; Klein et al., 2019; Mahoney et al., 2009; Wickert, 2021).

In the present paper, I adopt an issue of distribution perspective to analyze the outcomes of a policy aimed at promoting inclusion by encouraging firms to increase their overall philanthropic contributions and allocate more funding to underserved localities. Specifically, the policy attenuates market friction in the philanthropic market –i.e., it lowers search and matching costs for firms seeking socio-cultural initiatives to invest in by providing accurate and readily available information from the supply side. In parallel, a marketing campaign promotes a clear message encouraging firms to enhance their giving to underserved regions rather than concentrating resources solely on commercial areas⁹. As a result, the policy generates cost savings and provides guidance to firms on how to allocate resources effectively to maximize the impact of their giving, thus altering the comparative attractiveness of underserved regions from a cost-benefit perspective (Gupta et al., 2024). Figure A1 in the Appendix illustrates the potential cost savings across the entire philanthropic giving timeline, including improved ex-ante spending efficiency on search and selection processes through easier initial searches and less costly prioritization of initiatives, as well as potential reductions in ex-post monitoring costs due to clearer identification of investee quality during contracting, thereby facilitating adjustments in firms’ monitoring strategies (Akerlof, 1978; Milgrom & Roberts, 1982; Seamans, 2013).

⁹ For a detailed description of the policy’s goals and implementation, please refer to the section on Empirical Context.

4.2.2 Baseline hypothesis: policy effectiveness

At the baseline, I anticipate an increase in corporate philanthropic giving following the introduction of the policy, generating a more equitable distribution of giving between underserved regions and more commercially active areas. This effect can be expected based on any of the current four main streams of literature on corporate philanthropy within business strategy: instrumental, altruistic, comparative efficiency, and institutional approaches (Gatignon & Bode, 2023). From an instrumental perspective, firms responding to this institutional change will capitalize on reduced information acquisition costs to expand their portfolios, both in terms of size and diversity (Bénabou & Tirole, 2010). This approach can enhance their reputation among influential stakeholders by bolstering support for current causes (Bode et al., 2015; Bosse et al., 2009; Hornstein & Zhao, 2018; Wang & Qian, 2011) and reaching a broader audience through diversified investments that tap into new markets (Elfenbein & McManus, 2010; Seo et al., 2021), potentially including underserved regions previously overlooked due to higher access costs and greater risks of misuse (Dorobantu, Kaul, et al., 2017; Pongeluppe, 2022). This focus may also contribute to a differentiation in CSR strategy compared to industry peers, positioning firms uniquely with key stakeholders and thereby enhancing their market value (Nardi et al., 2022).

Alternatively, both comparative efficiency and altruistic approaches suggest that firms should prioritize projects with the greatest potential for social value creation—that is, they should enhance their focus on inclusion—differing only in their methods of achieving this goal: comparative efficiency advocates focusing on social causes aligned with core business activities to leverage existing firm capabilities (Kaul & Luo, 2018), while the altruistic approach prioritizes addressing the most urgent issues or underserved localities to maximize positive impact from supported initiatives (Carroll, 1999). Under both perspectives, then, firms facing a policy that reduces search costs in the philanthropic market are likely to increase their philanthropic contributions, particularly directing attention to underserved regions where investments can have the greatest potential for positive effects (Gatignon & Bode, 2023). From a purely institutional standpoint, external pressures from the market and other institutional actors, including government entities, are expected to influence firm CSR decisions (Ballesteros & Magelssen, 2022;

Brammer & Millington, 2005; DiMaggio & Powell, 1983; Marquis & Tilcsik, 2016). Given that the policy in question does not impose new costs on firms and assuming a reaction of at least the most instrumental competitors in the market towards increasing philanthropic investments, it is likely that external pressures also encourage firms to expand their overall giving post-policy. Additionally, although there is no clear theoretical mechanism within the institutional perspective suggesting a particular focus on underserved localities, firms may choose to align their philanthropic efforts with the broader goals of the policy, which in this case directly encompasses these regions (Gupta et al., 2024).

Combined, these mechanisms suggest that a policy aimed at reducing search costs in the corporate philanthropic market leads to an increase in giving by firms, potentially also contributing to the allocation of a greater share to underserved localities compared to more economically active areas. This motivates the following hypothesis:

Hypothesis 1: In response to a policy that reduces search costs in the philanthropic market, firms increase their philanthropic giving to projects from underserved regions compared to adequately served regions.

4.2.3 Heterogeneous effects: the roles of performance and ownership form

Institutional transitions have the potential to significantly impact CSR strategies, yet the effects of these shifts vary widely depending on market- and firm-specific characteristics (Gatignon & Bode, 2023; Gatignon et al., 2023; Luo et al., 2017; Marquis & Tilcsik, 2016). Distinct attributes such as market structure, community relationships, preferences toward social value creation, and financial performance interact with institutional changes, shaping firms' strategic responses and resulting in diverse outcomes in terms of social value creation (Ballesteros & Gatignon, 2019; Ballesteros & Magelssen, 2022; Useem, 1988). In that sense, I argue that both a firm's performance relative to competitors in the same industry and its ownership structure—whether private and for-profit or state-owned—play pivotal roles in determining post-institutional policy philanthropic contributions. Given the inherent competition within markets, I adopt a comparative approach to examine how high and low-performance firms are likely to respond following

policy implementation. Additionally, I employ a comparative governance approach to analyze differences in outcomes between organizational forms, drawing from the tradition of the literature that explores how different governance structures pursue the creation of value in the public interest (Cabral et al., 2013; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019).

4.2.3.1 Performance relative to competitors

Firms' CSR strategies are significantly influenced by competitors' decisions (Dupire & M'Zali, 2018; Kaul & Luo, 2018; Lee & Faff, 2009; Mohliver et al., 2023), and there is evidence that philanthropic giving follows a similar pattern (Choi et al., 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016). The nature of this influence varies depending on the firm's performance levels. For instance, high-performance firms typically adopt differentiated strategies compared to their competitors, stemming from their unique set of capabilities (Barney, 1991), their ability to promptly seize new market opportunities resulting from superior resource endowments (Makadok, 1998), and their increased absorptive capacity towards knowledge available in the external environment (Salomon & Jin, 2010). These capabilities enable high performers to innovate closer to the frontier and develop novel solutions (Andersén, 2015; Dasgupta et al., 2009; Zahra et al., 2007), generating a sequence of market advantages that puts them in a leading position over time compared to rivals, even when faced with variations in the external environment (Brown & Eisenhardt, 1998; Wiggins & Ruefli, 2005). In contrast, low-performance firms often face resource and capability constraints relative to their competitors (Tang et al., 2019), and thus may opt to mimic the actions of leading firms in an attempt to mitigate uncertainty, enhance learning of best practices, and attenuate performance pressures (Greve, 1998; Rashid & Said, 2024).

Given that performance is mainly driven by the pursuit of private benefits over the creation of public value beyond profits, it is anticipated that high performers adhere more closely to an instrumental approach rather than altruistic or comparative efficiency views (Kaul & Luo, 2018). Therefore, these firms structure their CSR strategies to maximize outreach to a broad range of stakeholders, enhancing their gains in terms of visibility and reputation (Elfenbein & McManus, 2010; Seo et al., 2021). Also, they prioritize

strategies that differentiate them from competitors, aiming for a unique market position that can be leveraged with influential investors (Nardi et al., 2022). This strategic positioning is crucial due to the heightened pressures faced by high-performance firms compared to their rivals, which include managing higher expectations and scrutiny from influential stakeholders (Adams & Hardwick, 1998; Wang & Qian, 2011).

As a result, when faced with an institutional transition that reduces search costs in philanthropic markets, high performers utilize their capabilities to swiftly adapt their strategies to capitalize on advantages not yet perceived by competitors. These strategic adaptations, however, may not necessarily involve increasing the overall amount of philanthropic giving but rather reallocating their portfolio (Seo et al., 2021), since low performers, who were previously aware of high performers' investment strategies but hesitant to follow due to uncertainty, can now exploit the institutional shift to mimic these behaviors at minimal information costs and reach the same customer base. Arguably, low performers' giving after the institutional shock are likely to focus on more concentrated commercial markets where the cost-effectiveness in terms of the number of stakeholders reached is higher. In contrast, by leveraging their enhanced resources and capabilities, high-performance firms may choose to enter new markets, including underserved localities previously overlooked, to both engage with new stakeholders and signal their distinctive strategy to current ones (Gatignon & Bode, 2023). This motivates the following hypothesis:

Hypothesis 2: In response to a policy that reduces search costs in the philanthropic market, high-performance firms experience a larger increase in their philanthropic giving to projects from underserved regions compared to low-performance firms.

4.2.3.2 Ownership form

Distinct ownership forms respond differently to the effects of institutional policies on philanthropy (Marquis & Qian, 2014; Wang & Qian, 2011). These differences stem not only from variations in cost structures but also from the distinct objective functions each organizational form pursues, influencing their engagement with social issues (Luo & Kaul, 2019). On the one hand, private organizations prioritize private

value creation and often adopt an instrumental perspective. On the other hand, state-owned organizations (SOEs) are more oriented towards social goals, driven by legal mandates to generate public gains alongside profitability, and are constantly faced with pressures from the political arena that shape their priorities towards social value creation or political objectives (Dixit, 2002; Inoue, 2020; Musacchio et al., 2015). From a comparative perspective, then, SOEs are more inclined towards social value creation than private organizations and thus can be expected to be more willing to allocate resources to projects in underserved localities where their impact can be substantial compared to highly competitive markets already served by other organizational forms. However, investing in underserved areas entails higher uncertainty, requiring firms to actively learn about local conditions and assess the feasibility of engagement. Such locations, however, are usually permeated by increased levels of uncertainty, requiring an active process of the firm to learn about the characteristics of the location and decide whether to engage with it or not. Under those circumstances, private organizations usually possess a comparative advantage in elaborating creative solutions to adapt to the needs of the location and still be able to reap private benefits (Luo & Kaul, 2019). Thus, the presence of SOEs in underserved localities may hinge on a favorable institutional environment with reduced uncertainty.

With the reduction of market friction through the introduction of the policy, two effects can be expected to occur. First, private organizations may leverage the lower search costs to increase their overall philanthropic giving more promptly than SOEs, which traditionally present lower levels of operational efficiency and thus may take longer to leverage a higher volume of resources to invest (Musacchio et al., 2015). Second, concerning giving to underserved localities, a heterogeneous effect is anticipated: the reduction in market friction decreases uncertainty associated with investing in such regions, potentially increasing incentives for SOEs to allocate more of their portfolio there to maximize social value creation. Moreover, since these organizations are more sensitive to changes in the political arena, an institutional policy with a clear mandate towards the redistribution of resources to better serve individuals in underserved locations is likely to resonate more strongly with SOEs than with private organizations (Dixit, 2002; Inoue, 2020). Hence, while aggregate philanthropic giving by private organizations may catch up to SOEs, the

allocation to underserved localities is expected to show a distinct pattern, with a much more substantial increase occurring among SOEs than in private firms. The complete theoretical model analyzed in the paper is presented in Figure 1.

Hypothesis 3: In response to a policy that reduces search costs in the philanthropic market, SOEs experience a larger increase in their philanthropic giving to projects from underserved regions compared to private firms.

INSERT FIGURE 1 ABOUT HERE

4.3 DATA AND METHODS

4.3.1 Empirical context

I examine the Brazilian corporate philanthropic sector, with a particular emphasis on giving to cultural projects facilitated by government intermediation. Brazil has a longstanding tradition of federal programs designed to promote philanthropic investments, dating back to 1991, shortly after the establishment of the New Republic. These programs operate on a tax-exempt basis, allowing firms to make deductible donations to organizations responsible for carrying out sociocultural initiatives (Bertrand et al., 2020). The Brazilian tax incentive regime is very similar to other corporate philanthropy programs worldwide, with the primary differences being related to the size of the deduction. While some countries allow for a partial deduction of the giving amount, ranging from around 50% in India (Chakravarty & Singh, 2021) and the Netherlands (Koolen-Maas et al., 2021) to about 60% in Canada (Alepin, 2021) and France (Loncle, 2022), other nations permit up to 100% deduction, such as in Geneva (Huber, 2021) and Brazil (Brasil, 1991).

These programs predominantly function through market mechanisms, decentralizing decision-making from the government to for-profit entities, which select nonprofit partners based on their own preferences. Consequently, these mechanisms generate two primary outcomes: they effectively attract

corporate investments and, due to their decentralized nature, may concentrate donations in urban areas with stronger marketing capacities, potentially overlooking underserved regions with less commercial viability (Garcia, 2020; Guimarães, 2020).

4.3.1.1 The Brazilian tax-exemption program for corporate investments in culture

(PRONAC)

The PRONAC program is one of the most prominent initiatives by the Brazilian Ministry of Culture with the aim of promoting broad access to cultural resources for the Brazilian population while preserving local cultural expressions and national heritage (Brasil, 1991, 2017). Established in 1991, the program operates on a market-based mechanism designed to facilitate the matching between cultural projects developed by for-profit entities, non-profits, citizens, and potential sponsors seeking to provide financial support. Cultural projects from diverse segments are eligible to participate, including historical, architectural, and archaeological heritage, as well as libraries, museums, literature, gaming, and audio-visual proposals. Each project can raise up to 10 million reais (approximately 2 million dollars) per fiscal year to cover operational, marketing, and administrative expenses. To qualify, proposed projects undergo evaluation by an expert committee from the Ministry of Culture, assessing feasibility in terms of timing, budget, and cultural content. Other competencies such as marketing, sales, or communication capabilities are not factored in the evaluation process. Once approved, projects become eligible for funding from any Brazilian firm subject to taxation under the Lucro Real System, a regime applicable to organizations earning more than 78 million reais (approximately 15 million dollars) annually. Participating firms can deduct up to 4% of their federal tax payments annually to invest in the program and are permitted to engage in projects' marketing campaigns, as well as request up to 10% of the project's production (e.g., tickets, books, etc.) to distribute among partners.

While the Ministry of Culture regulates budget utilization and evaluates projects' eligibility for funding, it does not intervene in the negotiation process between firms and cultural proponents. As a result, the matching process within this sector operates entirely on market dynamics, contingent upon the

alignment of preferences between firms and cultural projects seeking support. Since its inception in 1991 through 2016, the program relied on firms and cultural projects to independently connect with one another. Cultural projects typically sought out firms through direct outreach efforts, while firms used their networks to discover projects or issued calls for submissions where projects could apply and await contact from interested firms. This decentralized approach incurred significant expenses for both parties, as substantial investments were required for the search process. Still, the program was able to generate an average of 1.3 billion reais (approximately 250 million dollars) in investments annually between 2012 and 2021, benefiting 20,263 cultural projects and engaging 10,871 sponsors. However, due to the program's structure of incentives, a majority of firms concentrated their investments on projects with high marketing potential, aiming to maximize private value appropriation. From a demand-side perspective, financially robust projects had better access to firms, limiting funding opportunities for less affluent proponents. Consequently, there has been a pronounced concentration of resources in highly commercial regions, particularly in the Brazilian Southeast, which received 80.5% of total funding at its peak in 2016, reflecting the region's more developed markets (Belmiro et al., 2022). This trend is illustrated in Figures 2 and 3.

INSERT FIGURES 2 AND 3 ABOUT HERE

4.3.1.2 The introduction of a new policy (Versalic)

In 2017, aiming to address this concentration trend and streamline the matching process between sponsors and cultural projects, the Brazilian Ministry of Culture introduced a new policy, which included a significant overhaul in program communication, with a strong emphasis on recommending the redistribution of resources to underserved regions. Central to this effort was the introduction of Versalic, an online portal providing comprehensive details on approved projects seeking funding (Brasil, 2017). This portal features extensive project information such as budget breakdowns, schedules, descriptions, activity plans, technical specifications, marketing materials, counterparties, and legal documentation. As a result, the portal equips sponsors with precise project details, enhancing their understanding beyond traditional

marketing presentations or decks. Figure A2 in the Appendix illustrates an example of the information available through this platform. The new policy effectively reduced information asymmetry for sponsors, enabling them to make more informed decisions about projects to support. Notably, sponsors became able to access technical descriptions instead of marketing presentations or decks, further enhancing the accuracy of their assessments. As previously discussed, by lowering search, matching, and monitoring costs and by improving the visibility of projects from outside of the highly concentrated regions, the policy had the potential to increase overall philanthropic contributions in the cultural sector and to more equitably distribute resources across the country.

However, anecdotal evidence suggests that the policy did not succeed in altering investment trends, either in the highly concentrated and commercial Brazilian Southeast region or in other localities. For instance, between 2016 and 2017, aggregate investments increased marginally from 890 million reais (160 million dollars) to 905 million reais (165 million dollars), representing a mere 1% rise. Throughout the observed period, total investments through the mechanism grew from an average of 950 million reais (170 million dollars) between 2011 and 2016 to around 1.2 billion reais (220 million dollars) between 2017 and 2021, but this growth remained consistent with expected trends over time, as illustrated in Figure 4. This figure depicts both forecasted investment levels based on an optimal SARIMA model¹⁰ using monthly aggregate investment data and the actual trends (Bergh & Holbein, 1997; Tsay, 2005). Notably, corporate giving was not sufficiently impacted by the policy to diverge significantly from predicted trends and extrapolate confidence intervals, with actual investment peaks often falling below the expected values. Thus, it appears that the policy was partially ineffective, at least from the perspective of attracting new investments. Therefore, it is crucial to further analyze whether the policy achieved heterogeneous effects in reallocating existing resources depending on municipality characteristics (underserved or adequately served) and firm-level attributes.

INSERT FIGURE 4 ABOUT HERE

¹⁰ For a detailed description of the ARIMA implementation and the validity of the forecast, please refer to the Appendix.

4.3.2 Data and variables

I combine a series of publicly available datasets to analyze firms' philanthropic giving before and after the introduction of the policy. These datasets include information on firms' investments and attributes, details on cultural projects, and characteristics of their respective municipalities. First, I utilize data from the Versalic system, managed by the Brazilian Ministry of Culture, which documents every transaction between sponsors and cultural initiatives within the program. This dataset provides comprehensive information on each project receiving funding, such as: budget breakdown, exact location, descriptions of activities, proponent identification, and number of investors. Second, I merge this with data from Capital IQ on firms' performance metrics like Return on Assets (ROA), market value, advertisement expenses, and ESG scores. Third, I incorporate socioeconomic data compiled by the Brazilian Institute of Geography and Statistics (IBGE) and the Brazilian Institute of Applied Economic Research (IPEA), covering annual population sizes, GDP, and GDP per capita for each municipality. Finally, I include details from the Basic Municipal Information (MUNIC) dataset, also organized by IBGE, which outlines the availability of Cultural Equipment within each Brazilian municipality. This comprehensive approach results in a final sample of 7,916 observations covering 148 public companies investing in 5,616 cultural projects across 334 Brazilian municipalities from 2011 to 2021.

Dependent variable: Investment amount on each project

The main dependent variable captures the invested amount by each firm on each cultural project annually. To construct this variable, I aggregate the yearly investments made by each firm on each cultural project according to the Versalic dataset and apply a log transformation to achieve a normally shaped distribution. This approach allows for observing the dynamics of firm investments across different projects and localities over the years.

Main independent variable: Policy Introduction (Post)

I assess the effects of the policy by analyzing the timing of the implementation of Versalic by the Brazilian Ministry of Culture, which was initiated in 2017. To distinguish and compare pre- and post-policy periods, I create a dummy variable that takes the value of 1 for the period after 2017 and 0 otherwise. This variable allows for identifying the period when search and matching costs were affected by the introduction of the Versalic platform and facilitates comparisons with the years preceding this change.

Underserved localities

To assess whether municipalities are underserved or not in terms of access to culture, I utilize data from the MUNIC dataset by IBGE, which details the presence and quantity of cultural structures and equipment within each locality as of 2013. These include governmental cultural plans, management bodies, councils, budget allocations, funds, preservation councils, and heritage listings. Cultural equipment encompasses libraries, museums, theaters, cultural centers, and public archives. To aggregate information and establish a measure of access within each municipality, I create two separate indices: the *Municipality Index*, which sums 1 for each cultural factor that is present within a municipality and 0 for factors that are absent; and the *Total cultural equipment* index, which sums all the quantity of equipment per municipality. Acknowledging the potential limitations of these discrete measures in capturing the exact amount of access to culture in different municipalities, I define a binary variable identifying *Low culture access* by assuming value 1 if the locality is in the bottom 25% of the *Municipality Index*, and 0 otherwise. Grouping municipalities allows for comparisons of the *relative* levels of access to culture in very distinct contexts, thus providing some intuition on how localities with more adequate service provision perform relative to underserved ones. This framework offers insights akin to factors considered by firms when allocating corporate philanthropic investments and thus should work as a relevant proxy for this paper's purpose. Additionally, in parallel to the main analyses, I consider a series of robustness tests using alternative measures, so to test for the support of the findings obtained with the *Low culture access* measure.

High-performance firms

To implement comparisons between market high and low-performance firms, I created a dummy variable that assigns a value of 1 if a firm is the higher performer in its industry each year, and 0 otherwise, following the tradition of the literature that analyzes the sustainability of superior performance within distinct industries (Brown & Eisenhardt, 1998; Wiggins & Ruefli, 2005). To measure this variable, I utilize data on firms' ROA from the Capital IQ dataset and define as high performers the firms with the best performance within their sector each year. This comparative approach allows for straightforward comparisons between the two types of performance levels and thus is deployed for testing Hypothesis 2.

State-owned Enterprises (SOE)

To classify the ownership form of each firm, I employ a dummy variable that takes a value of 1 if the firm is state-owned and 0 if it is private, according to the classification found in the Capital IQ database, which categorizes as state-owned enterprises where the state has significant control through full, majority, or significant minority ownership. This approach mirrors methodologies used in prior studies that compare organizational forms (Cabral et al., 2013; Inoue et al., 2013; Jeong et al., 2020).

Control variables

I add a series of control variables at the cultural project, firm, and municipality levels to ensure that observed effects are related to firms' decisions to donate to underserved municipalities rather than alternative factors. At the project level, I control for the log-transformed amount requested by each project to the Ministry of Culture, aiming to account for its size and attractiveness for investment (Tilcsik & Marquis, 2013). I also include a categorical variable for the segment of the cultural project (e.g., music, literature, cinema, etc.) to control for investment trends related to the project's cause, instead of its locality (Gatignon & Bode, 2023). Finally, to mitigate potential effects arising from the geographical proximity of the firm to the community, I control for the geographical distance between the project and the firm's headquarters.

At the firm level, I primarily control for performance trends using Return on Assets (ROA), known to influence philanthropic action and donation diversity (Seo et al., 2021; Tilcsik & Marquis, 2013). I further control for Portfolio Diversification across segments and localities, measured by the Blau Index (1 – Herfindahl Hirschman index), to exclude effects stemming from diversification motives rather than preferences for specific causes and localities (Luo et al., 2018). Last, I include a control for firm Experience within the program, measured by the years since 2010 that the firm has invested through this channel, to account for past knowledge and consequential strategic advantages (Wang & Qian, 2011).

Finally, at the municipality level, I include controls to account for possible variations in the outcomes stemming from socioeconomic factors other than the level of access to cultural equipment. In that sense, I use data from IBGE to control for population size as a proxy for demand for cultural equipment. Additionally, based on data from MUNIC and Versalic, I also control for Total Investments in Culture and the Number of Projects seeking funding in each municipality per year, so to avoid any interference in the data related to market structure and project availability.

4.3.3 Econometric approach

To test the proposed hypotheses, I employ a panel data model with firm, municipality, year, and municipality-year fixed-effects to control for unobserved heterogeneity. Additionally, I add a series of control variables to the specification to eliminate the effects arising from observable factors that have already been identified by extant literature as potential drivers of philanthropic investments (Gatignon & Bode, 2023; Luo et al., 2018; Seo et al., 2021; Tilcsik & Marquis, 2013; Wang et al., 2008; Wang & Qian, 2011). The whole set of control variables is described in the previous section. The final specification is as follows:

$$\begin{aligned}
 \text{Invested amount}_{ipmt} = & \beta_1 \text{Low culture access}_m + \beta_2 \text{Post}_t + \beta_3 \text{Low culture access}_m * \text{Post}_t + \\
 & + \boldsymbol{\theta}' \mathbf{X}_{ipt} + \alpha_i + \alpha_m + \alpha_t + \alpha_{mt} + \epsilon_{ipmt}
 \end{aligned}$$

Where *Invested amount*_{*ipmt*} is the amount invested by each firm *i* in project *p* from municipality *m* during period *t*; *Low culture access*_{*m*} is a dummy variable indicating whether a municipality is underserved in terms of access to cultural (=1) or not (=0); *Post*_{*t*} is a dummy variable representing periods post=1 or pre=0 the introduction of Versalic; *Low culture access*_{*m*} * *Post*_{*t*} is the interaction between the two previous variables, providing the main effect of interest to our analyses; *X*_{*ipt*} is a vector of observable firms' and projects' characteristics; and α_i , α_m , α_t and α_{mt} are individual, municipality, year and municipality-year fixed effects, respectively. To test Hypothesis 1 the coefficient of interest is β_3 . An alternative specification for testing Hypothesis 1 is also presented, considering a differences-in-differences (DID) approach at the municipality level¹¹, but since it does not allow for the inclusion of project-specific characteristics in the model, it is not considered the baseline method for this study, despite its increased robustness from a causal inference perspective (Angrist & Pischke, 2009).

To test the remaining hypotheses, I implement slight changes to the previous equation and include one interaction term to *Low culture access*_{*m*} * *Post*_{*t*}, as a way to account for heterogeneities in firms' traits. In the following specification, β_7 is the coefficient of interest for testing Hypotheses 2 and 3:

$$\begin{aligned} \text{Invested amount}_{ipmt} = & \beta_1 \text{Low culture access}_m + \beta_2 \text{Post}_t + \beta_3 \text{Firm attribute}_i + \\ & + \beta_4 \text{Low culture access}_m * \text{Post}_t + \beta_5 \text{Low culture access}_m * \text{Firm attribute}_i + \\ & + \beta_6 \text{Firm attribute}_i * \text{Post}_t + \beta_7 \text{Low culture access}_m * \text{Post}_t * \text{Firm attribute}_i + \\ & + \theta' X_{ipt} + \alpha_i + \alpha_m + \alpha_t + \alpha_{mt} + \epsilon_{ipmt} \end{aligned}$$

Where *Firm attribute*_{*m*} may represent either variations in performance level, or ownership form, as described in the Data and variables section. Given the complexities in properly interpreting the outcomes from triple interaction terms, throughout the whole paper, I also present the results of two-way interactions

¹¹ In the municipality level differences-in-differences approach, the dependent variable measures the total amount of investments each municipality received annually, rather than the investments made by the firms to each project. The remainder of the model mirrors the one outlined in this section.

between $Firm\ attribute_m * Post_t$ in two different subsamples, where $Low\ culture\ access_m = 0$ or $Low\ culture\ access_m = 1$.

To address concerns regarding potential confounding effects, I perform a series of robustness exercises, including an analysis of an additional policy outcome, the use of alternative variables to ensure the consistency of the main findings, replications of the main tests in subsamples, and estimations of the influence of confounding factors. First, I reinforce the policy outcomes at the institutional level by analyzing whether it was able to decentralize giving from the Southeast region to the rest of the country. Second, I re-test the main models using alternative measures of the *Low culture access* variable to better grasp the potential drivers of firm investment in low culture localities. Third, I replicate the main tests in subsamples that exclude industries lacking competitors or new entrants post-policy introduction. Finally, I assess the influence of potential confounding factors on the main outcomes, such as portfolio diversification, industry competition, and municipality economic growth¹². Table 1 presents the descriptive statistics of the main variables alongside pairwise correlations.

INSERT TABLE 1 ABOUT HERE

4.4 RESULTS

4.4.1 Institutional level effects

Table 2 presents the results from the institutional-level analysis, examining how the policy impacts the distribution of giving across projects in underserved and adequately served municipalities. Panel A exhibits the results from the panel data model, while Panel B relates to the DID specification. Both models use the logarithm of invested amount as the dependent variable, incorporating municipality and year fixed effects, alongside control variables to account for observed trends, as described in the Data and variables section. The panel specification also includes firm fixed effects to address unobserved heterogeneity. Additionally, Figure 5 supplements these results with an event-study from the DID model, illustrating

¹² For more information on these approaches, refer to the session Robustness tests below.

differences in investment levels between underserved and adequately served municipalities over time. Together, these results provide inputs for evaluating the adherence of the results to Hypothesis 1 by analyzing the coefficient associated with the interaction between the Low culture access and the post-policy dummies.

INSERT TABLE 2 AND FIGURE 5 ABOUT HERE

Hypothesis 1 posits that in response to the policy's reduction in search costs within the philanthropic market, firms are associated with an increase in their philanthropic giving to projects in underserved regions relative to adequately served regions. The estimates reported in Panels A and B (Table 2) do not provide support for this hypothesis: there is no statistically significant effect of the policy on the allocation of resources to projects from low culture municipalities ($p > 0.10$). This finding is further corroborated by the event-study plot in Figure 5, which supports the parallel trends assumption from the DID model, thus improving our causal identification, and at the same time indicates no discernible impact of the policy on giving to low culture access localities compared to adequately served ones. Thus, in addition to failing to attract increased investments, as noted in the anecdotal evidence presented in the Empirical context section, the policy also proved ineffective in redirecting investments from more commercially attractive and concentrated localities to underserved ones.

4.4.2 Firm level effects

Table 3 provides the results examining how firms' performance level and ownership form influence their philanthropic giving to projects in underserved communities after the policy introduction. Columns [1] and [2] report the results from the panel specification, comparing high and low performers, with variations related to the subsample being adopted: column [1] focuses exclusively on municipalities with adequate access to culture, while Column [2] examines underserved localities. Subsequently, columns [3] and [4] preserve the same structure but refer to the comparisons between SOEs and private firms. In all four

cases, the coefficient of interest is the interaction term between Low culture access and post-policy dummies. Finally, in columns [5] and [6], the analysis encompasses the full sample, but now a third interaction term is added in substitution to the split samples, leading to a coefficient of interest related to the triple interaction between Low culture access, post-policy and organizational characteristic (High performance or SOE). Column [5] contrasts High vs. Low performers, while Column [6] compares SOEs with private firms. Across all specifications, the dependent variable is the logarithm of the invested amount per project. Each model includes individual, municipality, year, and municipality-year fixed effects, alongside control variables capturing project characteristics and firm performance heterogeneity. I assess the adherence to Hypotheses 2 and 3 by comparing the results from Columns [1]-[2] and [3]-[4], respectively. For confirmation of these findings, I refer to Columns [5] and [6], respectively.

INSERT TABLE 3 ABOUT HERE

Hypothesis 2 poses that, in response to the reduction in search costs promoted by the policy, high-performance firms experience a larger increase in their philanthropic giving to underserved regions compared to low-performance ones. The results presented in columns [1], [2], and [5] are consistent with this hypothesis: high performers exhibit an increase of approximately 66.3% more in projects from underserved localities post-policy compared to low performers (column 2: coef = 0.509, $p < 0.05$; column 5: coef = 0.456, $p < 0.01$), while there is no evidence that this change also occurred within adequately served regions (column 1: coef = 0.169, $p > 0.10$).

Finally, according to Hypothesis 3, when faced with the policy, SOEs are associated with a larger increase in their philanthropic giving to projects from underserved regions compared to private firms. The estimates from columns [3], [4], and [6] lend support to this hypothesis, indicating that SOEs did increase about 54.1% more their philanthropic giving to underserved regions post-policy than private firms (column 4: coef = 0.433, $p < 0.05$; column 6: coef = 0.310, $p < 0.05$). This pattern is not observed, however, in adequately served regions (column 3: coef = 0.055, $p > 0.10$). Furthermore, results from column [6] provide

insight into SOEs' portfolio allocation before the policy, suggesting they were less active in underserved communities compared to private firms (column 6: coef = -0.425, $p < 0.01$, SOE X Low culture access interaction), and the policy intervention reversed this trend.

In summary, these results suggest that while the policy fell short of effectively shifting investments away from the more commercially active Brazilian Southeast region towards underserved localities, there were notable heterogeneities depending on firm characteristics that could lead to positive resource allocation outcomes. In particular, both High-Performance firms and SOEs capitalized on the reduction in search and matching costs facilitated by the policy to enter previously neglected underserved markets, thus potentially contributing to promoting cultural development in these regions, where their involvement could arguably have a more transformative impact. Furthermore, the analysis indicates that neither type of firm—high-performance firms nor SOEs—became less active in adequately served markets following the policy, compared to their competitors. This suggests that they were able to extend their reach into underserved regions without harming their previous positions in other localities.

4.4.3 Robustness tests

In the first robustness test, I aim to provide additional evidence on the policy's lack of success in achieving its goals, despite introducing informational shifts in the market. To do so, I deploy an analysis focused on assessing the policy's impact on the amount invested by firms in the concentrated Southeast region compared to other regions across the country. The structure of the analysis followed the same triple-interaction specification outlined in the Econometric approach section, replacing the *Low culture access* variable with an *Outside Southeast region* dummy variable, which takes the value of 1 if the cultural project receiving investments was located outside the Southeast region, and 0 otherwise. The results, presented in Table 4, indicate that the policy did not effectively incentivize firms to redirect their giving from the Southeast regions to other parts of the country. This conclusion is supported by the null aggregate effect observed in column [1] (coef = -0.107, $p > 0.10$), as well as by estimates comparing High vs. Low-performance firms (column 2: coef = -0.070, $p > 0.10$) and SOEs vs. private firms (column 3: coef = -0.182,

p>0.10). These results complement previous findings indicating the policy's ineffectiveness in achieving its primary goals.

INSERT TABLE 4 ABOUT HERE

The second robustness test seeks to gain deeper insights into firms' decision-making processes regarding philanthropic giving based on observable levels of access to culture within municipalities. To do so, I incorporated three alternative measures of access to culture into the triple interaction term of the baseline econometric specification. The first variable is the *Municipality Index* described in the Data and variables section, which consists of a continuous, aggregate measure of the presence of a series of cultural equipment and structures in the municipalities. The second one is the *Total cultural equipment* index, which instead of just registering the presence of these equipment and structures, actually considers the quantity of available factors in each municipality. Finally, I also include a *Cultural equipment per capita* measure, consisting of the ratio between the Total cultural equipment index and the population size in each municipality. Rather than just providing a comparative assessment between underserved and adequately served regions, these measures allow for the interpretation of an average effect related to cultural equipment availability across municipalities. In all cases, the dependent variable is the logarithm of the invested amount per project, and the coefficient of interest is the one associated with the triple-interaction term.

Table 5 presents these robustness tests. Columns [1]-[3] refer to the comparisons between High and Low performers, considering the *Municipality Index*, the *Total cultural equipment* index, and the *Cultural equipment per capita* variable, respectively. According to the estimates, high performers are less associated with investments in municipalities with higher availability of cultural equipment after the shock than low performers, as indicated by the coefficient from the triple interaction term in column [1] (coef = -0.119, p>0.10), although the estimate is not statistically significant. This result not only is consistent with the main findings from Hypothesis 2, related to an increased participation of high performers in underserved regions after the policy, but also provides some intuition on the reactions of the low-performance firms to the policy,

who become comparatively more focused on municipalities where cultural provision is higher. The remaining analyses indicate while firms do consider the presence of cultural equipment and structures in their philanthropic decisions, the absolute quantity (column 2: coef = -0.000, $p > 0.10$) and the per capita availability (column 3: coef = 733.08, $p > 0.10$) are not the main drivers. Columns [4]-[6] similarly report the results regarding SOEs compared to private firms. The findings mirror exactly the previous results: the higher the availability of different cultural equipment and structures in the municipality, the lower the associated investment amount from SOEs compared to private firms (column 4: coef = -0.133, $p < 0.05$). Furthermore, the amount of equipment does not significantly alter these firms' strategies (columns 5 and 6: $p > 0.10$).

INSERT TABLE 5 ABOUT HERE

4.4.4 Confounding effects

The third set of robustness tests attempts to rule out potential confounding effects that might be driving the main results. Among them, I analyze three potential alternative explanations related to the strategy adopted by the firms when selecting their philanthropic portfolio, or characteristics from the external environment that might be affecting this relationship, and which might interact with the policy. Specifically, I investigate the role of portfolio diversification as a CSR strategy, increased competition within industry, and variations in municipalities' economic development. In all cases, I maintain the same specification from the baseline model, varying only the dependent variable or the triple-interaction term, depending on the test being conducted. Also, I take a look at both comparisons between High *vs.* Low-performance firms, and SOEs *vs.* private firms, to ensure that the main findings from Hypotheses 2 and 3 are indeed associated with municipalities' low culture access rather than any of the alternative explanations presently covered. The results from these estimations are presented in Table 6.

INSERT TABLE 6 ABOUT HERE

First, I consider the possibility that, when faced with the reduction in search and matching costs promoted by the policy, firms opted to adjust the diversification of their portfolios, a strategy that is widely recognized by extant literature as pertinent to the appropriation of private value by the firm (Bénabou & Tirole, 2010; Luo et al., 2018; Seo et al., 2021). In that sense, a possible alternative effect would be to observe both High performers and SOEs increasing the diversification within their portfolios to leverage future performance gains, and the expansion into underserved localities would occur as a mere consequence of this alternative channel. I test for this possibility by including firms' diversification level, measured by the Blau index, as the dependent variable from the models presented in columns [1] and [2]. The estimates from this analysis suggest that the policy did not alter the differences in diversification between high and low-performance firms (column 1: coef = 0.028, $p > 0.10$) or between SOEs and private firms (column 2: coef = -0.045, $p > 0.10$). Hence, it seems like the choice to enter low culture areas was not a side-effect of an alternative firm strategy focused on increasing variety.

Second, in acknowledging the importance of competition for firms' strategic decision-making processes, I test for the possibility that engagement with the policy would be associated with a more fierce competition in the industry, leading firms to look for alternative mechanisms of interaction with stakeholders as a consequence of this stronger rivalry (Choi et al., 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016; Zhang et al., 2010). In that case, variations in outcome stemming from the policy would be carried by firms in the most competitive markets, rather than representing the whole sample of participants. To test this alternative explanation, I included a proxy for competitiveness within each industry, measured by the number of firms (competitors) within the sector, as the third term in the triple interaction from the baseline model. The remainder of the specification is the same as the baseline one, including logarithm of the amount invested as the dependent variable, and the results are presented in columns [3] and [4]. The estimates suggest that there's no heterogeneous effect of the policy depending on the level of competition within the industry in the case of High vs. Low-performance firms (column 3: coef = 0.001, $p > 0.10$). As for the other comparison, increases in the level of competition within the main industry actually reduce the amount invested after the policy by SOEs relative to private firms (column 4: coef = -

0.004, $p < 0.05$), a result that is intuitively coherent due to the increased interest from private organizations to leverage the reduction in search costs for private gains (Musacchio et al., 2015). Importantly, this result does not undermine the interpretation of the main findings, where SOEs had to at least maintain their investment amount stable to be able to reach underserved regions despite competitive pressures.

In the same spirit of mitigating concerns related to variations in market structure, I deploy two additional robustness tests accounting for the potential influence of new entrants in the philanthropic market after the policy, being attracted by the lower search and matching costs; and for potential biases related to the presence of industries with a single firm in the dataset that might be driving the results. To address both points, I re-conduct all main tests employing subsamples of the dataset that either exclude new entrants or remove industries with a single firm. The estimates are presented in the Appendix (Tables A2 and A3). Notably, all results are consistent with the baseline estimations, thus reinforcing the validity of the conclusions and affirming the broader generalizability of the research outcomes.

In the final robustness test, I assess the possibility that firms' corporate philanthropy decisions may be subject to economic variations within municipalities instead of pertaining to the levels of access to cultural equipment. The 2010s decade in Brazil was marked by political and economic instability, consequent of the deflagration of a series of corruption scandals and significant political changes, including the impeachment of former president Dilma Rousseff (Gatignon et al., 2023). These instabilities affect both firms' financial positions and their political relationships with local governments, which ultimately interfere with their philanthropic activities (Wang & Qian, 2011). In order to acquire some intuition on whether these changes to the external environment could eventually alter firms' choices regarding underserved localities, I examine how variations in municipalities' GDPs affect corporate giving to these regions irrespective of the introduction of the policy. To do so, I maintain the baseline specification, keeping the logarithm of invested amount as the dependent variable, but substituting the post-policy dummy variable with the logarithm of each municipalities' GDPs in the triple-interaction term.

The estimates from this analysis indicate that, throughout the entire time series, the level of economic activity within municipalities does not affect high performers' choice for projects from

underserved localities (column 5: coef = -0.019, $p > 0.10$). This reinforces the conclusion that the policy-induced changes observed in firms' philanthropic strategies towards underserved regions were more likely driven by the policy's impact on reducing search and matching costs rather than broader economic fluctuations. Furthermore, from the perspective of SOEs, there's a reduced presence in underserved localities with increased economic activity after the introduction of the policy compared with private firms (column 6: coef = -0.136, $p < 0.05$), thus strengthening the argument that SOEs are focused on their mandate of providing to underserved rather than targeting more developed regions.

4.4.5 Extension analysis: projects' communication as determinants of firm investments

To gain deeper insights into firms' decision-making processes when selecting projects —whether driven by instrumental or normative reasonings— and their adaptations in the face of a policy that significantly reduces information asymmetry, I examine the influence of projects' descriptions on the investment size of high-performance firms (*vs.* low-performance ones) and SOEs (*vs.* private firms). Specifically, I classify project descriptions based on their orientation towards Private value and Social value and assess whether the influence of these orientations on firms' corporate philanthropy varies after the implementation of the policy.

For this analysis, I utilize the dictionary of Private (Economic) and Social value orientations developed by Moss et al. (2018). This dictionary was created to identify common terms related to these topics that are frequently used by small ventures in their funding narratives. Through a process of document scanning, literature review, and validation with independent scholars, the authors built a comprehensive dictionary consisting of 179 words or word roots, of which 71 are linked to a Private-value orientation and 108 are associated with a Social-value perspective. The whole dictionary is replicated in the Appendix (Table A4). Based on this dictionary, I create two indices that track the frequency of these terms in the main texts submitted by project proponents to the Brazilian Ministry of Culture, and which were made fully accessible to sponsors via the Versalic platform. The resulting variables, *Projects' marketing description*,

and *Projects' ESG description*, are measured by the ratio between the occurrence of dictionary terms related to each value dimension and the total number of words in the text.

I empirically examine how these factors may influence firms' investment decisions by incorporating each one of those measures in the baseline specification. To do so, I retain the logarithm of the invested amount as the dependent variable and set the coefficient of interest as the triple-interaction term between the post-policy dummy variable, the firm's characteristic (High performers or SOE dummy variables), and the projects' description orientation. The estimates from this analysis are reported in Table 7.

INSERT TABLE 7 ABOUT HERE

The results reveal no evidence of either of the orientations directly impacting firms' investment choices (double interaction terms between firm type and project description, where $p > 0.010$). However, the scenario shifts significantly post-policy implementation. With the policy's introduction, detailed and technical project descriptions become readily available to investors, reducing dependence on less imprecise project presentations and pitching decks. This enhanced transparency makes projects with a Private-value orientation particularly appealing to high-performance firms as opposed to low-performance ones (column 1: coef = 26.005, $p < 0.05$). Arguably, these findings align with the mechanisms expected to be at play in this type of competition, as described in the development of Hypothesis 2, where both firm types are driven by instrumental reasonings, but high performers are better equipped to leverage the information available in the external environment faster than low performers due to their enhanced capabilities and resource availability (Makadok, 1998; Salomon & Jin, 2010). Conversely, there is no empirical evidence that Social-value orientation plays a significant role in determining differential firm giving between high and low-performance firms (column 2: coef = 0.887, $p > 0.10$). This indicates that altruistic motivations, which are more closely associated with Social-value orientation, do not distinctly influence the investment choices between players with different performance levels.

The outcomes concerning the comparison between SOEs and private firms present a more puzzling picture. According to the results, neither Private-value nor Social-value orientations significantly influence the investment amounts of SOEs compared to private firms (column 3: coef = 1.585, $p > 0.10$; column 4: coef = -2.385, $p > 0.10$). One possible explanation for this lack of differentiation is that SOEs might already be able to apprehend Social value orientations among projects before the introduction of the policy because of their constant interactions with actors under this type of driver. Therefore, making such information more explicit might not significantly alter the differences in perception between SOEs and private firms. However, the absence of an effect stemming from the interaction between the Private value orientation and the policy is counterintuitive, since private firms would be expected to be more influenced by those arguments than SOEs. A potential alternative explanation to these null results is that the level of detail provided in project descriptions, although critical in differentiating between high and low-performance firms facing direct competition, may not be as pivotal in distinguishing between SOEs and private firms, who are differentiated by their distinct objective functions, and not by competitive dynamics. This underscores the nuanced ways in which organizational form and performance in the consumers' market affect how firms engage with available information and make philanthropic decisions.

4.5 DISCUSSION AND CONCLUSION

This paper contributes to the existing literature on corporate philanthropy by examining the implications of institutional change on firms' value creation and allocation through philanthropic activities (Ballesteros & Magelssen, 2022; Gatignon & Bode, 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016; Tilcsik & Marquis, 2013; Wang & Qian, 2011). While previous research predominantly explores the impact of unexpected institutional shocks—such as natural disasters and economic crises—on corporate giving (Flammer & Ioannou, 2021; Muller & Kräussl, 2011; Tilcsik & Marquis, 2013), I focus on the effects of a deliberate policy designed to reshape firms' incentives in the corporate philanthropic sector with enhancing stakeholder inclusion. Given the structure of the analyzed policy, which drastically mitigates search costs within the philanthropic market while also encouraging firms to relocate part of their

investments to underserved regions, I anticipate a positive aggregate response from the firms in terms of investment redistribution (Marquis & Battilana, 2009; Marquis & Tilcsik, 2016). Whether for instrumental or normative reasonings, firms can be expected to increase their investments in underserved regions in comparison to commercially concentrated ones after the introduction of the policy, in a way that maximizes value appropriation (Bénabou & Tirole, 2010; Elfenbein & McManus, 2010; Gatignon & Bode, 2023; Kaul & Luo, 2018; Seo et al., 2021).

Contrary to this hypothesis, however, my findings reveal that the policy did not significantly attract new investments or redirect them toward projects from underserved localities, suggesting that it fell short of its primary objective of promoting equitable philanthropic distribution nationwide. Upon examining how firm-level attributes interact with the institutional transition, a more nuanced picture emerges: while there is no significant aggregate effect on reallocating resources to projects from underserved localities, both high-performing firms in the consumers' market (compared to low-performing ones) and state-owned enterprises (compared to private firms) increase their investments in these initiatives following the policy change. High performers leverage their enhanced resource availability, as well as their improved capabilities to absorb new information from the external market to swiftly expand into new localities and engage a broader range of stakeholders, maintaining a differentiated strategy from their competitors (Andersén, 2015; Dasgupta et al., 2009; Makadok, 1998; Nardi et al., 2022; Wiggins & Ruefli, 2005). Meanwhile, low performers tend to replicate previous strategies by entering concentrated markets where reaching a larger number of stakeholders is more cost-effective (Greve, 1998; Rashid & Said, 2024).

A similar dynamic can be observed in the case of state-owned enterprises (SOEs), which use the policy to bolster investments in projects from underserved areas, aligning with their mandate to promote social value creation besides profits (Dixit, 2002; Inoue, 2020; Musacchio et al., 2015). In contrast, private organizations, driven primarily by private value appropriation, prioritize concentrated markets, taking advantage of the policy to strengthen their presence in such localities. On balance, market equilibrium remains largely unchanged due to competitive dynamics: while high performers and SOEs increase their

focus on underserved localities, competitors seize the opportunity to capture the remaining share of the philanthropic market, hindering a complete ecosystem shift towards more equitable distribution.

Altogether, the findings illustrate that although the policy does not produce significant aggregate effects, individual firm attributes critically influence how companies adjust their strategies to optimize value creation and position themselves advantageously relative to their competitors. For diverse reasons, firms are able to exploit opportunities presented by the policy's shortcomings, thereby contributing to social value creation and enhancing the inclusion of underserved stakeholders (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Marquis & Lee, 2013; Pongeluppe, 2022; Teodorovicz et al., 2023). In demonstrating these outcomes, this paper also answers recent calls in the Management literature for greater acknowledgment of government's role in influencing CSR, and the heterogeneous responses firms produce depending on their capabilities and preferences (Klein et al., 2019; Mahoney et al., 2009; Wickert, 2021).

This study also has implications for practice. In particular, it aligns with recent efforts across the globe to improve general understanding of the efficiency of tax exemptions for corporate philanthropy under different contexts (OECD, 2020; Peter & Lideikyte Huber, 2022). The findings are beneficial for a variety of stakeholders, including policymakers, firms in the philanthropic sector, and sociocultural projects seeking funding. From a policymaking perspective, this research underscores the importance of tailoring policy designs to the specific attributes of firms if the objective is to improve both the volume and distribution of philanthropic investments. Firms' responses to incentive changes within the social goods market vary significantly based on their characteristics (Gatignon & Bode, 2023; Luo & Kaul, 2019), so for a policy to be successful, it must account for these differences to ensure that changes in incentives truly influence firm behavior in the intended manner, avoiding costly and ineffective outcomes. For firms, the study sheds light on competitor behavior during institutional transitions aimed at fostering inclusion. In particular, it provides evidence that strategies such as reallocating value to underserved communities are already by various organizations, notably high performers and SOEs, potentially enhancing public value creation without compromising market positioning, thus creating incentives for this type of endeavor to be implemented more often (Boulongne et al., 2024; Marquis & Tilcsik, 2016; Teodorovicz et al., 2023).

Finally, for sociocultural projects seeking funding, this research provides valuable insights into the importance of customizing communication strategies. The effectiveness of pitch decks and marketing materials may vary depending on the attributes of the target firms, being necessary to adapt these pieces depending on the specific characteristics of the intended audience (Durand & Huysentruyt, 2022; Moss et al., 2018). This personalized approach can optimize outcomes and improve the likelihood of securing funding.

This research's empirical approach introduces certain limitations that merit consideration. First, the identification of the policy's aggregate effects using a DID methodology provides a clear claim in terms of causality, but the analyses of firm-level heterogeneities related to philanthropic giving are primarily correlational and subject to selection issues. Prior research has identified several firm attributes, such as portfolio diversification, experience, and existing partnerships, that influence philanthropic behavior and performance (Luo et al., 2018; Seo et al., 2021; Wang & Qian, 2011). Although the current hypothesis testing controls for these variables, there remains a possibility of selection bias resulting from the type of firm that takes part in the dataset on firm performance utilized in the analyses. This dataset primarily includes larger firms known for their superior financial performance and robust marketing capabilities, which may not be representative of all firms engaged in corporate philanthropy (Tilcsik & Marquis, 2013; Wang et al., 2008). A potential solution to address this issue could involve implementing alternative econometric techniques, such as the Heckman correction model (Certo et al., 2016; Heckman, 1979), which accounts for selection bias. Unfortunately, limitations within the available datasets preclude the use of such methodologies, as an appropriate instrument for the first stage of the Heckman model is absent. Consequently, this study relies on traditional panel data models, which provide insights that are strictly correlational rather than causal.

Second, the robustness of our results across various variables should be considered alongside certain measurement limitations. In particular, the current metrics for low access to culture in municipalities encompass solely the presence of cultural equipment and infrastructure. While such measures have the advantage of being directly related to the policy's focus by specifically assessing cultural access rather than

broader vulnerabilities that may not be pertinent to this context, they also have the downside of consisting of limited proxies that may not fully capture the breadth of cultural activities available in each locality, which could contribute significantly to cultural access for the populations involved. Third, although the results are consistent across several robustness tests aimed at mitigating confounding effects, other dynamic firm-level attributes may also play a role in decisions to reallocate resources to underserved groups. These include political connections, firm embeddedness, peer influence, and the personal preferences of owners (Dorobantu et al., 2017; Inoue, 2020; Marquis & Battilana, 2009; Marquis & Tilcsik, 2016; Oehlsen, 2024), which are not covered in the present study due to constraints related to data availability

Finally, there are important restrictions to the generalizability of the current findings. The philanthropic sector's diversity means that decision-making mechanisms likely vary considerably across different causes. Specifically, the cultural sector, which is the focus of this study, is quite idiosyncratic, such that investors in cultural projects may have different expectations about potential outcomes compared to sectors like Education or Health, which currently attract more mainstream corporate philanthropic investments (Gatignon & Bode, 2023). Furthermore, while the data used in this study is comprehensive concerning philanthropic investments in the Brazilian cultural sector, it pertains only to a specific public program. These limitations pose challenges when attempting to extrapolate the findings to other causes or geographies, restricting the ability to apply the presented conclusions more broadly across the entire spectrum of philanthropic activities.

Despite the technical constraints of the current study, I expect that it contributes to advancing current knowledge on the importance of adopting an issue of distribution lens when investigating corporate philanthropy and broader CSR activities (Arrow, 1985; Klein et al., 2019; Luo & Kaul, 2019; Mahoney et al., 2009). While it is fundamental to explore the potential for private value appropriation through these programs so to encourage firms to engage actively in those programs, there is an equal need to assess the outcomes of corporate actions in terms of value creation for a broader audience, especially when such endeavors involve partnerships with entities like governments and nonprofits, which are primarily driven by value creation in the public interest (Cabral et al., 2019; Chatain & Plaksenkova, 2019; Gupta et al.,

2024). Hence, potential extensions of this study could examine the interplay between CSR and the distribution of value to different stakeholder groups in alternative contexts, such as investments in other causes (e.g., education, infrastructure, health) or other forms of corporate social engagement (e.g., voluntary programs, workplace safety policies, philanthropic giving without tax exemptions, and diversity training). This broader research agenda could deepen our understanding of how firms' market and nonmarket strategies impact their ecosystems beyond their core activities, thereby providing a more comprehensive picture of the potential impacts stemming from organizational actions (Candeias & Sarkar, 2024; Caulfield & Lynn, 2024).

Furthermore, future research may also delve deeper into investigating the heterogeneous effects arising from various attributes of the organizations that interact with institutional-level transitions. Given the intricacy of these types of investments, which involve relationships between several different actors, characteristics such as the size and market influence of the firms (e.g., multinational vs. domestic corporations), the scope and impact of the sociocultural projects (e.g., community education programs vs. large-scale cultural festivals), and even the nature of the institutional transition at play (e.g., regulatory changes vs. policy reforms) may influence how these changes are absorbed. This, in turn, can lead to different outcomes both at the individual and ecosystem levels, substantially altering the allocation of value to the various stakeholders involved. Overall, examining the outcomes arising from the combination of different actors' attributes may prove beneficial to a more complete understanding of the potential impact of policies intended to generate social value.

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FIGURES AND TABLES

Figure 1 – Theoretical model

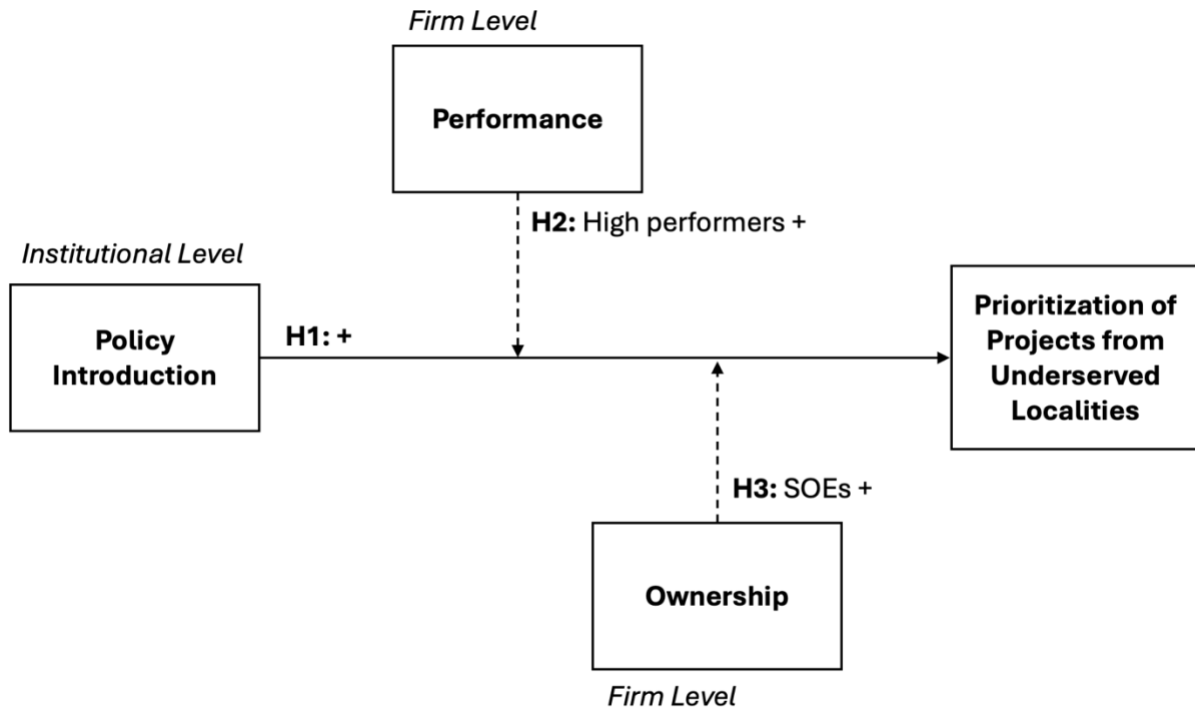
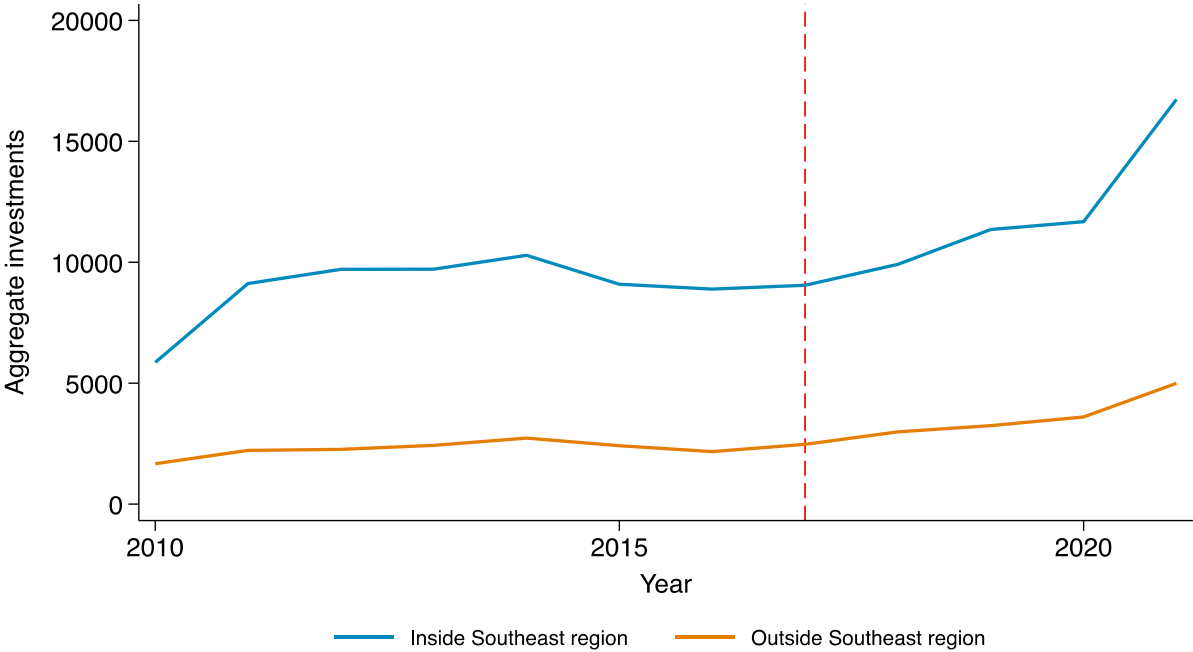


Figure 2 – Total investments within the PRONAC program, per Brazilian region



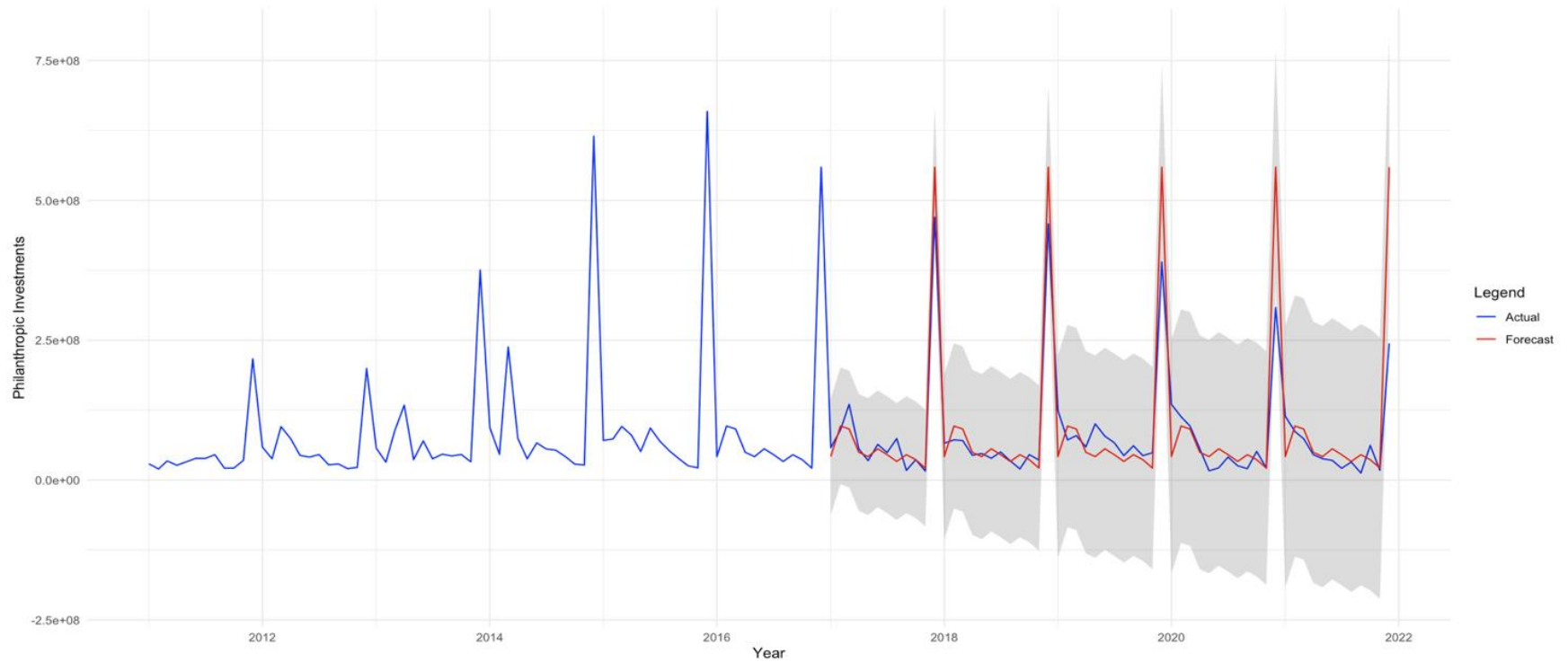
Note: Policy introduction occurred in 2017, as depicted by the solid red line.

Figure 3 – Availability of cultural equipment, per municipality



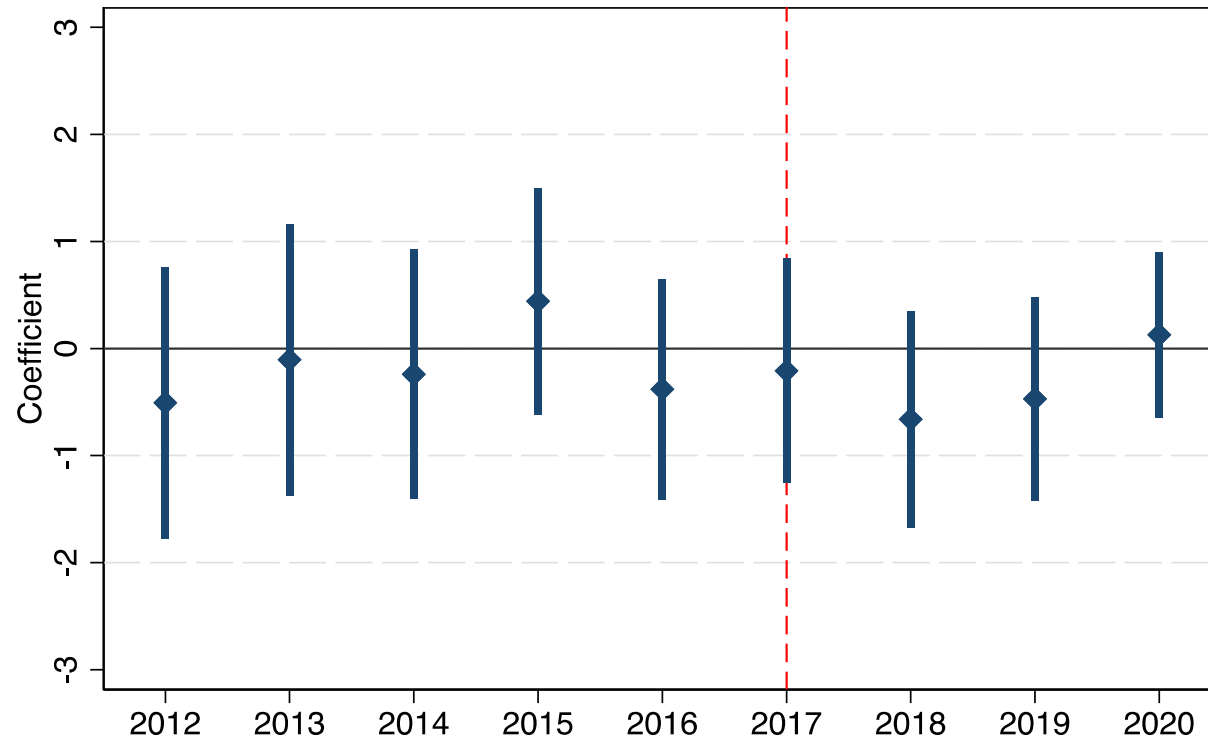
Note: The figure was elaborated using information from MUNIC regarding the availability of cultural equipment across municipalities, and data from Versalic on corporate philanthropic giving.

Figure 4 – Forecast vs Actual philanthropic investment (2017-2021)



Note: Forecasts are predicted based on an optimal-fit ARIMA(0,0,0)(0,1,0)[12], estimating using monthly data on corporate philanthropic investments from January 2011 to December 2016.

Figure 5 – Event-study: Low culture access localities vs. remaining municipalities



Note: baseline are municipalities from adequately served regions. C.I.: 95%.
Policy introduction occurred in 2017, as depicted by the solid red line.

Table 1 – Summary statistics and correlations

Variable	Summary statistics				Correlations													
	Mean	Std. Dev.	Min	Max	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	
[1] Log(Invested amount)	11.817	1.341	4.207	17.399	1.000													
[2] Post	0.367	0.482	0	1	0.1525**	1.000												
[3] Low culture access	0.342	0.474	0	1	0.0391**	-0.0411**	1.000											
[4] High performers	0.698	0.459	0	1	0.1295**	-0.0303**	0.1105**	1.000										
[5] SOE	0.379	0.485	0	1	-0.0509**	-0.1305**	0.0563**	0.0997**	1.000									
[6] Project's total budget	13.666	1.532	0	18.924	0.4989**	0.1915**	-0.0843**	0.0093	-0.2003**	1.000								
[7] Geographic distance	440,223.5	599,737.2	0	3,309,095	0.0381**	-0.0154	0.0429**	0.2091**	0.1501**	-0.1151**	1.000							
[8] ROA	-0.102	2.058	-69.615	12.607	-0.0190	-0.0059	-0.0055	0.1221**	0.0736**	-0.0289*	0.0418**	1.000						
[9] Blau index	0.824	0.224	0	0.982	0.1100**	-0.1086**	0.0902**	0.0999**	0.3141**	-0.1841**	0.1666**	0.0398**	1.000					
[10] Experience	11.543	1.474	1	12	-0.0423**	-0.2379**	0.0156	-0.0526**	0.2062**	-0.1666**	0.0396**	-0.0191	0.3142**	1.000				
[11] Population size	9,888,298	8,758,044	3454	2.30e+07	0.2285**	-0.0159	-0.1176**	0.2365**	0.0144	0.2784**	-0.0708**	-0.0288*	0.0017	-0.1343**	1.000			
[12] Ln(Municipality culture budget)	17.65	2.540	8.517	20.453	0.3026**	0.0191	-0.0711**	0.2317**	0.0290**	0.3011**	-0.0924**	-0.0133	0.0484**	-0.0990**	0.8260**	1.000		
[13] N. of projects per municipality	326.42	299.650	1	882	0.2054**	-0.1409**	-0.0281*	0.2417**	0.0368**	0.2324**	-0.0920**	-0.0242*	0.0367**	-0.0770**	0.9541**	0.8422**	1.000	

Note: This table presents the summary statistics and correlations for each pair of variables. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 2 – Main policy effects on the size of investments (institutional level)

Panel A: Panel data model (Low culture X Adequately served)			
	Coefficient	S.E.	p-value
Post X Low culture access	0.012	0.077	0.875
Control Variables	YES		
Firm Fixed Effects	YES		
Municipality Fixed Effects	YES		
Year Fixed Effects	YES		
Observations	6962		
Panel B: Municipalities DID (Low culture X Adequately served)			
	Coefficient	S.E.	p-value
ATET	0.272	0.375	0.468
Diagnosis for Parallel Trends	OK		
Control Variables	YES		
Municipality Fixed Effects	YES		
Year Fixed Effects	YES		
Observations	7989		

Note: This table presents the coefficients of regressions focused on analyzing hypothesis 1. Panel A displays the coefficients from the panel data model, while Panel B relates to a differences-in-differences (DID) specification. Variables ROA, Blau index, Ln(Project budget) and Geographic distance are included as controls for the panel specification, while Ln(GDP) is used as a control in the DID model. Standard errors are clustered at the firm level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 3 – Policy effects over the allocation of resources to underserved localities (firm level)

	[1]	[2]	[3]	[4]	[5]	[6]
	H2) Adequate access	H2) Low access	H3) Adequate access	H3) Low access	H2) Triple Interaction	H3) Triple Interaction
Post X High performers	0.169 (0.138)	0.509* (0.198)			0.145 (0.138)	
Post X SOE			0.055 (0.121)	0.433* (0.192)		0.064 (0.126)
High performers X Low culture access					-0.141 (0.141)	
Post X High performers X Low culture access					0.456** (0.174)	
SOE X Low culture access						-0.425** (0.149)
Post X SOE X Low culture access						0.310* (0.144)
ROA	-0.018** (0.006)	-0.006** (0.002)	-0.018** (0.006)	-0.006** (0.002)	-0.008** (0.002)	-0.008** (0.002)
Blau Index	0.243 (0.173)	0.478 (0.431)	0.251 (0.175)	0.533 (0.436)	0.293 (0.178)	0.304 (0.179)
Ln(Project budget)	0.339** (0.055)	0.430** (0.089)	0.339** (0.055)	0.427** (0.088)	0.364** (0.060)	0.362** (0.060)
Geographic distance	0.000 (0.000)	-0.000** (0.000)	0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	4503	1874	4503	1874	6402	6402

Note: This table presents the coefficients of regressions focused on analyzing hypotheses 2 and 3. Columns [1]-[6] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 4 – Robustness tests: Policy effects over the allocation of resources to regions outside the commercial center (firm level)

	[1]	[2]	[2]
	All firms	High x Low Perf.	SOEs x Private
Post X Outside southeast region	-0.107 (0.103)		
Post X High performers		0.271 (0.182)	
High performers X Outside southeast region		-0.050 (0.159)	
Post X High performers X Outside southeast region		-0.070 (0.207)	
Post X SOE			0.213 (0.141)
SOE X Outside southeast region			-0.108 (0.091)
Post X SOE X Outside southeast region			-0.182 (0.169)
ROA	-0.010** (0.002)	-0.009** (0.003)	-0.010** (0.002)
Blau Index	0.368 (0.190)	0.290 (0.177)	0.316 (0.180)
Ln(Project budget)	0.363** (0.056)	0.363** (0.060)	0.362** (0.060)
Geographic distance	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Controls for Municipality	YES	YES	YES
Firm Fixed Effects	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES
Municipality x Year Fixed Effects	NO	NO	NO
Year Fixed Effects	NO	YES	YES
Observations	6962	6402	6402

Note: This table presents the coefficients of regressions focused on analyzing the effects of the institutional-level policy on the relocation of resources to regions outside the Southeast region. Columns [1]-[3] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 5 – Robustness tests: Alternative measures of access to cultural equipment for testing H2 and H3

	[1]	[2]	[3]	[4]	[5]	[6]
	H2) High x Low Performers			H3) SOEs x Private		
Post X High performers	1.643*	0.401**	0.238			
	(0.712)	(0.124)	(0.137)			
High performers X Municipality Index	-0.003					
	(0.049)					
Post X High performers X Municipality Index	-0.119					
	(0.059)					
High performers X Total cultural equipment		0.000				
		(0.000)				
Post X High performers X Total cultural equipment		-0.000				
		(0.000)				
High performers X Cultural equip. per capita			3,430.76*			
			(1,376.56)			
Post X High performers X Cultural equip. per capita			773.08			
			(3,901.25)			
Post X SOE				1.685*	0.093	0.172
				(0.663)	(0.140)	(0.127)
SOE X Municipality Index				0.139*		
				(0.061)		
Post X SOE X Municipality Index				-0.133*		
				(0.055)		
SOE X Total cultural equipment					0.000	
					(0.000)	
Post X SOE X Total cultural equipment					0.000	
					(0.000)	
SOE X Cultural equip. per capita						5,525.28
						(3,868.45)
Post X SOE X Cultural equip. per capita						-3,257.44
						(7,746.39)
Controls	YES	YES	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	6402	6001	6402	6402	6001	6402

Note: This table presents the coefficients of regressions considering alternative measures of Low culture access. Columns [1]-[6] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 6 – Robustness tests: Diversification, industry competition, and economic activity

	[1]	[2]	[3]	[4]	[5]	[6]
	Effects on Diversification		Effects from Competition		Effects from Economic Activity	
	High x Low Performers	SOEs x Private	High x Low Performers	SOEs x Private	High x Low Performers	SOEs x Private
High performers	0.035 (0.039)					
Post x High performers	0.028 (0.028)		0.235 (0.234)			
SOE		0.212** (0.055)				
Post x SOE		-0.045 (0.025)		0.608 (0.337)		
Competition			-0.001 (0.001)	-0.000 (0.001)		
Post X Competition			-0.001 (0.002)	0.001 (0.001)		
High performers X Competition			0.001 (0.001)			
Post X High performers X Competition			0.001 (0.002)			
SOE X Competition				0.001 (0.001)		
Post X SOE X Competition				-0.004* (0.002)		
High performers X Low culture access					0.282 (1.082)	
High performers X Ln(GDP)					-0.020 (0.048)	
High performers X Low culture access X Ln(GDP)					-0.019 (0.063)	
SOE X Low culture access						2.211* (0.890)
SOE X Ln(GDP)						0.064 (0.052)
SOE X Low culture access X Ln(GDP)						-0.136** (0.050)
Controls	YES	YES	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	6402	6001	6402	6402	5300	5300

Note: This table presents the coefficients of regressions considering potential confounding effects influencing the main results. Columns [1]-[6] display the coefficients from the panel models. The dependent variable in columns [1]-[2] is the Blau index, while the remaining models use Ln(Invested amount). All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table 7 – Marketing and ESG descriptions of the projects as potential mechanisms

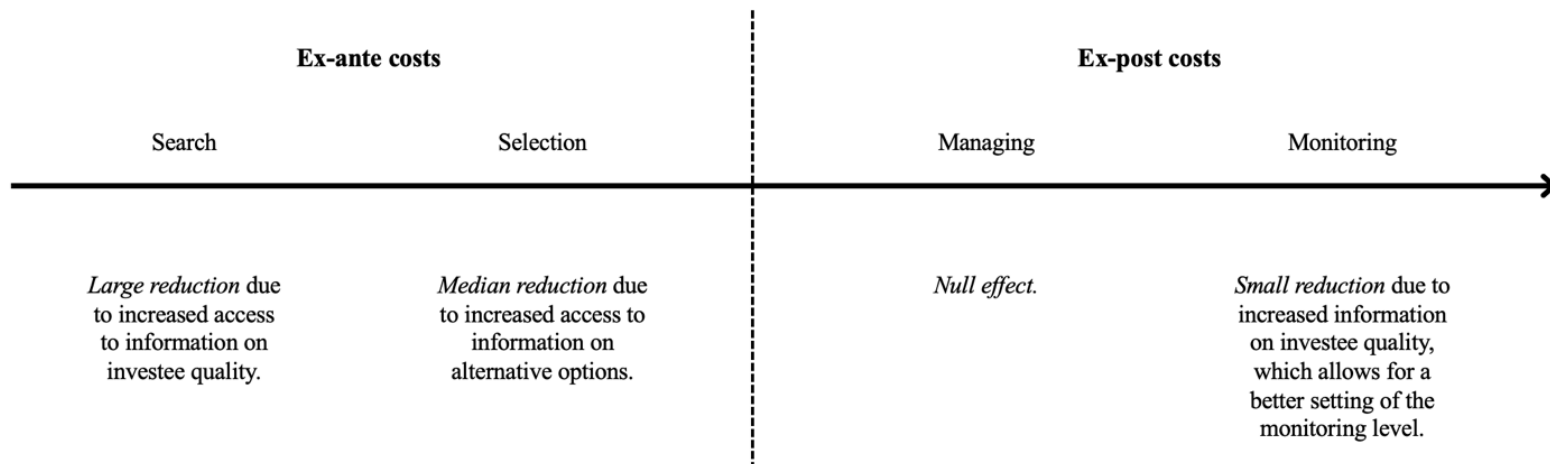
	[1]	[2]	[3]	[4]
	High X Low Performers		SOEs x For-profits	
Projects' marketing description	-2.051 (2.784)		2.128 (1.432)	
Projects' ESG description		-4.989* (2.244)		-2.652 (1.603)
Post X Projects' marketing description	-14.700 (8.254)		2.088 (5.684)	
Post X Projects' ESG description		0.518 (3.917)		2.014 (2.602)
High performers X Post	0.019 (0.104)	0.213 (0.194)		
High performers X Projects' marketing description	0.105 (3.926)			
Post X High performers X Projects' marketing description	26.005* (10.387)			
High performers X Projects' ESG description		4.465 (2.662)		
Post X High performers X Projects' ESG description		0.887 (7.127)		
SOE X Post			0.162 (0.093)	0.199 (0.166)
SOE X Projects' marketing description			-9.124 (6.273)	
Post X SOE X Projects' marketing description			1.585 (10.589)	
SOE X Projects' ESG description				1.476 (2.497)
Post X SOE X Projects' ESG description				-2.385 (7.732)
Controls	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	6402	6402	6402	6402

Note: This table presents the coefficients of regressions testing projects' descriptions as mechanisms. Columns [1]-[4] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

APPENDIX

APPENDIX A – POLICY EFFECTS OVER COSTS

Figure A1: Institutional-level policy effects over costs throughout the investment timeline.



APPENDIX B – VERSALIC SCREEN

Figure A2: Example of information accessed via Versallic

BLUE MAN GROUP SEASON - SAO PAULO - 2013

<p>PRONAC: 130496</p> <p>Mechanism: Patronage</p> <p>Project year: 2013</p> <p>Situation: Archived at the request of the proposer</p>	<p>Segment: Theater Presentation or Performance</p> <p>Framework: Article 18</p> <p>End date: 12/31/2014</p>	<p>Area: Performing Arts</p> <p>Municipality/State: Sao Paulo-SP</p> <p>Start date: 07/01/2014</p>
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Proposed value: R\$ 7,027,500.00	Approved value: R\$ 6,433,000.00
Requested amount: R\$ 7,027,500.00	Other sources: R\$ 0.00
Amount collected: R\$ 0.00	Project value: R\$ 6,433,000.00

► Provisions

<p>Associated lists</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Distribution: 1 item.</td> <td style="text-align: center;">See list</td> <td style="width: 50%;">Extension: 1 item.</td> <td style="text-align: center;">See list</td> </tr> <tr> <td>Disclosure: 18 items.</td> <td style="text-align: center;">See list</td> <td>Tax report: 0 items.</td> <td style="text-align: center;">See list</td> </tr> <tr> <td>Attached documents: 5 items.</td> <td style="text-align: center;">See list</td> <td>Negative certificates: 3 items.</td> <td style="text-align: center;">See list</td> </tr> <tr> <td>Attached brands: 0 items.</td> <td style="text-align: center;">See list</td> <td>Readjustments: 0 items.</td> <td style="text-align: center;">See list</td> </tr> <tr> <td>Displacements: 0 items.</td> <td style="text-align: center;">See list</td> <td>Capital goods relationship: 0 items.</td> <td style="text-align: center;">See list</td> </tr> </table>	Distribution: 1 item.	See list	Extension: 1 item.	See list	Disclosure: 18 items.	See list	Tax report: 0 items.	See list	Attached documents: 5 items.	See list	Negative certificates: 3 items.	See list	Attached brands: 0 items.	See list	Readjustments: 0 items.	See list	Displacements: 0 items.	See list	Capital goods relationship: 0 items.	See list	<p>Proponent </p> <p>Proponent: BLUE MAN BRAZIL ENTERTAINMENT LTDA.</p> <p>CPF/CNPJ: 15.604.475/0001-64</p> <p>Incentives </p> <p>Captures: 0 items.</p> <p>Suppliers </p> <p>Payment relationship: 0 items.</p>
Distribution: 1 item.	See list	Extension: 1 item.	See list																		
Disclosure: 18 items.	See list	Tax report: 0 items.	See list																		
Attached documents: 5 items.	See list	Negative certificates: 3 items.	See list																		
Attached brands: 0 items.	See list	Readjustments: 0 items.	See list																		
Displacements: 0 items.	See list	Capital goods relationship: 0 items.	See list																		

Proponent	Incentives	Collections	Suppliers	Products
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Summary	Stage	Goals	Synopsis	Justification	Datasheet	Technical specification	Environmental impact	Democratization	Acc
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A 7-month production and season with 104 performances of theatrical/musical performances developed exclusively for Brazil by Blue Man Group. The goal is to create a show that communicates with the general population, is non-elitist, and is palatable to any social class, age group, and ethnic group. A show of the highest artistic quality that makes people reflect on their role in society and reconsider their perspectives on life in a collaborative and inclusive context.

APPENDIX C – SARIMA MODEL FIT

I deploy a Seasonal AutoRegressive Integrated Moving Average (SARIMA) model to conduct a synthetic forecast analysis on corporate philanthropic investments from 2017 to 2021, the years following policy implementation. I use monthly investment data to identify the optimal model fit, focusing on the aggregate trend of corporate philanthropic investments over the initial 66 months (January 2011 to December 2016) of the series. After fitting the SARIMA model, I compare forecasted trends with actual data between January 2017 and December 2021 to assess the policy’s impact on aggregate philanthropic investments in the Brazilian cultural sector. As indicated in the Empirical Context section, this analysis suggests the policy did not significantly influence the ex-ante observed trend, with actual values consistently aligning with predictions and even displaying lower annual investment peaks compared to the average expected trend. I acknowledge that this analysis is not definitive for causal identification, but it at least provides anecdotal evidence of the policy’s null effects over the attraction of new investments.

The selection of SARIMA was based on evident seasonality in the time series (Tsai, 2005), likely stemming from firms opting to make investments in December, when tax calculations are clearer and, thus, allow for a better estimation of the volume of investments to be made through the program. Model estimation and selection involved evaluating AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion) across various potential models, with the best fit identified for the model ARIMA(0,0,0)(0,1,0)[12], which is described in more detail in Table A1.

Table A1 – Best-fit ARIMA model

ARIMA(0,0,0)(0,1,0)[12]	
Series: 2011 - 2016	
Sigma ²	1.97E+15
AIC	2,307.20
BIC	2,309.29
Ljung-Box test (p-value)	0.85
Observations	132

A closer inspection of model fit reveals that removing seasonality from the data effectively eliminates both autocorrelation and partial autocorrelation, as illustrated in Figure A3 and validated through the Ljung-Box test ($Q^* = 8.56, p > 0.10$). Furthermore, residual analysis, depicted in Figure A4, indicates that residuals exhibit characteristics akin to white noise. Together, these findings indicate that the comparison between forecasted and actual values in the Empirical Context section relies on the most suitable model available for this time series.

Figure A3 – Residuals’ autocorrelation analysis from ARIMA(0,0,0)(0,1,0)[12]

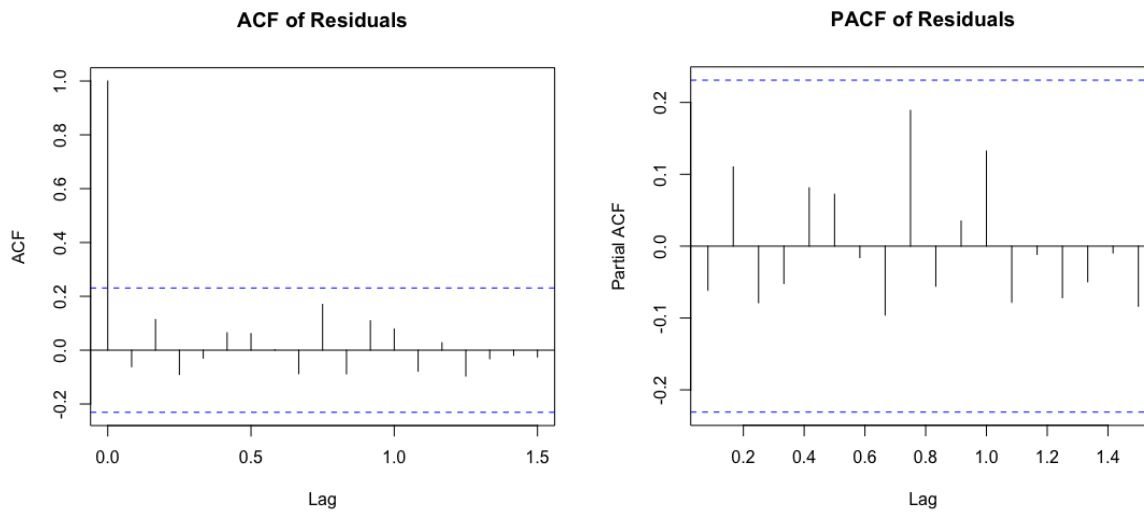
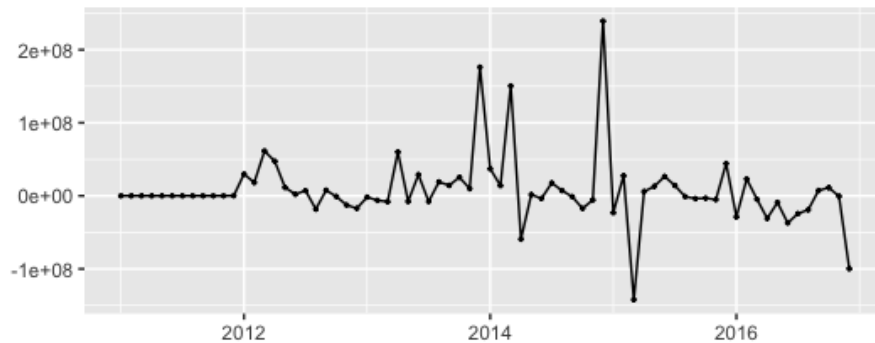


Figure A4 – Residuals from ARIMA(0,0,0)(0,1,0)[12]



APPENDIX D – ROBUSTNESS TESTS

Table A2 – Robustness tests: effects from H2 and H3 excluding industries without competitors

	[1]	[2]	[3]	[4]	[5]	[6]
	High x Low Performers		SOEs x Private		Triple Interaction	
	Adequate access	Low access	Adequate access	Low access	High Performers	SOEs
Post X High performers	0.186 (0.139)	0.520* (0.198)			0.161 (0.139)	
Post X SOE			0.045 (0.124)	0.431* (0.190)		0.057 (0.129)
High performers X Low culture access					-0.146 (0.141)	
Post X High performers X Low culture access					0.454* (0.176)	
SOE X Low culture access						-0.425** (0.150)
Post X SOE X Low culture access						0.311* (0.146)
ROA	-0.018** (0.006)	-0.005* (0.002)	-0.018** (0.006)	-0.005** (0.002)	-0.008** (0.002)	-0.008** (0.002)
Blau Index	0.277 (0.185)	0.505 (0.451)	0.291 (0.187)	0.552 (0.459)	0.333 (0.191)	0.339 (0.192)
Ln(Project budget)	0.347** (0.056)	0.433** (0.089)	0.347** (0.056)	0.430** (0.088)	0.370** (0.061)	0.368** (0.060)
Geographic distance	-0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	4464	1854	4464	1854	6343	6343

Note: This table presents the coefficients of regressions focused on providing robustness to the results obtained in testing hypotheses 2 and 3 by observing a subsample of the data in which industries with only one firm are excluded. Columns [1]-[6] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table A3 – Robustness tests: effects from H2 and H3 excluding entrants post 2016

	[1]	[2]	[3]	[4]	[5]	[6]
	High x Low Performers		SOEs x Private		Triple Interaction	
	Adequate access	Low access	Adequate access	Low access	High Performers	SOEs
Post X High performers	0.167 (0.137)	0.503* (0.197)			0.147 (0.138)	
Post X SOE			0.052 (0.121)	0.441* (0.192)		0.061 (0.127)
High performers X Low culture access					-0.143 (0.141)	
Post X High performers X Low culture access					0.436* (0.175)	
SOE X Low culture access						-0.424** (0.149)
Post X SOE X Low culture access						0.308* (0.144)
ROA	-0.018** (0.006)	-0.006** (0.002)	-0.018** (0.006)	-0.006** (0.002)	-0.008** (0.002)	-0.008** (0.002)
Blau Index	0.236 (0.175)	0.567 (0.433)	0.244 (0.177)	0.624 (0.439)	0.299 (0.181)	0.309 (0.181)
Ln(Project budget)	0.341** (0.056)	0.431** (0.089)	0.341** (0.055)	0.428** (0.088)	0.366** (0.060)	0.364** (0.060)
Geographic distance	0.000 (0.000)	-0.000** (0.000)	0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality Fixed Effects	YES	YES	YES	YES	YES	YES
Municipality x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	4443	1849	4443	1849	6313	6313

Note: This table presents the coefficients of regressions focused on providing robustness to the results obtained in testing hypotheses 2 and 3 by observing a subsample of the data in which new entrants post 2016 are excluded. Columns [1]-[6] display the coefficients from the panel models. All specifications include the segment of the cultural project (categorical) as a control variable. Standard errors are clustered at the firm level. Significance levels: + p < 0.10; * p < 0.05; ** p < 0.01.

Table A4 – Dictionaries for Private-value and Social-value orientations

Variable	Words
EVO (71 words or word roots)	affluen*, asset*, buy*, capital, cash, client*, contract*, cost*, cost-effective, customer*, earn*, economic*, economy, efficien*, employ*, expan*, fee, fees, financ*, fund*, grew, grow*, high-yield, hire*, hiring, income, interest, invest*, job*, lend*, livelihood, loan*, market*, monetary, money, money-saving, money-transfer, output, paid, pay*, performance, producti*, profit*, prosper*, purchas*, renovat*, rent, rental*, rented, renting, rents, repaid, repay*, return, revenue*, rich*, salar*, sale*, saving*, shareholders, sold, staff*, stipend*, transact*, turnover*, valuation, wage*, wealth, work*, worth, yield*
SVO (108 words or word roots)	<p><i>Social:</i> accountable, benefice*, beneficiar*, benefit*, benevolen*, brotherhood, care*, caring, charit*, civic, class, classes, communit*, compassion*, concern, concerned, cooperat*, cultivating, development, educat*, empower*, equal, equality, familial, families, family, freedom*, graduation, happiness, happy, harmony, harvesting, harvests, health*, help*, humanity, humankind, immuniz*, independen*, joy, justice, kind*, learn*, liberat*, liberty, life, mankind, partnership*, peace*, prosper*, reading, responsibilities, rights, social, societ*, SROI, success, support*, teach*, tender*, trustworth*, virtu*, welfare, wellbeing, well-being, wisdom</p> <p><i>Environmental:</i> air, biofertilizer*, biogas*, carbon, climate, conservation, conserve, conserved, conserves, conserving, contaminat*, eco-activis*, eco-friendly, ecolog*, emission*, emit*, energy, energy-efficien*, environment*, erod*, erosion, externalit*, fertilis*, fertiliz*, greenlife, landscaping, natural, pollut*, preserv*, purifi*, recharge*, re-charge*, recycl*, salvag*, solar*, sustainability, sustainable, toxic*, unpollut*, unspoil*, wast*, water*</p>

Note: This table is a replica of the one developed by Moss et al., 2018. For the application to the current case, all terms were adapted to accommodate the Portuguese language.

5. CONCLUSION

This dissertation contributes to the discussions from the extensive body of literature on Strategic Management that examines the potential for value creation through organizational actions (Barney, 2018; Cabral et al., 2019; Dorobantu & Odziemkowska, 2017; Flammer, 2013; Flammer & Luo, 2017; Hart & Milstein, 2003; Jones et al., 2018; Kivleniece & Quelin, 2012; Lazzarini, 2020; Luo & Kaul, 2019; Porter & Kramer, 2006; Portocarrero & Burbano, 2023) and particularly the effects of these actions on stakeholders from underserved communities (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Gatignon & Capron, 2023; Karnani, 2007; Pongeluppe, 2022; Singh et al., 2022). Through three studies that utilize differing levels of analysis and methodological approaches, this research places stakeholders from underserved communities at the forefront, significantly enriching our understanding of the varied dimensions of social impact generated by strategic organizational actions when engaging with such groups, and advancing a series of theoretical and practically relevant debates.

The first dissertation paper dialogues with the Strategy literature that analyzes firm action in the public interest, with a particular emphasis on the case of entrepreneurs from underserved regions (Boulongne et al., 2022; Burbano et al., 2023; Durand & Huysentruyt, 2022; George et al., 2016; Lazzarini, 2020; McGahan et al., 2013; Pongeluppe, 2022; Singh et al., 2022). There is notable excitement among both practitioners and theorists regarding the potential of digital technologies to improve access for populations in remote and underserved areas, while also lowering operational and implementation costs (Barnett et al., 2020; George et al., 2021). However, this paper argues that the inherent effectiveness of digital technologies must be seen with caution: their success may be highly contingent upon the ability of the target audiences to engage with the presented content and on the type of support provided to these individuals (DiMaggio et al., 2004; Karnani, 2007; Lazzarini, 2020). By assessing the responses of small entrepreneurs in underserved regions to variations in the mode of provision of digital business training programs, the study demonstrates that in contexts where small entrepreneurs struggle to operate or even understand digital platforms, the outcomes arising from business trainings can yield a negative impact.

Specifically, we identify a circumstance in which the use of algorithms negatively affects knowledge acquisition and the combination of algorithms and human support results in reduced business performance. These findings contribute to the literature that explores how firms adjust their strategies when engaging with individuals from underserved regions (Boulongne et al., 2022; Durand & Huysentruyt, 2022; Pongeluppe, 2022), suggesting that the effectiveness of algorithms and digital technologies may be *context-specific*, depending on the contingencies in which they are deployed and the characteristics of their target audience (Allen & Choudhury, 2022). Thus, firms seeking to engage with individuals from these communities may need to adapt their strategies accordingly.

The first study also has implications for practice, particularly for organizations aiming to enhance the capabilities of small entrepreneurs in underserved regions, who often lack high-quality human and financial capital, and face various institutional and market challenges in their operations (Berge et al., 2015; Bloom & Van Reenen, 2010; Bruhn et al., 2010; Duflo & Banerjee, 2011; Karnani, 2007; Kistruck et al., 2015; Pissarides et al., 2003). From an effectiveness standpoint, this research extends the discussion by demonstrating that, under specific circumstances of low digital literacy, digital platforms are not only ineffective but can actually hinder the absorption of content in real-world applications. Therefore, it is crucial to exercise caution when selecting the appropriate mode of provision and level of automation, with a keen focus on the needs and initial endowments of the target audience (Anderson et al., 2018; Avdeenko et al., 2021; Otis et al., 2023). On the other hand, from a cost perspective, the findings reveal that although human support can be beneficial in mitigating issues related to content absorption confusion, it does not necessarily lead to improvements in engagement or increased profitability. Therefore, depending on the situation, training programs can be designed to promptly address the technical challenges faced by users without the necessity of maintaining a full staff of human tutors. This not only conserves financial resources but also provides the flexibility to allocate these funds for alternative purposes, such as enhancing program content or expanding its scope to accommodate more participants.

In the second paper, we add to the literature that analyzes how distinct organizational forms generate social benefits beyond economic profits (Cabral et al., 2013; Cabral et al., 2019; Inoue, 2020;

Kivleniece & Quelin, 2012; Klein et al., 2013; Lazzarini, 2020; Luo & Kaul, 2019) by examining the strategic decisions of cooperatives compared to for-profit and state-owned counterparts in highly competitive markets, with a particular emphasis on their efforts to create social and community value. Traditionally, cooperatives have been portrayed as organizational arrangements that generate direct community benefits due to their shared ownership and shared decision-making structures (Ingram & Simons, 2000; Núñez-Nickel & Moyano-Fuentes, 2004). However, this study's results challenge this conventional perception and indicate that credit cooperatives, instead of prioritizing the creation of social value, primarily seek to reinforce their local presence to generate greater economic gains. As a result, these organizations may not necessarily prioritize serving clients with critical needs or vulnerable populations, but actually concentrate efforts in regions with increased economic development, positioning themselves as a relationship-based alternative to the more traditional for-profit and state-owned banks.

Furthermore, internal attributes of credit cooperatives, such as structure and scope, are key to their market entry strategies (Hansmann, 2000; Teece, 1986). For instance, additional results from the second paper indicate that credit cooperatives do rely more heavily on physical channels than the other two organizational arrangements, but this preference is less prominent in more vulnerable localities, which end up being attended by either state-owned or for-profit banks. Moreover, this research provides evidence that cooperatives' structure and scope matter, such that single cooperatives are more likely to retain physical units in vulnerable regions, while cooperative federations tend to withdraw from such areas. Also, non-credit cooperatives decrease their propensity to maintain credit services active during periods of accelerated digitalization in comparison to other organizational forms. Thus, this study contributes to the literature by showing that alternative organizational forms –cooperatives included— respond differently to competition and digitalization. Both external factors related to target audiences and internal attributes of the organization play important roles in leading to heterogeneous social value creation.

The third dissertation paper enhances the literature on corporate philanthropy by exploring the effects of institutional changes on firms' philanthropic value creation and allocation (Ballesteros & Magelssen, 2022; Gatignon & Bode, 2023; Husted & de Jesus Salazar, 2006; Marquis & Tilcsik, 2016;

Tilcsik & Marquis, 2013; Wang & Qian, 2011). Whereas existing research primarily examines the impact of unexpected institutional shocks—such as natural disasters and economic crises—on corporate giving (Flammer & Ioannou, 2021; Muller & Kräussl, 2011; Tilcsik & Marquis, 2013), this paper centers on the implications of a deliberate policy intended to reshape firms' incentives in the corporate philanthropy sector to enhance stakeholder inclusion. The policy in question significantly reduces search costs within the philanthropic market and encourages firms to redirect investments toward underserved regions. It was anticipated that this would lead to a positive overall response in terms of investment redistribution (Marquis & Battilana, 2009; Marquis & Tilcsik, 2016). However, contrary to this hypothesis, the findings indicate that the policy did not significantly attract new investments nor redirect them towards projects in underserved localities, thus falling short of its primary goal of promoting equitable philanthropic distribution across the nation.

Further analyses, however, reveal that despite the policy's lack of aggregate effects, firm-level attributes such as performance and ownership play crucial roles in how firms adapt their strategies to enhance value creation relative to their competitors (Kaul & Luo, 2018; Marquis & Lee, 2013). In other words, firms are able to capitalize on the opportunities presented by the policy's shortcomings, thereby contributing to improving the inclusion of underserved stakeholders (Boulongne et al., 2024; Durand & Huysentruyt, 2022; Marquis & Lee, 2013; Pongeluppe, 2022; Teodorovicz et al., 2023). Overall, this study underscores the importance of examining firm-level responses to fully understand how policies intended to generate social value can effectively achieve their goals and be inclusive in relation to their original objectives (Klein et al., 2019; Mahoney et al., 2009; Wickert, 2021).

The third study also has implications for practice. In particular, it aligns with recent efforts across the globe to improve general understanding of the efficiency of tax exemptions for corporate philanthropy under different contexts (OECD, 2020; Peter & Lideikyte Huber, 2022). The findings are beneficial for a variety of stakeholders, including policymakers, firms in the philanthropic sector, and sociocultural projects seeking funding. From a policymaking perspective, this research highlights the importance of tailoring policy designs to the specific attributes of firms if the objective is to improve both the volume and

distribution of philanthropic investments. For firms, the study sheds light on competitor behavior during institutional transitions aimed at fostering inclusion. In particular, it provides evidence that strategies such as reallocating value to underserved communities are already being used by various organizations, notably high performers and SOEs, potentially enhancing public value creation without compromising market positioning, thus creating incentives for this type of endeavor to be implemented more often (Boulongne et al., 2024; Marquis & Tilcsik, 2016; Teodorovicz et al., 2023). Finally, for sociocultural projects seeking funding, this research provides valuable insights into the importance of customizing communication strategies. The effectiveness of pitch decks and marketing materials may vary depending on the attributes of the target firms, being necessary to adapt these pieces depending on the specific characteristics of the intended audience (Durand & Huysentruyt, 2022; Moss et al., 2018).

Overall, the three papers developed in this dissertation shed light on the importance of a holistic understanding of the relationship between organizational action and value creation in the public interest. These studies challenge the traditional view of for-profit firms solely maximizing private value and broaden the scope to include a variety of ownership forms and the impact these organizations have on a vast array of internal and external stakeholders. Thus, a comprehensive evaluation of an organization's potential impact on value creation requires a multidimensional perspective. Specifically, when organizations engage with groups from underserved localities, the complexity of stakeholder relationships evolves, necessitating that organizations adapt their strategies based on their own attributes, the demands of the external environment, and the specific needs of their target audience. This perspective must account for the organization's role within the complex ecosystem it operates, potential outcomes at institutional, organizational, and individual levels, and the interplay among these elements. By exploring these diverse facets, this dissertation advances management scholarship's understanding of how organizational actions play a critical role in creating and allocating value in the public interest.

5.1 FUTURE RESEARCH DIRECTIONS

The diverse perspectives explored in this dissertation not only enrich the current literature but also pave the way for a novel research agenda. In that sense, the first paper highlights the importance of aligning the mode of provision of digital technologies with the needs of underserved populations, yet it primarily focuses on varying levels of automation within digital tools. A logical extension of this work would be to examine the effectiveness of different modes of provision, exploring how they interact with various content types and the specific demands of different target audiences. Further, investigating the significance of enhancing digital literacy among individuals from underserved regions, and analyzing the impact of such advancements on business outcomes, could provide deeper insights into the effectiveness of digital technologies in these settings. This approach would not only broaden our understanding of digital tools' reach but also contribute significantly to the strategic deployment of resources in enhancing engagement in underserved areas.

The second paper challenges conventional assumptions by suggesting that, in certain contexts, cooperatives may prioritize performance goals over social value creation, diverging from their theoretical expectations. While this paper's findings are centered on the banking sector, they open the door for future research to explore whether cooperatives in other sectors exhibit similar behaviors and under what circumstances. The findings also underscore the significance of cooperatives' internal attributes in shaping their strategic actions. Empirical expansions of this study could further investigate these internal dynamics in more detail to provide a more nuanced understanding of cooperative behavior. Moreover, exploring the broader impact of cooperatives in markets traditionally dominated by for-profit and state-owned entities could enrich the comparative governance literature. Such studies would offer a more comprehensive view of the role these organizations play in market structuring and their influence on the actions of other organizational forms.

The third paper puts forward the idea that, in certain circumstances, firms can attenuate the effects of ineffective policies through their corporate social actions, thereby contributing to positive outcomes and distributing value to underserved groups based on their internal incentives. Future studies may opt to adopt

a similar issue of distribution perspective to analyze firm actions concerning the inclusion of underserved groups in different contexts, such as in corporate voluntary programs, workplace safety policies, philanthropic giving without tax exemptions, and diversity training. Furthermore, future research may also delve deeper into investigating the heterogeneous effects arising from various attributes of the organizations that interact with institutional-level transitions. This exploration could significantly enhance our understanding of the dynamic interplay between organizational strategies and institutional changes, offering a more nuanced view of how firms can effectively contribute to broader societal goals related to inclusion and equity.

Across these papers, a central theme emerges: while it is crucial to explore how firms can appropriate private value from CSR initiatives to motivate their engagement, there is an equally—or perhaps more—important need to evaluate the outcomes of corporate actions in terms of value creation for a broader audience, especially when such endeavors involve other types of organizations, such as governments and nonprofits. This comprehensive assessment is essential to fully grasp the potential impact of organizations and their roles in reaching and including underserved communities, which are vital for the development of various regions globally. Moreover, all papers suggest that scrutinizing the role of digitalization—and its potential shortcomings in effectively reaching these communities—presents a promising research avenue. This exploration could yield valuable insights for both theoretical advancement and practical application. Understanding the nuances of digital outreach's effectiveness in different contexts can inform better strategies for CSR initiatives, ensuring that digital tools enhance rather than hinder the inclusion of marginalized groups. Such an approach highlights the complex and multidimensional nature of corporate social responsibility in the modern era, and the need to adapt and innovate to meet the needs of diverse stakeholders effectively.

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