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Articles

SMEs, Sustainability, and Capital Budgeting

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This applied analysis addresses issues and concepts of capital budgeting for sustainability-related projects by SMEs. It reviews literature on SME characteristics, sustainability for SMEs, and capital budgeting for investments in sustainability-related projects. A discussion of the implications of capital budgeting for sustainability-related projects by SME managers, policy makers, and future research is included.

Small-to-Medium Enterprises (SMEs) are under pressure to become more sustainable because of demands from their external business environment (Braun & Tietz, 2020; CDP, 2022; Deloitte, 2022; EU Taxonomy, 2020; IFRS, 2021; TCFD, 2017, 2020; UNSDG, 2022; World Economic Forum, 2022). These include customer demands such as the requirements of larger companies in their supply chain and consumers' changing preferences toward sustainable products, services, and business practices. SMEs also face reporting demands from the growing ecosystem of sustainability reporting frameworks (e.g., EU Taxonomy; International Sustainability Standards Board (ISSB) affiliated with the International Financial Reporting Standards Foundation (IFRS); Task Force for Climate-related Financial Disclosures (TCFD); UN Sustainable Development Goals). There are further demands associated with attracting talented labor in a tight labor market and improving their brand. All these forces create a compelling rationale for SMEs to invest in becoming more sustainable businesses.

To become more sustainable, SMEs need to develop, invest, and implement sustainability-related projects. SMEs can make sustainable investments in energy efficient lighting, recycling, composting, reducing waste, heat pumps for heating, and solar panels for renewable power (Fresner et al., 2017). These potential investments in sustainability-related projects also include opportunities for revenue growth in the form of new products and services in the transition to a low carbon economy (Mezzio et al., 2022; OECD, 2021).

Such investments require SME managers to evaluate a proposed investment in a sustainability project using capital budgeting techniques. SMEs tend to use less sophisticated capital budgeting techniques like Payback Period than do larger companies, which use more sophisticated techniques like Net Present Value (NPV). The use of less sophisticated capital budgeting techniques potentially increases the risk that an SME will make a poor investment decision in its efforts to become a more sustainable business (e.g., higher than expected costs, lower than expected benefits, and longer than expected payback period). SMEs can ill afford bad investments due to their typical scarcity of resources (e.g., financial, expertise).

This paper explores issues confronting SMEs in making capital budgeting decisions in the context of potential investments in sustainability-related projects. First, we discuss characteristics of SMEs. We then draw on the existing literature to discuss the ever-evolving field of sustainability. Next, we summarize capital budgeting issues as they relate to SMEs. Finally, we conclude with a discussion of the implications for SME managers, policy makers, and future research.

Characteristics of SMEs

SMEs range in size from micro businesses to mid-sized companies. The United States Small Business Administration (SBA) defines a small business as an independent business with fewer than 500 employees (SBA, 2021). Fifty-four percent of all employer establishments have fewer than 5 employees (US Census, 2021). SMEs though small have significant economic impacts. Over the last 25 years, small businesses have been responsible for two out of every three jobs added (SBA, 2022). There are estimates that SMEs contribute up to 70% of global GDP (World Economic Forum, 2021).

SMEs also have significant environmental impacts. It is estimated that US small businesses annually account for half a billion metric tons of carbon emissions (Hill, 2015). Worldwide, SMEs are estimated to produce over 60% of all Greenhouse Gas (GHG) emissions (Ashton et al., 2017).

In general, SMEs face constraints because of their limited finances, limited access to financing, difficulty in attracting and retaining employees (compounded by limited numbers of employees in the first place), insufficient expertise, challenges of growth, and a non-supportive policy situation (Gadenne et al., 2009; Nicholas et al., 2011; SBA, 2022; World Economic Forum, 2021). These constraints can create barriers to moving forward to meet the growing expectations of becoming a sustainable business that is environmentally and socially friendly in the way it operates

(i.e., acting to minimize the negative environmental and social impacts of the business on its stakeholders).

Sustainability

Sustainability is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, now known as the Brundtland Commission). A sustainable business has been defined as one that "meets the needs of its stakeholders without compromising its ability to meet their needs in the future" (Hubbard, 2009). To be sustainable means acting always with the future in mind and the understanding that stakeholders to business endeavors are global. An intergenerational focus on the future alone can be very difficult to accomplish (Parhankangas et al., 2014), much less coupled with possible global considerations. It is even more difficult given the constraints faced by SMEs. As discussed above, unlike larger companies, SMEs have fewer financial and human resources. SMEs also tend to lack awareness of sustainability issues because SME managers and owners may hold the perspective that their impact on the environment is minimal (Brammer et al., 2012; Johnson & Schaltegger, 2016; Mitchell et al., 2020).

The ecosystem of sustainability reporting frameworks is growing in impact. In 2021, the CDP (previously known as the Carbon Disclosure Project) sent out 23,487 requests to suppliers for disclosure of their environmental impacts and 11,457 responded. Requests and responses have been increasing over time from a baseline in 2008 of 2,318 supplier requests and 634 responses (CDP, 2022). The TCFD has a set of recommended financial disclosures and has found evidence of increasing voluntary compliance with its recommendations (TCFD, 2017, 2020, 2023). The ISSB has issued its disclosure standards that evolved under its former name as the Sustainability Accounting Standards Board for disclosure of material environmental and social impacts in 11 sectors of the economy covering 66 industries (IFRS, 2021, 2023). The US Securities and Exchange Commission (SEC) is proposing more standardized disclosure in financial reports of material climate change related risks (Soroosh, 2022).

These organizations and their respective sustainability reporting frameworks are having a growing impact on the demand and supply of sustainability-related disclosures by organizations. Today SMEs in supply chains always must be prepared for requests for information concerning the environmental and social impacts of their businesses. To better position themselves, they need to develop programs and projects to reduce the environmental and social impacts of their business. These projects require investments.

In order for an SME to become more sustainable, it has to be aware of its impacts on the environment and on its community and follow up with actions in the form of investments in sustainability-related projects. These projects range in size from relatively low cost (e.g., changing lighting fixtures to more efficient lighting, recycling, composting) to higher cost (e.g., installation of arrays of solar panels for renewable energy, refurbishing a building, or purchasing electric vehicles) (Fresner et al., 2017; Lamoureux et al., 2019). These investments, depending on their magnitude for a particular SME, require proper due diligence in the form of applying capital budgeting techniques.

Capital Budgeting

Businesses employ capital budgeting techniques to analyze investment decisions and help allocate capital to prospective projects. These techniques provide a measurable, quantitative framework to capital budgeting decisions, helping to increase accountability and promote efficiency (Sureka et al., 2022). While there are numerous capital budgeting techniques that firms use in practice, variables such as company size, the financial literacy of top management, and a firm's leverage affect the particular method that a company may choose to employ (P. Graham & Sathye, 2018).

NPV and the Payback Period are two of the more widely used capital budgeting techniques employed by firms. NPV is a discounted cash flow technique that compares the present value of the future cash flows arising from an investment with the cost of the investment. This technique requires the application of a discount rate—a proxy for the opportunity cost of undertaking the project—to account for risk and the time value of money (Datar & Rajan, 2021). NPV is considered to be one of the more effective capital budgeting techniques due to the application of this discount rate; however, this level of sophistication oftentimes makes it less appealing to those with limited knowledge of finance. The Payback Period method is a more simple and intuitively appealing technique as it only requires an estimate of the length of time it will take to recover a firm's initial investment—no discount factor is applied in this computation (Datar & Rajan, 2021). The drawback to this approach is that forgoing the discount rate ignores costs associated with the time value of money, leading to less effective financial decision-making (Datar & Rajan, 2021).

Generally, large firms prefer sophisticated capital budgeting techniques such as NPV, whereas SMEs are more likely to adopt the Payback Period method (Brounen et al., 2004; J. R. Graham & Harvey, 2001). In one study, more than half (55%) of SMEs have reported using the Payback Period as their preferred capital budgeting method, in contrast to those that favored NPV (37%) (Alles et al., 2020). The complexity of the application of NPV is a limiting factor that prevents more widespread use of this technique among SMEs (Alleyne et al., 2018).

The overwhelming preference for the use of this less sophisticated capital budgeting method (i.e., Payback Period) is particularly problematic for SMEs given their limited access to capital markets (Rao et al., 2021). The Payback Period method is particularly ill-suited to analyze investments with a long-time horizon, as the lack of discounting results in overvaluing future cash flows. SMEs may have an understandable inclination to adopt the Payback Period method as they frequently are reliant on bank financing for capital investments; using this methodology can help these firms determine whether they will in fact be able to repay borrowed funds. The nature of this form of financ-

ing places a premium on liquidity, and the Payback Period method is particularly attractive when trying to determine the time frame needed to repay the loan. However, this focus on short-term liquidity is to the detriment of long-term value maximization (White & Miles, 1993).

Another factor leading to the application of the Payback Period method among SMEs is the lack of financial literacy among the owners and top managers of these firms (Yogendrarajah et al., 2015). A greater level of financial sophistication helps firms to more effectively take advantage of financial opportunities (Ye & Kulathunga, 2019). Individuals with stronger backgrounds in financial decision-making are more likely to employ discounted valuation techniques (Brijlal & Quesada, 2009). Further, many smaller companies simply do not have the necessary human capital to employ sophisticated capital budgeting techniques such as NPV. As small organizations mature, they are more likely to employ discounted cash flow methodologies (e.g., NPV) (Alles et al., 2020).

Capital Budgeting and SME Sustainability Decisions

Capital budgeting decisions are more complex when SMEs undertake capital investments in sustainability projects. Sustainability initiatives pose a variety of valuation questions for firms of all sizes but can be particularly problematic for SMEs given the limited resources they can devote to capital budgeting decisions (Frost & Rooney, 2021). One of the key issues that firms of all sizes must face is the fact that costs and benefits of sustainability initiatives are often difficult to quantify (Hoejmose et al., 2012). Benefits from projects like the installation of solar panels may take years to realize and rely on a myriad of uncertain factors such as the future price of alternative fuel sources. Both consideration of and measurement of environmental and social impacts can be difficult to value.

While the benefits of sustainability measures may be difficult to quantify, they are significant. Benefits can include the direct financial impact of sustainability investments, such as cost savings. Some of the largest drivers of these cost reductions include increased efficiency in use of materials, greater energy efficiency, and reduced disposal costs (Prashar, 2019). These investments might also serve to increase firm value through enhanced reputation and public image. Companies may find it easier to attract new customers if they appear to be acting in an ecologically friendly manner. Likewise, firms with a reputation for being sustainability-focused can be at an advantage in recruiting talent (Burlea-Schiopoiu & Mihai, 2019). Other stakeholders, such as government entities and community and civic organizations, also are positively influenced by a company's commitment to sustainability (Ramanathan, 2016).

SMEs face roadblocks in their efforts to undertake investments in sustainability. The long-time horizon of payoffs of sustainability initiatives coupled with inherent capital constraints that SMEs face (Journeault et al., 2021) is a difficult hurdle for many companies that would like to undertake sustainable investments; they simply do not have the financial resources to withstand the uncertainty in potential cash flows.

Not only do larger organizations have greater resources to manage the risks associated with sustainable initiatives, but they also have greater ability to generate revenue due to their size in specific markets. Smaller companies can be described as price-takers when they have to accept the market rate for their products or services—they may be limited in raising the markups on their goods because they typically have little market influence on price (Prasanna et al., 2019). Additionally, SMEs, due to human capital limitations, have greater difficulties meeting regulatory compliance requirements that are often associated with grants and funding made by governmental or non-profit organizations to promote sustainability initiatives (Amankwah-Amoah & Syllias, 2020).

Given the contributions of SMEs to the economy and their relatively large carbon footprints, research has begun to focus on the managerial attributes that enable firms to successfully invest in sustainability projects. Sustainability initiatives are more likely to succeed if executives are actively engaged in promoting these projects. Active involvement of top operations managers in energy efficiency projects has resulted in increased savings of 13.4% per project (Blass et al., 2013). Ramanathan (2016) found that the positive correlation between financial performance and sustainability practices may be attributable to the fact that talented managers may be attracted to firms with strong commitments to sustainability.

Implications for Managers

Given the importance of sustainability initiatives, SME managers are likely to benefit by incorporating more sophisticated capital budgeting approaches. While there are many projects that can be undertaken with little upfront investment (e.g., recycling, composting, conserving water), as the dollar value of the capital investment increases and possibly the payback period is longer (e.g., solar panels, retooling for reuse of components, new product development), managers also should incorporate the time value of money into their analysis with the aim of avoiding risks associated with poor decisions. The gaze of stakeholders and the strategic importance of sustainability today demands it. Because of the long payback period for potentially valuable sustainability projects, the analysis of both costs and benefits associated with the NPV approach to capital budgeting leads to better decisions by incorporating the time value of money.

NPV is a logical and simple extension to the Payback Period method of capital budgeting techniques for SMEs. The Payback Period method requires estimating a timeline of cash outflows and inflows associated with an investment to establish the payback period. SMEs can use this timeline and add to it the cost of capital for the specific investment or the returns of an alternative investment to establish the discount rate necessary for NPV. With this simple additional step, SMEs can incorporate the time value of money into their capital budgeting decisions and improve the quality of these decisions.

In addition to the need for active involvement of top managers in sustainability decision making cited above, SME managers should not only develop talent from within but also seek the expertise of economic development entities (e.g., Small Business Administration, Small Business Development Center) on the use of capital budgeting techniques such as NPV.

Managers also should incorporate nonfinancial aspects of projects (such as carbon emissions avoided, brand effects, etc.) for more complete decision analysis in the capital budgeting process. Even aspects that are hard to quantify in dollar terms are important elements of sustainability investment decisions. For example, if a project decreases the use of electricity, then the energy saved should also be translated into carbon emissions avoided in metric tons associated with the reduction in electricity consumption. Quantification is relevant even if it cannot be put into the form of dollars. These other benefits are tangible and important in capital budgeting decision making. Even though a more complete decision analysis takes more time, this approach, once learned, can be used in future capital budgeting decision making.

Management's selection of the specific forms of sustainable investments can significantly influence the potential success of a project. Firms have a variety of options to choose from in terms of sustainable investments, and managers are often uncertain as to how the adoption of an investment will affect an SME's financial performance. Initiatives such as waste management, material and resource efficiency, and stakeholder engagement significantly improve both company profitability and market value (Boakye et al., 2020). Although they did not contribute to stock price, energy efficient practices and waste abatement efforts have been shown to help raise company profitability (Boakye et al., 2020). Managers should consider such relationships when undertaking their capital budgeting decisions in sustainable investments, keeping in mind that the evidence is changing as sustainability science incorporates new technologies and sustainability efforts become more widespread in SMEs. As sustainability reporting frameworks become more mature and the demand for sustainability-related information disclosure increases, companies that are more engaged and transparent are likely to benefit.

Implications for Policymakers

Policymakers in the US should facilitate SMEs becoming more sustainable. Among the top five barriers to SMEs taking action on climate is the lack of the right skills and lack of funds (SME Climate Hub, 2022). Given the challenges faced by SMEs in terms of scarce resources and the benefits of investing in sustainability-related projects in order to make progress on becoming more sustainable companies, policymakers need to provide training on capital budgeting techniques to SMEs to facilitate their making better quality investment decisions. Better access to financing would also facilitate progress. The EU has done much better than the US in terms of investing in sustainability and in helping SMEs become more sustainable (EU, 2022; KPMG, 2019; OECD, 2021).

Future Research

Future research should address SMEs' use of capital budgeting techniques in the context of evaluating sustainability-related projects. Issues that could be addressed include the techniques currently in use for various sustainability-related projects, dollar values, completeness of information, sources of financing, and so forth. Are non-financial benefits (e.g., carbon emissions avoided, reputation effects) folded into the investment analysis and, if so, then what kinds and how are they weighed in the analysis? Further, research could explore whether sustainability projects have met expectations (e.g., cost savings, reduction in negative environmental impacts). Findings from empirical study of these issues are likely to yield the practical outcome of facilitating the investment in sustainability by SMEs.

Conclusions

In conclusion, this applied paper has explored key issues facing SMEs as they seek to budget for sustainability-related projects and initiatives. These include the importance of sustainability efforts despite limited resources and the major approaches to capital budgeting that typically are employed by large and small firms. Our examination of the issues suggests that the use of more sophisticated capital budgeting techniques could reduce risk inherent in sustainability-related decisions that have long time horizons and large dollar value investments.

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