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ENHANCING GREEN INNOVATION IN SMALL AND MEDIUM ENTERPRISES: THE STRATEGIC ROLE OF BANKING PROXIMITY

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Abstract

Sustainability's growing importance drives companies to align strategies with social responsibility (CSR) and stakeholder concerns. Green Innovation (GI) reduces environmental impact but requires substantial costs, often financed by banks. Small and Medium Enterprises (SMEs) face challenges in accessing its benefits. Grounded in Institutional Theory, CSR, and Stakeholder Theory, this study explores how banking proximity fosters GI through trust, tailored financial solutions, technical support, and reduced knowledge barriers. Based on interview findings, results show that proximity enhances SME-bank relationships, driving sustainable transitions. The study underscores the need for long-term collaboration and its implications for banks, SMEs, and regulators in advancing GI.

Keywords: Banking, Green Innovation, Proximity, Small and Medium Enterprises, Sustainability, Institutional Theory, Corporate Social Responsibility, Stakeholder Theory

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1. Introduction

The growing emphasis on climate change has driven businesses to adopt sustainable practices, often viewed as a competitive advantage rooted in corporate social responsibility (CSR). Legitimacy Theory emphasizes that aligning corporate strategies with societal values ensures sustainability by leveraging enterprises' need to actively seek legitimacy (Dai et al., 2022; Dowling & Pfeffer, 1975). Businesses now depend on stakeholder relationships to achieve environmental, social, and financial objectives in addition to making a profit (Russo & Perrini, 2010).

Stakeholders have demanded improved banking evaluation tools (KPMG, 2008; Pérez et al., 2012) as a result of financial scandals that have damaged trust in banks (Piñeiro et al., 2009). Simultaneously, Green Innovation (GI) has become a crucial approach (Md, 2023; Sun et al., 2024) to reduce environmental impact through innovative practices (Horbach et al., 2012). However, in contrast to general innovation, GI comes with high costs, risks, and lengthy return on investment periods (Adams et al., 2015; Guoyou et al., 2020; Liu, Thurasamy & Hijrah Hati, 2004). Since GI efforts are expensive and require additional funding, banks are essential to their financing (Dai et al., 2022).

GI adoption is encouraged by CSR, which improves environmental performance and stakeholder relationships (Ahmad et al., 2021; Dai et al., 2022; Indriastuti & Chariri, 2021; Siddik et al., 2023). Since banks' indirect environmental impact outweighs the direct effect, their influence on clients magnified their role in sustainability (Lins & Wajnberg, 2007; Peiyuan & Yongda, 2004). However, research on how banks support Small and Medium Enterprises (SMEs) in adopting GI is limited, despite SMEs collectively contributing to 64% of the European Union's (EU) environmental footprint (Calogirou et al., 2010; De Falco et al., 2021), and 70% of industrial pollution globally (Hillary, 2000; Journeault et al., 2021).

To promote sustainability, SMEs must collaborate across organizational boundaries (Alter & Hage, 1993; Clarke & Roome, 1999; Hall & Kerr, 2003; Roome, 1991, 2001) due to barriers including limited resources and expertise (Journeault et al., 2021). Local banks promote SMEs in sustainable practices, help close information gaps, and foster trust through their proximity and community relationships (Bezzon et al., 2024; Périlleux et al., 2016; Zhao et al., 2020). This trust-based relationship is pivotal for credit allocation to SMEs, whose financial practices rely on soft, relational information (Agarwall & Hauswald, 2010; Berger & Udell, 2002; Bragoli et al., 2022; Pollard, 2007; Torrès, 2011), which is difficult to preserve, send across long distances, or have someone other than the source verifying it (Bragoli et al., 2022; Udell, 2009).

This study turns its attention to addressing "How does banking proximity mitigate barriers and leverage drivers for GI in SMEs?" focusing on the Portuguese context. Portugal lags behind EU averages in innovation and climate action metrics, ranking 19th in overall innovation performance (EIS, 2024; European Commission, 2022; GEE, 2024). SMEs, comprising 99.9% of Portuguese businesses, are key to the country's green transition but lack robust support for GI (Oliveira, 2022). Proximity-based banking strategies tailored to regional dynamics can effectively bridge this gap (Díaz-García et al., 2015; Jalabert, 2020) and drive sustainable innovation within SMEs. By examining the relationship between SMEs and banks in the context of proximity dimensions such as geographical, social, and cognitive, the study aims to comprehend how these dynamics can leverage the drivers of GI adoption to overcome its barriers.

2. Literature Review

2.1. Theoretical Foundation

According to Legitimacy Theory, institutional sustainability depends on societal acceptance (Dai et al., 2022), meaning that, to achieve sustainable development, organizations must align strategies with external requirements (Li et al., 2022). GI addresses regulatory demands and consumer needs for sustainable products (Li et al., 2022). The impact of regulatory, customer, and competitive pressures on organizational decisions is highlighted by Institutional Theory (Chu et al., 2018; Huang et al., 2016; Li et al., 2022; Liu et al., 2010; Sarkis et al., 2011; Tate, et al., 2011; Wu et al., 2012; Zhu & Sarkis, 2007). Regulations and compliance are the source of regulatory pressures (Chu et al., 2018; DiMaggio & Powell, 2000), while competitive and customer pressures drive businesses to mimic the example of their successful peers and adhere to environmental standards to gain legitimacy (Berrone et al., 2012; Lin & Ho, 2011; Liu et al., 2010; Ruef & Scott, 1998).

Organizations embrace GI for compliance, financial gains, and improved customer collaboration due to external pressures such as market dynamics and regulations (Ali et al., 2019; Burki et al., 2018; Han & Chen, 2021; Huang et al., 2020; Li et al., 2022; Porter & van der Linde, 1995; Qi et al., 2020; Wang, 2020; Weng et al., 2015). Proactive environmental strategies mitigate regulatory risks and reputational damage while enhancing absorptive capacity for GI advancement (Bansal, 2004; Dreher & Gassebner, 2013; Ghisetti et al., 2015; Guoyou et al., 2020).

By striking a balance between social, ethical, legal, and economic expectations, CSR increases an organization's legitimacy (Carroll, 1979; Yu et al., 2022). The European Commission (CEC, 2001) defines CSR as a voluntary company's commitment to contribute to societal and environmental well-being (Russo & Perrini, 2010). Despite challenges faced by SMEs due to

resource constraints and complex standards (Enderlee, 2004; Lepoutre & Heene, 2006; Russo & Perrini, 2010; Yu et al., 2022), CSR improves financial and social performance (Ambec et al., 2013). Banks support CSR by providing sustainability-linked financing and enhancing credibility (Dai et al., 2022; Pérez et al., 2012).

Embedding firms within community networks and reducing information asymmetry, emphasizing trust and ethical practices, fosters CSR (Chintrakarn et al., 2017; O'Brien & Tan, 2015; Pérez et al., 2012; Russo & Perrini, 2010; Spence & Lozano, 2000; Wang & Pirinsky, 2010; Zientara, 2017). While Institutional Theory stresses the role of social rules in legitimacy, Stakeholder Theory focuses on managing relationships with entities that influence or are influenced by organizational goals (DiMaggio & Powell, 2000; Freeman & McVea, 1984; Russo & Perrini, 2010). Effective stakeholder engagement helps address environmental and social concerns (Agbenyegah & Kumadey, 2024), guiding banks to incorporate sustainability in lending practices (Capella, 2002; Clarkson, 1995; Pérez et al., 2012; Schwind, 2007; Thompson, 1998). Banks must consider not just the shareholders but also employees, customers, and society to avoid financial exclusion (Pérez et al., 2012; Ruiz et al., 2009). This approach fosters SMEs' use of social capital (Russo & Perrini, 2010) and urges banks to adopt social and environmental standards, generating long-term value (World Bank Group, 2007). As Jeucken and Bouma (2001, p.28) noted, pollution caused by bank-financed companies is the responsibility of banks; thus, banks should allocate credit to companies that behave in a socially responsible way (Schwind, 2007).

Stakeholders play multifaceted roles as trainers, coordinators, specialists, financial providers, and analysts, supporting SMEs in overcoming resource and knowledge gaps (Journeault et al., 2021). As specialists, banks can provide technical expertise, and as coordinators, they can facilitate partnerships; on the other hand, as trainers, they can provide education on sustainability business opportunities; and, as analysts, evaluate the company's social and

environmental impacts to offer tailored funding models to support sustainability projects (Journeault et al., 2021). Since powerful stakeholders hold authority over resources and public opinion (Rowley, 1997; Savage et al., 1991), firms are compelled to strengthen their ties with these stakeholders (Boaventura et al., 2020; Bosse & Coughlan, 2015) to mitigate risks.

Businesses improve their legitimacy, competitive edge, and environmental performance by collaborating with stakeholders, adhering to institutional demands, and engaging in CSR. To ensure long-term societal and corporate advantages, banks, as powerful stakeholders, play a vital role in promoting and rewarding sustainable development practices.

2.2. Green Innovation

Organizational learning and knowledge acquisition within businesses or larger societal systems is intimately related to innovation (Henderson & Clark, 1990; Magnusson et al., 2003; Sadler-Smith & Badger, 1998; Tidd et al., 1997, as mentioned by von Malmborg, 2007). Despite the heated discussion on the subject, defining GI remains complex (Ben Arfi et al., 2018; Oliveira, 2022). However, a common thread across definitions is that GI emphasizes the aim of reducing environmental impact and promoting sustainability (Bahn-Walkowiak et al., 2022, p.2; Oliveira, 2022; Rennings & Rammer, 2011). Unlike general innovation, GI generates favorable externalities by incorporating green technologies (Jaffe et al., 2005) and knowledge spillovers (Dong et al., 2020) and encompasses goods or procedures that reduce pollution and resource consumption (Horbach et al., 2012).

Kiefer et al. (2019), as cited by Oliveira (2022), classify GI as systemic, externally driven, eco-efficient, radical, and continuous improvement. The study highlights systemic and externally driven GI due to its collaborative nature. Systemic GI disrupts business models and operational procedures, achieving significant environmental benefits through partnerships, while externally driven GI responds to societal and regulatory demands to meet local communities' needs.

2.3. Small and Medium Enterprises (SMEs)

According to the European Commission (2020), SMEs have fewer than 250 employees, generate less than 50 million euros in revenue, and have an annual balance of less than 43 million euros (Oliveira, 2022). SMEs play a vital role in economic growth, accounting for 90% of firms and creating two-thirds of all jobs (European Commission, 2020), playing a critical role in economic growth (Gupta & Barua, 2018). Investigating the impact of SMEs' GI investments is vital for Portugal's sustainable development, particularly in terms of enhancing access to financing for green initiatives through banking proximity. However, before delving into the effects of banking proximity, it is important to understand the potential value that GI could add to its business models.

2.3.1. Advantages of Green Innovation for SMEs

In light of stakeholders' increased preference for environmentally conscious companies, SMEs might get a competitive edge from the expanding significance of GI (Oliveira, 2022). In addition to promoting regulatory compliance, GI boosts brand recognition and stimulates economic expansion (Gupta & Barua, 2017; Oliveira, 2022). It enhances a company's stakeholder loyalty and improves financial and market performance (Oliveira, 2022; Przychodzen & Przychodzen, 2015; Singh et al., 2021).

Investing in GI fosters corporate efficiency by optimizing resource consumption, reducing costs, and improving supply chains, particularly in energy and water use, leading to greater competitiveness, market expansion, and higher profit margins (Pacheco et al., 2018).

Systemic GI facilitates technological leadership and provides a competitive advantage in new market segments (Kiefer et al., 2019; Oliveira, 2022), while externally driven GI fosters regulatory compliance and meets environmental expectations of local communities but does not significantly boost the economic value of firms' competitiveness (Kiefer et al., 2019).

Notwithstanding their limited resources, SMEs' agility allows them to seize new opportunities and build customer loyalty quickly (Przychodzen et al., 2019).

2.3.2. Challenges and Factors Influencing GI Adoption in SMEs

SMEs are essential to the Portuguese and international economies, but they face challenges such as governance issues, financial limitations, and information asymmetries, particularly when it comes to financing innovative projects that frequently lack transparency and predictability (Bezzon et al., 2024; Rao et al., 2021). Sustainable practices are hampered by a lack of time, resources, and knowledge, as well as by a lack of working capital and a lack of awareness of the effects of sustainability (Hillary, 2000; Johnson & Schaltegger, 2015; Journeault et al., 2021). Managers' limited awareness of social and environmental impacts, coupled with poor knowledge of sustainability costs and benefits, further exacerbates these barriers (Brammer et al., 2011; Friedman & Miles, 2002; Hillary, 2004; Johnson & Schaltegger, 2015; Journeault et al., 2021). Furthermore, the skills required to manage sustainability issues are difficult to acquire. Thus, the lack of training and expertise also impacts the adoption of GI (Boiral et al., 2019; Journeault et al., 2021).

SMEs frequently prioritize current requirements ahead of long-term sustainability due to risk aversion and a focus on short-term advantages (Oliveira, 2022; Pacheco et al., 2018). Green investments are discouraged by high upfront costs, unclear returns, knowledge asymmetries, and limited finance (Bezzon et al., 2024; Cecere et al., 2018; Demirel & Danisman, 2019; Gupta & Barua, 2018). The "double externality" problem, where development costs fall on SMEs while societal benefits accrue, further reduces GI's appeal (Cecere et al., 2018; Oliveira, 2022).

Banks play a pivotal role in addressing these barriers by fostering trust, mitigating information gaps, and adopting proximity-based relationship banking (Bezzon et al., 2024; Bhattacharya & Thakor, 1993; Bragoli et al., 2022). The relational and informal nature of SME financial data

makes it hard to store, transmit, and verify across broader networks (Agarwal & Hauswald, 2010; Berger & Udell, 2002; Bragoli et al., 2022; Pollard, 2007), hindering growth and access to bank financing (Antonietti et al., 2014; Bragoli et al., 2022; Presbitero et al., 2014; Zhao & Jones-Evans, 2016). To overcome barriers to GI adoption, collaborative networks involving banks and stakeholders are essential (Cecere et al., 2018).

By using agility, cost-effectiveness, brand recognition, and customer demand to encourage sustainable investments (Aboelmaged & Hashem, 2019; Corrocher & Solito, 2017; Oliveira, 2022; Pacheco et al., 2018), banks can assist SMEs in making the shift from reactive to proactive market approaches (Halila, 2006). Additionally, they can offer vital resources like capital, knowledge, and instruction on eco-friendly items (Journeault et al., 2021). SMEs can be further encouraged to embrace sustainable practices by cultivating an eco-innovative culture through social norms, regulatory compliance, and stakeholder pressure (Carfora et al., 2021; Han & Chen, 2021; Oliveira, 2022; Triguero et al., 2014).

2.4. Proximity

Proximity plays a vital role in fostering SME growth and sustainable practices through local networks and collaborations (von Malmborg, 2003, 2007). Local authorities and banks strengthen regional economic and social structures by facilitating innovation systems and fostering trust among actors, enhancing regional welfare (Bezzon et al., 2024; von Malmborg, 2007).

The interactionist perspective tweaks the institutionalist approach and categorizes proximity into geographical, organizational, institutional, cognitive, and social dimensions (Bezzon et al., 2024; Boschma, 2004; Colletis & Pecqueur, 2005; Rallet & Torre, 2004), emphasizing that effective coordination does not require physical closeness but relies on interpersonal networks that build trust and cooperation (Bezzon et al., 2024). Geographical proximity reduces

transaction costs (Marshall, 1890), fosters trust through face-to-face interactions (Rallet & Torre, 2004), and enhances financing access through privileged local knowledge (Bezzon et al., 2024; Torre, 2011). Local banks, acting as "proximity banks", use this advantage to tailor financing strategies and improve SME outcomes (Bezzon et al., 2024; Bragoli et al., 2022).

Social proximity facilitates trust and communication (Bezzon et al., 2024; Torrès, 2011), enabling banks to assess SME projects beyond hard data (Uzzi, 1999), leveraging "proximity capital" to gather soft information and build long-term relationships (Bezzon et al., 2024; Bezzon & Levy, 2020; Crévoisier, 1997; Ferrary, 2006). This trust, shaped by individual judgment, requires sustained investment and must be supported by cognitive proximity to ensure ethical and sound decisions (Bezzon et al., 2024; Cornée, 2014; Rivaud-Danset, 1996). Cognitive proximity allows banks to provide tailored advice and technical expertise, improving risk assessment and investment decisions while fostering collaboration with other financial actors (Alexy et al., 2011; Bezzon et al., 2024; Crévoisier, 1997).

Integrating social capital into proximity frameworks enhances SMEs' capacity for CSR and sustainable practices (Avram & Kuhne, 2008). Social capital, defined as trust and reciprocity within network connections, supports coordinated actions and operational stability (Burt, 1992; Coleman, 1988, 1990; Putnam, 1993, p.19, 2000; Russo & Perrini, 2010). However, SMEs often underutilize these relationships for sustainability despite their potential to foster collective action and mutual support (Murillo & Lozano, 2006; Russo & Perrini, 2010).

Local banks can align funding with SME strategies by leveraging geographical, social, and cognitive proximity to support growth (Bezzon et al., 2024). Institutional proximity, dominated by national and international regulations, and organizational proximity, related to sectoral dynamics, are less relevant in this context (Bezzon et al., 2024).

Although extended research has been done on the GI topic and how it can be an advantage or a challenge for companies in general, there is still a lack of focus on SMEs' specific challenges and on how to overcome them in sustainable practices. The role of proximity has not been deeply leveraged in the context of SME GI adoption. Thus, this study aims to address this gap by analyzing the perceptions of SME managers and banking representatives on how this closeness can support banks in leveraging the drivers of GI adoption to help SMEs overcome the barriers associated with this kind of investment. Both Institutional and Stakeholder Theories rooted in CSR can help explain the potential drivers of GI adoption.

3. Methodology

3.1. Research Design

Using a qualitative methodology, this study investigated the perspectives and experiences of banking representatives and SME managers through semi-structured interviews. The study found patterns in the data by using inductive and deductive reasoning to connect responses to theoretical topics.

It is challenging to obtain a detailed knowledge of relational dynamics and subjective factors impacting GI finance using quantitative methods, whereas semi-structured questions allow for flexibility in addressing new issues while staying on topics. The interview guides were tailored for each participant group (Appendix A).

A Data Display and Analysis approach, based on Miles et al. (2014), was employed. This method, known as the Interactive Model of Data Analysis, includes data condensation, display, and conclusion drawing and verification (Saunders et al., 2016; *Research for Business Students*, 7th edition, p. 613). This approach aligns with the study's objectives, offering subjective insights and proposing strategies to enhance GI adoption.

3.2. Data Collection

A combination of purposive and convenience sampling strategies was employed to ensure the balance between an intentional selection of participants with relevant experience in the SME-bank relationship and the practical ease of access to participants, ensuring the study's feasibility. The selection included SME managers from various sectors and banking representatives from regional and national institutions to capture different impacts on GI investments (Appendix A, Table 1).

Based on guidelines from Guest et al. (*Field Methods*, 2006, p. 59 – 82) regarding the Principle of Saturation, six to twelve interviews are typically sufficient to identify significant themes. Thus, three interviews were conducted with banking representatives and nine with SME managers. Invitations were sent via email or phone, with interviews held in person or virtually. Two distinct interview guides, each comprising approximately fifteen questions, were used to interview SME managers and banking representatives. Each interview, lasting from thirty to sixty minutes, was recorded with consent, transcribed, and anonymized for confidentiality.

Participants shared background information about their SMEs, followed by discussions on their experiences with banks and GI adoption, focusing on how proximity influences the SME-bank relationship in this matter.

3.3. Data Analysis, Validity and Reliability

The data analysis involved organizing interview responses into tables to highlight key insights, ensuring clarity, and facilitating comparison across interviews. Each table categorized information by themes related to the research objectives, such as GI adoption drivers, challenges, and the role of banking proximity in overcoming them. These themes, drawn from the literature, align with Stakeholder Theory, Institutional Theory, and CSR and allow for a

direct connection between participants' responses and theoretical concepts, providing a deeper understanding of the SME-bank relationship.

To ensure validity, participants reviewed the interpretations and results to confirm accuracy. Peer debriefing with subject-matter experts further validated the analysis process and findings. For reliability, the research design and qualitative data analysis method were inspired by the work of Miles et al. (2014).

4. Results

The interviews revealed valuable insights from SME managers and bank representatives about their experiences with GI and the SME-bank relationship. These discussions highlighted key drivers, challenges, and actionable trends related to how banking proximity influences GI adoption. This chapter focuses on identifying practical solutions for banks to leverage their proximity to SMEs, facilitating the transition to sustainability. It emphasizes the importance of this shift for all stakeholders, rooted in CSR, stakeholder collaboration, and addressing local community and societal needs.

4.1. Drivers of Green Innovation

This section highlights key drivers motivating SMEs and banks to adopt GI, as identified by participants (Appendix B, Table 2). These include social responsibility, efficiency optimization, compliance, and competitive advantage in the business environment. The main drivers are categorized and linked to the relevant theoretical frameworks discussed earlier.

One of the key drivers identified among SMEs is social responsibility toward society and their local community. Participants emphasized the strategic importance of addressing societal needs. For instance, PM1 noted, *"We know that socially, new generations are more sensitive to these issues, so it's a strategic vision. We understand our role within the society we are inserted*

into, but we also recognize that it has become one of the main concerns in society in general", underlining the growing importance of sustainability due to societal concerns.

Similarly, PM5 articulated the intrinsic motivation to preserve resources for future generations, remarking, *"Beyond the social and environmental awareness that resources are finite, we have a role in preserving them for future generations."*

These statements align with Stakeholder Theory, emphasizing businesses' responsibility to address stakeholder expectations. PM7 further tied these practices to Institutional and Legitimacy theory, noting, *"The reasons align with the desires and needs of society in general, and, of course, for reputational reasons and preserving the corporate and conscious image."*

Another significant driver is enhanced efficiency, a benefit often highlighted in the literature. SMEs noted operational cost reduction and process improvements as key advantages: *"Economic benefits and internal efficiency… the cost savings were significant, and productivity was not affected by this change – quite the opposite." (PM6)*, *"Reduction of Operational Costs (…)" (PM8), and "It was implemented to increase the efficiency of the company, as well as to allow our clients to benefit from a more technologically advanced service." (PM3)*

This pursuit of efficiency aligns with Institutional Theory, as firms adopt certain practices to meet expectations and achieve legitimacy. Efficiency also drives competitive advantage through cost savings and improved operational processes, as illustrated by PM5: *"Many of these practices help reduce operational costs, as well as serve as a distinguishing factor from competitors."* Competitive advantage was another key motivator. PM9 highlighted the growing consumer demand for sustainability, *"improving competitiveness in the food market, where consumers seek more sustainable products."*

GI initiatives help firms align with consumer preferences, offering differentiation in the market.

PM5 also pointed out that sustainability fosters innovation and long-term growth: *"(…) seeking new practices leads to innovation and the development of potential new services."*

Finally, regulatory compliance emerged as a critical driver, especially for SMEs in highly regulated sectors, like PM8 ("*alignment with environmental regulations*") and PM9 ("*compliance with legal requirements*"). This reflects the Institutional Theory, which emphasizes the importance of adhering to norms to maintain legitimacy. Compliance not only avoids penalties but also enhances reputation and trust with stakeholders.

4.2. Barriers to Green Innovation

Participants highlighted SMEs' vulnerability to structural and operational challenges due to their limited size and resources. Key barriers include scale, access to financing, taxation, human capital, and operational inefficiencies (Appendix B, Table 3). SMEs struggle to compete with larger firms, particularly during market fluctuations. PM1 noted, *"The challenges of expanding into new markets are exacerbated by limited scale, which restricts diversification and resilience in volatile markets."*

Access to financing is another key barrier. SMEs face difficulties securing funds for growth and innovation, particularly for GI adoption. PM8 emphasized that *"(…) financing difficulties are particularly pronounced for SMEs aiming to modernize their business processes and adopt GI solutions."*

Their limited liquidity and unfavorable credit conditions are compounded by excessive taxation, limiting reinvestment into innovation. PM3 and PM6 remarked: *"High tax burden diverts financial resources from strategic growth areas, reducing the ability to prioritize technological change and adaptation." (PM3)*

Resource constraints, including shortages of skilled labor and managerial expertise, further find SMEs, as seen with PM4 and PM5, which struggle with inadequate human resources. *"The*

absence of skilled employees with specialized technical expertise limits the ability to engage with new technological processes." (PM4)

Operational inefficiencies, like poor cash flow management, exacerbate SMEs' ability to plan and take on long-term projects. PM6 noted, *"(...) liquidity issues remain a constant obstacle, particularly when considering the costs associated with adopting new technologies." (PM6)*

These general challenges will enhance the complexity of the process of implementing GI, as it involves technological, financial, and cultural adjustments.

High upfront costs are a major obstacle, particularly for smaller firms with limited liquidity. *"The costs associated with implementing green technologies are often prohibitively high, especially when financial incentives are absent." (PM4)*

Additionally, delayed economic returns discourage SMEs focused on short-term goals. PM7 and PM9 both report that *"The financial benefits of GI adoption are too delayed to align with the immediate needs of SMEs, creating hesitation to invest without short-term visibility." (PM7)*

Knowledge gaps are pervasive among SMEs since there's an absence of internal expertise and familiarity with GI, which creates uncertainty and complexity. PM3 underscores, *"A lack of in-house expertise hampers SMEs' ability to evaluate and adopt the technological innovations required for GI." (PM3)*

Internal resistance to change further hinders progress, rooted in fear of risk and disruption, as identified by PM4 and PM5: *"(...) employees and management alike are resistant to significant operational shifts, especially when these shifts are perceived as risky or resource intensive." (PM5)*

Lastly, bureaucratic regulatory environments pose administrative burdens that deter SMEs from pursuing GI. *"(...) navigating through bureaucratic hurdles, obtaining the necessary permits,*

and adhering to environmental standards is time-consuming and costly."(PM2, PM9). These administrative demands consume resources that could otherwise support strategic innovation.

4.3. Barriers to SME-bank relationship

The SME-bank relationship significantly influences SMEs' GI adoption but is often constrained by mutual barriers that undermine collaboration (Appendix C, Table 4).

Trust issues are central to this dynamic. PM1 illustrates how economic downturns impair SMEs' confidence in banks as reliable financial partners: *"During such periods, banks tend to tighten their credit. Therefore, I have significant doubts about viewing banks as true partners. (...) This happened in 2008-09, for example, and it reinforces the perception that the relationship between banks and businesses is one of power imbalance, which is not positive for genuine partnership."*

Knowledge spillover emerges as a barrier due to banks limited technical understanding of GI-related financing mechanisms: *"(...) banks often lack the technical knowledge to assess GI projects properly or offer tailored financial instruments, limiting SMEs' access to critical financial pathways." (PM9)*

Collateral requirements pose further obstacles as SMEs struggle to meet stringent expectations for securing loans: *"Banks' expectations for substantial collateral create a significant hurdle, particularly for SMEs with limited assets." (PM8)*

The lack of proactive support weakens the SME-bank relationship: *"Banks often fail to provide adequate guidance or strategic advice, especially in helping SMEs access green financing opportunities." (PM4)*

Additionally, size-related biases favor larger SMEs, as illustrated by B2's focus on firms with turnovers above 10 million euros, prioritizing financial stability and track records over smaller businesses.

4.4. Banks' Initiatives to mitigate barriers

Banks have adopted strategies to try to mitigate barriers and support SMEs' transition to GI (Appendix C, Tables 5 & 6). One approach is promoting a customer-focused culture through personalized services and proactive communication (B1). PM4 noted: *"Proactive engagement builds trust and allows SMEs to feel supported as they seek financial institutions."*

Another strategy involves sustainability criteria, such as green labeling, KPIs, and enhanced risk assessment models incorporating ESG factors, enabling SMEs to access green financing by meeting specific standards, as mentioned by B2.

Finally, banks like B3 offer tailored financial solutions to address SMEs' unique challenges, aligning lending portfolios with sustainable objectives and assessing the long-term viability of GI investments.

4.5. The Role of Proximity – Participants' Perception

Bank representatives underscored the dual significance of geographical proximity and interpersonal relationships in shaping financial interactions and building trust with SMEs (Appendix D, Tables 7 & 8). While digital banking reduces the need for physical visits, as B1 noted: *"More and more, there is less need for people or businesses to go to banks because they can do everything autonomously. The digital channels provided by the banks are much more accessible, and people don't need to go to a branch as much." (B1),* the traditional value of physical presence remains crucial for trust and personalized service. B2 provided evidence that branch closures can damage trust and customer relationships: *"The bank had 80 branches, and now only has 12, so when visiting some companies, the feedback is usually 'B2 abandoned us because it closed the branch here, so I stopped working with you."*

B3 stressed that geographical proximity enables a deeper understanding of SMEs' needs: *"Geographical proximity facilitates frequent in-person interactions, allowing managers to get*

to know entrepreneurs and the specifics of their businesses better. This builds trust, accelerates financial decisions, and allows for closer support during project implementation."

In underserved areas, geographical proximity emerges as a symbol of reliability and inclusivity: *"We are seen as the bank that doesn't abandon. Yes, we've closed branches, but we are present in areas where no other bank is." (B3)*

The interpersonal trust further strengthens SME-bank relationships. B1 noted: *"I have had a relationship with Person X for many years. I know their behavior. They are a person I trust a lot. I wouldn't have a problem granting them credit or anything like that because they are someone I know (...)" (B1)*

B2 exemplified that interpersonal trust is solidified through mutual familiarity and shared social networks: *"Company X has the size to be treated as a corporate company. However, Company X, which started as a very small company and is now a giant, was initially managed by a branch manager in Galicia. And since then, this manager has never left the Galicia branch (...) for the last 40 years, they've managed Company X. And it was the company itself that said it wanted the contact to remain with this person from the Galicia branch because of the proximity to the headquarters, the close and even family relationships, etc." (B2)*

Similarly, B3 noted that such interactions allow banks to clarify doubts, offer guidance, and align financial decisions with the specific needs of SMEs: *"The exchange of information between our employees and entrepreneurs helps align the expectations of both parties, as well as those of society."*

5. Discussion

This section analyzes the barriers and drivers SMEs face in implementing GI, emphasizing how geographical, social, and cognitive proximities can address these challenges and enhance

drivers, with banks acting as multifaceted players – analysts, trainers, specialists, financial providers, and coordinators (Journeault et al., 2021).

5.1. Accountability for Social and Reputational Benefits

While financial benefits are not always immediate, SME managers are tasked with maintaining accountability for their social and reputational contributions. Many focus primarily on financial returns, overlooking the broader benefits of GI, signaling a knowledge gap. Banks must actively educate SMEs about sustainability's long-term value in social, reputational, and financial terms.

Kiefer et al. (2019) highlight that GI can be classified as systemic or externally driven; however, these classifications do not have to be exclusive. GI can simultaneously disrupt a business model and have a positive environmental impact due to societal pressures. These pressures drive businesses to seek legitimacy within their communities, transcending financial benefits to include social and reputational gains. Institutional Theory explains how companies adapt to societal pressures and embrace CSR efforts to unlock non-financial advantages.

Banks can leverage cognitive proximity to transfer this knowledge, positioning GI as a pathway to align with community expectations and societal needs: *"If banks show that they understand both our company and our needs, as well as the benefits that Green Innovation can bring to our business models… they can only benefit." (PM8)*

Moreover, building real connections with SMEs will raise confidence, as PM1 highlighted: *"Proximity can create trust and connection needed for clients to believe that they won't be left out by banking institutions during crisis periods."*

5.2. Leveraging Proximity to Overcome Barriers

Geographical, social, and cognitive proximities can act as mechanisms to address the financial and operational barriers faced by SMEs. Geographical proximity fosters trust and transparency

(B3). Frequent interactions reinforce financial support and mitigate perceptions of abandonment.

Social proximity builds long-term interpersonal relationships based on trust. B1 emphasized: *"If you have a trusting relationship with your account manager, they will be your manager for life. They might change banks, but you will follow them." (B1).* PM2 reinforced this, noticing how: *"The local bank, benefiting from physical proximity, can, from trust and also persuasion, more easily align its clients with these types of initiatives.",* while PM6 states that: *"Local banks can act as agents of external change, by incorporating knowledge and innovation, especially for micro and small businesses (...) that do not have the skills or resources to research and implement these measures."*

Cognitive proximity bridges knowledge gaps. PM9 stresses the importance of expertise: *"The bank must have the ability to evaluate our business models and, if it wants to play an important role in this transition, understand where the areas for improvement are in businesses."* This is reinforced by B3, where proximity was used to clarify doubts and guide SMEs: *"It allows the bank to identify clients' needs, clarify any doubts regarding credit allocation, and provide guidance through the trust we've established with them."*

Banks' traditional role as financial providers limits their potential impact. PM4 highlights the need for banks to act as analysts, trainers, and coordinators, offering proactive advice and long-term support: *"Proximity can be a good base for them to act as advisors, adopting a more proactive approach when offering solutions to SMEs."*

By leveraging proximity, banks can transition from transactional roles to strategic partners, aligning social, environmental, and economic goals (PM5). B3 described this cooperative approach: *"We are seen as the bank that doesn't abandon. Yes, we've closed branches, but we are present in areas where no other bank is."*

Institutional Theory and CSR highlight that SMEs strive to achieve legitimacy within their communities, aligning their practices with societal expectations, while Stakeholder Theory and social capital emphasize managing relationships. Through proximity, banks can educate SMEs, foster trust, and align interests, enabling sustainable transitions. Acting as analysts, trainers, and coordinators, banks can address knowledge gaps and support systemic GI in meeting evolving societal and environmental demands.

6. Implications

Implementing GI in SMEs requires integrating technological, market, and consumer trends while fostering cooperative networks with key stakeholders, such as banks. Proximity within local communities enhances SMEs' absorptive capacity, enabling them to replicate successful GI initiatives. Banking proximity can help SME managers to integrate sustainability metrics into their operations, including social and environmental impact, as well as to address resource and expertise challenges, boosting their legitimacy and alignment with sustainability goals.

Governments and regulators can facilitate GI adoption through financial incentives, subsidies, and technical assistance. However, proximity amplifies these efforts, as banks act as intermediaries, raising SMEs awareness and fostering collaboration between stakeholders, enabling SMEs to navigate regulatory landscapes more effectively. Stricter regulations, tax incentives, sustainability certifications, and preferential loan rates further drive engagement.

Proximity allows banks to provide targeted training and advisory services, addressing SMEs' financial and non-financial needs, such as social and reputational benefits. By building trust, banks increase the likelihood of GI adoption. As ESG criteria gain prominence, banks hold significant stakeholder power in driving sustainability while leveraging their local presence to influence SME behavior. This creates a cascading effect where sustainable banking practices incentivize SMEs to align their strategies with environmental and social goals.

Proximity fosters trust-based relationships and personalized support, particularly in rural and underserved areas, empowering SMEs to overcome barriers to GI. Banking proximity to SMEs allows them to act as analysts, coordinators, and trainers rather than merely financial providers, offering tailored financial products, educational tools, and co-developed strategies to mitigate risks and align SMEs with GI objectives. This closeness allows for gathering granular ESG data, which not only informs banks' strategic decisions but also helps SMEs understand how GI can enhance their business models and reduce exposure to environmental risks.

Lastly, collaboration fostered by proximity is essential for overcoming financial and technological barriers to GI adoption by simplifying bureaucratic processes and ensuring that SMEs are motivated and equipped to transition to sustainable practices, enhancing their legitimacy within communities and markets.

7. Conclusion

This study explored the strategic role of banking proximity in fostering GI among SMEs, focusing on its impact on sustainability, legitimacy, and social responsibility. Proximity – geographical, social, and cognitive – is a key enabler for SMEs to overcome barriers like resource limitations, knowledge gaps, and the complexities of implementing GI.

SMEs, the backbone of many economies like Portugal's, are pivotal in environmental change but face unique challenges. Banking proximity can mitigate these by fostering trust, tailoring financial products, and providing advisory and technical support.

Geographical proximity ensures a strong local presence, particularly in underserved areas, enabling trust-building through regular interactions and signaling reliability during economic uncertainties. Physical presence signals inclusivity, ensuring that no community is left behind in the transition to sustainability. Social proximity enhances interpersonal relationships, positioning banks as trusted advisors who align SME goals with societal demands for

sustainability. This personalized guidance helps SMEs gain legitimacy and competitive advantages while integrating GI into their operations. Cognitive proximity allows banks to bridge knowledge gaps, particularly in the technical aspects of GI. By investing in workforce training and building expertise in green finance, banks can support SMEs in evaluating the risks and benefits of GI projects. This alignment fosters long-term strategic partnerships, transforming banks from mere financial providers into catalysts of sustainable innovation.

Proximity also aligns SMEs with regulatory frameworks and societal expectations, with banks acting as intermediaries to navigate environmental policies and unlocking incentives like tax benefits and preferential financing. The "cascading effect" of proximity further amplifies its impact, as banks' ESG-focused initiatives encourage SMEs to adopt GI, creating a cycle of mutual adaptation.

In conclusion, banking proximity serves as a strategic driver for GI adoption, enabling SMEs to address challenges, enhance collaboration, and align with societal and environmental goals. Tailored proximity-based strategies are essential to equip SMEs for sustainable transitions, ensuring a greener economy.

8. Limitations and Recommendations for Future Research

This study sheds light on the role of banking proximity in fostering GI adoption by SMEs but has certain limitations. Challenges in participant recruitment, particularly among banks, resulted in a smaller and unbalanced sample size, limiting the depth of analysis. While flexibility in participation formats – such as phone, virtual, and in-person interviews – mitigates some issues, the limited sample size constrained the ability to explore proximity dynamics across regions and cultures. Although the Principle of Saturation (Guest et al., 2006) supports the adequacy of the sample size, a larger pool would have offered richer insights and more nuanced conclusions.

Despite substantial efforts to broaden the scope of the performed literature review, it is acknowledged that due to pre-defined research criteria, certain topics and articles were required to be prioritized over others, potentially excluding valuable discussions. The short timeframe for the thesis further constrained data collection and analysis, limiting opportunities to employ more comprehensive methodologies. Thematic Analysis, though ideal, could not be automated due to time constraints. Instead, manual analysis based on data displays from Miles et al. (2014) was employed, which, while effective, lacked the depth and robustness of full thematic analysis. According to Saunders et al. (2016), thematic analysis requires at least 30 codes to achieve academic reliability.

Future research should focus on broadening the participant pool to include more diverse SMEs and banks, encompassing various regions and cultures. This would enable a richer exploration of proximity dynamics and their variations. Employing advanced analytical tools such as MAXQDA for thematic analysis is essential for uncovering deeper patterns and connections, enhancing the academic rigor and reliability of findings. Moreover, quantitative methods, such as surveys or econometric analyses, could complement qualitative findings, providing measurable insights into the effects of proximity on sustainability and innovation outcomes.

In addition, the role of technological proximity should be explored, focusing on how digital banking and fintech solutions reshape the relationships between banks and SMEs. This emerging dimension could offer valuable insights into how proximity evolves in an increasingly digitalized environment. Addressing these gaps will further strengthen the understanding of banking proximity's impact on SMEs' transitions to sustainable practices, contributing to the development of more effective strategies for fostering a greener economy.

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A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

10. Appendix

CAROLINA ANJOS (46886)

Work project carried out under the supervision of:

João Loureiro Rodrigues

06/01/2025

Appendix A: Semi-structured Interview Protocol

Disclaimer: The interviews' transcript won't be provided due to its extent (55 pages).

SMEs

1- Can you briefly describe your company and the sector in which it operates?
2- Does the company have a department or team dedicated to Innovation or Sustainability? What is your company's vision and mission regarding sustainability and social responsibility?
3- As an SME, what do you see as the main challenges faced by a company of this size?
4- How would you describe your company's relationship with local banking institutions?
5- Do you believe that, in today's world, banking institutions play an important role in the path towards a sustainable world? In what ways?
6- What do you understand by Banking Proximity?
7- Do you think the physical proximity of a bank can influence your decision to seek financing? How?
8- Would you say that financing is easily accessible to SMEs? Has your company had any experience with cooperative/regional banks? If so, how did that experience compare to working with a traditional hierarchical bank?
9- What do you understand by Green Innovation?
10- Has your company implemented any type of Green Innovation? If so, what?
11- What were the main reasons for adopting green practices? (Examples: regulatory compliance, consumer pressure, economic benefits, internal efficiency, etc.)
12- What were the main challenges you faced when implementing this type of innovation? (Examples: costs, lack of knowledge, internal resistance, etc.)
13- And what were the main benefits?

14- Do you believe that proximity to the bank facilitates access to the necessary information and resources? In what way?
15- How do you evaluate the role of local banks in supporting Green Innovation initiatives?
16- What improvements would you suggest to enhance the support provided by financial institutions and regulatory bodies to SMEs in terms of sustainability?
17- Is there any additional information you would like to share?

Banks

1- How many branches does your bank have, and what is its geographical distribution?
2- Does the bank have any specific policy or program focused on sustainability and green innovation? How does it integrate sustainability into the bank's daily operations?
3- How does your bank define and manage its relationship with SMEs?
4- What are the main challenges the bank faces when working with SMEs?
5- How does the bank assess risk when granting financing to SMEs, especially for innovation projects? And for green innovation?
6- How does the geographical proximity of the bank's branches influence its relationship with SMEs?
7- In what ways do social proximity (interpersonal relationships) and information sharing between bank managers and business owners impact credit granting?
8- Does the bank offer specific financial products to support green innovation in SMEs? If so, could you describe some examples?
9- What criteria does the bank use to approve financing for green innovation projects?
10- How can the proximity of the bank benefit access to financing for this type of project?
11- Does your bank encourage SMEs to adopt corporate social responsibility (CSR) practices? If so, how?

12- How do you view the role of financial institutions in promoting sustainability and green innovation within the business sector?

13- What improvements can the bank implement to support access to financing and raise awareness among SMEs for these types of projects? What are your expectations for the future of this kind of innovation?

14- Is there any other information or experience you would like to share about the relationship between banking proximity and green innovation in SMEs?

Table 1: Participants' Characterization

Code	Age	Corporate Position
PM1	52	CEO
PM2	58	CEO
PM3	60	Managing Partner
PM4	64	Founder and CEO
PM5	56	CEO
PM6	53	CEO
PM7	58	CEO
PM8	44	CEO
PM9	52	CEO
B1	45	Account Manager
B2	40	Banking Business Center
B3	38	Account Manager/Sustainability Department

Appendix B: GI Initiatives developed by SMEs and Banks, alongside barriers and drivers faced in its development

Table 2: Drivers for GI Implementation and Connection to Literature Review

Code	Connection to Theory	Drivers
PM1	Corporate Social Responsibility Stakeholder Theory	"We know that socially, new generations are more sensitive to these issues, so it's a strategic vision" (PM1). "We understand our role within the society we are inserted into, but we also recognize that it has become one of the main concerns of society in general" (PM1).
	Corporate Social Responsibility	"As an institution, we aim to contribute to the common good, and on the other hand,

	Institutional Theory (Legitimacy Theory)	being seen as a responsible entity helps us in terms of strategic positioning" (PM1).
PM2	Corporate Social Responsibility Optimization of resources Enhanced Efficiency	"Motivations to contribute to environmental improvement through reducing nonbiodegradable waste, recycling materials, and reducing paper consumptions" (PM2).
	Institutional Theory	"Some companies are awake to the application of sustainable standards and regulations" (PM2).
PM3	Enhanced Efficiency Stakeholder Theory	"It was implemented to increase the efficiency of the company, as well as to allow our clients to benefit from a more technologically advanced service" (PM3).
PM4	Stakeholder Theory – the Advisory Role of Banks	"It's a matter of determining how long it will take, I will have this paid off in two, four, five years" (PM4). "The person doing the project should explain it to you and conduct a feasibility study" (PM4).
PM5	Corporate Social Responsibility	"Beyond the social and environmental awareness that resources are finite, and we have a role in preserving them for future generations (…)" (PM5).
	Enhanced Efficiency. Institutional Theory (Legitimacy Theory) Competitive Advantage	"Many of these practices help reduce operational costs, as well as serve as a distinguish factor from competitors." (PM5).
		"(…) seeking new practices leads to innovation and the development of potential new services" (PM5).
PM6	Enhanced Efficiency. Economic benefits.	"Economic benefits and internal efficiency. The costs savings were significant, and productivity was not affected by this change – in fact, quite the opposite" (PM6).
PM7	Corporate Social Responsibility	"The main reasons are, obviously, leaving a better planet for the younger generation." (PM7). "The goal of adopting all these practices, and I believe it should be the same worldwide, is that everyone should act with this reference: to leave a better world with resources" (PM7).
	Stakeholder Theory Institutional Theory Legitimacy Theory	"The reasons align with the desires and needs of society in general, and, of course, for reputational reasons and preserving the corporate and conscious image" (PM7).
PM8	Institutional Theory – Regulatory Compliance	"Alignment with environmental regulations (…)" (PM8).
	Enhanced Efficiency	"Reduction of operational costs (…)" (PM8).
	Institutional Theory (Legitimacy Theory)	"(…) and improving reputation with customers who value sustainability" (PM8).
PM9	Institutional Theory – Regulatory Compliance	"Compliance with legal requirements (…)" (PM9).
	Enhanced Efficiency	"(…) waste reduction (…)" (PM9).
	Competitive Advantage Institutional Theory	"(…) and improving competitiveness in the food market, where consumers seek more sustainable products" (PM9).

Table 3: GI Initiatives and Barriers in SMEs

SME	Sector	Implemented GI	Overall SME Barriers	SME Barriers regarding GI
PM1	Education Infrastructures	Energy Efficiency: Photovoltaic energy on campus. Waste reduction and recovery: reduce plastic usage. Urban mobility initiative with bicycles, aimed at promoting its use among students for commuting from their residence to our higher education institution.	Scale issues, more susceptible to market fluctuations. Challenging expansion into new business areas and products.	High Costs. Not immediate positive economic impact. Complex management.
PM2	Consulting	Waste reduction and recovery: recyclable waste and paper and promoting the use of sustainable packaging. Design projects for its clients with GI objectives. Significantly reduced paper consumption, no longer printing reports. Advise clients on how to reduce their carbon footprint and ensure sustainability in their processes.	Greater vulnerability due to size. Lack sufficient scale to meet international demands. Inability to finance long-term investments in Portugal. Constant pursuit of excellence in customer services. Price competition hinders the process of accompanying and collaborating in areas outside the normal	High Costs. Bureaucracy. Lack of oversight. Lack of enforcement.
PM3	Real Estate	Operational efficiency and Waste Reduction and recovery: Documental approval processes and contract signing using blockchain technologies, no more paper waste.	Excessive taxation hindering investment. Market shrinkage of at least 30% after 8 years of growth.	Internal resistance to blockchain technologies. Lack of knowledge. High Costs. Lack of awareness on social impact.
PM4	Food	Energy and Operational efficiency, Waste reduction and recovery: Aim to develop a greener restaurant with new equipment related with water usage, waste reduction, and less energy expenditure. Separate oils and waste. Plans to install 50 solar panels.	Lack of human resources. Affordability. Lack of capabilities and knowledge.	Internal resistance. High Costs. Complex financing system and investment. Lack of support of major entities. No incentives.
PM5	Health	Waste reduction and recovery: several departments paper-free. Recycling. Focus on water and energy Efficiency.	Competition with larger units that have greater economies of scale and access to financing. Lack of attraction and retention of staff, leading to lack of capabilities and knowledge. Cash flow management due to payment terms.	Internal Resistance. Lack of human and financial resources for infrastructure changes.

PM6	Services	Waste reduction and recovery: restricted unnecessary document printing, printing mostly in Black and White, using scrap paper for printing. Separation of waste. Energy Efficiency: switching to LED lighting.	Tax burden. Lack of liquidity and cash flow management which does not promote financial stability.	Internal resistance to business models disruptions. Lack of knowledge. Lack of expertise.
PM7	Wine	Water management: water with no dirt is recovered after pre-washing the wine bottles. Monitor dirty water that isn't recovered annually. Circular economy: recovery of grapes' flaxy part to fertilize members' land. Operational efficiency: reduce bottles' weight to reduce carbon footprint. Energy efficiency: photovoltaic panels.	Scale: lack of access to complex financial instruments. Weak financial indicators, leading to unfavorable credit conditions. Conservative Business Model: preference for more traditional financial products.	The execution itself is complex. Lack of resources. Lack of time. Lack of human resources. High Costs. Unbalanced: immediate costs and benefits only flourish in the long-term.
PM8	Textile	Water recycling system in the dyeing process, reducing water consumption by 30%. Adopted Biodegradable dyes in part of their production process.	Difficulty in accessing funding in specific areas: process modernization, green initiatives. Market pressures to reduce costs, limiting the ability to invest in innovation. Environmental legislation is financially demanding for SMEs. Fewer opportunities in less urban, isolated areas.	High Costs. Lack of internal know-how to operate new technologies and processes.
PM9	Food Processing	Waste reduction and recovery: a System for utilizing organic waste to produce compost, which is returned to agricultural suppliers, promoting a circular economy.	High energy costs. Scale: increases vulnerability to fluctuations in the price of raw materials and to general fluctuations in the market, increasing the difficulty to compete against larger companies.	Lack of financial resources. Internal resistance. Lack of knowledge. Lack of coordination and orientation throughout the process.

Appendix C: The role of Banks in overcoming GI's barriers in SMEs

Table 4: The role of Banks and barriers faced in SME-bank relationships

SME Code	GI development goal	The role of the bank	Barriers within SME-bank relationship
PM1	Energy Efficiency. Waste Reduction and Recovery. Sustainable Mobility.	Financial Provider: Good relationship with bank. Long-term commitment with the company (53 years), except in the 2008-09 crisis.	Lack of trust during downturns. Not aware of support line for green economy.
PM2	Waste Reduction and Recovery. Recycling. Energy Efficiency.	Financial Provider: Good relationship overall due to good financial ratios and Scoring TOP	Financial Institutions that adopt ESG criteria reduce their financing to projects that have a negative

	Promotion of Sustainable Practices among Clients.	5% certificate that offers credibility. Partner, Coordinator: client/partner Relationship Coordinator, Advisor: Innovation and development are carried out in partnership with the Algarve University, following the bank's intermediation.	environmental impact, which can be harmful for companies that are not aware of their environmental impacts.
PM3	Operational Efficiency. Waste Reduction and Recovery. Blockchain Technologies.	Financial Provider, Coordinator, Specialist: Close relationship as an orientator of the mortgage credit of real estate clients.	As a company in the services sector, they don't rely as much in this relationship, and they don't feel the need to.
PM4	Waste Reduction and Recovery. Development of a green restaurant project. Energy Efficiency.	Financial Provider: Regular relationship, neither good nor bad, but prevails in heavier investments, like the investment in new equipment for the new restaurant.	Only meant to be in heavier investments. Lack of coordination and advice regarding the right path for sustainable practices. Lack of knowledge spillover.
PM5	Waste Reduction and Recovery. Recycling. Water usage and Energy Efficiency.	Financial Provider, Partner: Balanced relationship in both professional and human terms due to common presence in the same network and community.	Financing for SMEs is time-consuming.
PM6	Waste Reduction and Recovery. Recycling. Energy Efficiency.	Financial provider, Partner: Close and positive long-term relationship with the bank that has supported them from the start. There are also partnerships with different banks, due to their operational activities.	Even though the manager didn't point out a specific barrier within this relationship, indirectly the lack of knowledge and expertise can be connected to this.
PM7	Water usage and Energy Efficiency. Operational Efficiency. Circular Economy.	Financial Provider, Partner, Coordinator: Very close, direct relationship with regular meetings. Analyst: The banks know the company very well in terms of financial data and cash cycles, which means that they are aware of the timing of the solutions they need to offer cash in a proactively manner.	Financing for more complex investments, such as those in sustainability, involves deeper challenges.
PM8	Waste Reduction and Recovery. Water usage efficiency. Adoption of Biodegradable raw materials.	Financial Provider: Stable and close relationship. Treasure Management is carried out with regional banks.	Lack of knowledge regarding the specific challenges of the sector when it comes to financing sustainable projects. For sustainable projects, obtaining credit becomes significantly more difficult due to collateral requirements.
PM9	Waste Reduction and Recovery. Circular Economy.	Financial Provider, Partner: Good and healthy relationship with a cooperative bank, marked by trust and cooperation.	Lack of technical specialization to assess energy efficiency projects, limiting access to better financing conditions and solutions. Lack of regional banks support for larger projects. Lack of tailored financial instruments for SMEs

Table 5: GI Promotion Initiatives Developed by Banks

Bank Code	Nº Branches	Initiatives to promote GI
B1	300	Special financial products for the acquisition of solar panels.
B2	12	Focus on companies based on fossil fuels, since B2 issued a statement ensuring that they will stop working with companies that produce and exploit "dirty energy" (B2). "There is a strong trend to reduce financing for these industries, focusing instead on renewable energy projects" (B2). The bank has worked with a plastic company that produces bags and similar products to invest in a machine that would allow them "to recycle used plastic and reintegrate it into the same production process" (B2). "This allowed the bank to gain recognition, and for the company to improve its image" (B2).
B3	620	Financial products to support innovation in general within SMEs. Collaboration with "PME Líder" and "PME Excelência" certificates, awarded by *IAPMEI* and *Turismo de Portugal*. Awards for entrepreneurship and innovation. "Our core is based on a bank striving for a Net Zero Portuguese economy, contributing to a fairer and more inclusive society through informed and sustainable internal culture" (B3). Green financial products to support renewable energy and energy-efficient housing. Financial lines for the social sector, decarbonization, and circular economy. "Financing for adopting sustainable passenger transport options, such as 100% electric vehicles and projects that reduce carbon footprints (…)" (B3). Just a Change partnership – fight against energetic poverty through investments in energy efficiency in particular housing (B3). Programs related with clients' capacitation regarding the need for transition the environmental impact of their activities (B3). Development of a proximity and transition hub (B3), and reformulation of company's website for sustainability matters (B3). Inclusive and Sustainable internal culture (B3), aimed at reducing the internal carbon footprint as well. Continuous training for internal workforce.

Table 6: Barriers faced by Banks while dealing with SMEs and their role in overcoming those

Bank Code	Barriers faced with SMEs	How did they overcome those barriers?
B1	Managers connect with the branch itself, not with the bank. SMEs, as overall companies, are based on profits and set targets and expectations that usually go beyond feasibility. This urgent need for growth might be a challenge, "largely driven by the size of these types of businesses and the associated risks of these investments made by entrepreneurs" (B1), since SMEs are too focused on short-term benefits rather than long-term value, hindering sustainable practices' adoption.	"We're working on creating what we call a customer culture. We want to bring the customer closer, making them feel like a customer of the bank, not just the branch" (B1). "We have been working on behavior with the staff as well. It's about managing the situation, the behaviors of people. We're constantly undergoing training, even behavioral training" (B1). However, "even if there's a script, (…) it needs to be influenced by the context" (B1). The bank carries out a sustainability analysis of the enterprises and of the credit allocation itself. "The loan is analyzed and granted depending on the company's performance" (B1). A behavioral analysis of the customer is conducted to understand the viability of the allocating credit to that specific company.
B2	High taxation. Size. "Track record of results that may not be very expressive yet, which might not give the bank enough	"We have a policy of not working with companies that have a turnover of less than 10 million, so small businesses. Then we enter the SMEs that have a turnover above 10 million, and (…)" (B2) the taxation issue is not detrimental there.

	confidence to finance and support you" (B2).	They have set the green label based on "KPIs that must be met, and if they are met, the client will receive the label and also benefit from the green product" (B2). The risk department evaluates the company and has "an internal rating system that we assign to each company, and this rating then allows the client to access more credit products, or not, obviously" (B2).
B3	Size. Lack of resources – "not only financial but also the lack of technical capacity to evaluate more complex projects, such as those related to green innovation" (B3). Difficulty to "find a balance between risk and return to support long-term projects" (B3). "Many short-term costs when investing in this transition and often fail to recognize the benefits (…)" (B3). "Entrepreneurs don't typically consider the reputational and social benefits that come with it" (B3).	"The bank prioritizes a close relationship with managers dedicated to understanding the particularities of each client, including each SME. This relationship is built on trust and constant support, creating financial support tailored to the specific needs of businesses and contributing to their sustainable growth" (B3). Risk assessment with additional criteria, such as environmental impact and long-term viability. "Everything is evaluated based on customer's rating" (B3). "It becomes easier to grant credit when we know how the relationship with that customer works. We can guide them in structuring projects that make them robust and attractive for financing and for society in general" (B3).

Appendix D: The role of Proximity in the SME-bank relationship

Table 7: The role of Proximity in the SME-bank relationship

SME Code	Barriers within SME-bank relationship	The role of Proximity in the SME-bank relationship
PM1	Lack of trust during downturns. Not aware of support line for green economy.	Proximity can create trust and connection needed for clients to believe that they won't be left out by banking institutions during crisis periods. If actors know each other and understand how each other behaves in these time periods, they will know if they are trustworthy or not. At the same time, the proximity also aims to facilitate the information transfer between actors, allowing for a more effective communication of the current green financial products that the bank has in its portfolio.
PM2	Financial Institutions that adopt ESG criteria reduce their financing to projects that have a negative environmental impact, which can be harmful for companies that are not aware of their environmental impacts.	Banks need to assess the company's degree of risk in accordance with the company's values, mission and investment objectives. Thus, they need to know their clients very well, in order to assess whether it's viable or not to allocate credit to these enterprises. By being close to the clients, they create a relationship made upon trust and commitment. If the bank effectively communicates its intention to reduce negative environmental impacts, companies will be aware that their access to financial instruments will be affected by this factor. This communication is facilitated if the actors are face to face, for instance. By being aware of this risk, managers who are usually not aware of the impact that their company has on the environment and society, will start to care and learn about the specific metrics needed to assess this impact and understand how they can mitigate it to get a good score in the banking sustainable rating. "The local bank, benefiting from physical proximity, can, from trust and also persuasion, more easily align its clients with these types of initiatives. On the other hand, entrepreneurs benefit from this relationship to more easily obtain the financing they need" (PM2).
PM3	As a company in the services sector, they don't rely as much in	Banks' need to be there to make companies see that they are more than just regular financial providers. Most companies are not aware of the benefit that this relationship can bring to them. If banks aim to become

	this relationship, and they don't feel the need to.	the vital player in the transition to a sustainable future, they need to be ready to sustain these relationships, and not only for heavier investments. Proximity aims to become the driver for this relationship, by building long-term sustainable relationships through trust, communication, and presence.
PM4	Only meant to be in heavier investments. Lack of coordination and advice regarding the right path for sustainable practices. Lack of knowledge spillover.	Banks need to sustain these relationships over time, not only for heavier investments. Proximity can be a good base for them to act as "analysts", which means adopting a more proactive approach when offering solutions to SMEs. By analyzing companies' behavior, cash cycles, and operational efficiency, as well as their social and environmental impacts, banks can act as tutors, while advising certain behaviors to mitigate companies' operational risks. Being present and close to a client, is not letting him/her think that the relationship only matters for heavier investments. Their proximity to the bank needs to be sufficient for them to keep investing in the relationship and relying on it. To benefit from sustainable financing, companies need experience and a baseline, and this is where proximity can help building trust and enable the sharing of ideas, information, risk management, etc.
PM5	Financing for SMEs is time-consuming	This balanced relationship was made possible due to common presence in local community and, consequently, network. This is related with both geographical proximity and social proximity. The feeling of belongingness among the community allows people to know each other and create a vast network with reliable actors that interact with trust and regularity. To avoid time-consuming financing processes and assessment, there are products designed for sustainable purposes, especially when looking at banks that are alternatives to traditional hierarchies, such as regional cooperative banks that operate to benefit local communities. This underlies the importance of proximity in design tailored financial products. "By aligning their actions with the social, environmental, and economic goals of society, they can direct more resources to projects that create environmental and social benefits (…)" (PM5).
PM6	Even though the manager didn't point out a specific barrier within this relationship, indirectly the lack of knowledge and expertise can be connected to this.	The bank that works with the company offers products tailored to their needs and sector. However, the manager has pointed out that one of the major barriers of this kind of investment is related with the lack of knowledge and expertise regarding this matter. Banks need to understand way more than individual needs; they need to be aware of society needs, keeping in mind their corporate social responsibility towards it. Thus, instead of providing the products tailored to sector and individual company's needs, these products need also to include the social parameter. By understanding the need that society has on adopting a certain kind of practice, banks will need to be aware and learn the functioning of such initiatives as well. As the vital player in the sustainable transition, they need to rely on proximity to teach and guide companies in adopting green practices. "Local banks can act as agents of external change, by incorporating knowledge and innovation, especially for micro and small businesses (…) that do not have the skills or resources to research and implement these measures." (PM6).
PM7	Financing for more complex investments, such as those in sustainability, involves deeper challenges.	Need for a business center within banks that offers personalized recommendations for each enterprise. These tailored recommendations will increase in value terms if banks know the entrepreneur and environment they are dealing with. This connection was made possible through the geographical proximity of the actors, making them able to meet each other on a weekly basis to have a regular meeting, even if is something which was not scheduled beforehand. The transfer of hard data is important to understand the company's cash cycles and tailor personalized solutions, but it's the soft information exchange that allows the bank to be there when needed.

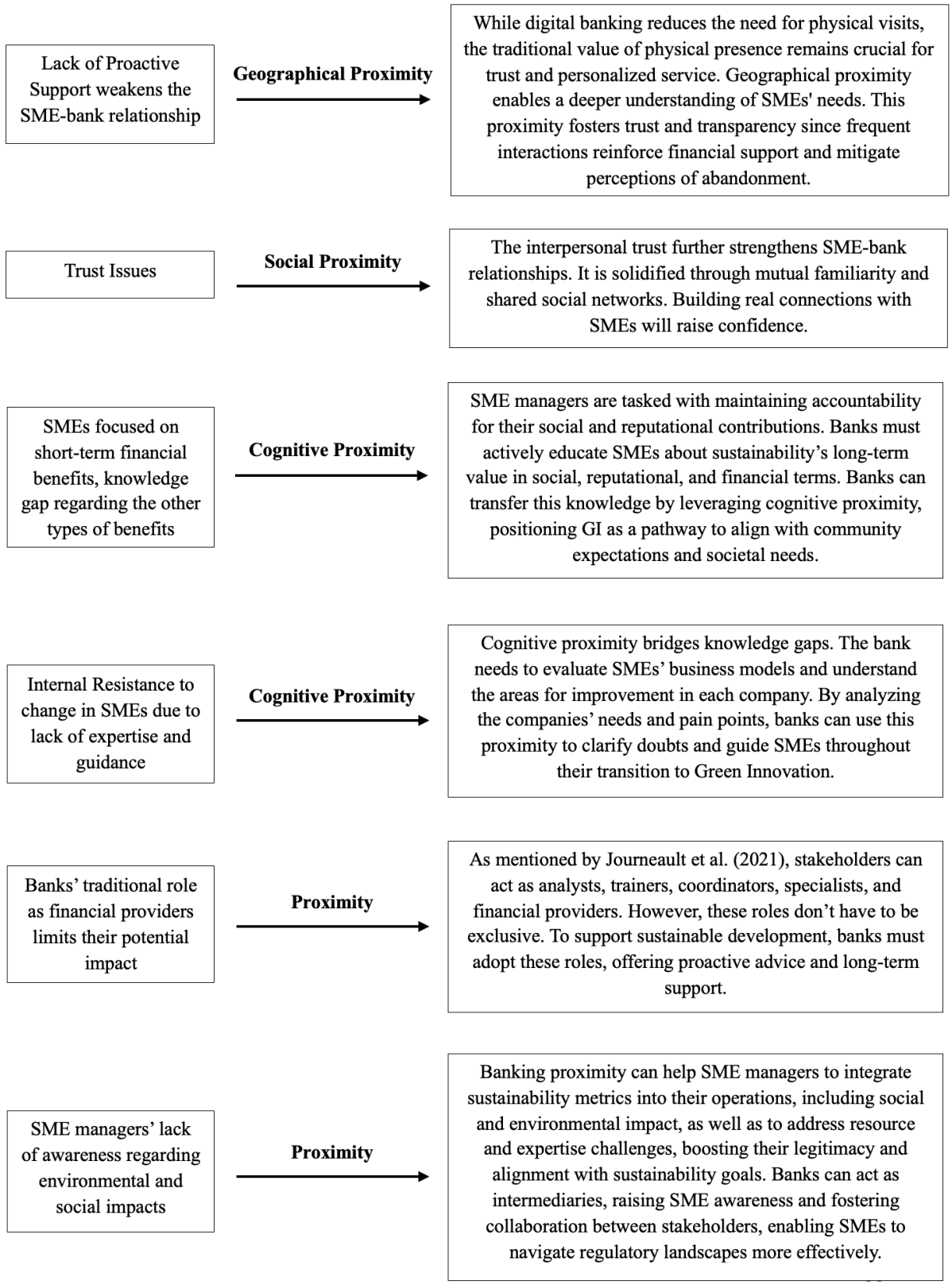
		In regional banks, the working force is local, they know each other well, they belong to the same community. There's the ability to meet daily if needed, and understanding of the region and obstacles. There is a "more contextualized understanding of the needs and characteristics of the businesses and communities they serve. (…) They can act as strategic partners, promoting not only financing but also raising awareness and providing training on innovative and sustainable practices" (PM7). Since proximity allows banks to know their clients, "it is crucial for them to continuously adapt to new market demands, developing products and services that further encourage the adoption of green initiatives by companies in the region" (PM7).
PM8	Lack of knowledge regarding the specific challenges of the sector when it comes to financing sustainable projects. For sustainable projects, obtaining credit becomes significantly more difficult due to collateral requirements.	SMEs often turn to larger banks or banks in urban areas for more structured projects due to lack of knowledge spillovers from banks and lack of orientation during these investments. Proximity aims at understanding the needs and interests of the local community in order to meet their expectations and evaluate what should be discussed in meetings and analyzed with the company for them to be comfortable in allocating their resources and time. Proximity allows banks to train these companies and coordinate them throughout these investments. Managers don't always know the benefits that arise from this business model's disruptions, so banks need to be there to clarify them regarding their individual and societal benefits. "If banks show that they understand both our company and our needs, as well as the benefits that more sustainable practices can bring to our business models, and can put into practices – meaning, define the best solutions for us – they can only benefit" (PM8). The company has worked with regional banks, and the experience was positive since it showed a better understanding of local needs and adaptability of financial products.
PM9	Lack of technical specialization to assess energy efficiency projects, limiting access to better financing conditions and solutions. Lack of regional banks support for larger projects. Lack of tailored financial instruments for SMEs	Proximity aims to reduce the lack of expertise present in SMEs. Banks need to rely on the close relationships they have with local clients, in order to adopt a more "teacher" and "specialist" based roles. They need to be able to provide insights, tailored recommendations, and, simultaneously, know-how transfer thanks to their technical expertise. This lack of specialization is due to banks' unawareness of the investment they're actually promoting, leading to another major barrier which is the lack of internal knowledge within banks. This barrier will, consequently, affect the knowledge spillover between the SME and the bank. The bank will be trying to sell a financial product for something they don't understand, which is not feasible and ethical. To be aware of societal impacts of these projects, banks need to understand their technical specificities. By relying on cognitive proximity, banks will align the goals with companies and manage to meet their needs. "The bank must have the ability to evaluate our business models and, if it wants to play an important role in this transition, understand where the areas for improvement are in businesses (…)" (PM9).

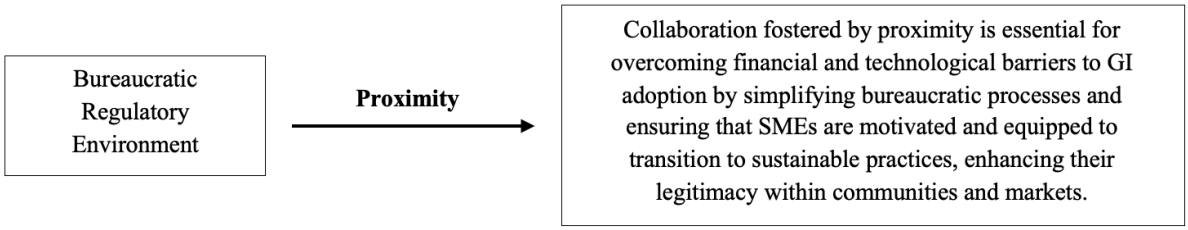
Table 8: The role of geographical proximity and interpersonal relationships in SME-bank relationship

Bank Code	The role of geographical proximity	The role of interpersonal relationships
B1	"More and more, there is less need for people or businesses to go to banks because they can do everything autonomously. The digital channels provided by the banks are much more accessible, and people don't need to go to a branch as much" (B1).	"I have had a relationship with Person X for many years. I know their behavior. They are a person I trust a lot. I wouldn't have a problem granting them credit or anything like that because they are someone I know (…)" (B1). "If you have a trusting relationship with your account manager, they will be your manager for

		life. They might change banks, but you will follow them" (B1). "Mutual trust is essential" (B1).
B2	The bank had 80 branches, and now only has 12, so when visiting some companies the feedback is usually "B2 abandoned us because it closed the branch here, so I stopped working with you" (B2) underlying the need for physical presence. "Physical proximity through a branch, has an impact on what you end up selling to the customer. Especially in more rural and more abandoned areas (…) and specifically with SMEs" (B2).	The bank has a recent example: "Company X has the size to be treated as a corporate company. However, Company X, which started as a very small company and is now a giant, was initially managed by a branch manager in Galicia. And since then, this manager has never left the Galicia branch. (…) For the last 40 years, they've managed Company X. And it was Company X itself that said it wanted the contact to remain with this person from the Galicia branch, because of the proximity to the headquarters, the close and even family relationships, etc." (B2). "The fact that they might have families that know each other and people from the same region and city (…) leads to an excellent relationship, one of transparency, closeness, etc." (B2). "Even though a branch might not have as much knowledge as a corporate area, the truth is the company prefers that over transitioning because of empathy and proximity" (B2).
B3	"Geographical proximity facilitates frequent in-person interactions, allowing managers to get to know entrepreneurs and the specifics of their businesses better. This builds trust, accelerates financial decisions, and allows for closer support during project implementation" (B3). "Being within a community that knows us and know that we are there for them gives the bank a completely different feeling compared to a traditional hierarchy" (B3). In a cooperative bank, the capital is used to invest in the communities that banks are part of, creating a direct connection with people and being directly inserted and part of this community. "We are seen as the bank that doesn't abandon. Yes, we've closed branches, but we are present in areas where no other bank is" (B3) making them the ideal partner for "excluded" communities.	"Social proximity (…) is crucial for building long-term relationships with our clients" (B3). "The exchange of information between our employees and entrepreneurs helps align the expectations of both parties, as well of those of society" (B3). It allows the bank to identify clients' needs, "clarify any doubts regarding credit allocation", and provide guidance "through the trust we've established with them" (B3). This leads to "more informed credit decisions and greater client satisfaction" (B3). It allows the banks to "raise awareness among entrepreneurs about opportunities for sustainable investment and innovation." (B3).

Appendix E: Summarized Diagram regarding the role of Proximity in overcoming SME barriers to GI Adoption




Bureaucratic Regulatory Environment
Proximity
Collaboration fostered by proximity is essential for overcoming financial and technological barriers to GI adoption by simplifying bureaucratic processes and ensuring that SMEs are motivated and equipped to transition to sustainable practices, enhancing their legitimacy within communities and markets.