Received 15 May 2020
Revised 24 June 2020
5 August 2020
12 August 2020
Accepted 14 August 2020

Understanding the influence of environmental production practices on firm performance: a proactive versus reactive approach

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Abstract

Purpose – Exploring ways to sustain competitive positions as well as improve firm performance through environmental production initiatives has been a major preoccupying topic for mostly practitioners and researchers. Despite several studies on the influence of environmental initiatives on firm performance, many questions remain unanswered as to how to further extract more gains from environmental production initiatives. This study, thus, explores environmental production practices impact on firm performance from proactive and reactive perspectives.

Design/methodology/approach – The study adopted a survey research design, a quantitative approach and partial least square structural equation modelling (PLS-SEM) technique in making data analysis and interpretations due to its suitability for predictive research models.

Findings – The results indicated that proactive environmental production practices positively related with process and environmental performances but negatively associated with financial performance. Although the findings contrast with majority of past findings, they gain the support of other scholars in establishing that early adoption stages of proactive environmental production initiatives strain financial capabilities and thus present a negative relationship. Reactive environmental production practices are positively and significantly related with process, environmental and financial performances.

Originality/value – The study is among the first to expose environmental production practices from a proactive and a reactive perspective and in the context of a developing country. As such, the study provides guidance to relevant authorities in further promoting sustainable production practices to preserve the environment by manufacturing safer consumer products through efficient sustainable production processes and practices.

Keywords Environmental production practices, Process performance, Environmental performance, Financial performance, PLS-SEM

Paper type Research paper

Journal of Manufacturing Technology Management
Vol. 32 No. 2, 2021
pp. 266-289

1741-038X
DOI 10.1108/JMTM-05-2020-0195

1. Introduction

Achieving environmental sustainability has been the key focus of several companies worldwide (Awan, 2017). The rapid rise in the integration of green strategies or initiatives into diverse aspects or areas of firm operations indicates the enormous benefits sustainability presents when efficiently managed. According to several scholars (Awan, 2017; Baah *et al.*, 2020), an in-depth view of environmental orientation in current business environments portrays it as a critical tool or weapon in the acquisition and sustenance of competitive

advantages and improved firm performance, especially during times of market volatility and uncertainty. Over the past decade, firms that have been able to integrate sustainable practices into business strategies and policies have benefitted enormously according to several studies (Gligor *et al.*, 2016; Shashi *et al.*, 2019). Benefits such as stakeholder loyalty, satisfaction, improved goodwill, deepened competitive positions, among others, have attracted several firms to adopt environmental practices and policies. In developed countries where majority of firms are integrating environmental practices into production and processes, the competitive prowess which used to be enjoyed by key and few firms is being diluted since several small-scaled firms are also in their little ways engaging in environmental initiatives, thus attracting stakeholders that were once loyal to other firms (Darnall *et al.*, 2010). The above indicates that in the face of ever-changing technology and market dynamics, companies or firms need to find new ways of ensuring improved competitive and firm performance, seeing the gradual dilution of prowess gained as a result of environmental orientation (Gligor *et al.*, 2016).

According to Darnall *et al.* (2010), gaining better environmental recognition goes beyond adhering to environmental legislations imposed by regulatory stakeholders, but by engaging in proactive environmental practices that benefit both firm and the entire society. Thus, adopting a proactive approach to environmental practices as compared to a reactive approach will likely present results that are better than adopting the latter approach to sustainability. Although several scholars (Gligor *et al.*, 2016; Baah *et al.*, 2020) agree with the above assertion, it is necessary to highlight that several economies may present different outcomes because of different market conditions, policies, stakeholders' orientations and government influences. Fundamentally, it is prudent to conduct studies that assesses the impacts of both reactive and proactive approaches to environmental orientations on firm performance, so that strategies and policies can focus on either one of the approaches, depending on the firm's objectives, capacities and capabilities. This study thus highlights and sets a distinction between proactive and reactive approaches to environmental production practices and how each influences firm performance. Although this study views firm performance from the perspective of owners, managers and workers, thus making it more internally oriented, Llach *et al.* (2013) focused on how quality and environmental practices affected firm performance from the external perspective by focusing on market success factors in line with Sangle and Ram Babu (2007) who focused on stakeholder satisfaction. Baah *et al.* (2020) also highlighted the importance of green practices in the attainment of corporate reputation and, as such, recommended firms to be sustainable in their quest to achieving good reputation. From this regard, assessing benefits of environmental practices from an internal perspective is crucial because environmental practices need to be well implemented within the firm before it can begin to attract gains such as reputation and stakeholder satisfaction. Hence, this study assesses the internal gains of the adoption of environmental production practices from a proactive and a reactive perspective.

Environmental or green production has gained grounds especially in the manufacturing sector due to its enormous contribution to the emission of greenhouse gasses as well as the significant consumption of resources among other negative environmental impacts (Deif, 2011). Moreover, diverse pressures from stakeholder groups in one way or the other have coerced firms operating in such sectors to be either reactive or proactive to environmental sustainability. As a result, majority of manufacturing firms are integrating green initiatives into production processes, and thus promoting sustainable ecological growth and development. Furthermore, recent pressures from key stakeholder groups, namely, organizational, regulatory and community stakeholders, have resulted in the shift towards environmental production practices (Shashi *et al.*, 2019). Most importantly, the call for manufacturing firms to be sustainable has widely been answered in both developed and developing countries. Baah *et al.* (2020) suggested that this call has been answered from either

a proactive or a reactive standpoint based on the management and stakeholder focus of firms. The authors further indicated that productions practices that only seek to meet environmental regulations reflect a reactive approach, while production practices that go beyond meeting environmental regulations to consider other voluntary green practices not mandatory for manufacturing firms reflect a proactive approach to greening production practices and processes.

Greening production processes and practices undoubtedly have consequences on firm performance as well as stakeholder satisfaction and perceptions. Stakeholders perceive firms that act in the best interest of the environment as trustworthy, and they thus associate or develop strong relations with such firms, leading to improved brands, goodwill and accrued social and moral capitals (Rusinko, 2007). These capitals, according to Kantabutra (2012), present financial and competitive gains for such firms. Firm performance in the past studies has mostly been viewed from financial perspectives, especially considering profitability measures (Stainer and Stainer, 1998). According to Stainer and Stainer (1998), assessing the performance of firms in this current sustainability-oriented world should reflect other aspects that speak to overall business performance. From this perspective, the study adopts the process, environmental and financial performances in determining the overall business performance. Integrating environmental practices into operations results in the alteration of production practices and processes, which, in turn, have a bearing on process performance of firms (Kueng, 2000). Additionally, greening production processes also improve a firm's adoption of environmental practices, which go to the core of environmental performance, and, most importantly, efforts by firms to adopt green practices result in financial costs during the initial phase of investment in environmental practices and technologies for the firm. These financial costs may be recovered in the long run with other benefits if such green initiatives or investments are efficiently monitored and managed.

As a further step to improving competitive advantage and business performance, this study moves further in setting a distinction between reactive and proactive environmental production practices and how these affect firm performance, specifically in terms of process, environmental and financial performance. This study being among the first of its kind seeks to provide a detailed contribution to literature by expanding environmental production practices into reactive and proactive approaches to know which one contributes robustly to firm performance. Few studies conducted on proactive and reactive approaches to environmental orientation have concentrated on developed countries and have assessed performance of firms from only financial or environmental perspectives. This study, therefore, seeks to add to existing literature by projecting findings that expose reactive and proactive environmental production practices from a developing country, namely, the Ghanaian manufacturing sector or industry. Additionally, firm performance is examined form diverse perspectives, which are very critical in the implementation of green initiatives as well as for firm growth and survival, namely, the process, environmental and financial performances. Thus, this study in bridging past research gaps considers not only financial measures but also captures non-financial measures as well.

This paper is organized as follows. The following section exposes the literature review, conceptual model and hypotheses development. The next sections reflect on the research methods, discussion of results and conclusions that highlight managerial implications as well as research limitations and future research recommendations.

2. Literature review, conceptual model and hypotheses development

2.1 Institutional isomorphism and organizational legitimacy

Based on the institutional theory as explained by Deephouse (1996), organizations based on the industry in which they operate adopt structures, processes and strategies that are similar. Deephouse (1996) further categorized this act as institutional isomorphism, highlighting that

industry firms mostly adopt similar practices and strategies which also lead to organizational legitimacy (i.e. external stakeholders recognizing organizations as accommodating to acceptable behaviour standards). According to Tsinopoulos *et al.* (2018), a firm's behaviour is motivated by the desire to conform to established rules and norms, and as such indicated that the institutional theory investigates the role of social influence in shaping a firm's actions. Specifically, Deephouse (1996) mentioned social actors such as government regulators and the public. It is worth noting that in these current times, several organizations aiming for legitimacy through environmental production practices and processes have been more oriented towards external norms, hence reflecting institutional isomorphism. These norms existing in the industry affect firm strategies, decisions and practices. The integration of institutional isomorphism and organizational legitimacy can aid in explaining the factors that promote adoption of some environmental practices.

In the case of developed countries, the adoption of environmental practices has been phenomenal due to the early availability of sustainable technologies, leading to early adoption of sustainable practices. As such, diverse firms in the industry, on the basis of isomorphism, have oriented themselves towards green practices, and as a result have gained legitimacy from stakeholders. Although Deephouse (1996) only captured government regulators and the public as social actors in terms of gaining legitimacy, today's business environment presents diverse stakeholder groups that are also critical in terms of legitimizing organizations and their practices. However, developing countries are now picking up the pace in terms of sustainable practices because of the motivation to attain legitimacy from stakeholder groups, improve performance and preserve the environment. Hence, manufacturing firms operational in developing countries are operating in resemblance to recognized sustainable firms in their industries. Tsinopoulos *et al.* (2018) further indicated that most firms motivated to gain legitimacy with stakeholders pursue ISO standards, which basically aim to communicate to stakeholders for adherence to regulatory requirements and best environmental practices. The gradual push for the adoption of proactive environmental practices in developing and developed countries suggests that stakeholder groups in a matter of time will associate endorsement or legitimacy with organizations that move beyond reactive environmental initiatives to capture proactive environmental initiatives.

2.2 Environmental production practices

Greening production practices have gained attention over the past decades since the introduction of ISO 14001 in 1996 (Govindan *et al.*, 2014). This standard, together with stakeholders' demands of firms to employ sustainable manufacturing practices, led to the rapid spread of green manufacturing practices, which is captured in this study as environmental production practices. According to Govindan *et al.* (2014), developed countries such as Britain and Germany witnessed a massive wave of green manufacturing strategy implementation, particularly after the introduction of ISO 14001, although green manufacturing was initially referred to as environmentally conscious manufacturing. The authors further highlighted the enormous benefits of adopting environmental practices, especially in the production or manufacturing sector. The authors indicated the integration or implementation of environmental production practices leads to the reduction of waste and pollution through the efficient use of resources as well as efficient material and production processes. As a general concept, environmental production practices have diversely been integrated and adopted in both developed and developing countries (Govindan *et al.*, 2014; Baah *et al.*, 2020).

This wide adoption has, to some extent, negatively influenced those manufacturing firms that were industry movers in the adoption and implementation of green manufacturing or production practices, because now several firms, including SMEs, are trying to meet the

minimum legislations relating to environmental preservation (Li *et al.*, 2017). This has motivated the further probe into environmental production practices that go beyond minimum requirements in an attempt to further deepen or strengthen competitive positions and performance. Such efforts, according to some scholars, are proactive in nature and hence lead to lasting relationships with stakeholders and improved overall performance amongst others, while meeting minimum requirements is reflected as reactive; although the latter leads to some benefits, it cannot compare to those derived by engaging in proactive practices. Although manufacturing firms operational in developed countries have largely embodied sustainability concepts, firms in developing countries are trying to also fully meet the set standards and hence proceed to engage in practices that are beyond those required in legislations (Govindan *et al.*, 2014). The above connotes the need to explain the distinction between proactive and reactive environmental production practices as well as how they individually influence overall performance. Early studies on the issue of corporate environmental strategy and its applicability according to Ghobakhloo and Azar (2018) showed how being responsive to environmental strategy implementation led to developments or emergence of unique organizational capabilities which are deemed vital for firm competitiveness.

According to Baah *et al.* (2020), proactive environmental orientations have been associated with organizational stakeholders, while reactive environmental orientations have been linked to regulatory stakeholders. Organizational stakeholders, due to their key relevance to firm survival, are able to dictate to management in terms of actions that need to be taken; thus, if these are environmentally conscious, then firms have higher possibilities of not just meeting legislations but further considering interactions with key environmental players to develop collaborative production methods and techniques that will improve societal and environmental health. On the other hand, regulatory stakeholders use the fear of sanctions and litigations to coerce environmentally reactive firms to be sustainable. This mostly works because these reactive firms stand to lose goodwill and legitimacy should they be known for violating environmental regulations (Backer, 2007). It is noteworthy that the fundamental distinction between proactive and reactive environmental production practices is that the proactive approach satisfies environmental manufacturing legislations such as waste and pollution reduction, reverse logistics, efficient production processes and reducing energy consumptions, while also additionally creating awareness and establishing collaborative relationships with diverse environmental players and stakeholders with the sole aim of protecting and persevering the society and the environment, respectively. The reactive approach captures, promotes and sticks to those environmental practices specified in legislations as highlighted by Rusinko (2007). The study is trying to assess the specific impacts of proactive and reactive environmental production practices and thus presents an exploratory analysis of the relationships between these approaches, process, environmental and financial performances.

2.3 Firm performance

Over the past decade, several scholars (Stainer and Stainer, 1998; Kantabutra, 2012) have expressed concerns as to the use of only financial measures in speaking to overall firm performance. These concerns have pushed diverse studies to consider both quantitative and qualitative measures in assessing overall firm performance based on the objectives of their studies (Zhu and Sarkis, 2007; Shashi *et al.*, 2019). This study, in its quest to establish how environmental production practices influences overall business performance, highlighted the process, environmental and financial performances.

2.3.1 Process performance. Organizational activities related to production, distribution and beyond can all be broken down into processes (Kueng, 2000). Production activities are key to manufacturing firms because they form the basis for their existence. According to

Seth *et al.* (2016), engaging in environmental production or green manufacturing places these production processes under critical observation to eliminate processes that are redundant and contribute to waste, pollution or energy consumption. Undergoing this procedure obviously has either positive or negative impacts on other processes, and these processes collectively influence the financial soundness of a firm. Specifically, efficiently reducing resources that form inputs needed to manufacture end products through energy and material efficient handling techniques will in one way or the other reduce production cost due to the elimination of redundant processes as well as the reduction of waste, thus reducing cost of production (Baah and Zhihong, 2019). The above discussion indicates the necessity of this study adopting process performance as a firm performance measure.

2.3.2 Financial performance. Financial performance has gained the dominance in relation to measuring organizational performance according to management scholars (Stainer and Stainer, 1998; Li *et al.*, 2017). From this perspective, several studies assessed the overall well-being of an organizational from its financial performance using profitability measures. Financial performance, according to Stainer and Stainer (1998), when used together with other firm performance, measures present results, which are more accurate and not biased. This study, attempting to follow suggestions of scholars, adopted not only financial measures but also other measures that predict firm performance. Literatures that exist on measuring financial performance in an organizational setting considered profitability measures. This is because profitability measures expose core indicators that show how a firm is performing with sales, gross and net profits, returns on sales, equity, investments among others. This study also adopts profitability measures in reflecting financial performance. Financial performance was assessed in this study because the adoption and implementation of environmental production practices, whether reactive or proactive, have huge financial obligations. In fact, these financial burdens serve as a reason for rejecting sustainability practices by several firm managers and shareholders (Santis *et al.*, 2016).

2.3.3 Environmental performance. Current business environments necessitate the need to be environmentally oriented because of the presence of environmentally conscious stakeholders (Shashi *et al.*, 2019). According to Pullman *et al.* (2009), adopting and implementing environmental practices have a positive bearing on economic and quality performance, which, in turn, also boost corporate image as well as brands. Furthermore, implementing both proactive and reactive environmental production practices has been known to improve environmental reputation, which helps in achieving stakeholder loyalty and satisfaction. Although implementing environmental practices that boost environmental performance seems to be the right way forward, only few firms are able to significantly integrate reactive or proactive practices due to the enormous costs entailed in its integration (Kim and Lee, 2012). Despite the initial huge financial and technological investments in environmental production practices according to Shashi *et al.* (2019) and Govindan *et al.* (2014), firms should still strive to implement such initiatives, since they serve as catalyst to improve performance and sustain competitive advantage mostly in the long run.

2.4 Development of hypotheses

2.4.1 The relationships between proactive environmental production practices and process, environmental and financial performances. Few studies strike a clear distinction between ecological manufacturing practices, indicating that the green business literature usually focuses on environmental production practices as a composite (Buysse and Verbeke, 2003). The primary goal of environmental production practices is to conserve energy while preventing pollution; proactive environmental production practices further integrate diverse stakeholder groups into supply chains and production processes. Baah *et al.* (2020) suggested these act promote the collaborative efforts of suppliers, customers, governments, employees

and the society in improving production processes which aid in making safer consumer products, building stakeholder trust, efficient utilization of natural resources and minimizing or eliminating waste and pollution. Specifically, proactive environmental practices allow the integration of technologies which monitor environmental and production process performance while detecting processes that need reconfiguration in terms of sustainability (Buysse and Verbeke, 2003). Such monitoring, evaluation and reconfiguration of production practices, coupled with collaborative efforts of supply chain partners, without question improve process performance; thus, the first hypothesis (H1) proposes that,

H1. Proactive environmental production practices have a positive impact on process performance.

Despite several scholars (Buysse and Verbeke, 2003; González-Benito and González-Benito, 2006; Venkatraman and Nayak, 2015) indicating proactive environmental production practices as the ideal way forward for manufacturing firms, it is worth mentioning that the financial obligations that come with proactive initiatives can be huge, and as such, only few well-to-do manufacturing firms, mostly industry leaders, are able to engage in such practices and initiatives, thereby allowing them to sustain their industry positions. In addition, Santis *et al.* (2016) stated that in as much the incorporation of environmental initiative into business process and operations cannot be ignored, governments and other stakeholders should be willing to support firms in making those initial investments, as they are expensive and costly. Baah *et al.* (2020) also added to the above by asserting that the huge investments in environmental initiatives are likely not to yield any benefit in the short run, but gains may be present in the long run. The authors further noted that uncertainty issues in the business environment make such investments much more risky. In as much as investing in green initiatives is costly, the benefits derived, if well managed, are enormous and significantly improve a firm's competitive and financial standing. The financial gains that emanate because of proactive initiatives are significant; however, only few firms with the financial capacity and capabilities can implement such practices and reap benefits (Li *et al.*, 2017). Although findings related to the relationship between environmental orientation and financial performance have been widely seen as positive (Santis *et al.*, 2016; Shashi *et al.*, 2019), few studies have studied the influence of proactive environmental production practices on financial performance. This study, in contributing to existing literature, proposes the second hypothesis (H2), which states,

H2. Proactive environmental production practices have a positive impact on financial performance.

Furthermore, proactive environmental production processes, although expensive to implement, enable efficient monitoring and evaluation of green production processes (Shashi *et al.*, 2019). According to Shashi *et al.* (2019), environmental proactiveness is promoted through efficient monitoring and evaluation systems as well as through auditing and reporting systems which keep stakeholder groups updated as to environmental production practices leading to a boost in environmental performance. Venkatraman and Nayak (2015) further indicated that engaging in proactive environmental production practices results in lasting relationships with several, if not all, stakeholder groups, thus enabling stakeholder endorsements as well as firm competitiveness. The relevance of environmental performance cannot be downplayed in this environmentally conscious stakeholder business era. Thus, Backer (2007) indicated the need to be environmentally proactive in the quest to achieving and sustaining competitive and improved firm performance. The author further detailed that these are attainable once a firm has been able to uplift its environmental performance to gain legitimacy from stakeholders. González-Benito and González-Benito (2006) clearly indicated that engaging in environmental

practices that involve the integration of stakeholders as captured under environmental proactiveness robustly relates to or boosts environmental performance which ultimately influences overall firm performance. From the above, the third hypothesis (H3) proposes that,

H3. Proactive environmental production practices have a positive impact on environmental performance.

2.4.2 The relationships between reactive environmental production practices and process, environmental and financial performances. Since the introduction of green production standards such as ISO and Leadership in Energy and Environmental Design (LEED) in 1996 and 1998, respectively, several firms in Britain and United States have engaged in environmental production processes, which, to an extent, have resulted in greener products and the satisfaction of environmentally conscious stakeholders (Rusinko, 2007). Although manufacturing firms have the mandate of meeting environmental legislations, stakeholders due to the rapid rise in environmental concerns expect more from manufacturers. Thus, firms that remain reactive to environmental production practices despite meeting required legislations and standards may not gain as much as firms that go a step further to be proactive (Marshall *et al.*, 2015). Despite this view, reactive environmental production practices have been associated with the consideration of green production processes which, to an extent, improve process performance. Specifically, the elimination of hazardous production processes reduces production costs and ensures efficient production process as well as faster production flows. These initiatives focusing on greener methods undoubtedly influence process performance which, in turn, also impacts overall firm performance. Melnyk *et al.* (2003) connoted that reactive environmental practices improve process performance through the gradual implementation of best production practices that lead to reducing environmental stressors. Additionally, reactive approach to green production ensures the minimum satisfaction of environmental preservation, and thus results in better production and process performance. From the above, the fourth hypothesis (H4) states,

H4. Reactive environmental production practices have a positive impact on process performance.

Integrating reactive green production practices also impacts financial performance in the sense that meeting and satisfying legislations requires resources, technologies and expertise which are, to some extent, costly to acquire (King and Lenox, 2001). Although environmental production practices generally cost a lot financially to integrate and implement, adopting a proactive approach is largely costly as compared to adopting a reactive approach (Baah *et al.*, 2020). According to King and Lenox (2001), reactive approaches to environmental production present financial burdens especially to manufacturing firms that are considered as SMEs; as such, most SMEs only focus on meeting set standards and legislations to avoid sanctions, litigations and bad reputation, thus making them reactive in their approaches to environmental production initiatives. However, such SMEs that put in best efforts in adhering to environmental guidelines also eventually improve financial performance due to stakeholder appreciation and endorsement which translates to market share, more sales, and improved goodwill and brands, ultimately increasing profit and financial performance. Thus, although being proactive results in best possible outcomes for firms to be able to implement them, most firms operating in manufacturing industries characterized by SMEs are likely to also reap enormous benefits only by being reactive since there exist few larger manufacturing firms who are able to be proactive. This view, to some extent, shows that as few larger manufacturing firms are reaping best outcomes from proactive environmental production practices, manufacturing SMEs, on the other hand, are reaping good or better outcomes from adopting reactive environmental production practices, especially in developing countries,

with manufacturing SMEs forming over 90% of the industry (OECD report, 2010). From this perspective, the fifth hypothesis (H5) states,

H5. Reactive environmental production practices have a positive impact on financial performance.

According to Shashi *et al.* (2019) and Baah *et al.* (2020), engaging in environmental initiative has bearing on environmental performance. From this perspective, the authors suggest green initiatives, whether reactive or proactive, positively influence environmental performance, although a detailed look will support the findings of Bansal and Roth (2000) in asserting that proactive approaches to sustainability have impacts that are more potent on environmental performance than reactive approach to sustainability. López-Gamero *et al.* (2008) further indicated that the environmental benefits of engaging in sustainable production are vital for reducing carbon emissions. The authors further suggested that environmental initiatives should be fused with daily business operations, especially in developing economies, to deal with the severe ecological deterioration. Additionally, Vachon (2007) asserted that implementation of reactive or proactive green supply chain practices impacts environmental performance positively, and thus recommended more green supply chain practices to ensure staying competitive. In short, diverse scholars have attested to the positive influence of reactive environmental production practices on environmental performance. Based on this perspective, the sixth hypothesis (H6) states (see Figure 1),

H6. Reactive environmental production practices have a positive impact on environmental performance.

2.4.3 The relationships between environmental, process and financial performances. Majority of studies that focus on the interaction between environmental and financial performance have indicated positive outcomes (Li *et al.*, 2017; Shashi *et al.*, 2019). The introduction of process performance in this study also suggests positive influences on financial performance, because improving production practices to reduce waste and ensure efficient utilization of raw materials connotes reduction in production costs as well as the production of greener products, which will attract green-minded consumers ultimately leading to improved financial performance. This implies that both environmental performance and process performance together positively influence the financial standing of a firm. Furthermore, Kueng (2000) indicated that process performance is critical for enhanced productivity as well as improved financial gain. According to Kueng (2000), process activities and systems allow the gathering of operational data or information that is relevant for inter- and intra-processes, collaboration, learning and effective implementation of production practices. On this basis, environmental performance, which relies on the implementation of sustainable production processes, is smoothly undertaken when based on the right process activities or systems. Tsinopoulos *et al.* (2018) further indicated that efficient process innovation and activities also ensure the reduction in production costs as well as shorten production time due to the elimination of waste and inefficient processes. Hence, process performance relates to environmental and financial performances. The adoption of green production practices definitely impacts production processes and hence process performance (Buysse and Verbeke, 2003). Buysse and Verbeke (2003) highlighted that the scrutiny of production processes to take away redundant as well as hazardous processes and practices leads to higher production efficiency, particularly reducing cost and time used in production. This leads to the proposition of the following hypotheses;

H7. Environmental performance has a positive influence on process performance.

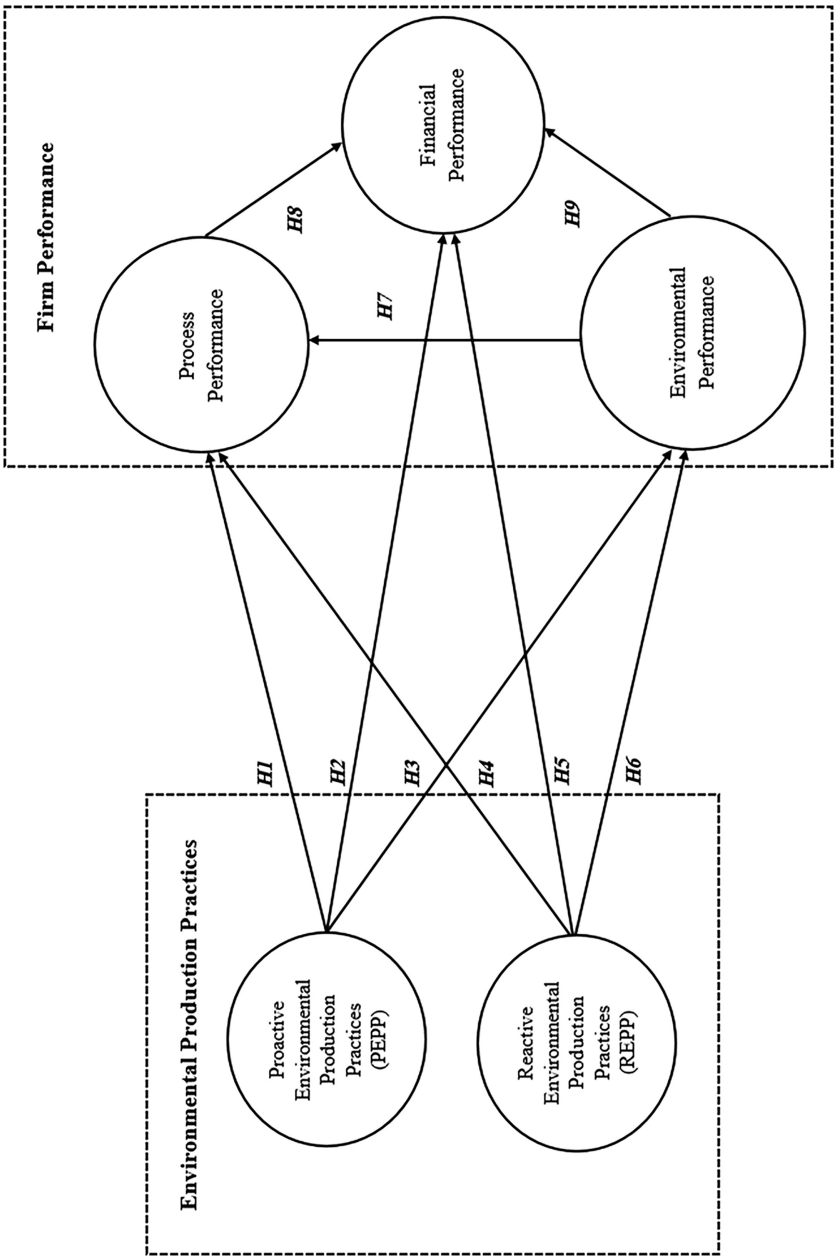

Figure 1.
Conceptual framework and hypothesis

H8. Process performance has a positive influence on financial performance.

H9. Environmental performance has a positive influence on financial performance.

3. Research method

3.1 Data collection and common method bias (CMB)

The rapid rise in manufacturing SMEs to constitute over 90% of key industries as indicated by the OECD report (2010) motivated basing empirical study on a sample of manufacturing SMEs operational in the Ghanaian manufacturing sector. A thorough review of literature on the variables adopted in the study, namely; proactive and reactive environmental production practices, process performance, environmental performance and financial performance, led to the development of questionnaires used to solicit data from managers of manufacturing companies. From the list of 1,000 manufacturing firms obtained from manufacturing associations, 278 samples were randomly selected using Krejcie and Morgan's sampling technique. This sample size is representative for the list of 1,000 SMEs obtained from manufacturing associations using Krejcie and Morgan's sampling technique. The questionnaires were developed following the guidelines stipulated by Podsakoff *et al.* (2003) to curb issues of CMB. Particularly, the questionnaires promised anonymity to respondents and obtained measures from diverse sources and well separated sections of measured items, coupled with others.

The questionnaires were sent to managers of selected firms together with a cover letter detailing the purpose of the study via e-emails, which were obtained together with the list from manufacturing associations, and follow-ups were done to show appreciation and serve as reminders for non-respondents after two to three weeks interval. Questionnaires were sent out during August 2019 to selected manufacturing firms operational in the Ghanaian manufacturing sector, and after a period of two months, 218 questionnaires were received out of the total 278 questionnaires sent out, representing a response rate of above 70%. Further scrutiny of the data indicated that 18 of the received questionnaires were inconclusive, containing missing values and as such, and could not be used in the data analysis. In line with Baah *et al.* (2020), we measured CMB using the Harman's one factor test. Analysis using EFA and the principal component analysis extraction method procedure indicated that this study is free from CMB since the single factor explained 39.5% of the cumulative variance.

3.2 Measurement items description

The questionnaires included items to measure proactive and reactive environmental production practices, process performance, environmental performance and financial performance based on a rigorous review of literature since the study is exploratory in nature. These items were measured using a 5-point Likert scale (where 1 represented strongly disagree, to 5 representing strongly agree) to portray the extent to which respondents either agreed or disagreed to each measurement item as applicable in their respective manufacturing firms. Each variable captured five measurement items in the questionnaire, but to enhance model and path strengths, items that had factor loadings <0.70 were removed from the model and have been marked with * in Table 2. Table 1 reflects the characteristics and product type of manufacturing firms captured in this study. Additionally, the demographics of the sample size as captured in Table 1 reflect the demographics of the entire population in that most SMEs operational in the manufacturing sector are into the production of similar product type and have similar employee numbers among other characteristics reflected in Table 1.

Table 2 highlights the measurement items and their respective loadings, and items marked with * were deleted from the model during confirmatory factor analysis (CFA) because such items had loadings of <0.70.

3.3 Constructs reliability and validity

This study being exploratory in nature adopted a survey research design, a quantitative approach and partial least square structural equation modelling (PLS-SEM) technique in making data analysis and interpretations due to its suitability for predictive research models as employed in this study as well as exploratory studies (Hair *et al.*, 2013). Additionally, the research adopts a positivist methodological paradigm, which involves formulating and testing hypotheses empirically. As such, SmartPLS 3 software, which is grounded in regression-based path and principal components factor analysis and is efficient in testing and generating standardized regression for paths in structural models as well as factor loadings for measurement items, was employed. Moreover, PLS-SEM assesses a structural model performance and suitability based on measurement criteria that investigate the model's reliability and validity (Henseler *et al.*, 2015). These criteria, according to Henseler *et al.* (2015), should reflect factor loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE) and Heterotrait-Monotrait ratio (HTMT) ratio. The authors further indicated that factor loadings, Cronbach's alpha, composite reliability, AVE and HTMT ratio should have ≥0.70, ≥0.70, ≥0.60, >0.50 and <0.90, respectively. SmartPLS 3 further assesses multicollinearity issues as connoted by Ringle *et al.* (2015) by suggesting that collinearity statistics (both inner and outer VIFs (Variance Inflation Factor)) indicating best results

Firm characteristics	Frequency	(%)
Number of employees		
<10	25	12.5
11–50	31	15.5
51–100	45	22.5
101–500	49	24.5
>500	50	25
Product type		
Wood, lumber products and processing	37	18.5
Leather products and processing	29	14.5
Textile and fabric products	32	16
Food and beverages	40	20
Rubber and other plastic products	23	11.5
Stationery and allied products	15	7.5
Others	24	12
Work experience (years)		
1–5	48	24
6–10	59	29.5
11–15	47	23.5
Over 15	46	23
Job qualification		
Owner	58	29
Manager	60	30
Assistant manager	50	25
Department heads/supervisors	32	16

Table 1. Profile of respondents ($n = 200$)

Construct	Item	Measurement item	Factor loadings	Collinearity statistics (outer VIF)
Proactive environmental production practices	PEPP1	We engage in voluntary environmental production education for all supply chain partners and stakeholders	0.772	1.415
CA: 0.769	PEPP2*	We ensure the participation of environmental production managers across our supply chain in strategic planning	0.642	–
CR: 0.867	PEPP3*	We integrate diverse stakeholders in environmental production concerns or issues	0.635	–
AVE: 0.686	PEPP4	We engage in both internal and external environmental production practices reporting	0.830	1.764
	PEPP5	We frequently monitor and evaluate environmental production systems and procedures	0.879	2.135
Reactive environmental production practices	REPP1	Our company invests in green production processes to produce safer and eco-friendly products	0.875	2.779
CA: 0.926	REPP2	Our company strives to reduce production and processes that lead to environmentally harmful products	0.841	2.341
CR: 0.944	REPP3	Our company improves production processes to avoid raw material waste and high energy consumption	0.876	2.905
AVE: 0.773	REPP4	Our company reduces waste and emissions through recycling programs, reverse logistics, among others	0.888	3.220
	REPP5	Our company changes product and material specifications as well as strives to meet minimum legislations	0.915	3.974
Process performance	IPP1	Our firm frequently reconfigures production processes to improve quality and speed	0.772	1.674
CA: 0.762	IPP2	Our firm ensures supply chain and production processes flexibility, accuracy and transparency	0.751	1.540
CR: 0.843	IPP3	Our firm promotes product and process innovation through sustainable production and supply chain processes	0.772	1.245
AVE: 0.574	IPP4*	Our firm production processes project efficiency and effectiveness as well as competitiveness	0.646	–
	IPP5	Our firm processes due to environmental practices ensure reduced production cost and high productivity	0.735	1.670
Environmental performance	EP1	Our firm minimizes environmental impacts of its operations	0.711	1.568

Table 2. Measurement items and constructs reliability and validity

(*continued*)

Construct	Item	Measurement item	Factor loadings	Collinearity statistics (outer VIF)
CA: 0.795	EP2	Encourage stakeholders involvement in planning and executing environmental practices	0.829	1.991
CR: 0.862	EP3*	Allow environmental audits	0.634	–
AVE: 0.61	EP4	Adoption of cleaner production methods	0.809	1.389
	EP5	Our firm reuses and recycles materials	0.772	1.716
Financial performance	FP1	Return on sales	0.846	2.241
CA: 0.876	FP2*	Return on equity	0.540	–
CR: 0.915	FP3	Return on investment	0.863	2.406
AVE: 0.729	FP4	Profit margin	0.863	2.242
	FP5	Net profit	0.842	1.969

Note(s): * – deleted item; CA – Cronbach's alpha; CR – Composite reliability; AVE – Average variance extracted

Table 2.

should be <3. However, according to Ringle *et al.* (2015), VIFs of <5 are also deemed as acceptable and should pose no major issues of multicollinearity.

The analysis and results of the study connoted the constructs have internal consistency reliability as measured by Cronbach's alpha and composite reliability. From Table 2, the Cronbach's alpha and composite reliability of the constructs were within the range 0.762–0.926 and 0.843–0.944, respectively, above the recommended thresholds, thus indicating the model has reliability. Additionally, the scrutiny of collinearity statistics indicated that the model has no issues of multicollinearity since most items had outer VIF <3 except for REPP4 and REPP5 which had values of >3 but <5, thus posing no multicollinearity threats. Additionally, inner VIFs between proactive and reactive environmental production practices of environmental, financial and process performances were 1.000, 1.034, 1.024 and 1.000, 2.657, 2.087, respectively. The inner VIFs between environmental performance on process and financial performances were 2.111 and 2.303, respectively, while the inner VIF between process performance on financial performance was 2.258, further proving no issues of multicollinearity. We further investigated validity using AVE and from the results construct AVEs which were above the recommended threshold of >0.50 because AVEs ranged between 0.574 and 0.773. AVE is vital in that a value of >0.50 reflects that the construct predicts more than half of its factor variance. This study being exploratory in nature relies on predictive measures such as the AVE, Stone Geisser's Q^2, path coefficients, t-statistics and p-values to make relevant interpretations.

Next, we investigate the discriminant validity of the model using Fornell-Lacker criterion and HTMT ratio. Fornell-Lacker criterion as explained by Henseler *et al.* (2015) has the fundamental reliance on AVE. Thus, it emphasizes a model achieves discriminant validity when the square root of AVEs is larger when compared with correlations of other variables in the structural model. The Fornell-Lacker criterion results presented in Table 3 indicated that the model achieves discriminant validity.

As the current best method to examining discriminant validity, the HTMT ratio, which presents estimates of correlations by examining the hetrotrait-heteromethod correlations relative to monotrait-heteromethod correlations, projects that a structural model has discriminant validity when HTMT ratios are <0.90. From Table 3, it is evident the model achieves discriminant validity since all ratios were below 0.90.

Fornell-Lacker criterion Construct	1	2	3	4	5
1. Environmental performance	0.781				
2. Financial performance	0.651	0.854			
3. Proactive environmental Production practices	0.107	−0.088	0.828		
4. Process performance	0.660	0.668	0.102	0.758	
5. Reactive environmental Production practices	0.718	0.759	0.002	0.712	0.879
HTMT ratio Construct	**1**	**2**	**3**	**4**	**5**
1. Environmental performance					
2. Financial performance	0.731				
3. Proactive environmental Production practices	0.149	0.121			
4. Process performance	0.768	0.758	0.151		
5. Reactive environmental Production practices	0.782	0.840	0.046	0.796	

Table 3.
Discriminant validity

3.4 Structural model assessment

In addition to proving the model has reliability and validity, the next step assesses the structural model as well as hypotheses by examining the variances of endogenous variables explained by exogenous variables (i.e. R square), the model's predictive relevance using Stone-Geisser's Q^2, path coefficients (β) and significance levels (p-values). Hair *et al.* (2013) indicated that studies that are exploratory in nature need to report Stone-Geisser's Q^2 to show predictive relevance, and thus PLS as a structural equation modelling tool is considered ideal for such studies. Stone-Geisser's Q^2 values are obtained by running the blindfolding procedure, and it is deemed a model has predictive relevance when Q^2 values are >0. From Table 4, the blindfolding procedure indicated that environmental performance ($Q^2 = 0.285$), financial performance ($Q^2 = 0.450$) and process performance ($Q^2 = 0.291$) have predictive relevance because Q^2 values are >0 as suggested by Hair *et al.* (2013). Moreover, the structural model predicted 52.6% variance of environmental performance, 63.7% variance of financial performance and 55.7% of the variance of process performance. The R^2 values adjusted of environmental performance, financial performance and process performance were also 52.1, 62.9 and 55.0%, respectively, as indicated in Table 4.

4. Results

The analysis and scrutiny of data connoted in Table 5 and Figure 2 that the first hypothesis, which sought to establish a positive relationship and influence of proactive environmental production practices on process performance, was supported ($\beta = 0.070$, $T = 1.309$,

Endogenous constructs	R square (R^2)	R square adjusted	Stone-Geisser's Q^2
Environmental performance	0.526	0.521	0.285
Financial performance	0.637	0.629	0.450
Process performance	0.557	0.550	0.291

Table 4.
Structural model R^2 and Q^2

Hypothesis testing	Beta coefficient (β)	Standard deviation	T statistics	p-values
H1 (s): Proactive environmental production practices have a positive impact on process performance	0.070	0.053	1.309	0.191
H2 (ns): Proactive environmental production practices have a positive impact on financial performance	−0.131	0.043	3.067	0.002
H3 (s): Proactive environmental production practices have a positive impact on environmental performance	0.106	0.054	1.960	0.050
H4 (s): Reactive environmental production practices have a positive impact on process performance	0.503	0.064	7.851	0.000
H5 (s): Reactive environmental production practices have a positive impact on financial performance	0.469	0.076	6.197	0.000
H6 (s): Reactive environmental production practices have a positive impact on environmental performance	0.717	0.034	21.126	0.000
H7 (s): Environmental performance has a positive influence on process performance	0.292	0.067	4.320	0.000
H8 (s): Process performance has a positive influence on financial performance	0.231	0.064	3.629	0.000
H9 (s): Environmental performance has a positive influence on financial performance	0.176	0.074	2.380	0.017

Note(s): s – supported; ns – not supported

Table 5. Structural model hypotheses

$p = 0.191$). Although the study results support the hypothesized relationship, the beta coefficient was small and the relationship not significant. This finding contrast with other findings, suggesting that engaging in proactive environmental practices robustly improves process performance (Zhu and Sarkis, 2007; Shashi *et al.*, 2019; Baah *et al.*, 2020). However, it is vital to state that in developing countries, with several manufacturing SMEs not having the financial capacity to engage in proactive environmental practices, the above results seem reasonable because very few SMEs have started incorporating proactive initiatives into production practices. From the above, it is to an extent conclusive that the reason for the small beta coefficient and insignificant impact is due to low proactive environmental production practices currently being implemented in the Ghanaian manufacturing sector.

Hypothesis 2, which also highlighted the positive association of proactive environmental production practices on financial performance, was not supported. The findings ($\beta = -0.131$, $T = 3.067$, $p = 0.002$) indicated a negative relationship between proactive environmental production practices and financial performance as initially suggested by Baah *et al.* (2020) and Shashi *et al.* (2019). The authors indicated that engaging in proactive environmental production practices in the initial adoption and implementation phase negatively relates with financial performance due to the strain it imposes on finances. Although some respondent firms have been able to implement proactive practices, enabling them to accrue significant financial gains, most respondent firms in the study are short run in that these firms lack the financial capacity or strength to undertake or engage in proactive initiatives or practices in relation to environmental sustainability and, as such, face negative financial impacts should they try to engage in proactive practices. However, the presence of other factors may contribute to this relationship since proactive initiatives are not only limited to proactive environmental production practices. This connotation further supports the study in asserting that concerning the proactive environmental production practices, it is vital to indicate the study sector is in its initial phases of adoption and implementation. As such, despite several

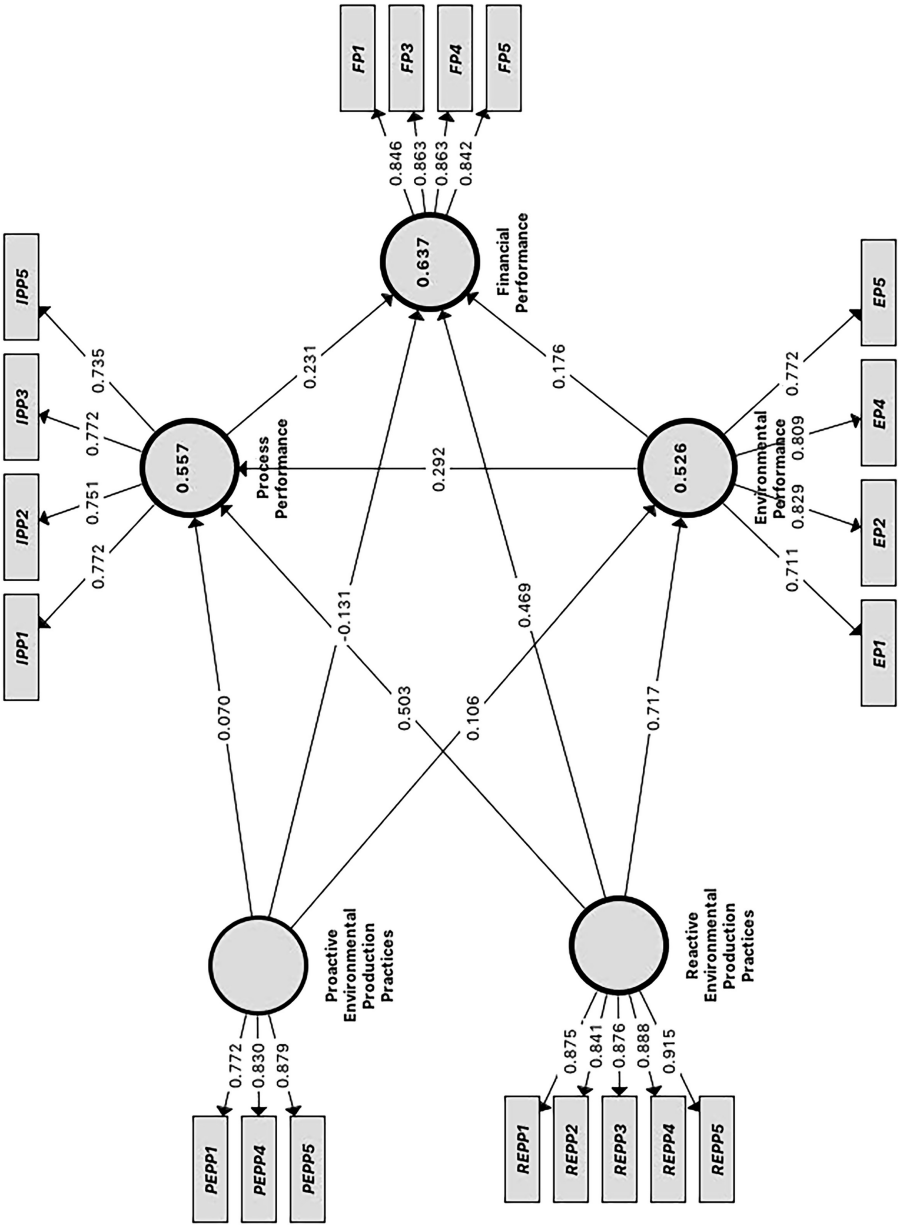

Figure 2.
Structural model with factor loadings, beta coefficients (β) and R squares (R^2)

scholars (Zhu and Sarkis, 2007; Kantabutra, 2012) indicating a positive link between proactive initiatives and financial performance in the long run, the short run poses significant financial influences, thus establishing a negative relation.

The data analysis further indicated that hypothesis 3, which centred on the positive impact of proactive environmental production practices on environmental performance, was supported. This result harmonizes with scholars in asserting that engaging in proactive environmental initiatives improves the environmental performance of firms (Kim and Lee, 2012). The results ($\beta = 0.106$, $T = 1.960$, $p = 0.050$) suggested an insignificant impact although it supported the hypothesized relationship. This can be attributed to the fact that currently only few proactive initiatives are adopted and are being implemented. This also highlights that although manufacturing firms are taking measures to produce or manufacture in accordance to legislations, few are taking steps to go beyond minimum requirements, and as such it can be noted that, concerning proactive environmental production practices, the Ghanaian manufacturing sector is in its initial phase of adoption based on the study findings.

Furthermore, interpretation of the data analysis suggested that reactive environmental production practices had positive influence on process performance, financial performance and environmental performance, thus supporting hypotheses 4, 5 and 6. Particularly, reactive environmental production practices had a robust effect on process performance ($\beta = 0.503$, $T = 7.851$, $p = 0.000$), thereby supporting and agreeing with the findings of Melnyk *et al.* (2003) and Marshall *et al.* (2015). Melnyk *et al.* (2003) and Marshall *et al.* (2015) asserted that engaging in reactive environmental initiatives significantly leads to the adoption and implementation of the best practices which further lead to better and enhanced process performance. The finding of the study reasonably supports the above assertion since the link was positively robust and significant. Additionally, the findings also supported hypothesis 5, which stipulates that reactive environmental production practices have a positive influence on financial performance. This findings ($\beta = 0.469$, $T = 6.197$, $p = 0.000$) indicated a positive link in line with the findings of Kim and Lee (2012) by showing that although initial phases of accepting and adopting environmental production practices can be costly and present financial burdens, the gains that will accrue after full integration are enormous and significant. Mostly regulatory stakeholders in addition to other stakeholders have pressured the manufacturing sector under study into the adoption of green production techniques. Firms operational in this sector in order to avoid bad publicity and damage to goodwill, market share and other key business areas have no choice than to comply with set regulations and standards because failure on their part will lead to sanctions and litigations. Thus, in harmony with Baah *et al.* (2020), this study indicates that reactive environmental production practices present robust and significant impact on financial performance in the long run.

Hypothesis 6 establishes that reactive environmental production practices positively influences environmental performance ($\beta = 0.717$, $T = 21.126$, $p = 0.000$). The effect was robust, large and significant mainly because most of manufacturing SMEs in the industry have the obligation of meeting minimum legislations related to sustainable production, and, as such, most firms engage in reactive environmental production practices as compared to proactive practices. However, the findings harmonize with that of Gonzalez-Benito and Gonzalez-Benito (2006) in asserting that meeting green or sustainable legislative requirements significantly boosts a firm's environmental performance, and hence recommended firms, no matter their size, to engage in such practices while reporting to stakeholders to ensure maximum benefit returns.

In addition, hypothesis 7, which states that environmental performance has a positive influence on process performance, was supported. Specifically, the finding ($\beta = 0.292$, $T = 4.320$, $p = 0.000$) suggested that environmental performance which comprises of the adoption and implementation of both reactive and proactive environmental practices has a

significant and a positive effect on process performance. This is mostly because such green practices lead to better production processes, material and waste reduction, less pollution and noise among others. Hypothesis 8, which was supported, established the positive and significant influence of process performance on financial performance. The results ($\beta = 0.231$, $T = 3.629$, $p = 0.000$) in line with that of Shashi *et al.* (2019) indicate that firms that adopt better production processes such as timely product innovations, process reconfigurations, material and waste eliminations as well as other cleaner production techniques will ensure improved or high financial performance. The study supports this finding by highlighting that although engaging in both reactive and proactive green production practices is initially costly, it leads to better production processes that ensure high financial gains and performance in the long run. The final hypothesis 9, which establishes the effect of environmental performance on financial performance, was supported. In fact, several studies over the past few years have rigorously tested this hypothesized relationship, and most of these studies indicate positive outcomes (Kim and Lee, 2012; Shashi *et al.*, 2019; Baah *et al.*, 2020). This study details findings ($\beta = 0.717$, $T = 21.126$, $p = 0.000$) that support these studies in suggesting that environmental performance leads to stakeholder endorsements, social and moral capitals, larger market share, goodwill and improved brands which eventually result in more sales and high financial gains. Thus, it is undeniable in specifying that adoption of environmental production initiatives leads to enhanced environmental performance, which also leads to improved financial performance.

Conclusively, this study relied on the institutional theory specifically, institutional isomorphism and organizational legitimacy to projects findings, which indicate that different conditions and technologies in developed and developing countries specifically regarding business environments critically affect the ability of diverse firms to adopt certain environmental initiatives.

5. Discussion and conclusion

The rapid depletion of the Earth's resources among other environmental concerns necessitates the need for proactive approaches to environmental practices as compared to reactive practices. This study was positioned in a developing country's context to better understand environmental preservation orientation approaches currently needed on the ground. The study indicated that among proactive and reactive environmental production practices, the manufacturing sector, as captured in this study, mostly and largely engaged in reactive practices as compared to proactive practices. Although the projected result is acceptable and noteworthy, reactive initiatives are widely adhered to because of institutional isomorphism, the need for organizational legitimacy and the coercive nature and legal consequences environmental legislations and standards come with (Backer, 2007; Tsinopoulos *et al.*, 2018). Presently, sustainable production practices are deemed as compulsory and not optional. As such, manufacturing firms have the perceived legal obligation of reconfiguring production practices to promote sustainability. Additionally, while the differentiation between proactive and reactive environmental practices is vital in achieving competitive positions, the motivation which mostly pushes for proactive environmental initiatives can be associated with the rising scrutiny and demand to protect and preserve the environment. On the other hand, most firms are motivated to engage in reactive environmental practices mostly because of reducing cost, which may come from sanctions and litigations as a result of lack of compliance to regulations and legislations which will also lead to bad publicity and reputation. The above shows firms, in their effort to gain legitimacy from stakeholders, need to fully understand their motivations for undertaking environmental production practices and act accordingly.

This study sought to understand the effect of environmental production practices on firm performance from a reactive and proactive approach. This step is vital because the rapid increase in environmental concerns requires the adoption of proactive environmental production practices to efficiently and effectively respond to environmental preservation concerns. The results suggested that although in developing countries proactive practices are on the rise, reactive practices tend to dominate developing countries. Firm performance was also captured from both financial and non-financial perspectives by adopting process, environmental and financial performances. The results indicated reactive environmental production practices robustly and significantly influenced process performance, environmental performance and financial performance, while proactive environmental production practices had lower and insignificant impacts on process performance and environmental performance. Additionally, proactive environmental production practices negatively and significantly influenced financial performance, thus agreeing with the findings of Shashi *et al.* (2019).

Further basing on the institutional theory, the results indicate that most firms adopt reactive environmental production practices due to institutional isomorphism. Firms are influenced by what happens in their business environments and that social factors influence decisions and strategies leading to the adoption of certain practices in this case environmental production practices. As such, the large or robust influence of reactive environmental production practices as compared to the low impact of proactive environmental production practices on firm performance suggests that reactive practices dominate the sector and adopting reactive environmental production practices will result in achieving legitimacy from stakeholders, both regulatory and non-regulatory. On the other hand, if proactive environmental production practices dominated the sector, most firms will orient towards proactive practices on the basis of institutional isomorphism, and legitimacy will only result from engaging in proactive practices. This study also projects findings from a developing country's perspective since several studies conducted on environmental production practices focusing on proactive and reactive approaches have been conducted in developed countries. Although the findings in relation to the effects of reactive environmental production practices on process performance, environmental performance and financial performance agrees with previous studies (Easley and Lenox, 2006; Backer, 2007), proactive environmental production practices influence on process performance, environmental performance and financial performance present new findings which to an extent contradicts past studies. These variances in findings can be attributed to differences in government and environmental legislations, technology, working and business environments among others.

5.1 Implications for theory

The study aimed to assess the effects of proactive and reactive environmental practices on process, financial and environmental performances. Based on the objective, we explored the need to adopt environmental production processes from the institutional theory perspective, focusing on institutional isomorphism and organizational legitimacy. On the basis of institutional isomorphism, firms in developed countries due to early adoption of sustainable production practices are now mostly proactive, whereas firms in developing countries are now picking up pace in terms of environmental practices, hence are reactive-based. The study results indicate that most firms are engaged in reactive environmental practices because sustainable practices in the industry are mostly reactive in nature. This result is consistent with the view of isomorphism in that firms adapt to norms existing in industries in specific relation to practices, processes and strategies.

Organizational legitimacy, which is based on isomorphism as connoted in this study, indicates that firms by engaging in reactive environmental practices gain significant levels of legitimacy as compared to firms that do not engage in any sustainable practices. Those few firms that have the financial capacity and strength to engage in proactive environmental practices gain enormously and are mostly industry movers. Such firms have good legitimacy from diverse stakeholders due to good stakeholder perceptions and endorsements. From the discussion, there is support that the decision to adopt environmental orientation is to an extent based on institutional isomorphism and the need to gain legitimacy. In summary, institutional theory determines the adoption of environmental practices in an industry since a firm's environment to a large extent impacts decisions, strategies and practices. As such, firm operating in industries, where reactive practices are the normal practices, will also adopt same practices so as to gain legitimacy and not deviate from the norm as is the case in this study.

5.2 Implications for practice

In particular, the study provides a basis for SMEs in Ghana to further improve environmental knowledge and awareness of diverse stakeholders by engaging them in environmental initiatives and planning. Furthermore, understanding and implementing best environmental production practices by Ghanaian SMEs will better position such firms to increase process efficiency, reduce cost, minimize raw material wastage and optimize cleaner production practices, which will eventually result in increased productivity and better adherence to legislations. This will ensure improved process, financial and environmental performances. The demands to reconfigure production techniques and processes to reflect environmental values have been costly, especially in the implementation phase for manufacturing firms. As such, managers aiming to reduce costs in the implementation phase can collaborate with external environmentally conscious stakeholders to gain support and introduce and improve production processes. Again, managers aiming to improve the environmental performance of their SMEs should engage in industry environmental practices in addition to cooperating with diverse stakeholder groups to gain legitimacy and social and moral capitals from stakeholders. Additionally, managers that are centred on attracting environmentally conscious investors, customers, suppliers, among others, can refer to the findings of this study to engage in environmental practices which will aid in achieving desired results. Policy-makers have a role to play to aid companies, especially manufacturing SMEs in this case, to embrace green production practices by setting policies that subsidize proactive environmental initiatives since more environmental proactiveness or responsiveness is needed in the manufacturing sector to curb negative environmental impacts, leading to improved process performance as well as cleaner production techniques, especially regarding product material and resource use, product innovation, product packaging, product development, product recycling, among others, with the aim of manufacturing safer consumer products that preserve the environment as well.

5.3 Limitations and future research

The study has some limitations, which can be improved upon in future studies. To start with, the study was based on survey data and thus may present some level of bias in response. Although issues of biases were resolved in this study, using Harman's one-factor tests, future studies can consider other methods of attaining data that present none or low bias. Again, future studies can capture other variables not captured in this study since changes in market trends and technologies are presenting manufacturing firms with new confrontations and uncertainties. Finally, capturing more study variables in a future study with data collected overtime also will significantly help evaluate the long-term impact of environmental

production practices in the manufacturing context, thus helping understand environmental production practices and how they relate to firm performance in the long term.

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