Analyzing the Drivers and Barriers to Green Business Practices for Small and Medium Enterprises in Ohio

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Abstract

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The depletion of natural resources as a byproduct of widespread, global economic growth has urged several entrepreneurs to think about the environment when starting or conducting business. However, several entrepreneurs and 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, and are, thus, worth studying in the context of environmental impacts. This research uses survey methods to assess and better comprehend the key drivers and barriers of green business practices by SMEs in the State of Ohio specifically.

Results from this study show that a majority of the respondents reported that they have implemented green practices within their business. The two main drivers for engaging in those practices are internal motivations and the opportunity to obtain a better public image. However, respondents also mentioned a lack of capital as the central barrier to implementing green business practices. These results can be used by government and business actors, especially in Ohio, as a benchmark to consider better strategies for implementing green business techniques. Overall, this work helps to better discern best practices and ways to develop more prosperous SMEs without undermining the quality of the environment.

Dedication

to my mother

Acknowledgments

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Chapter 1: Introduction

The continuous expansion and economic growth across the globe has led to concerns about climate change, depletion of natural resources, air pollution, and diversity loss, among other challenges (McEwen, 2012). Several scholars have indicated that the positive level of economic growth in the global economy cannot be sustained if the current rate of natural resource consumption continues (e.g., Gordon-Harper, 2017). The increasing public concern about the sustainability of economic development, coupled with growing awareness of environmental issues, have caused enhanced 'green business' practices to emerge around the end of the 20th century (Čekanavičius, Bazytė, & Dičmonaitė, 2014). In 2011, the United Nations Environment Program (UNEP) published a seminal green economy 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 adoption of a greener economy, therefore, may be a way to address current environmental challenges and allow more sustainable future economic expansion.

The present process of defining and researching aspects of this green economy began in 2008 with the establishment of the Green Economy Initiative by UNEP (United Nations, 2011). A green economy concerns shifting from the 'business as usual' paradigm to one with regulatory measures and strong financial incentives for innovation, investments, sustainable consumption behaviour, and information-sharing for businesses (Ryszawska, 2015). This greening of the economy has often been an appealing concept to governments and businesses 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’ or ‘sustainability’ (Loiseau et al., 2016). Thus, the green economy can address both environmental and economic issues in a similar kind of way.

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, and two-thirds of employment across the Organization for Economic Co-operation and Development (OECD) countries (OECD, 2018). There are 36 countries who are members of the OECD, including Germany, Japan, United Kingdom, and the United States (U.S.). In the U.S., SMEs account for nearly 66% of all employment (Ashton, Russel, & Futch, 2017). In general, SMEs are enterprises that have less than 500 employees (U.S. Small Business Administration, n.d.). Due to their large volume, SMEs can potentially serve as a central driver of green innovation. Green innovation is typically defined as innovative practices that reduce environmental harm throughout the business supply chain (Aboelmaged & Hashem, 2019). Though small businesses’ respective environmental footprint may be lower than their large firm counterparts, their collective or comprehensive impacts can actually exceed large businesses. As a result, reducing the environmental impacts of SMEs by going beyond environmental compliances may be a path forward toward greening the larger economy (OECD, 2018). In addition, greening a business may also bring benefits for SMEs, both internally (e.g., improved employee ethical behavior) and externally (e.g., positive public image) (Hillary, 2004).

Greening the economy has been a research focus in response to the public demand for more environmentally conscious businesses. It is reported that there has been a

considerable growth of green business ideology and practice in the U.S. (Depken & Zeman, 2018). However, most studies have predominantly examined large enterprises, and there are relatively fewer studies specifically focused on the environmental practices of SMEs (Ashton, Russel, & Futch, 2017). A number of papers have found a strong relationship between environmentally friendly business practices and firm performance (e.g., Ndubisi & Nair, 2009); for example, energy efficiency can be good for the environment, but, on the margin, also saves money as it reduces the need for energy use by the firm. That noted, there has still been relatively little work done on SMEs and their role in the environmental movement (Allen & Malin, 2008). Thus, it is necessary to study and better understand how SMEs play a role in adopting (or lack thereof) environmentally friendly business practices.

Research Questions

This study explores whether SMEs in the State of Ohio (U.S.) incorporate green business practices into their daily operations, the drivers that encourage them to adopt such practices, and potential barriers that hinder their use. For the purpose of this study, 'green business practices' are defined as efforts that a company makes to decrease negative impacts on local and global environments, the economy, and society. The results of this study aim to provide a better understanding of green business practice implementation for other SMEs, both in and beyond Ohio.

Only a few prior studies have investigated how SMEs incorporate green business practices into their operations, including what kind of activities they adopt, as well as the drivers and barriers of implementing those practices. The objective of this study is to explore if green business practices are incorporated into SMEs in Ohio, and what factors

enable and impede them to integrate green business activities. The three specific research questions being investigated are:

1. What types of green business practices do SMEs utilize in Ohio?
2. What are the drivers of SMEs engaging in green business practices in Ohio?
3. What are the barriers of SMEs engaging in green business practices in Ohio?

Study Area

The State of Ohio is divided into five general districts: the Northwest District (24 counties), the Northeast District (15 counties), the Southwest District (16 counties), the Central District (10 counties), and the Southeast District (23 counties). The state has a diverse geography, despite its 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).

Though some have claimed that Ohio's economy is falling behind other state counterparts, the growth of sustainable entrepreneurs in the state is actually promising (Seryak, 2008). Ohio is currently ranked 6th in the country for the percentage of green jobs, and, as many states are beginning to pursue a green jobs strategy, it becomes imperative for each to pursue an optimal strategy that is specifically tailored to their unique resources (Sims, 2018).

Chapter 2: Literature Review

This chapter begins with a description of the search process to acquire literature relevant to the study. Next, an introduction to SMEs and their role in the economy are described. This is followed by narratives about the green economy and green business. The discussion then continues to the shift to green business, including the benefits and the barriers in implementing green business practices. Previous studies on green practices among SMEs and the research gap are explained at the end of this chapter.

Search Process

The researcher used Ohio University Alden Library's ArticlesPlus to search peer-reviewed articles that would provide relevant information for the literature review. ArticlesPlus is a specialized research tool for searching articles, newspapers, books, and other media. The phrases that were used as keywords in this search process were 'small and medium enterprises,' 'green economy,' 'green business,' 'sustainable business,' 'sustainable entrepreneurship,' and 'green entrepreneurship.' The researcher also used the Google and the Google Scholar platforms to add important information from relevant websites and to supplement articles found on the ArticlesPlus. Peer-reviewed articles, conference proceedings papers, and articles from relevant websites in the years 2000–2019 were utilized.

The Importance of SMEs

The definition of SMEs varies by country and by industry. According to the OECD glossary, SMEs are "non-subsidiary, independent firms" that employ a small number of employees (OECD, 2005, para. 1). They explain that micro-enterprises generally have a maximum of 5–10 workers, while small firms have up to 50 employees.

In the U.S., OECD points out that a firm with fewer than 500 employees is considered an SME. In addition to the number of employees, methods used to classify small companies include annual sales, profits, the value of assets, or any combination of these (OECD, 2005).

SMEs play an important role in all OECD economies, as they make up over 95% of enterprises, and account for 60–70% of jobs in OECD countries (OECD, 2018). Moreover, globally, SMEs account for 70% of industrial pollution (Hillary, 2004). In the European Union (EU), 64% of industrial pollution is caused by SMEs, but very few of them proactively engage in actions to reduce their environmental impact (OECD, 2018). SMEs are potentially important as key drivers of green innovation. Green innovation typically refers to the modified method that results in a reduction of environmental risks when compared to relevant alternatives, which adds business value through promoting sustainability (Aboelmaged & Hashem, 2019; Gupta & Barua, 2018). The International Chamber of Commerce (2012) emphasized that SMEs can play a critical role in green growth and environmental responsibility. Despite the large number of SMEs in most nations, their importance as key players in green innovation is sometimes overlooked (Allen & Malin, 2008).

Researchers, policymakers, and entrepreneurs generally agree that the role of entrepreneurship convincingly contributes to economic growth and development (Terjesen, 2016). Entrepreneurs often have the capability to adopt innovative practices since they are usually smaller-sized organizations that are more flexible compared to larger organizations (Ndubisi & Nair, 2009). Today, entrepreneurs have started to incorporate and consolidate their environmental concerns and create eco-friendly

businesses (Allen & 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 & Ozanne, 2005). Opportunities for an action from the entrepreneurial world that can lead to environmental sustainability are also supported by the growing number of consumers who are willing to pay extra for eco-friendly products (McEwen, 2012).

Green Business Practices

A green economy is defined as an economy that minimizes negative environmental impacts while improving the well-being of society (Carfi & Schilirò, 2012). In a green economy, jobs and income development are determined by public and private investments that diminish carbon emissions, foster the utilization of efficient energy, and protect the ecosystem (Gordon-Harper, 2017). A green economy is perceived as a way to achieve green growth, a development that focuses on ensuring the continuity of the environmental services while, at the same time, promoting economic growth (Loiseau et al., 2016). Though economic growth has produced many benefits, it has also resulted in the depletion of natural resources and degradation of ecosystems (Everett et al., 2010). In order to achieve greener industrial growth, investment and innovation that reinforces environmental sustainability and encourages new economic opportunities could be catalysed (Loiseau et al., 2016). Destroyed environments, coupled with the rise in human population, have driven the need for more sustainable business models (Steer, 2012).

Green 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, Bazytė, & Dičmonaitė, 2014). The Business Dictionary (2020, para. 1) defines a green business as "a business functioning in a capacity where no negative impact is made on the local or global environment, the community, or the economy." Green business can also be more narrowly defined as an enterprise that has green output as a product (Brown & Ratledge, 2011). For the purpose of this study, green business practices are defined 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 paper of green entrepreneurs, described that the term 'green' is used to define an action towards 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 emerged with a promise to provide efficient and safe operations while being environmentally and socially responsible (Ndubisi & Nair, 2009). Among the terms available to describe 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 businesses that desire to minimize or 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).

Green business shares the same foundational beliefs as the circular economic system in its attempts to minimize its environmental impact. The concept of a circular economic system refers to a process that re-utilizes waste or any byproduct materials, 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 (Rizos et al., 2016). There are two approaches in characterizing green business: the process approach and the output approach. The process approach focuses on the technology used for production in any sector of the economy, or the sectors where firms are active. In contrast, the output approach pays attention to the parts of the economy producing specific types of output (Walley & Taylor, 2002).

There are various practices that can be applied when a business wants to implement green behaviors. For instance, the U.S. Small Business Administration (SBA) provides recommendations on several areas for businesses to explore including becoming energy efficient, improving waste management, and utilizing renewable energy (Chang & Slaubaugh, 2017). A study by Ashton, Russell, and Futch (2017) concerning the adoption of green business practices among small manufacturing enterprises in the Greater Chicago area 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) 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 they 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. In the next section, what help or prevent businesses to adopt green practices are discussed.

Drivers and Barriers to Green Business Practices

While it is clear that green practices are desired by various business sectors, being mindful of environmental concerns can sometimes help businesses find market opportunities, and discover potential areas for cost reduction in daily operations (Rao et al., 2009). Hillary (2004), in her study regarding environmental management systems, classified the 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 the external interaction. The internal benefits are often divided into three different categories: organizational benefits (e.g., improved working conditions and safety), financial benefits (e.g., cost savings from materials efficiencies), and people benefits (e.g., improved employee ethical behavior). Similarly, external benefits are also categorized into three classifications: commercial benefits (e.g., gaining competitive marketing advantage), environmental benefits (e.g., reduced pollution), and communications benefits (e.g., creating a positive public image).

Čekanavičius, Bazytė, & Dičmonaitė (2014) found that while shifting to green practices usually required certain additional costs, it can also bring tangible benefits such as increased profit. The authors indicated that revenue increases could be achieved from

product differentiation and brand image, while cost savings could be generated by practices such as waste incineration, cutting down on paper use, and turning off electronic appliances when they are not in use. Despite these potential advantages offered, SMEs are not always aware of the benefits that are associated with environmentally-friendly initiatives (Rao et al., 2009).

Moreover, the personal value of a business owner, and their perceived intimacy and responsibility for employees and communities, may affect the level of social responsibility (Vives, 2006). A study about the adoption of green energy by German SMEs showed that entrepreneurs' personalities reflected by their perceived responsibility and perceived relative advantages for the environment were among the adoption factors (Rahbauer et al., 2016). In his comparative 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. The most consistent reasons given for engaging in those practices were ethics and religious values (Vives, 2006), and that ethical standards showed to be the main motivation that drives to the actual practice (Parry, 2012). The decision to 'go green' is also strongly influenced by attitudes of importance and convenience, and these determinations should not be perceived as inconvenient changes or additional costs (Čekanavičius, Bazytė, & Dičmonaitė, 2014).

A qualitative study by Bansal and Roth (2000) examining the motives of why companies go green classified the drivers of corporate ecological responsibility into four main areas: legislation, stakeholder pressure, economic opportunity, and ethical motives. Parry (2012) included perceived economic advantage 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 reduce costs and seek new business opportunities, rather than promoting public image and reputation (Chang & Slaubaugh, 2017). Research about 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, better relationships with the community and the public sector, and the desire to improve relations with clients and suppliers. Table 1 concisely summarizes several research papers by various authors revealing the motivations for implementing green practices.

Green business practices can help decrease the negative environmental impacts from a firm's activity. Regardless of their size and industry sector(s), SMEs face different kinds of barriers in incorporating green practices into their operations. 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. In fact, this process does not have to be costly or complicated, however, SMEs are often unaware that there are many financially attractive opportunities for environmental improvement, such as tax breaks and subsidies from governmental entities (OECD, 2018). Often, SMEs are busy increasing their productivity and focusing mainly on their product outcomes (Rao et al., 2009). A lack of necessary skills and expertise commonly prevents SMEs from embracing new opportunities even when they are aware of the potential of improving competitiveness (OECD, 2018).

Table 1

Drivers for Implementing Green Practices in Prior Studies

Drivers	**Author**						
	Bansal & Roth, 2000	Vives, 2006	Parry, 2012	Čekanavičius et al., 2014	Rahbauer et al., 2016	Ashton, Russel, Futch, 2017	Depken & Zeman, 2018
Required by market/customers				√	√	√	√
Required by government		√	√	√		√	
Investment opportunity	√		√	√	√		
Internally motivated	√	√	√	√	√	√	√
Community pressure		√					√
Better public image	√		√		√		

Complexities in implementing such green business practices were examined in the Gupta and Barua (2018) study. These authors discussed overcoming barriers to green innovation, and classified the impediments into seven clusters: organizational or managerial, technological, financial and economic, external partnership and stakeholder engagement, government support, market and customers, and 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 intend to avoid unexpected risk from innovation. Additionally, they also 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 companies that can support technological advancement through their research and development activities, SMEs

often depend on the readily available technology in the market (Chang & 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 perceived challenge of implementing green innovation is understandable, given the uncertainty on the payback period. Gupta and Barua (2018) also mentioned that the lack of support from the external stakeholders such as governments, business partners throughout the supply chain, and customers also act as deterrents for SMEs to further pursue green practices. The results of their study proposed effective policies and a framework by government and policy makers, such as environmental tax benefits and subsidized loans, to slash environmental degradation as the highest-priority solution to overcome the barriers.

The Research Gap of Green Business Practices and SMEs

A number of prior studies that focused on the implementation of green business practices have showed mixed results concerning strategies, enablers, and barriers. An example of this is the study carried out by Ashton, Russell, and Futch (2017), in which they examined the current practices and motivations of SMEs in the Midwestern U.S. to incorporate green business practices. They conducted a survey on 59 SMEs in the tool and die manufacturing industry, which was strategically chosen as it is widely condemned as the cause of many environmental problems, such as water pollution. The study found that most of the SMEs are internally motivated to adopt green

practices in order to improve their competitiveness in the market. They also found that there is a significant difference between the types of green practices implemented with the size and sales of the company, and also between the number of green practices implemented with the age, size, and sales of firms. However, these results cannot be widely generalized because they are specific only for the manufacturing industry in a specific region (Ashton, Russell, & Futch, 2017).

In a similar study, Depken and Zeman (2018) also assessed the current practices, motivations, benefits, and needs of sustainable business practices, but their focus was on small businesses in Iowa. The study found that profitability, the moral obligations to future generations, and environmental impacts are what motivated SMEs the most. This study has more variation of the industries in their sample than the study by Ashton, Russell, and Futch (2017). However, the sample size is very low (N=31), which is a major limitation of the research.

The implementation of sustainable business practices was also studied by Chang and Slaubaugh (2017), which involved 172 business professionals across industries in the U.S. They found that only 34% of respondents had comprehensive sustainable management plans, and that the most popular sustainable business practices were those which directly benefit the firms, such as conserving water, employing energy-efficient technology, and recycling materials. In addition, they found that the size of the business determines the likelihood of implementing sustainable business practices; large firms are more engaged in sustainable business practices than the smaller firms. This study produced recommendations for business firms that would like to start deploying

sustainable strategies, which is to start by engaging the easier practices so the benefits are more readily realizable, and so implementation would be more manageable.

The limitations from prior studies can be addressed by identifying the types of green business practices, as well as the drivers and barriers on the implementation of the practices. A comparison across industries and a larger sample size is also required to fill the gap of existing research. This specific study, thus, aims to fill this research gap, especially as there has not been any research on the implementation of green business practices, including the drivers and barriers to their implementation, for SMEs in the State of Ohio.

Chapter 3: Methods

This chapter is divided into four sections: research design, sampling design, data collection, and data analysis. First, the research design section provides a general overview on how this research was conducted. Second, the sample design presents a discussion on how the sample was generated from the population. Third, the data collection provides a method on how the sampled respondents participated in this research. Finally, the data analysis section explains how the acquired data was analyzed.

Research Design

The research design functions as the general plan to study specific research questions. Here, the researcher investigated whether SMEs in Ohio implement green business practices into their daily operations, the drivers that encourage them to adopt such practices, and the barriers that impede them. To accomplish this, the researcher used a quasi-experimental design, as this method is frequently used when it is impractical to conduct a randomized controlled trials (Harris et al., 2006). This research measured data only at a single point in time, where data was collected from October 29 to December 12 of 2019.

Sample Design

A non-probability sample design was utilized in this research since there was no guarantee that every sampling unit had an equal chance of being selected into the sample (Frankfor-Nachmias & Nachmias, 2008). The researcher used convenience sampling as a way to obtain the sampling units to represent the population. The population for this research was every SME in Ohio which employs 1–500 workers, while the sample were those businesses with email addresses. Those email addresses were derived from the

publicly available data in the Chamber of Commerce websites and the LexisNexis database in July of 2019. LexisNexis is a digital research tool that provides a convenient and cost-efficient method to access to extensive business records and other information (Michaud & Jolley, 2017). In particular, the researcher utilized the 'Company Dossier' function in LexisNexis to search for companies, and gathered data such as address, employee count, and sales/revenue figures. The researcher sorted by employee count, and included businesses with 1–500 employees to meet the definitional standards of SMEs. The Company Dossier mines data from numerous company and financial sources for more than 240,000,000 public and private companies worldwide (LexisNexis, 2019). Company Dossier utilizes a specific list of company and financial resources that is profiled in one of the sources listed below:

- LexisNexis Corporate Affiliations
- Worldscope-International Profiles
- Hoppenstedt Firmenprofile
- Creditreform German Companies
- Reuters Knowledge Direct
- Creditreform Bilanzdatenbank-Osterreich
- Dutch Company Information
- Market Guide Company Profiles
- Vickers Securities Report
- Morningstar US Institutional Database
- Morningstar Institutional Database
- SGA Executive Tracker Companies
- Standard & Poor's Descriptions Plus News
- FBR Asian Company Profiles
- Creditreform Bilanzdatenbank-Deutschland
- Creditreform Austrian Companies
- ICC Financial Analysis Reports
- D&B WorldBase
- Global Duns Market Identifiers

Data Collection

A survey instrument was designed to collect data regarding the implementation of green practices by SMEs in Ohio. To make the survey 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 to what extent their companies engaged in those practices. To construct the list of commonly implemented green practices, most of the green practices discussed in previous studies noted in the literature review were included.

The survey consisted of 12 questions (see Appendix A: Questionnaire) and is 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 and to further implement green business practices in the future; 4) barriers in implementing green business practices; and 5) types of support needed to implement green business practices. To minimize bias that may be caused by different interpretations of 'green business practices,' the researcher provided the definition of green business practices that is used for this study in the questionnaire.

The survey was sent out directly to 1,672 SMEs' email address, and to the 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 businesses 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 researcher, some Chamber of Commerce sent out the survey to their members on behalf of the researcher.

The SMEs were sent an online questionnaire by Qualtrics to examine whether or not they incorporate green practices within their businesses, and what are the drivers and barriers of implementing the green practices. Since the researcher only sent the survey to businesses who have an email address listed in the LexisNexis data, the unit of analysis does not have the same chance of being included in the sample, and, thus, this sampling method has a potential for biased estimates (Ruhil, 2019).

Data Analysis

IBM's 'Statistical Package for the Social Sciences' (SPSS) software was used to analyze the data and create frequency tables, cross tabulations, and chi-squared tests in order to assess patterns seen in the survey responses. The results distribution was disaggregated according to company size and geographical location. The researcher divided company size into two groups: small (1–50 employees) and medium (51–500 employees) and into two different locations, rural and urban. All counties that are not designed as parts of Metropolitan Areas (MAs) by the Office of Management and Budget (OMB) are considered rural, as shown in Figure 1 (figure developed by author, using U.S. Census Bureau data).

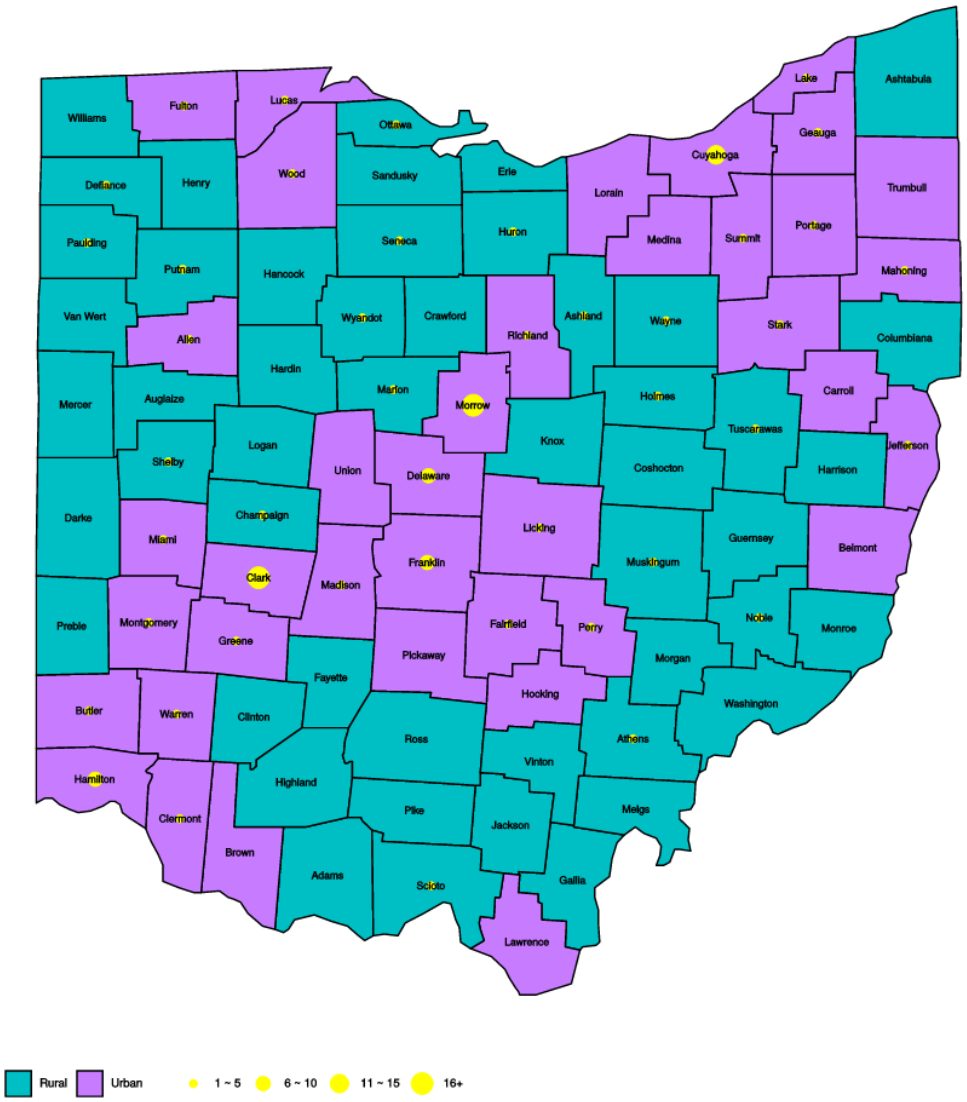

Figure 1. Map of the Study Area

Chapter 4: Results

This chapter catalogs the results of the types of green business practices that SMEs are implementing in Ohio, as well as the drivers and barriers in engaging those practices. The chapter first displays the results regarding the background of the respondents, and is then followed by data analysis aiming to uncover the frequency and relations among the key variables.

Background of Respondents

In October through December of 2019, an online survey was sent directly to 1,672 businesses email address via LexisNexis, and to an additional 229 through Chambers of Commerce in the State of Ohio. After the close of the survey, 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 the cleaning involved eliminating the respondents that had the same IP address and answers. There were also some unfinished responses, and responses without consent. In total, the response rate was 5.4% (91 responses out of 1,672 emails). Given this response rate, the usual limits 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 the results of this research. Thus, readers should treat the results as suggestive rather than conclusive. The demographic data of respondents are summarized in Table 2.

Table 2

Demographics of SME Respondents

Demographics	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
Medium (51–500 employees)	20
Total	**100**
Region	
Urban	77.1
Rural	22.9
Total	**100**

The survey first asked about the SMEs' familiarity with green business practices, and their perceived importance of 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. Very few firms viewed green practices as not at all important.

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**

Green Business Practices

In the survey, over 65% of the respondents reported that they have implemented green practices within their business. Figure 2 shows the types of green practices that the sample of SMEs implemented, as well as the frequency of each type. This figure also shows the differences between small and medium enterprises, as well as between enterprises that are located in rural and urban areas. Though each group has different preferences in implementing a green practice, ‘recycling materials and reducing waste’ is shown as the most common practice, and ‘pursuing green certification’ as the least utilized practice for every group.

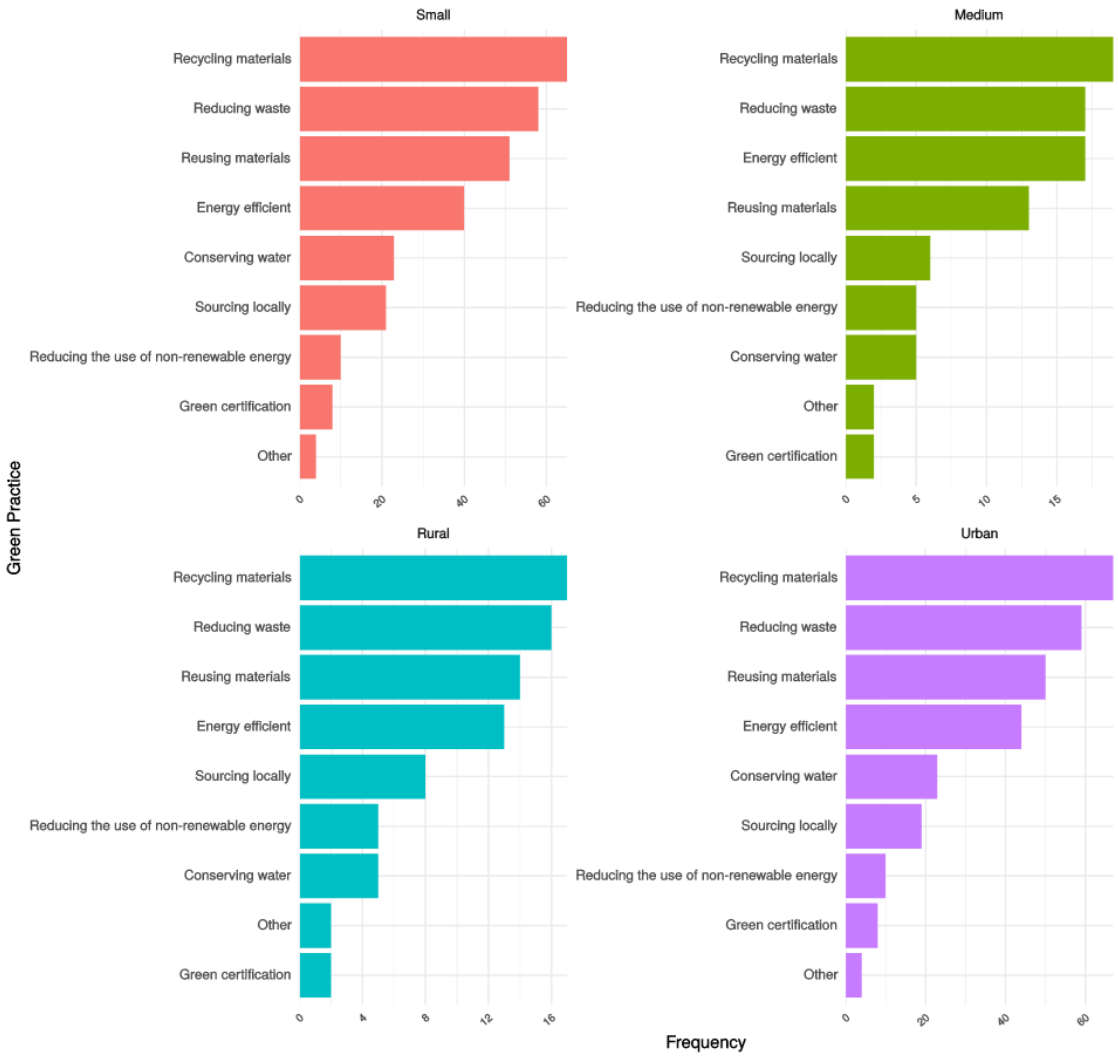

Figure 2. Green Practices Implemented by Surveyed SMEs

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. Figure 3 shows the distribution of the challenges among each group. It is clear that firms are concerned about the potential for increasing costs due to green business practice implementation.

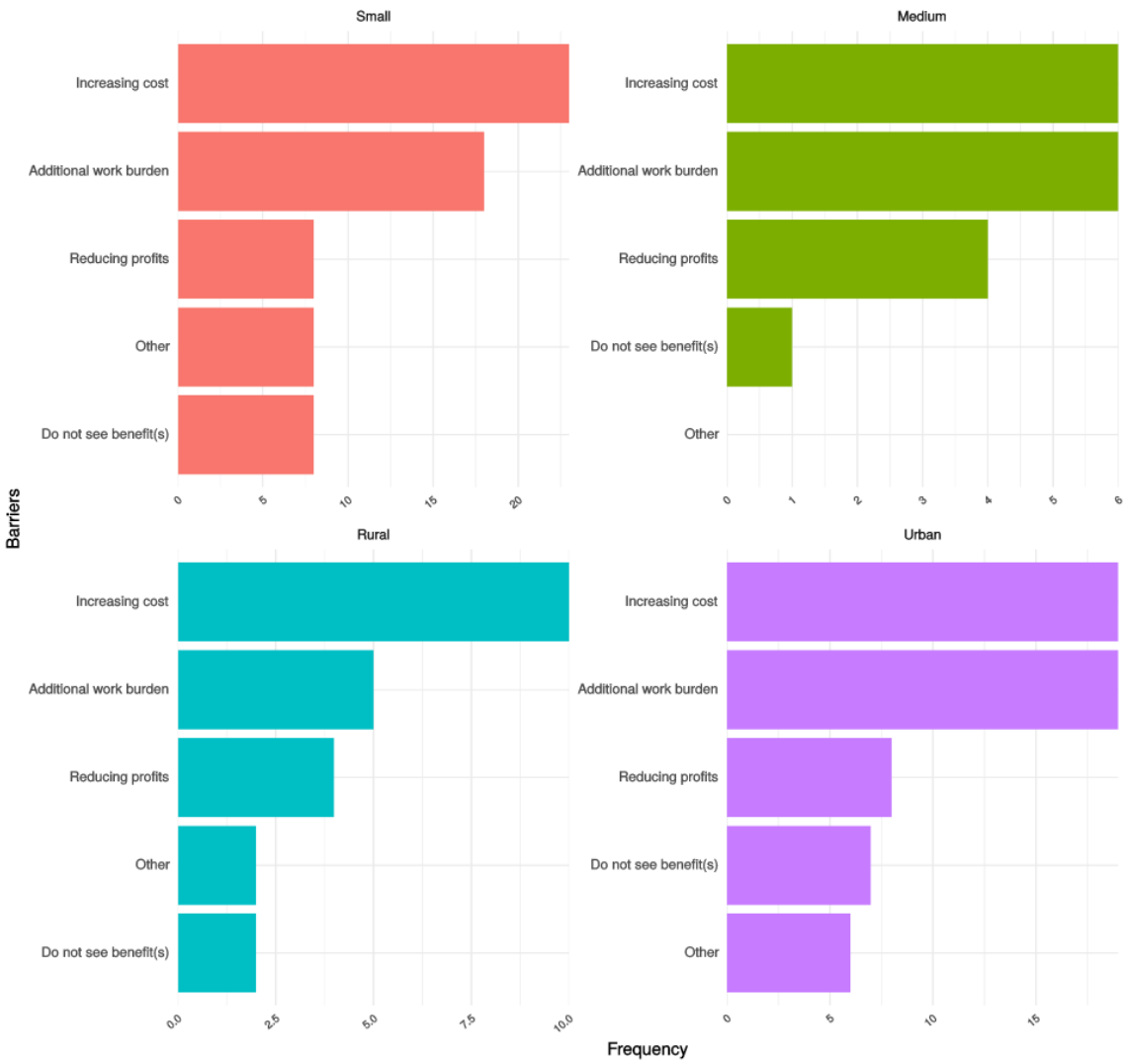

Figure 3. Challenges for Implementing Green Practices by Surveyed SMEs

After identifying the challenges, respondents were then asked to suggest the types of support that might encourage them to implement green practices. Table 4 shows the frequency of each type of support. These data are congruent with the results from Figure 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.

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 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

Drivers of Implementing Green Practices

In the literature review (see Chapter 2), Table 1 shows that a wide variety of factors drive SMEs to implement green practices within their business. However, in this survey, 60% of respondents reported that 'internal motivation' was the main driver for implementing green business practices, followed by 'better public image.' Internal motivation refers to the personal value of the business owner (Vives, 2006) and their ethical principles (Parry, 2012). In their paper, Ashton, Russell, and Futch (2017, p. 2,136) described 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 3 shows the distribution of the drivers on each groups.

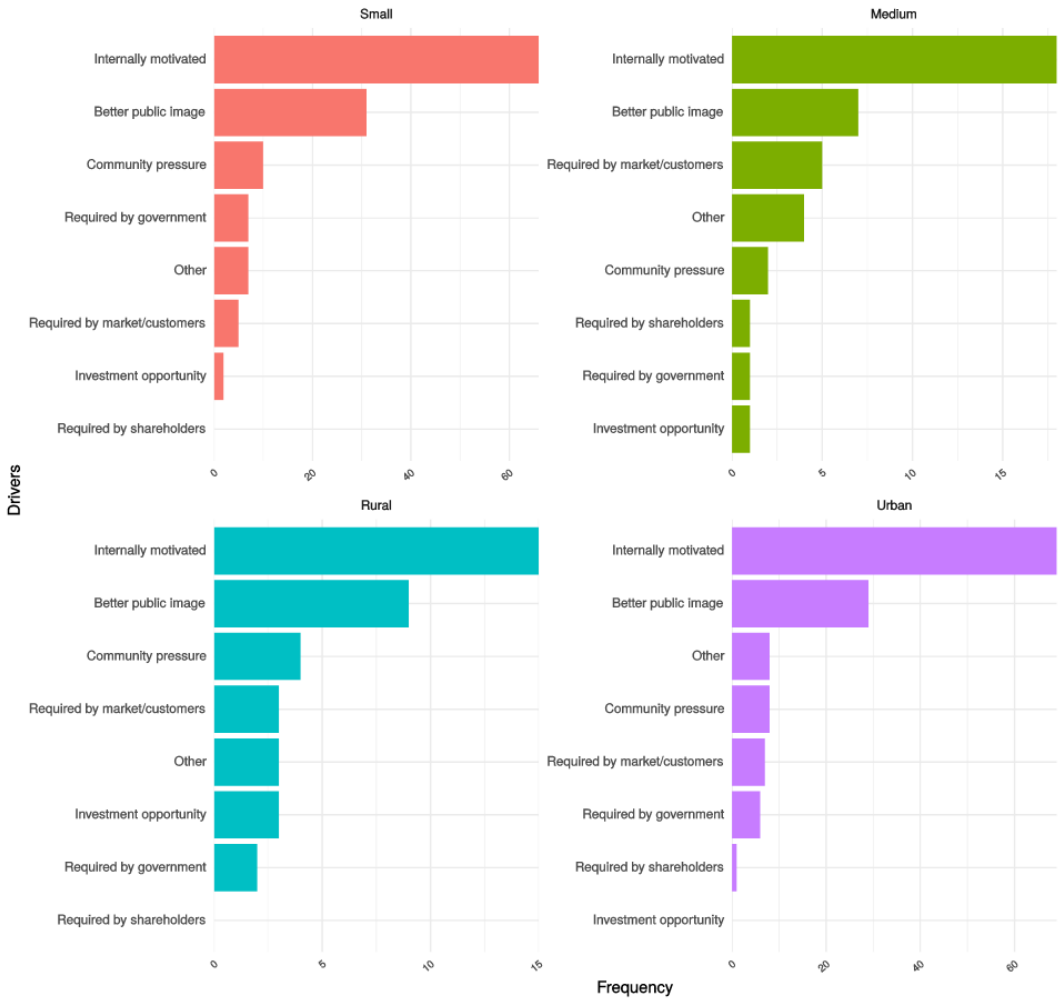

Figure 4. Drivers for Implementing Green Practices by Surveyed SMEs

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

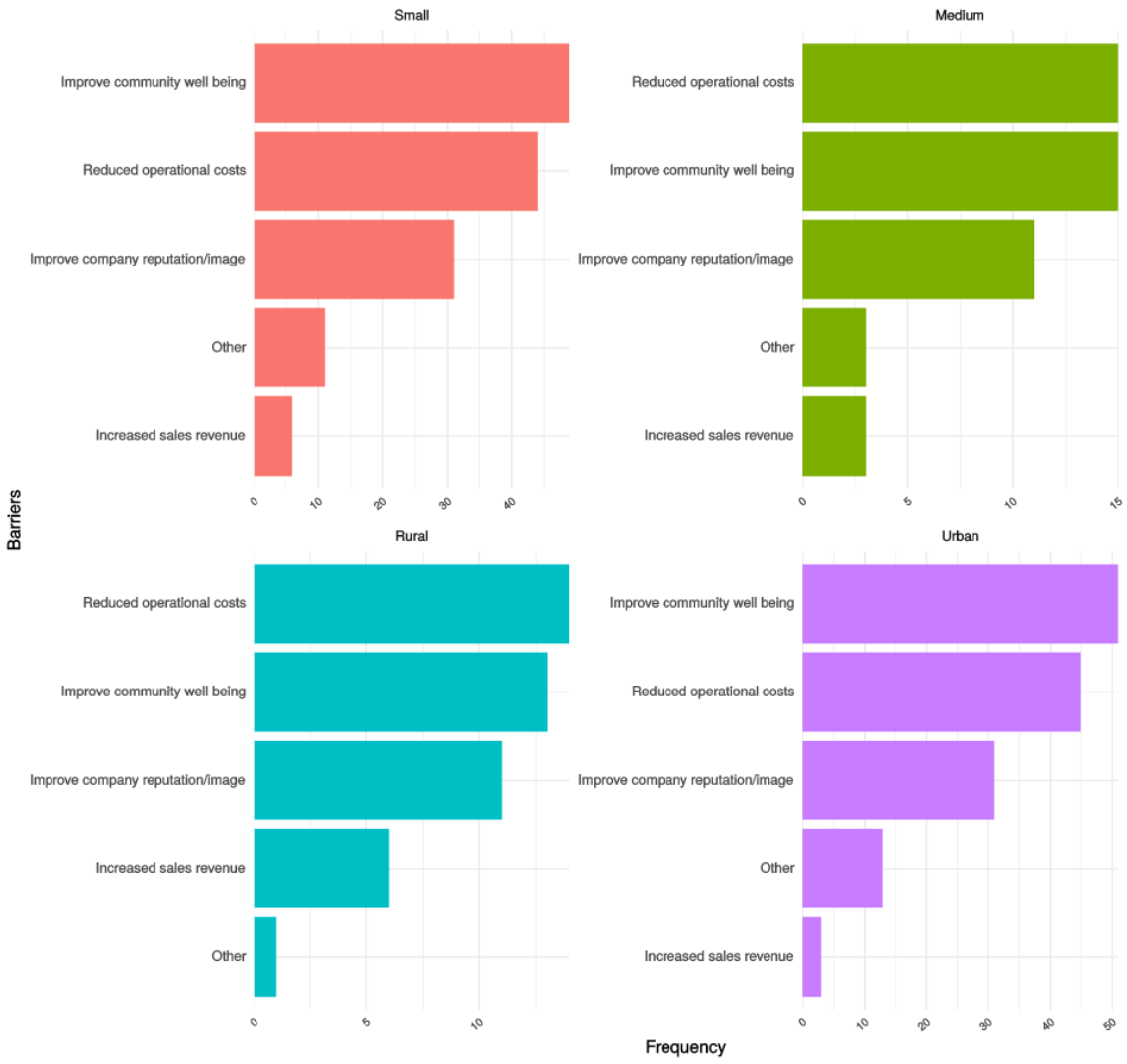

Figure 5. Benefits for Implementing Green Practices by Surveyed SMEs

Barriers to Implementing Green 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 the four different groups. Lack of capital seemed to be a major barrier for the small SMEs, as well as the SMEs located in more urban areas.

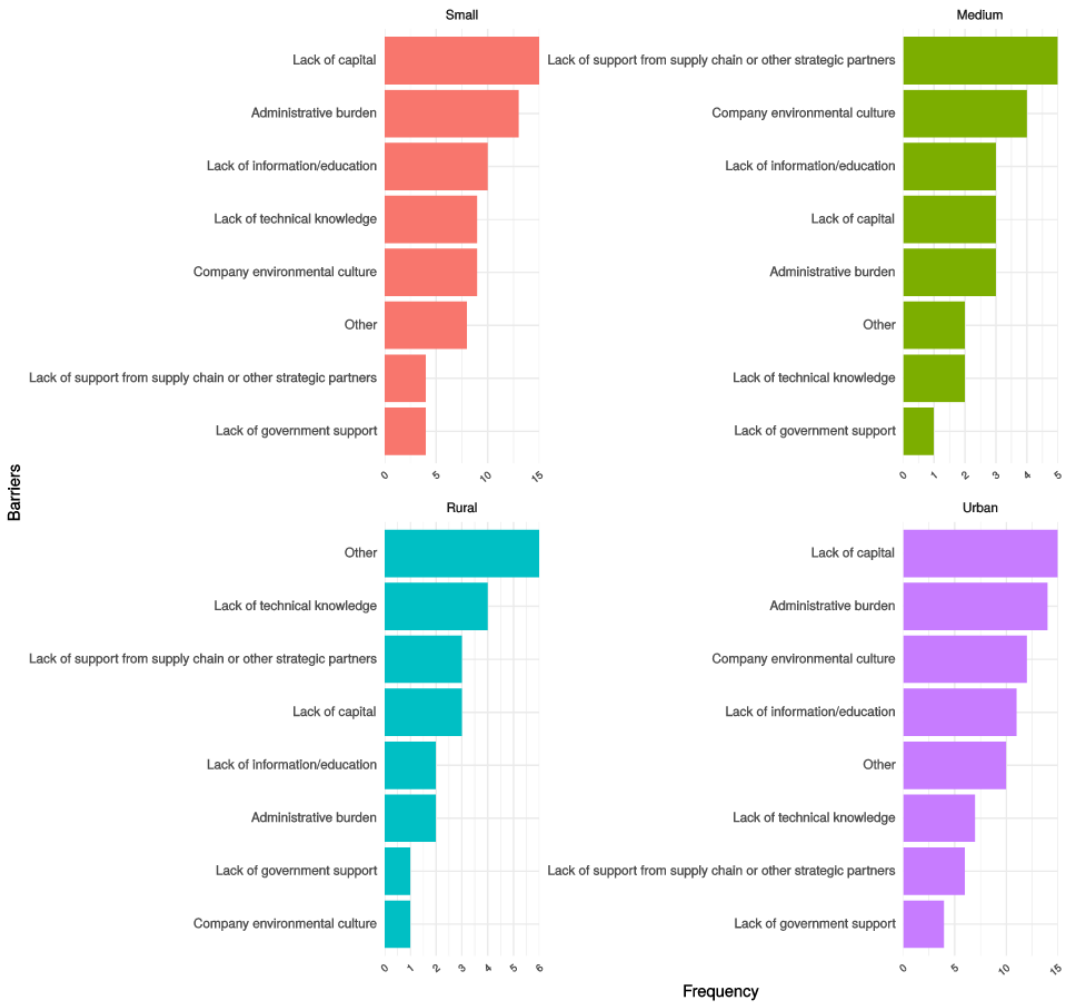

Figure 6. Barriers for Implementing Green Practices by Surveyed SMEs

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

Table 5

Types of Support to Address Barriers

Types of Support	Frequency (n)	Percentage (%)
Governmental tax reduction	22	15.7
Support from 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

In sum, the core green business practices that were identified as being implemented from SMEs in Ohio were recycling and reducing waste. It was also found that internal motivation, and aiming for better public image, were the main drivers for SMEs in Ohio 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. The results presented in this chapter will be discussed in greater detail in the next chapter.

Chapter 5: Discussion

Environmental sustainability is an important aspect for the business community (Chang & Slaubaugh, 2017). This research sought to find the types of green practices that SMEs have implemented in their business operations throughout the State of Ohio, as well as the key drivers and barriers in doing so. Further, this research looked for patterns or relationships between those types, drivers, and barriers in terms of the firms' size and geographic location.

Background of Respondents

Respondents were categorized as a 'small' firm if they have 1–50 employees, and a 'medium' firm if they have 51–500 employees (OECD, 2005). Respondents were also sorted into rural and urban based on their firm location (see Figure 1). Specifically, 80% of the respondents were categorized as small enterprises, and more than 75% were located in urban area (see Table 2). Respondents were asked to identify their business sector, and more than 30% chose 'other,' followed by 'service industries' and 'manufacturing,' with the proportion of 27.9% and 19.3%, respectively. The 'other' option comprised of various industries such as real estate, consulting firms, the media, and distributors, among others. The size and location of a firm were used as independent variables in the analysis, while the industry sector was eliminated from the analysis since there were not enough responses within each business sector.

The survey respondents were asked about their familiarity with green business practices, as well as their perceived importance of implementing green practices. The analysis shows that roughly 70% of the respondents are somewhat familiar with green practices. Likewise, 66.4% of the respondents also perceive green practices as somewhat

important. A crosstab analysis was performed to see if a certain size or location of a firm tends to be correlated with a higher level of familiarity than their counterparts. Results from this analysis show that smaller firms, and firms located in urban areas, are more familiar with green practices than larger firms and firms that are located in rural areas. However, the chi-square test results ($\alpha = 0.05$) indicated that the relation between familiarity with firm size, and location of the firms, is not statistically significant. Further, the researcher implemented a similar methodology to analyze the perceived importance of green business practices. Though these results are not statistically significant, both small and urban enterprises are shown in this survey to perceive green practices to be more important than medium and rural enterprises. However, this result cannot be generalized as the distribution of the respondents is uneven; urban and smaller firms outnumber the sample population (see Table 2).

Implementation of Green Business Practices

In general, more than 65% of the 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. This is aligned with the study from Ashton, Russel, and Futch (2017) for the tool and die manufacturing industries in the Greater Chicago in 2013, and Depken and Zeman (2018, for small businesses in Iowa in 2015), which both reported that recycling materials was the most implemented green practice. Pursuing green certification is 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 (Chang & 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 certain circumstances. For instance, a company could avoid having to pay mileage for employees to drive to a meeting.

Besides looking at the types of green practices and calculating their frequency, a crosstab analysis was also performed to see if there was a relationship between firms' size and the level of engagement to green practices. 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, and that can be a sacrifice for the businesses (Depken & Zeman, 2018). However, results from this analysis show that small enterprises in the sample are reported to be *more* engaged in green business practices. Nevertheless, the chi-squared analysis indicated that this result is not statistically significant. Although insignificant, it is still of interest to investigate why smaller firms are more engaged with green practices.

Smaller firms are perhaps more likely to implement green practices since they are inherently smaller and 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). Similar analysis was also conducted to see if there was a significant relationship between green practices and the firms' location. Results from the survey showed that urban enterprises are more engaged

in green business practices. This may be due to the fact that urban firms 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 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 green practices. Some of the respondents also held the perception that adopting green 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 (Gupta & Barua, 2018). These challenges could potentially be avoided if information on the benefits of implementing green 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 practices. Government-funded programs to provide financial and/or technical assistance was identified to be the primary support that SMEs needed. Additionally, many respondents also mentioned a governmental tax reduction to encourage them to implement green business practices.

Drivers and Benefits for Implementing Green Business Practices

Respondents who 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 the responses, with 27% of respondents noting it as a 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.

Respondents were also asked to identify the benefits of implementation, and they noted reduced operational costs as the main advantage for such adoption. This result supports findings from a study by Hillary (2004), which found cost savings to be a financially beneficial outcome of adopting green business practices. 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. This is related with the result from a study by Ashton, Russell, and Futch (2017) where respondents believed that implementing green practices will make them less competitive in the market. This impediment could potentially be addressed by amplifying the flow of information about the potential advantages of implementing green practices.

Barriers for Implementing Green Business Practices

Though a majority of SMEs in Ohio have implemented green business practices, they still face numerous barriers in the process. To illustrate, a lack of capital was identified as the main barrier by 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 might impede SMEs to greening their businesses.

Second, administrative burden was indicated as one of the main barriers, especially for the smaller and more urban firms. Respondents also mentioned other barriers, such as cost prohibitions, long payback periods, labor intensive, not competitive, and unaffordable recycling facilities. 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 completely minimize the barriers faced by SMEs, various supports may be needed to encourage further implementation of green practices. Most respondents noted that governmental support is the key approach needed to reinforce green practice implementation. Assistance via tax reduction, and 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 this sample.

Conclusions and Implications

The findings from this research bring forth several implications for both SMEs and government agencies. For SMEs just beginning to develop green strategies, it may be easier to start with lower cost practices, such as recycling materials and reducing waste. In this way, the benefits are more readily realizable, as these practices have been found to directly contribute to a company's financial profits (Chang & Slaubaugh, 2017). For more advanced SMEs that have already implemented some level of green practices, more progressive actions, such as adopting renewable energy, may be a path forward. Renewable energy offers multiple benefits, such as improvement in environmental quality through the emissions reduction (Menegaki, 2008).

In this research, internal motivation and aiming for better public image were found to be the major drivers toward implementing green business practices for SMEs in Ohio. Thus, in addition to adopting renewable energy, SMEs may want to further pursue green certification. Such certification can have several benefits, such as increase in demand and popularity, as well as an improved employee engagement.

For policymakers attempting to encourage green business practices, especially for SMEs, additional financial assistance, such as tax reductions, or other incentives and subsidies, could be provided to increase participation. Policymakers should investigate the extent to which a specific state 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), and examine the intricacies and effectiveness of these programs to understand both gaps and opportunities for new program implementation.

In addition, Ohio could specifically adopt best practices to encourage green business practices from other states such as New York and New Jersey. For instance, the State of New York has a New York Green Business Program that 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 sustainability leaders, and receive technical assistance from the Pollution Prevention Institute. Similarly, New Jersey has developed a series of Sustainable Business Guides to assist SMEs in adopting sustainable business practices and reducing their environmental impact (State of New Jersey Department of Environmental Protection, 2019).

Further, state governmental agencies can foster the implementation of green practices by providing additional information and raising awareness about these practices. Such a strategy may be useful in diminishing misconceptions that green practices are complex and overly burdensome. The Department of Energy and Environmental Protection in Connecticut, as an example, provides guidelines for businesses to adopt more sustainable practices, which may be an educational model that a state like Ohio could implement. Yet another example comes from the Green Chamber of San Diego County (now U.S. Green Chamber of Commerce), which educates communities on sustainability matters (Hardwick, 2011). This advocacy program also addresses other potentially challenging barriers, such as a lack of support from business partners. Additionally, as SMEs often depend on the readily available technology in the market (Chang & Slaubaugh, 2017), government can foster the participation by making sure that off-the-shelf green options are available.

At the time of this writing, a public health pandemic (i.e., COVID-19) is occurring, which has negatively impacted the business landscape, including the green economy. Global oil prices have plummeted, resulting in challenges such as decreased sales for energy efficient solutions such as electric vehicles. The pandemic has also slowed down clean energy developments, as many essential components (e.g., photovoltaic panels and blades for wind turbines) are made in China, and flight restrictions have made it challenging for many countries to receive such components (Hodges et al., 2020). This health crisis will also likely to threaten investment in energy efficiency retrofits and other green practices, as discussed above (Ambrose, 2020). Of particular interest is a recent survey by the National Federation of Independent Business

(2020) that found that 76% of small business owners (n = 300,000) have been negatively impacted by the pandemic, such as through slower sales and negative supply chain impacts. Though green business practices can offer both financial savings and environmental protection, this economic disruption may make it more challenging for SMEs to adopt green practices in the shorter-term, especially as they shift toward emergency modes and, relatively speaking, have less capital to invest or put at risk.

Limitations

One methodological limitation of this research project was the concept of selection bias, in which the researcher did not have full control of the recipients of the survey. Further, many of the email addresses gathered from LexisNexis are generic or sales-related emails (e.g., info@xyzcompany.com) and not an individuals' email address, which may have lowered the chance of response. Moreover, the researcher did not have full and direct control over the engagement and distribution techniques of the various Chambers of Commerce whom the researcher sent the survey to. Perhaps as a byproduct, the survey had a limited amount of responses despite the large number of emails sent. In turn, this could have affected the data analysis, in which statistically significant results failed to be identified due to the relatively smaller sample size. It is also worth noting that the responses were also 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 SME email addresses is needed for future research of this variety. Searching through other potential databases (e.g., D&B, Hoovers, etc.), or even doing company website scraping via coding techniques, may be a way to gather better, and a larger amount of, email addresses. In addition, the study areas could

also be expanded for a more comprehensive investigation to enhance generalizability beyond the State of Ohio. Firms' characteristics, such as the age of firms, might also need to be specified for a deeper trend analysis.

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Appendix A: Questionnaire

1. How many employees does your company have?
   - □ 1-10
   - □ 11-50
   - □ 51-500
   - □ >500

2. Please identify your business sector:
   - □ Food, Agriculture, and Forestry
   - □ Manufacturing
   - □ Wholesale and Retail Trade
   - □ Construction, Utilities, and Transportation
   - □ Services Industries (e.g., healthcare, financial, entertainment, etc.)
   - □ Others: _____

3. In which county does your primary business reside? _____

4. How familiar are you with "green business practices"?
   - □ Not at all familiar
   - □ Somewhat familiar
   - □ Very familiar

5. "Green business" practices are efforts that a company makes to decrease negative impacts on local and global environments, the economy, and society. How important is it for your business to incorporate green business practices?
   - o Not at all important
   - o Somewhat important
   - o Very unimportant

6. Does your company engage in green business practices?
   - □ Yes
   - □ No

IF YES:

7. What kind(s) of green business practices does your company implement? Please click on all that apply.
   - □ Reducing waste
     What type(s) of waste does your company reduce? Please click on all that apply.
     - □ Metals
     - □ Cardboard and/or paper

- Plastics
- Food
- Glass
- Wood
- Other: _____

- Recycling materials
  What type(s) of materials that your company recycle? Please click on all that apply.
  - Metals
  - Cardboard and/or paper
  - Plastics
  - Food
  - Glass
  - Wood
  - Other: _____

- Reusing materials
  What type(s) of materials that your company reuse? Please click on all that apply.
  - Metals
  - Cardboard and/or paper
  - Plastics
  - Food
  - Glass
  - Wood
  - Other: _____

- Sourcing materials locally and/or committing to purchase from green suppliers

- Reducing the use non-renewable energy

- Becoming energy efficient
  What type(s) of energy efficient technologies has your company adopted? Please click on all that apply.
  - Energy efficient design for building
  - Renewable energy (e.g., solar panel)
  - Energy efficient utilities (e.g., energy efficient refrigerator)
  - Other: _____

- Conserving water
- Pursuing green certification and/or eco-labelling products
- Other : _____

8. What drives your company to engage in green business practices? Please click on all that apply.
   - Required by governments
   - Required by shareholders
   - Required by customers/market
   - Community pressure
   - Investment opportunities
   - Better public image
   - Internally motivated
   - Other: _____

9. What are the benefits that your company acquires by implementing green business practices? Please click on all that apply.
   - Increased sales-revenue
   - Reduced operational costs
   - Improved company reputation/image
   - Improved community well being
   - Other: _____

10. Have you experienced any barriers while implementing green business practices? As a reminder, green business practices are efforts that a company makes to decrease negative impacts on local and global environments, the economy, and society.
    - Yes
    - No

11. What are the barriers you have experienced while implementing green business practices? Please click on all that apply.
    - Company environmental culture (philosophy, habits, and attitudes of the company in implementing green business practices)
    - Lack of capital
    - Lack of government support
    - Lack of information/education
    - Administrative burden
    - Lack of technical knowledge
    - Lack of support from your supply chain or other strategic partners

- ☐ Other: _____

12. What type(s) of support would encourage you to further implement green business practices? Please click on all that apply.
    - ☐ Government's tax reducing
    - ☐ Support from community (e.g., community values green business)
    - ☐ Government-funded program(s) to provide financial and/or technical assistance
    - ☐ Support in providing training for employees
    - ☐ Support through seminars and workshops
    - ☐ Other: _____

IF NO:

7. What challenges do you face with implementing green business practices? Please click on all that apply.
    - ☐ Increasing cost
    - ☐ Additional work burden
    - ☐ Reducing profits
    - ☐ Do not see benefit(s)
    - ☐ Other: _____

8. What might encourage you to incorporate green business practices? Please click on all that apply.
    - ☐ Government's tax reducing
    - ☐ Support from community (e.g., community values green business)
    - ☐ Government-funded program(s) to provide financial and/or technical assistance
    - ☐ Support in providing training for employees
    - ☐ Support through seminars and workshops
    - ☐ Other: _____

Do you have any additional questions, comments, or ideas about the green business practices?

We thank you for your time spent taking this survey. Your response has been recorded. Should you be interested in the final report of this study, please contact the researcher (Junia A. Purwandani: jp487818@ohio.edu or (858) 428-4646) or thesis advisor (Dr. Gilbert Michaud: michaudg@ohio.edu or (740) 597-9085).

Appendix B: Consent Form

Ohio University Anonymous Online Consent Form

Title of Research: Analyzing the Drivers and Barriers to Green Business Practices for Small and Medium Enterprises in Ohio

Researchers: Junia Anindya Purwandani
IRB number: 19-E-285

You are being asked by an Ohio University researcher to participate in research. For you to be able to decide whether you want to participate in this project, you should understand what the project is about, as well as the possible risks and benefits in order to make an informed decision. This process is known as informed consent. This form describes the purpose, procedures, possible benefits, and risks of the research project. It also explains how your personal information will be used and protected. Once you have read this form and your questions about the study are answered, you will be asked to participate in this study. You may print a copy of this document to take with you.

Summary of Study

This study would like to explore the factors (drivers and barriers) that Small and Medium Enterprises (SMEs) at Ohio face in incorporating green practices in their businesses. Data is being collected via a survey and the result of the study is expected to provide a recommendation to the government body on how to encourage SMEs to shift from business as usual to the green business, for example through tax reductions.

Explanation of Study

This study is being done because business owners and managers need to know the challenge and opportunities in implementing green business practices from the peers companies.

Data is being collected via a survey. If you agree to participate, you will be asked to answer up to 15 questions regarding your business involvement with green business practices.

Your participation in the study will last for about ten minutes.

Risks and Discomforts

No risks or discomforts are anticipated from your participation in this study.

Benefits

This study is important to science/society because government and communities need to know how to support business owners and managers to shift their business to be more environmentally friendly.

You may not benefit, personally by participating in this study.

Confidentiality and Records

Your study information will be kept confidential by on a secure, password protected device accessible only to the researchers. The recorded responses will be deleted at the conclusion of the researcher study period, July 2020. For maximum

confidentiality, please clear your browser history and close the browser before leaving the computer.

Compensation

As compensation for your time/effort, you will be eligible to win one of five $10 Amazon e-gift cards. You will be prompted to indicate interest in being entered for a chance to win an e-gift card by providing an email address. To protect your privacy, you may enter any one of your email addresses by which you cannot be identified by the researchers of this study. Your odds of winning one of the e-gift cards will depend on the total number of participants who will have successfully opted in the prize drawing, which about 0.35%. The winner will be randomly selected. Each eligible participant has an equal chance to win.

Future Use Statement

Identifiers might be removed from data/samples collected, and after such removal, the data/samples may be used for future research studies or distributed to another investigator for future research studies without additional informed consent from you or your legally authorized representative.

Contact Information

If you have any questions regarding this study, please contact the investigator ***[Junia Purwandani, jp487818@ohio.edu, 858-428-4646]*** or the advisor ***[Dr. Gilbert Michaud, michaudg@ohio.edu, 740-597-9085]***.

If you have any questions regarding your rights as a research participant, please contact Dr. Chris Hayhow, Director of Research Compliance, Ohio University, (740) 593-0664 or hayhow@ohio.edu

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By agreeing to participate in this study, you are agreeing that:

- you have read this consent form (or it has been read to you) and have been given the opportunity to ask questions and have them answered;
- you have been informed of potential risks and they have been explained to your satisfaction;
- you understand Ohio University has no funds set aside for any injuries you might receive as a result of participating in this study;
- you are 18 years of age or older;
- your participation in this research is completely voluntary;
- you may leave the study at any time; if you decide to stop participating in the study, there will be no penalty to you and you will not lose any benefits to which you are otherwise entitled.

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