What are the drivers and barriers for green business practice adoption for SMEs?

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Abstract

The depletion of natural resources as a byproduct of widespread, global economic growth has urged entrepreneurs to think about the environment when starting or conducting business. However, several of these smaller-sized firms struggle with implementing environmentally conscious business practices, especially Small and Medium Enterprises (SMEs), which represent more than 95% of all private sector firms. This study uses a survey method to assess and better comprehend the key drivers and barriers of green business practices by SMEs in the State of Ohio (USA). Results from our study show that a majority of respondents reported that they have implemented green practices, broadly defined, within their business. The two main drivers for deciding to engage in such practices are internal motivations and the opportunity to obtain a better public image. However, respondents also noted a lack of capital as the central barrier to implementing green business practices. We also observe that smaller firms, and firms located in urban areas, are more familiar with green business practices than larger firms and firms that are located in rural areas. Our results can be used by government and business actors alike, especially in states comparable to Ohio, as a benchmark to consider better strategies, programs, and policies for implementing green business techniques. Overall, this research helps to better discern best practices and ways to develop more prosperous SMEs without undermining the quality of the environment.

Keywords Green businesses · Small and medium enterprises · Sustainability · Adoption

1 Introduction

Continued economic growth and expansion across the globe has led to concerns about the depletion of natural resources, air pollution, and broader climate change challenges (Balsalobre-Lorente et al. 2018; Rao and Yan 2020; Riekhof et al. 2019; Rosales 2008; Zhu et al. 2019). Moreover, several scholars have contrarily indicated that global economies cannot be sustained if the current rate of natural resource consumption continues, as climate change also inhibits positive economic growth (Abidoye and Odusola 2015; Alagidede et al. 2016; Chandio et al. 2020; Lal et al. 2011). The long-standing public concern about the sustainability of

economic development (Elliot 2005; Gibbs 1997), coupled with a growing awareness of environmental issues (Michaud 2019; Severo et al. 2021), spurred the development of 'green business practices' to emerge in greater force in the latter half of the twentieth century (Bergquist 2017; Čekanavičius et al. 2014). In 2011, the United Nations Environment Programme (UNEP) published a seminal report that defines a green economy as one which results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (United Nations 2011, para. 9). The progress toward such a green economy, specifically through business-related activities, may be a way to address current environmental challenges and allow more sustainable future economic expansion.

The contemporary process of defining and researching aspects of this green economy began around 2008 with the establishment of the Green Economy Initiative by UNEP (United Nations 2011). This green economy aims to shift from the 'business as usual' paradigm to one with regulatory measures and strong financial incentives for green investments, innovation, sustainable consumption behavior, and

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information-sharing for businesses (Ryszawska 2015). This greening of the economy has been an appealing concept to governments and businesses alike, as it aims to provide a simultaneous solution to both economic and environmental issues. Green economy-related strategies are frequently perceived as a pathway to sustainability, as the phrase has also been associated with similar ones such as 'sustainability development' (Loiseau et al. 2016).

Small and Medium Enterprises (SMEs) play an essential part in the creation of goods and services, as they account for more than 95% of all enterprises, as well as roughly two-thirds of employment, across the Organization for Economic Co-operation and Development (OECD) countries (Organisation for Economic Co-Operation and Development 2018). There are 36 countries that are members of the OECD, including Germany, Japan, United Kingdom, and the United States (U.S.). In the U.S., there are roughly 28 million SMEs, which account for over 60% of the country's total employment (Ashton et al. 2017; U.S. Small Business Administration 2021). In general, SMEs are enterprises that have less than 500 employees (U.S. Small Business Administration 2021). Due to their large volume, SMEs can potentially serve as a central driver of 'green innovation,' or innovative practices that reduce environmental harm through business activities (Aboelmaged and Hashem 2019). Though SMEs' individual-level environmental footprint may be lower than their large firm counterparts, their collective impacts can actually exceed many large businesses. As a result, reducing the negative environmental impacts of SMEs may be a path forward for greening the larger economy. Moreover, greening a business may also provide benefits to SMEs directly, both internally (e.g., improved employee ethical behavior) and externally (e.g., positive public image) (Hillary 2004).

The greening of the economy has been a topic of interest for many, in direct response to the growing public demand for more environmentally conscious businesses. There has been a considerable growth of green business ideology and practice in the U.S. (Depken and Zeman 2018). However, a larger percentage of the historic literature has examined large enterprises, and there is a growing, yet still underdeveloped, suite of studies specifically focused on the environmental-related business practices of SMEs. While a number of papers have found a strong relationship between environmentally friendly business practices and firm performance (e.g., Ndubisi and Nair 2009), it remains necessary to continue to better understand how SMEs play a role in adopting such practices. Our paper aims to accomplish this task, using the U.S. State of Ohio as a case study, first by reviewing the prior literature, and then discussing our survey method, results, and key conclusions. In particular, we aim to answer the research question: what are the drivers and barriers for green business practice adoption for SMEs? We find that internal motivations and a better public image

serve as key drivers, and limited access to capital as a key barrier, to engaging in green business practices. We also observe that smaller firms, and firms located in urban areas, are more familiar with green business practices than larger firms and firms that are located in rural areas. Our paper concludes with synthesizing takeaways and implications for future policymakers and SMEs interested in green business practice adoption, as well as study limitations and questions for future research.

2 Literature review

2.1 The importance of SMEs in the green economy

The definition of an SME varies by country and by industry, among other factors (Ribau et al. 2018). According to the OECD glossary, SMEs are "non-subsidiary, independent firms" that employ a "small number" of workers (Organisation for Economic Co-Operation and Development 2005, para. 1), with micro-enterprises generally having a maximum of 5–10 employees, and small firms having up to 50 employees. In the U.S., OECD points out that a firm with fewer than 500 employees is considered to be an SME. In addition to the number of employees, methods used to classify SMEs may include annual sales, profits, the value of assets, or some combination of these variables (Organisation for Economic Co-Operation and Development 2005).

SMEs play an important role in all OECD economies (e.g., supporting local jobs), but, globally, account for 70% of industrial pollution (Hillary 2004). In the European Union (EU), 64% of industrial pollution is caused by SMEs, but few of them proactively engage in actions to reduce their environmental impact (Organisation for Economic Co-Operation and Development 2018). SMEs, thus, represent potentially important drivers of broader green innovation, which can also enhance SME performance and add business value through the promotion of sustainability (Aboelmaged and Hashem 2019; Broccardo and Zicari 2020; Gupta and Barua 2018; Topleva and Prokopov 2020). Despite the large number of SMEs in most nations, including the U.S., their importance as key players in green innovation is sometimes overlooked (Allen and Malin 2008).

Researchers, policymakers, and several others generally agree that entrepreneurship convincingly spurs economic growth and development (Acs et al. 2018; Klofsten et al. 2019; Urbano et al. 2019). Entrepreneurs often have the capability to adopt innovative practices since they are usually smaller-sized organizations that are more flexible compared to larger organizations (Benzidia and Makaoui 2020; Ndubisi and Nair 2009). In recent years, entrepreneurs have started to incorporate and consolidate their environmental concerns and create eco-friendly businesses (Allen

and Malin 2008). This shift is important since, in order to thrive in the future, businesses should have the ability to efficiently use their resources and develop their expertise to address the challenges of environmental constraints (Menguc and Ozanne 2005). Opportunities for environmentally sustainable actions by smaller businesses are also supported by the growing number of consumers who are willing to pay extra for eco-friendly products (Gregory-Smith et al. 2017; Namkung and Jang 2017).

2.2 Green business practices

A green economy is generally defined as one that minimizes negative environmental impacts while improving the well-being of society through jobs and economic growth (Gasparatos et al. 2017; Georgeson et al. 2017). Here, jobs and wage development are, in part, determined by public and private investments that diminish carbon emissions, foster the utilization of efficient energy, and protect the ecosystem. A green economy is perceived as a way to achieve green growth, a development that focuses on ensuring the continuity of the environment while, at the same time, promoting economic growth (Danish and Ulucak 2020; Loiseau et al. 2016). Though economic growth has produced many benefits, it has also resulted, over many years, in the depletion of natural resources and degradation of ecosystems (Everett et al. 2010; Rao and Yan 2020). In order to achieve greener industrial growth, investment and innovation that reinforces environmental sustainability and encourages new economic opportunities could be catalyzed (Loiseau et al. 2016; Mensah et al. 2019), especially given the continued rise in human population.

Greener businesses base their activities on the standard of environmental sustainability, minimize the damaging environmental impact of their operations, and strive to utilize renewable energy resources (Čekanavičius et al. 2014). Green businesses can also be more narrowly defined as an enterprise that has a green output as a product (Brown and Ratledge 2011), such as a solar photovoltaic module manufacturer. For the purposes of this study, we define green business practices as efforts that a company makes to decrease negative impacts on local and global environments, the economy, and society.

Walley and Taylor (2002), in their typology of green entrepreneurs, explained that the term 'green' is used to define an action toward environmental sustainability. In their work, 'green business' and 'green entrepreneurship' are used interchangeably, as green entrepreneurship also simultaneously pursues economic, environmental, and social prosperity. Amidst rapid global population growth, industrialization, and economic development, green entrepreneurship has emerged with a promise to provide efficient and safe operations while being environmentally and socially responsible

(Ndubisi and Nair 2009). Among the terms or phrases available to describe this concept of green entrepreneurship, the following are the most commonly used: ecoentrepreneurship, ecopreneurship, environmental entrepreneurship, sustainable entrepreneurship, ecological entrepreneurship, enviropreneurship, and sustainopreneurship. All of these labels refer to entrepreneurs and smaller businesses that desire to decrease their impact on the environment and root their activities in sustainable, environmentally friendly, and green principles (Gast et al. 2017). Green entrepreneurship is also defined as "entrepreneurship through an environmental lens," or creating value through ecological innovations and products (Gevrenova 2015, p. 322).

Further, the concepts of green entrepreneurship or green business share the same foundational beliefs as the circular economic system in its attempt to minimize environmental impact. The concept of a circular economic system refers to a process that re-utilizes waste or any byproduct materials (Kirchherr et al. 2017; Prieto-Sandoval et al. 2018), such as low-grade lumber being a byproduct of high-grade lumber from wood industries. This concept benefits not only the economy through cost savings, but also the environment through emission reductions and related attributes (Rizos et al. 2016).

There are various practices that can be applied when a business wants to implement greener behaviors. For instance, the U.S. Small Business Administration (SBA) provides recommendations on several strategies for businesses to explore, including becoming energy efficient, improving waste management, and utilizing renewable energy (Chang and Slaubaugh 2017). Ashton et al. (2017) studied the adoption of such green business practices among small manufacturing enterprises in the Greater Chicago area, and found that adopting energy efficiency in facilities, as well as recycling materials such as metal, paper, and plastics, were the most common green practices implemented in these firms. A similar study by Depken and Zeman (2018), which focused on SMEs in Iowa, also found that waste reduction and recycling were the most implemented green practices, followed by deploying energy efficiency measures. Chang and Slaubaugh (2017) studied businesses across the U.S. and found that using less paper, conserving water, and adopting energy efficient technologies, among other green practices, are preferred by the companies they studied, as they have immediate impacts on a firm's financial benefits.

2.3 Drivers for green business practice adoption

There have been a number of studies in recent years that have discussed or investigated the drivers of sustainable business practices, broadly speaking, for SMEs (e.g., Aboelmaged 2018; Aboelmaged and Hashem 2019; Bartolacci et al. 2020; Caldera et al. 2019; Chege and Wang 2020; De Steur et al.

2020; Johnstone 2020; Johnstone and Hallberg 2020; Pizzi et al. 2021; Singh and Sarkar 2019; Wahga et al. 2018). While it is clear that green businesses practices are desired by many SMEs, being mindful of environmental concerns may also help businesses find new market opportunities, as well as discover potential areas for cost reduction in daily operations (Rao et al. 2009). Fundamentally, Hillary (2004) classified the various benefits of greening a business into *internal* and *external* benefits. Internal benefits are advantages acquired that are related to the internal operation of SMEs, while external benefits are related to external interaction. The internal benefits are often divided into three distinct categories: (1) organizational benefits (e.g., improved working conditions and safety), (2) financial benefits (e.g., cost savings from materials efficiencies), and (3) people benefits (e.g., improved employee ethical behavior). Relatedly, external benefits are also divided into three categories: (1) commercial benefits (e.g., gaining competitive marketing advantage), (2) environmental benefits (e.g., reduced pollution), and (3) communications benefits (e.g., creating a positive public image).

Many authors (e.g., Baah et al. 2021; Chege and Wang 2020) have indicated that internal financial benefits, such as cost savings, could be achieved by practices such as waste incineration, cutting down on paper use, and turning off electronic appliances when they are not in use. For instance, Čekanavičius et al. (2014) found that while shifting to green business practices usually required certain additional costs, they can also bring tangible benefits such as lower materials costs, and, thus, increased profit. Despite such potential advantages, SMEs are not always aware of the financial benefits that are associated with environmentally friendly initiatives (Rao et al. 2009).

The personal values of a business owner, and their internal intimacy and responsibility for employees and communities (e.g., De Steur et al. 2020), may also affect the level of sustainability of an SME (Vives 2006). A study regarding the adoption of renewable energy by German SMEs showed that entrepreneurs' personalities reflected by their perceived internal responsibility for the environment were among the core adoption factors (Rahbauer et al. 2016). In a case study to explore the development of green practices within micro-businesses, Parry (2012) confirmed this notion, reporting that the formation of green strategies within small businesses are closely linked to the ethical principles of the business leaders, which often flow into the ethical behavior of employees.

A seminal study by Bansal and Roth (2000), examining the motives of why companies go green, comprehensively classified the drivers of corporate ecological responsibility into four main areas: (1) legislation, (2) stakeholder pressure, (3) economic opportunity, and (4) ethical motives. Many others have included commercial benefits (e.g., Camacho and Fernandez 2018; Parry 2012; Wahga et al. 2018) as an additional factor in why businesses adopt green practices. This idea is supported by the fact that there is an increasing number of companies that are pursuing sustainability to seek new market advantages, in addition to promoting public image and reputation through pollution reduction and new communications (Chang and Slaubaugh 2017). Research regarding the social and environmental responsibility of SMEs in Latin America by Vives (2006) also found that profit was considered an important factor in engaging in green practices, in addition to compliance with legislation (e.g., Johnstone and Hallberg 2020). Others have noted better relationships with the community and the public sector, as well as the desire to improve relations with clients and suppliers. Table 1 concisely summarizes selected research papers by authors revealing the motivations for implementing green business practices, most similar to our own, many of which also employ survey methods. While internal motivations are rather consistently found to be a key driver for green business practice adoption across studies, the results remain relatively mixed.

Table 1 Drivers for green business practice adoption found in selected prior studies

Drivers	Author						
	Bansal and Roth (2000)	Vives (2006)	Parry (2012)	Čekanavičius et al. (2014)	Rahbauer et al. (2016)	Ashton et al. (2017)	Depken and Zeman (2018)
Required by market/customers				√	√	√	√
Required by Government		√	√	√		√	
Investment opportunity	√		√	√	√		
Internally motivated	√	√	√	√	√	√	√
Community pressure		√					√
Better public image	√		√		√		

2.4 Barriers for green business practice adoption

Regardless of their precise size and industry sector(s), SMEs face different kinds of barriers in incorporating green practices into their operations, which have sometimes been slow and challenging (Teh et al. 2020). According to Rao et al. (2009), SMEs often expressed their intention to opt for *voluntary* environmental initiatives, as long as the process was not too expensive and not too daunting (Wu 2017). Yet, SMEs are often unaware that there are many financially attractive opportunities for environmental improvement, such as tax breaks and subsidies from governmental entities (Organisation for Economic Co-Operation and Development 2018). Often, these SMEs are busy increasing their productivity and focusing mainly on their product outcomes (Rao et al. 2009). A lack of necessary skills and expertise also commonly prevents SMEs from embracing new opportunities, even when they are generally aware of the potential of improving competitiveness (Organisation for Economic Co-Operation and Development, 2018).

The complexities in implementing green business practices were examined in a study by Gupta and Barua (2018). These authors discussed overcoming barriers to green innovation, and classified the impediments into seven clusters: (1) organizational or managerial, (2) technological, (3) financial and economic, (4) external partnership and stakeholder engagement, (5) government support, (6) market and customers, and (7) knowledge and information-related barriers. They argued that organizational- or managerial-related barriers often come from the lack of commitment by management to green practices since they prefer to run a business in a conventional way, and they strive to avoid unexpected risk from innovation. Moreover, they indicated that the technological, as well as knowledge and information-related, barriers are mainly present due to the resource constraints that are often found within SMEs. Unlike multinational firms that can support technological advancement through their research and development activities, SMEs often depend on the readily available technology in the market (Chang and Slaubaugh 2017).

Financial and economic issues may also serve as both a driver and barrier toward the adoption of green business practices. Gupta and Barua (2018) explained that, while financial incentives by reducing costs can drive some to adopt green practices, the high cost of investing in green innovations often hampers SMEs from making such shifts. This financial challenge of implementing green innovation is understandable, given the uncertainty on payback periods, and has been noted in prior studies (e.g., Ormazabal et al. 2018). Gupta and Barua (2018) also note the lack of support from external stakeholders such as governments, business partners throughout the supply chain (e.g., Kumar et al. 2019), and customers as deterrents for SMEs to further pursue green practices. The results of their study proposed effective policies and a framework by government and policymakers, such as environmental tax benefits and low-interest loans. Comprehensively, it is apparent that mixed results exist in prior studies concerning the adoption of green business practices, as a product of various methods, geographies analyzed, and questions asked.

3 Methods

3.1 Sample design

For this study, we employed a non-probability convenience sample, with the population being every known SME in the State of Ohio (USA) that employs 1–500 workers. Ohio was chosen as a representative case study given the authors' familiarity with the state, as well as its diverse business and political structures across its distinct regions, which comprehensively embodies what might be found in most other U.S. states. We gathered business email addresses from publicly available data on the LexisNexis database. LexisNexis is a digital research tool that provides a convenient and cost-efficient method to access to extensive business records and other information (Michaud and Jolley 2017). In particular, we utilized the 'Company Dossier' function in LexisNexis to search for companies in Ohio, and gathered ancillary data such as address and employee count. We then sorted this list by employee count, and only included businesses with 1–500 employees to meet the definitional standards of SMEs as previously identified. The Company Dossier mines data from numerous company and financial sources for more than 240,000,000 public and private companies worldwide (LexisNexis 2019).

3.2 Study area

The U.S. State of Ohio is divided into five general districts: (1) the Northwest District (24 counties), (2) the Northeast District (15 counties), (3) the Southwest District (16 counties), (4) the Central District (10 counties), and (5) the Southeast District (23 counties). The state has a diverse geography, with many major cities and metropolitan areas, which include Columbus, Cleveland, and Cincinnati. Further, more than 25% of Ohio's land cover is forest and more than 50% is farmland (Restoring Prosperity 2010). Ohio's economy consists of core industries such as advanced manufacturing, energy and chemicals, financial services, food and agribusiness, and healthcare (JobsOhio 2010).

3.3 Data collection

A survey method was utilized to collect data regarding the implementation of green business practices by SMEs in Ohio. To make our set of questions more manageable in response time and more efficient in its administration, most of the questions used were close-ended. As opposed to open-ended questions, subjects were presented with lists about common green business practices, and then asked, in the questionnaire, to what extent their companies engaged in those practices.

The questionnaire itself consisted of 12 questions (see Online Appendix A), and was divided into the following sections: (1) demographics (i.e., firm size, industry sector, and location), (2) types of green business practices implemented, (3) motivations to implement current green business practices or to implement green business practices in the future, (4) barriers in implementing green business practices, and (5) types of support needed to better implement green business practices. To minimize bias that may be caused by different interpretations of 'green business practices,' we provided the definition of green business practices that is used for this study in the questionnaire itself.

Our survey was sent out directly to 1672 SMEs' email addresses from LexisNexis, as well as to an additional set of SMEs through 229 Chambers of Commerce across the State of Ohio. Chambers of Commerce are non-profit organizations with an objective to promote the interests of businesses, who have several local SMEs as their members. Due to privacy concerns and the importance of anonymity in the survey, in this study, instead of sharing their members' email addresses with the researchers, some Chamber of Commerce sent out the survey to their members on behalf of the researchers.

The Ohio-based SMEs were sent our online questionnaire via Qualtrics to examine whether or not they incorporate green practices within their businesses, and what the drivers and barriers of implementing the green practices were. Since we only sent the survey to businesses who had an email address listed in the LexisNexis database, the unit of analysis does not have the same chance of being included in the sample, and, thus, we acknowledge that this sampling method has a potential for biased estimates. This research measured data only at a single point in time, where data were collected from October 29 to December 12 of 2019.

3.4 Data analysis

For data analysis, our results distribution was disaggregated according to company size and geographical location. In particular, we divided company size into two distinct groups: small (1–50 employees) and medium (51–500 employees),

and into two different locations, rural and urban. Consistent with prior studies using a rural/urban dichotomy, all counties that are not designated as parts of Metropolitan Areas by the Office of Management and Budget (OMB) were considered rural in this study. Below, Fig. 1 displays our study area, broken down into the rural (green) and urban (purple) dichotomy, while also displaying the number of respondents from each county (as indicated by the yellow dots by size).

4 Results

4.1 Background of the respondents

After the close of our survey, in December of 2019, there were 178 recorded responses, and, after being sorted and cleaned, there were 140 total responses to be analyzed, 49 of which came from the Chambers of Commerce portion of the sample. Some of our cleaning involved eliminating the respondents that had the same IP address and answers. There were also some unfinished responses, and responses that did not provide consent. In total, our response rate was 8.4%, which is within the typical range of similar external surveys. The demographic data of respondents are summarized below in Table 2, with many small and urban SMEs that responded.

The survey first asked about the SMEs' familiarity with green business practices, and their perceived importance of such green practices (see Table 3). In other words, the goal here was to assess to what extent SMEs incorporate green practices while conducting their normal businesses operations. A majority of the firms (70.7%) claimed that they were somewhat familiar with green business practices, which they perceived as somewhat important (66.4%). Very few SMEs (11.4%) were not at all familiar with green business practices, and even fewer (7.9%) viewed these green practices as not at all important.

4.2 Green business practices

In our survey, roughly two-thirds of the respondents reported that they have implemented green practices, to some extent, within their business. Figure 2 displays the types of green business practices that the sample of SMEs implemented, as well as the frequency of each type. This figure also shows the differences between small versus medium enterprises, as well as between enterprises that are located in rural versus urban areas. Though each group has different preferences in implementing a green practice, 'recycling materials' and 'reducing waste' are shown as the most common practice, and 'pursuing green certification' as the least utilized practice across each group.
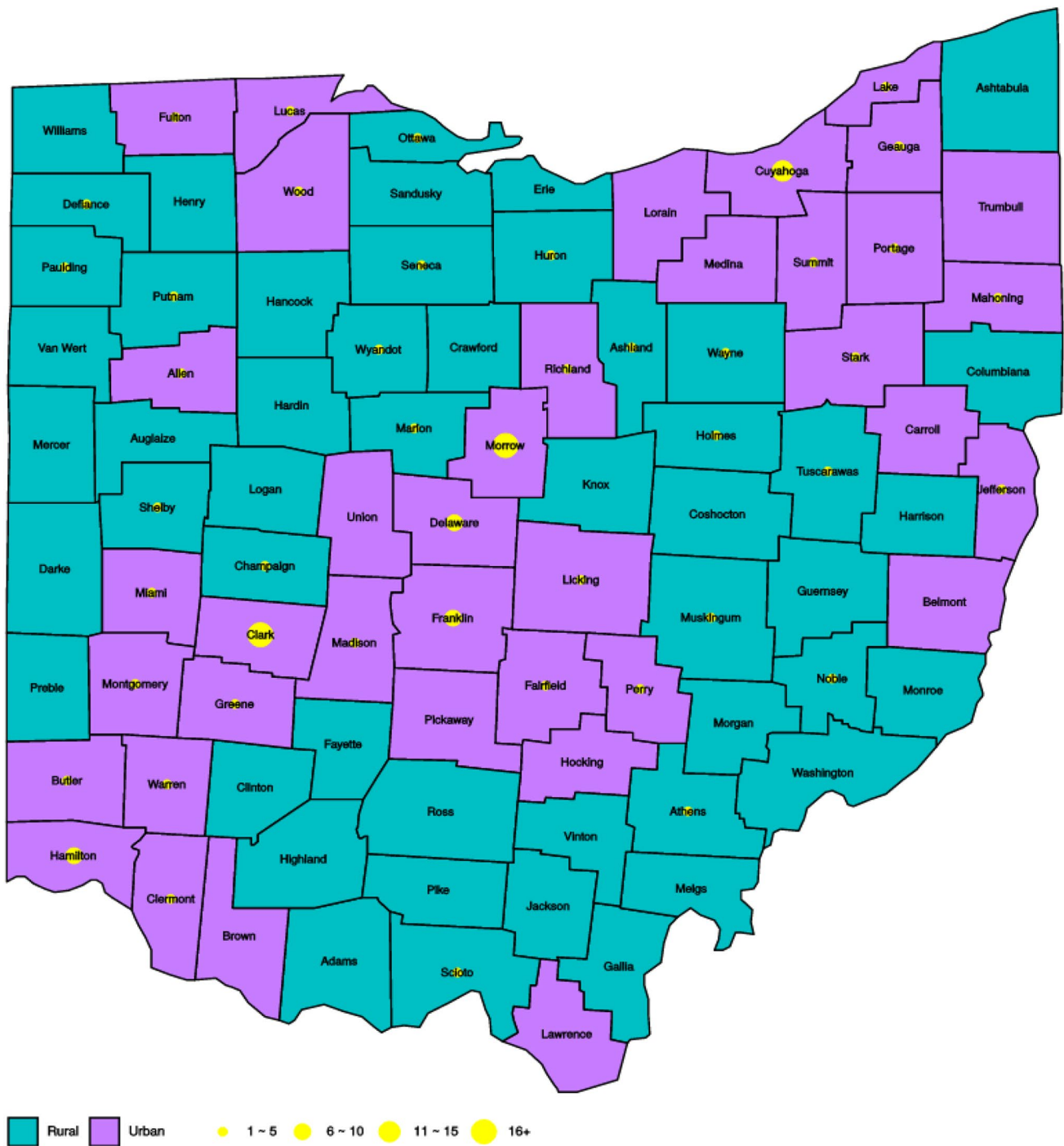
Fig. 1 Map of study area and respondents by County

Next, respondents who do not implement green practices within their business were asked to identify the *challenges* that they faced in terms of implementing green practices. Below, Fig. 3 shows the distribution of the challenges among each group. Here, it is clear that firms are concerned about the potential for increasing costs due to green business practice implementation, as this emerged as the top challenges across all four groups. Concerns about additional work burdens were also prevalent.

After identifying the challenges, respondents were then asked to suggest the types of support that might encourage them to implement green business practices. Table 4 shows the frequency of each type of support desired. These data

Table 2 Demographics of SME respondents in this study

Demographic variable	Percentage (%)
Industry sector	
Food, agriculture, and forestry	2.8
Construction, utilities, and transportation	6.4
Wholesale and retail trade	9.3
Manufacturing	19.3
Service industries (e.g., healthcare, financial, etc.)	27.9
Other	34.3
Total	100
Firm size	
Small (1–50 employees)	80.0
Medium (51–500 employees)	20.0
Total	100
Region	
Urban	77.1
Rural	22.9
Total	100

Table 3 Familiarity with green business practices and perceived importance

Degree	Frequency (n)	Percentage (%)
Familiarity		
Not at all familiar	16	11.4
Somewhat familiar	99	70.7
Very familiar	25	17.9
Total	140	100
Perceived importance		
Not at all important	11	7.9
Somewhat important	93	66.4
Very important	36	25.7
Total	140	100

are congruent with the results from Fig. 3 in the sense that cost is a major concern, as the two most common responses in Table 4 relate to subsidies and tax incentives. Education and training emerged as less important here, contrary to the findings from some prior studies. This perhaps suggests that most SMEs know about green business practices at this point, but are largely looking for the appropriate capital to implement such strategies.

4.3 Drivers of implementing green business practices

In the literature review, Table 1 shows that a truly wide variety of factors drive SMEs to implement green practices within their business. However, in our survey, about 60% of respondents reported that 'internal motivation' was the

main driver for implementing green business practices, followed by 'better public image.' Internal motivation often refers to the personal value of the business owner and their ethical principles. Ashton et al. (2017, p. 2136) described this internal motivation as "personal belief, awareness, and commitment to social and environmental responsibility." More than 7% SMEs utilized the 'other' option, and listed specific items that have motivated them to implement green practices within their business. Figure 4 shows the distribution of the drivers on each groups.

The implementation of green business practices can generate several benefits. Benefits noted by the SMEs in our sample are reported in Fig. 5. Interestingly, firms that have actually implemented practices notice reduced costs (though this might be the reason, and not the effect, of green practices).

4.4 Barriers to implementing green business practices

The Ohio SMEs who have implemented green practices within their business identified a number of barriers in doing so. Figure 6 displays the distribution of the barriers across our four groups. Lack of capital seemed to be a major barrier for the smaller SMEs, as well as the SMEs located, interestingly, in more urban areas.

Respondents who have experienced barriers were then asked to identify the types of support that they need to address those barriers. Again, the desire for government assistance, especially with respect to costs, was a major factor, as shown in Table 5.

In sum, the core green business practices that were identified as being implemented from SMEs in Ohio were recycling and reducing waste. We also found that internal motivation, and aiming for better public image, were the main drivers for SMEs to adopt green business practices. Conversely, the main barriers for SMEs in Ohio to adopt green business practices varied depending on business size and location, but, generally, included lack of capital, lack of support from partners, and other financial constraints.

5 Discussion

Our survey showed that roughly 70% of our respondents are somewhat familiar with green business practices, and that over 66% of the respondents perceive green business practices as somewhat important. We observe that smaller firms, and firms located in urban areas, are more familiar with green business practices than larger firms and firms that are located in rural areas. Further, both small and urban firms were shown to perceive green practices to be more important than medium and rural firms.
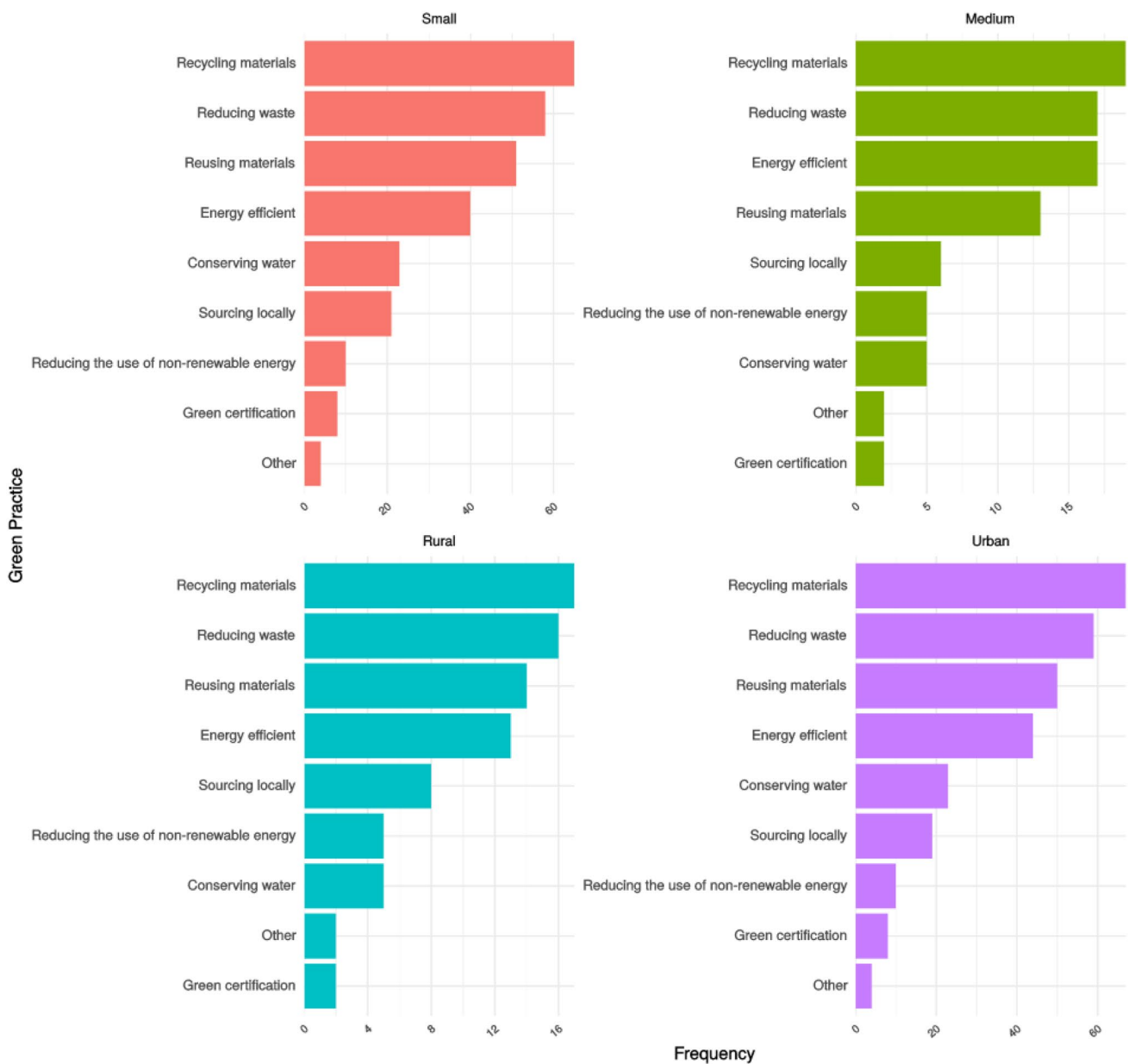
Fig. 2 Green business practices implemented by surveyed SMEs

5.1 Implementation of green business practices

At large, more than 65% of our respondents have implemented green practices within their business operations. Recycling appeared to be the most implemented green practice, with cardboard and paper as the most recycled materials. Pursuing green certification was the least common practice within each group, perhaps because business owners are less enthusiastic about practices that may benefit the public more than the business itself (see: Chang and Slaubaugh 2017).

In addition to the close-ended questions regarding green business practices, respondents also were able to choose the 'other' option and identify an alternative green practice that they have implemented. One respondent reported that they use less paper in their efforts to be more environmentally friendly. Having a Zoom call instead of traveling for a meeting was also reported as a green practice by respondent. Both practices can save costs in many circumstances.

Besides looking at the types of green business practices and simply calculating their frequency, a cross-tabulation analysis was also performed to see if there was a relationship between firms' size and the level of engagement in green
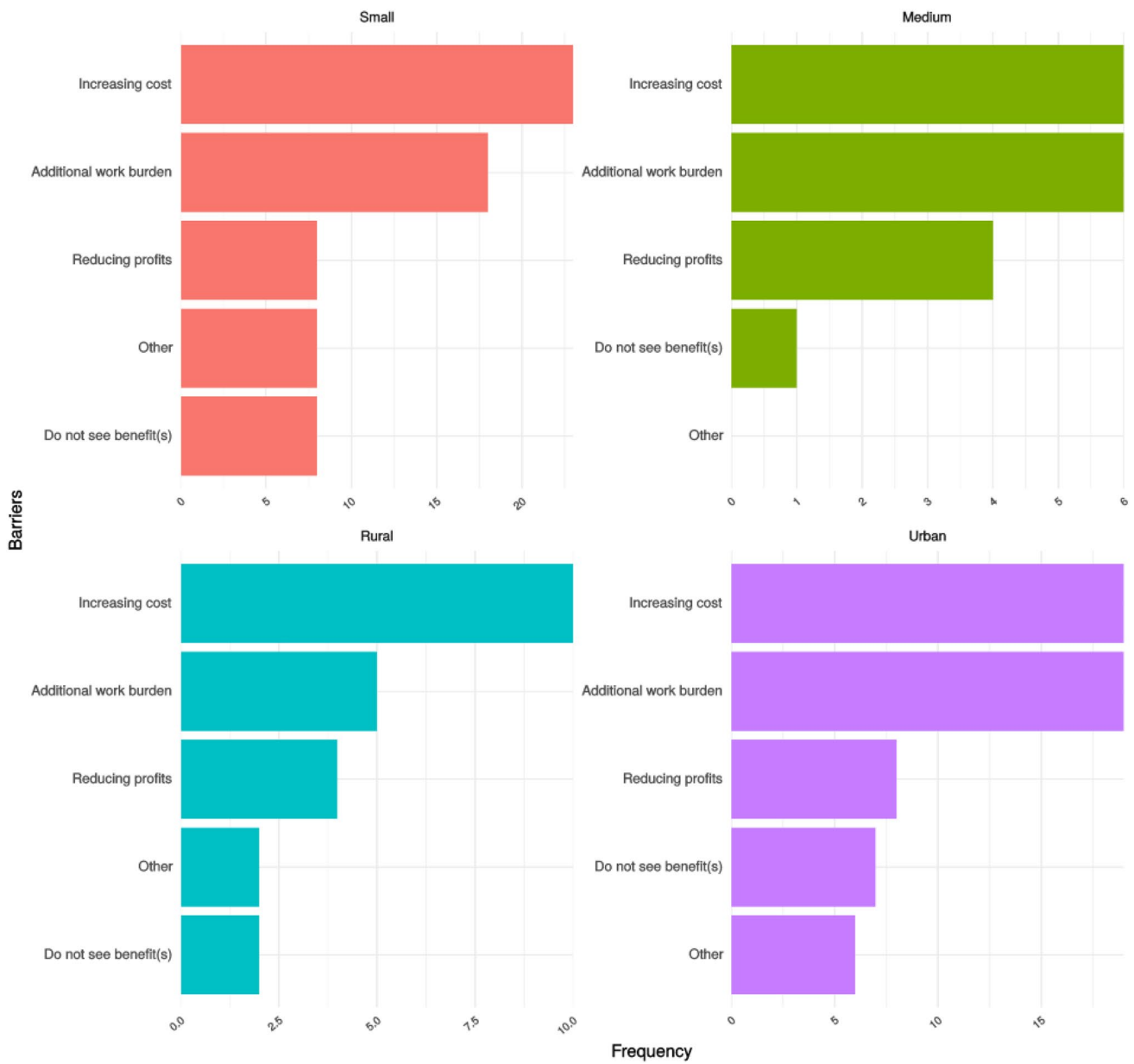
Fig. 3 Challenges for implementing green business practices

Table 4 Types of support desired by SMEs

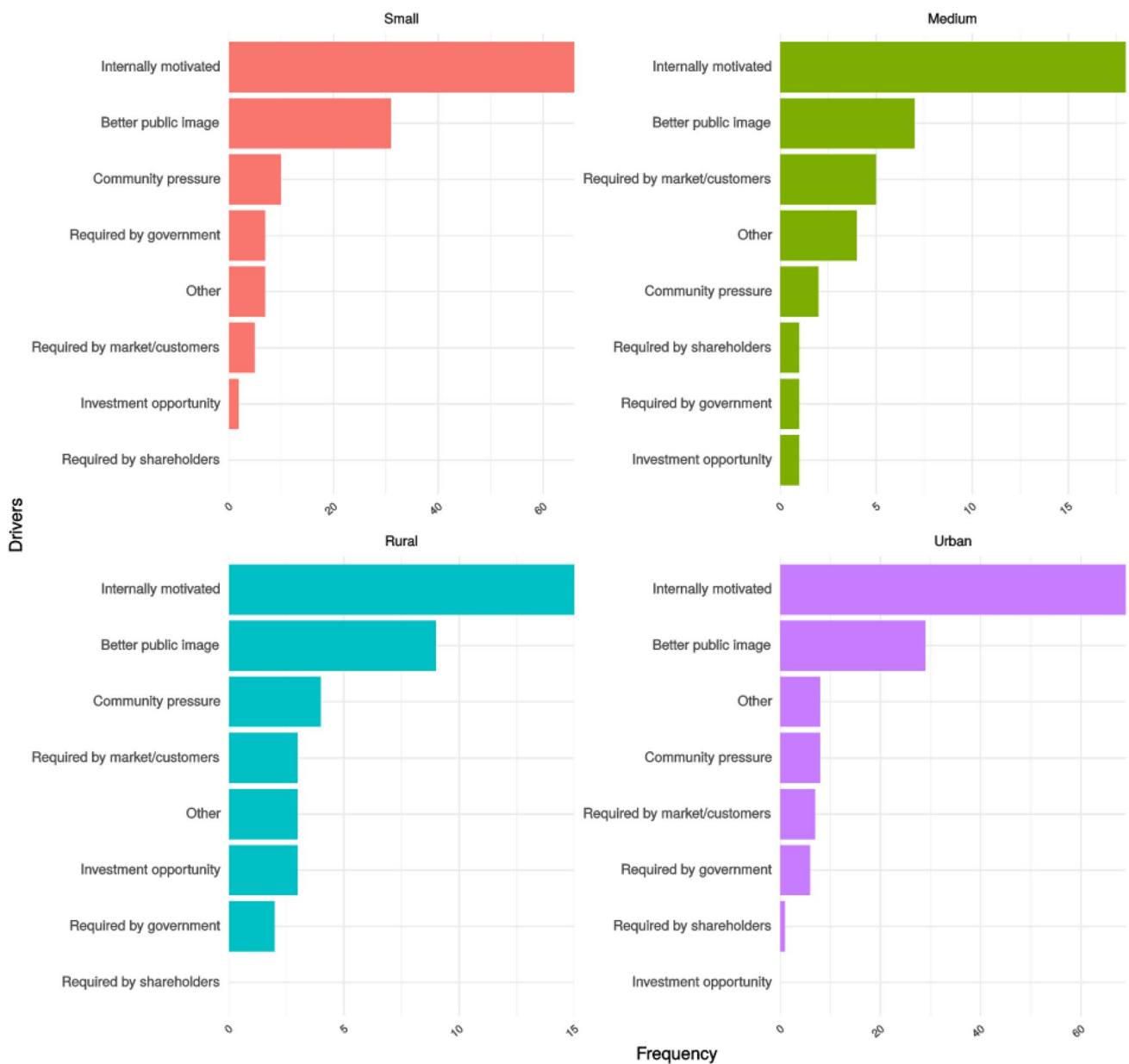| Type of support	Frequency (*n*)	Percentage (%)
Government-funded program(s) to provide financial and/or technical assistance	26	18.6
Governmental tax reduction	22	15.7
Support from the community	14	10.0
Support through seminars and workshops	12	8.6
Support in providing training for employees	9	6.4
Other	9	6.4

Fig. 4 Drivers for implementing green business practices

practices. Results from this analysis show that the smaller SMEs, as well as those located in urban areas, were more knowledgeable with green business practices than larger SMEs, as well as those located in rural areas. Results from a chi-square test indicated that the relation between familiarity with firm size, and location of the firms, is statistically significant. Further, we implemented a similar method to analyze the perceived importance of green business practices. With significance, smaller and more urban SMEs were shown to perceive green practices to be more important than medium and more rural SMEs. Prior research has found that small businesses are less likely to implement green practices,

as they often require more resources, including specific sets of knowledge and expertise, which can be a challenge for the businesses (e.g., Depken and Zeman 2018). However, results from our analysis show that smaller SMEs in the sample are reported to be *more* engaged in green business practices.

Smaller SMEs are perhaps more likely to implement green business practices since they are smaller and inherently more flexible. The nature of stakeholder pressure in small businesses, where customers have closer relationships with business owners, may also play a role in pushing businesses to be greener (Parry 2012). Results from our survey also showed that urban enterprises are more engaged
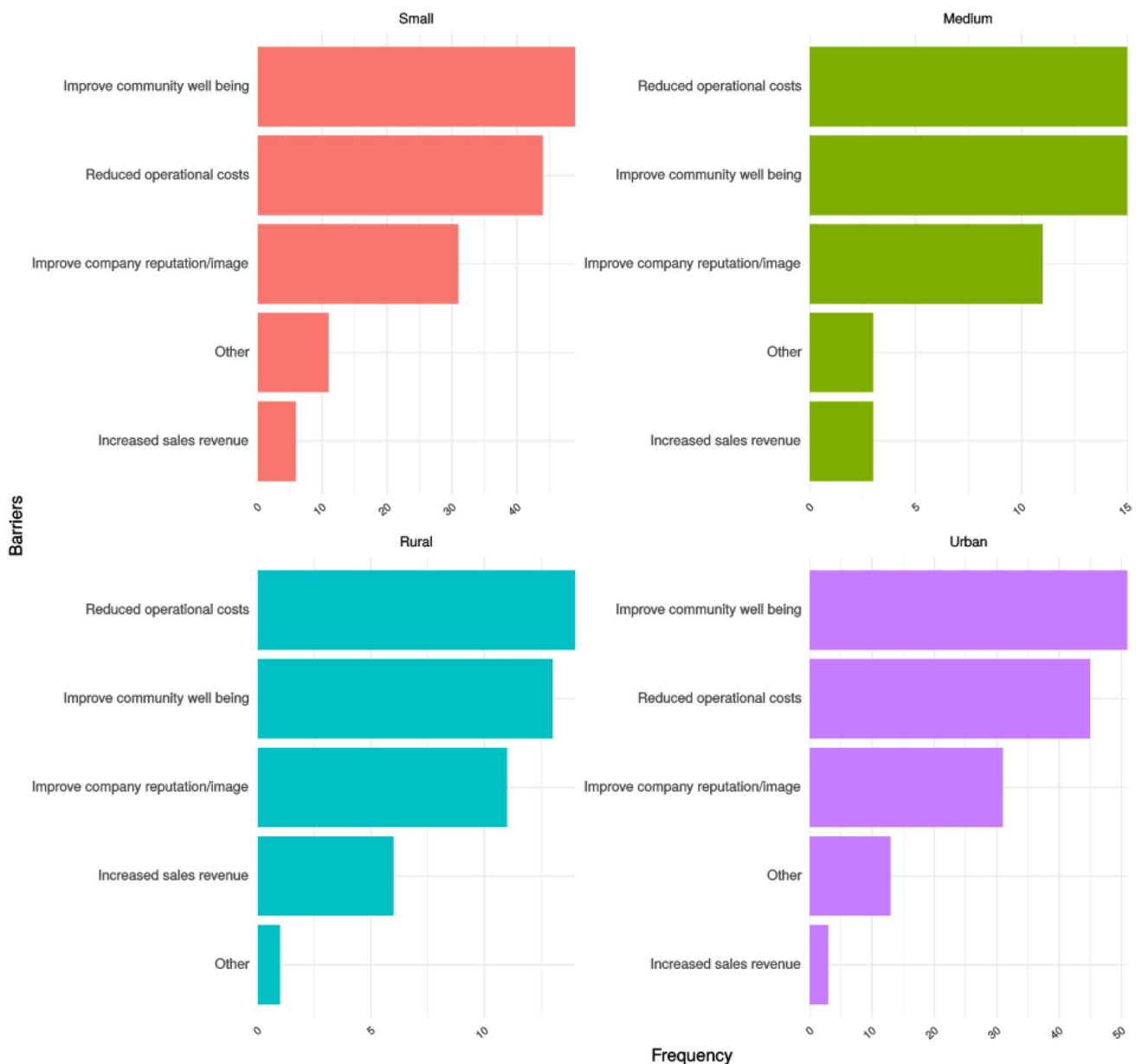
Fig. 5 Benefits for implementing green business practices

in green business practices. This may be due to the fact that urban SMEs typically have greater access to facilities and technology that will enable them to implement green practices, such as more accessible recycling facilities (Desilver 2016).

Respondents who do not implement green business practices were asked about the challenges that they faced. Most respondents cited increasing costs and additional work burden as the two main challenges in implementing such practices. Some of the respondents also held the perception that adopting green business practices will reduce their profits, and, thus, they do not see benefits of adoption. These

knowledge and information-related challenges are mainly present due to the resource constraints that are often found within SMEs. These challenges could potentially be avoided if information on the benefits of implementing green business practices was more widespread. One respondent also pointed out that it might be challenging for government agencies to fund such green initiatives.

In addition to identifying the challenges, respondents were asked to indicate the types of support that might encourage them to implement green business practices. Government-funded programs to provide financial and/or technical assistance was identified to be the primary
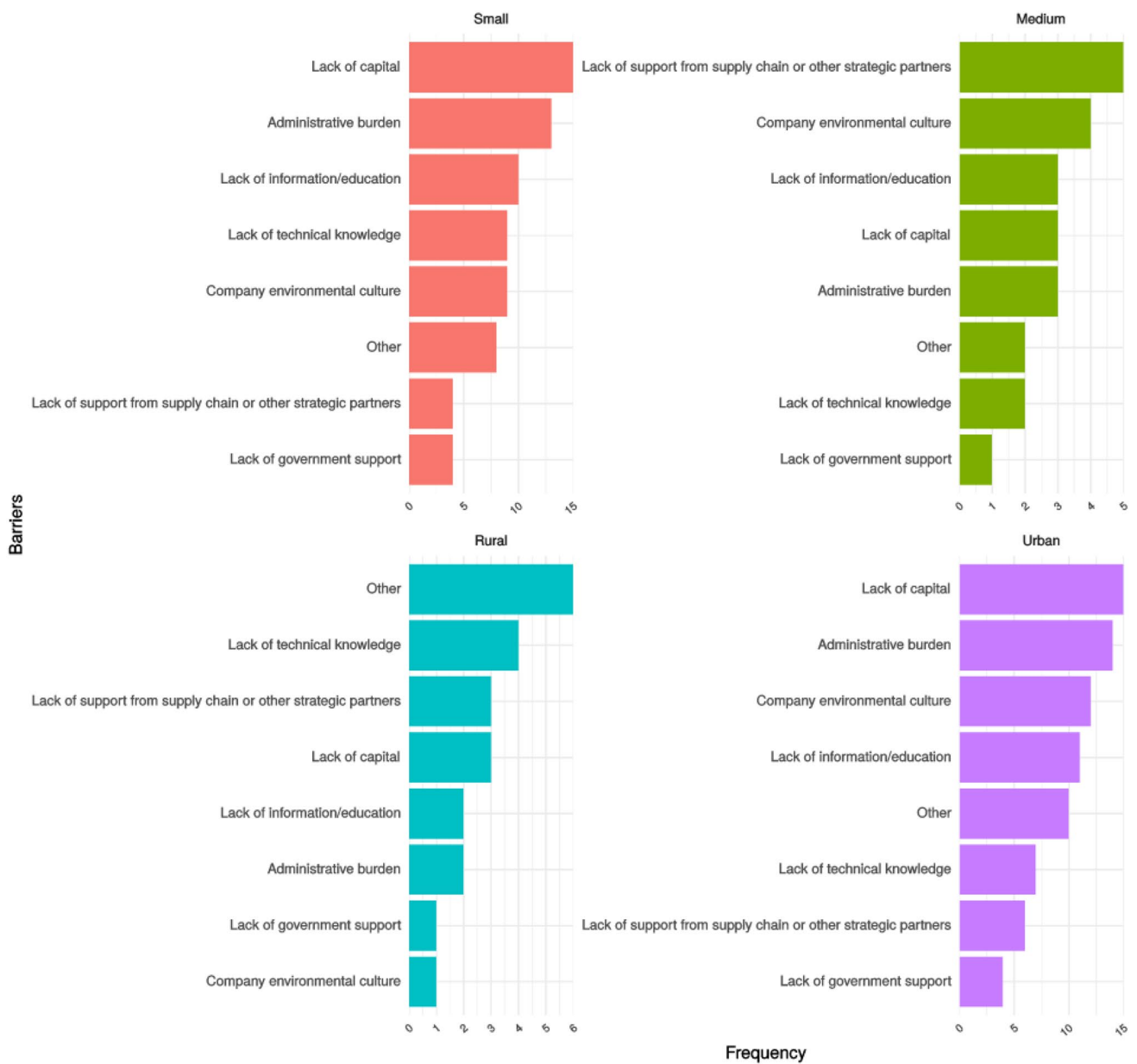
Fig. 6 Barriers for implementing green business practices

Table 5 Types of support to address barriers

Types of support	Frequency (n)	Percentage (%)
Governmental tax reduction	22	15.7
Support from the community	20	14.3
Government-funded program(s) to provide financial and/or technical assistance	20	14.3
Support in providing training for employees	17	12.1
Support through seminars and workshops	14	10.0
Other	6	4.3

support that SMEs needed. Additionally, many respondents also mentioned a governmental tax reduction to encourage them to implement green business practices.

5.2 Drivers and benefits for implementing green business practices

Respondents who do implement green business practices were asked to identify their main drivers for implementing such practices, and the majority cited internal motivation as the key motivating factor. Internal motivation was frequently displayed as a sense of 'it is the right thing to do' or 'environmental responsibility.' Better public image was also frequently observed in our responses, with 27% of respondents noting it as a key driver for implementing green practices. Some respondents also mentioned other drivers, such as being motivated by employees and clients, as well as the availability of the financing options.

Our respondents were also asked to identify the benefits of implementation, and they noted reduced operational costs as the main advantage for such adoption. Survey respondents also identified an improved community well-being as a benefit. Nevertheless, there were some respondents who were uncertain of the benefits. For instance, one claimed that there were complaints from the employees when conducting green practices (e.g., more work for employees to separate waste into multiple bins). This suggests that green practices are still perceived, by some, as burdensome for SMEs in Ohio.

5.3 Barriers and challenges for implementing green business practices

Though a majority of SMEs in Ohio have implemented some form of green business practices, they still face numerous barriers in the process. To illustrate, a lack of capital was identified as the main barrier by a large percentage of our respondents. Though financial incentives via costs savings can drive SMEs to adopt green practices, the high cost of investing in green innovations and a lack of capital may impede SMEs to greening their businesses. Second, administrative burden was indicated as another main barrier, especially for the smaller and more urban SMEs. Respondents also mentioned other barriers, such as cost prohibitions, long payback periods, laborious, and how recycling facilities are unaffordable. These barriers have been previously identified by scholars such as Rao et al. (2009), who suggested that SMEs will express their intention for environmental initiatives, as long as the process is not too expensive and not too daunting.

In order to minimize the barriers faced by SMEs in this realm, various support structures may be needed to encourage further implementation of green business practices.

Most respondents noted that governmental support is the key approach needed to strengthen green practice implementation. Assistance via favorable tax incentives, as well as programs that provide financial and technical assistance, were also noted as key types of support. Finally, support from the community was also seen as an important aspect of a greener business in our sample.

6 Conclusions

The findings from our study bring forth several implications for both SMEs directly, as well as government agencies and policymakers. For SMEs thinking about, or just beginning to develop, green business practices, it may be easier to start with lower-cost strategies, such as recycling materials and reducing waste. These types of strategies are more easily implementable, with benefits that are more readily realizable, and these practices have been found to directly contribute to a company's financial profits (Broccardo and Zicari 2020; Chang and Slaubaugh 2017; Topleva and Prokopov 2020). For more advanced SMEs that have already implemented some level of green business practices, more progressive (and costly) actions, such as adopting renewable energy, may be an alternative path forward. The installation of renewable energy (such as rooftop solar) can offer multiple benefits, such as improvement in environmental quality through emissions reductions, and supporting local contracting jobs (Burke and Stephens 2017; Menegaki 2008; Millstein et al. 2017; Pitt and Michaud 2015). In addition to potentially adopting renewable energy, SMEs may want to further pursue formal green certification. This certification can have several benefits, such as an increase in product demand and popularity from consumers (Tseng et al. 2018), as well as an improved employee engagement with the business.

Beyond the direct implications for SMEs, governmental entities and policymakers attempting to encourage green business practices could provide additional financial assistance, such as tax reductions, or related incentives and subsidies. These policymakers should investigate the extent to which their specific state or locality already has tax exemptions for energy efficiency or renewable energy investments, such as operationalized via the Database of State Incentives for Renewable and Efficiency (DSIRE) in the U.S., and examine the intricacies and effectiveness of these programs to understand both gaps and opportunities for new program implementation.

In addition, the State of Ohio, in particular, could adopt better programs to encourage green business practices, such as seen in other states such as New York and New Jersey, among many others. To illustrate, the State of New York has the New York Green Business Program, which

provides benefits and recognition to businesses that are committed to operating sustainably and protecting natural resources (Alliance for the Chesapeake Bay 2017). Participant firms are able to market themselves as environmental leaders, as well as have access to a network of other sustainability leaders in the region, and also receive technical assistance from the Pollution Prevention Institute. Similarly, the State of New Jersey has developed a series of sustainable business guides and funding to assist SMEs in adopting sustainable business practices and reducing their environmental impact (State of New Jersey Department of Environmental Protection 2019).

Moreover, state governmental agencies can foster the implementation of green business practices by providing additional information and raising awareness about these practices. Such an educational strategy may be useful in diminishing misconceptions that green practices are complex, costly, and overly burdensome. The Department of Energy and Environmental Protection in the State of Connecticut, as an example, provides guidelines for businesses to adopt more sustainable practices, which may be an educational model that a state like Ohio, or other laggard policy states, could implement. Yet another example comes from the Green Chamber of San Diego County, California (now U.S. Green Chamber of Commerce), which educates communities and businesses on sustainability matters (Hardwick 2011). This advocacy program also discusses other potentially challenging barriers, such as a lack of financial support. Additionally, as SMEs often depend on the readily available technology in the market (Chang and Slaubaugh 2017), government can foster participation by making sure that off-the-shelf green options are available. Though green business practices can offer both financial savings and environmental protection, their adoption remains generally uncertain, especially amid the economic disruption felt by the recent global health pandemic (i.e., COVID-19), which may make it more challenging for SMEs to adopt green practices in the shorter term, as they have less capital to invest or put at risk.

It is well known that the broad goals of business and economic development are to improve and enhance prosperity for all, such as through new workforce opportunities and wages, especially at the local level (Bartik 2003). This discussion has increasingly been confounded by growing concerns about environmental sustainability, causing elected officials, state and local practitioners, and many others to think creativity about ways to pursue economic development without further burdening the environment. The implementation of green business practices offers a viable path forward to target and spur solutions that continue to encourage entrepreneurship and small business development with environmental systems and concerns in mind. SMEs, governments, and other relevant stakeholders

can use the results of this study to better comprehend the specificities of green business practice development and related decisions in their respective regions.

6.1 Limitations and questions for future research

Given this study's survey response rate, the usual limitations that apply to lower-response surveys, i.e., limited variation in answers to some survey questions, limited variation in demographics of respondents, and likely under-representation of some groups at the expense of other groups, apply to our results. Thus, readers should treat these results as suggestive rather than fully conclusive. One particular methodological limitation of this study was the concept of selection bias, in which the researchers did not have full control of the recipients of the survey given the distribution techniques of the various Chambers of Commerce of which the survey was sent to. It is also worth noting that the responses were uneven in terms of the distribution of the firms' location and size of the employees, with small and urban SMEs largely dominating the respondents.

Moving forward, a better way to access appropriate SME email addresses, especially in the US context, is needed for future research of this variety. Our study areas could also be expanded, perhaps even to other countries, for a more comprehensive investigation to enhance generalizability beyond just the State of Ohio. Such an approach would help researchers develop a more robust, and perhaps even random, sample that would allow the use of advanced statistical methods of analysis. Firms' characteristics, such as the age of firms, might also need to be specified for a deeper trend analysis. We believe that future research can use our initial investigation and build on our findings, and that the use of a theoretical framework could also help provide grounding or testable concepts in future studies of small business sustainability.

Declarations

Conflict of interest The authors declare that they have no competing interests.

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