Modeling the implications of sustainable supply chain practices on sustainable performance in Ghana’s petroleum industry: the role of stakeholders’ pressure

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ABSTRACT

The influx of Agenda 2030 for Sustainable Development and the COP 21 has necessitated the need for a paradigm shift in traditional consumption and production to reflect a balance between environmental safety, social justice and profitability. The Ghanaian Petroleum Industry is predominately fossil fuel-based with higher level of carbon and methane emissions. Ensuing from the Stakeholders’ and the Resource-Based View theories, this paper aims to develop a model to explain the relationship between sustainable supply chain management (SSCM) practices and sustainable performance (SP) by examining the extent to which pressure from stakeholders could strengthen the proposed model in the context of downstream petroleum supply chain. Variance-Based Partial Least Square method has been used to analyse a cross-sectional data from Oil Marketing companies in Ghana. Our results have revealed that SSCM practices such as environmental, economic, and social are positively related to SP. Moreover, stakeholder’s pressure positively and significantly relates to SP. Again, stakeholders’ pressure significantly moderate the relationships between environmental and social dimensions of SSCM practices and SP. By implications, there is an emergency of an SP model with enhanced predictability. Again, policymakers and advocates can achieve greater sustainability by maximising stakeholders’ pressure.

1. Introduction

It has now been apparently acknowledged that the world is skewed towards achieving the United Nations’ (UN) Agenda 2030 and the Paris Climate Agreement for Sustainable Development. In addition, the African Union (AU) in particular has adopted Agenda 2063 Goals which extend beyond the UN Agenda 2030 with the aim of addressing its fundamental sustainable development challenges (Kititis and Chen 2020; Appiah, Sedegah, and Akolaa 2021a; Solovida and Latan 2021; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022). Sustainable development in the context of this paper encompasses a carefully designed strategy to achieve economic growth through more efficient use of resources and maximising immediate and long-term benefits for the planet and its people. Sustainable development means changing technologies that are developed and used to conserve and improve resources. All countries must meet basic needs such as jobs, food, energy, water and sanitation. Economic growth has had a negative impact on the environment, especially in the last two decades (Ortas et al., 2014). The world’s natural resources are used inefficiently and the environment is wasted, leading to dangerous consequences such as deteriorating air quality and global climate change (Wang and Dai, 2018). To achieve effective sustainable development, social equity, economic prosperity and environmental sustainability must be pursued simultaneously and linked together in a coherent and credible effort (Kumar and Rahman 2016; Dey et al., 2019; Sun et al., 2020; Alonso-Martinez, De Marchi, and Di Maria 2021). Putting these strategies into practice means promoting low-carbon technologies and public transport, climate-smart agriculture, resource efficiency, energy efficiency and global supply chain efficiency.

Ensuing from the Stakeholders’ and the Resource-Based View (RBV) theories this paper aims to develop a model to explain the relationship between sustainable supply chain management (SSCM) practices and sustainable performance (SP) by examining the extent to which pressure from stakeholders could strengthen the proposed model in the context of downstream petroleum supply chain where such studies remain largely unexplored. The present study focuses on Sustainable Supply Chain (SSCM) Practices and how it is aligned to SP, and the extent to which stakeholders’ pressure strengthens the existing relationship between SSCM practices and SP with a focus on emerging economy where such studies have empirically remained fuzzy. Given that the Ghanaian Petroleum Industry is predominately fossil fuel based with higher level of carbon and methane emissions there is the need to develop a new model to encourage sustainability practices in the sector. To address the objective of the paper, we have developed three categories of determinants (contributions) of SP in the context of oil marketing and distribution sector in Ghana.

The first category of determinants is SSCM practices. SSCM practices comprise economics, social, and environmental...
practices. These practices encompass general activities that work interrelated to achieve sustainability course. Prior studies (Ahmad et al. 2016; Bikram and Harmee 2017; Chen and Kitsis 2017; Das and Hassan 2021) have described SSCM practices as deliberate attempt to emphasise the integration of social equity, economic prosperity, energy efficiency, and environmental sustainability into supply activities in order to argument SP. SSCM practices are structured into three, namely, social environmental and economic. Each dimension contributes uniquely into SP within any given supply chain system. The economic dimension of SSCM is about building a strong and competitive economy by making enough resources to be available at the appropriate place at the appropriate time in order to support the innovation growth, and by identifying and coordinating the developmental needs (Sanchez-Flores et al. 2020; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022). Moreover, environmental dimension of SSCM is a means protecting and enhancing the natural and managed environment, increasing biodiversity, using natural resources wisely, reducing waste and pollution, and supporting climate change adaptation and mitigation, including the global transition to a low-carbon economy. The social dimension promotes strong, vibrant and healthy communities by providing housing and quality development that meets the needs of current and future generations, with accessible local services that reflect the needs of the community and promote health, social and cultural well being. This applies to all areas of development, including urbanisation, agriculture, infrastructure, energy, water and transport (Baah and Jin 2019; Fantasy and Tipu 2019; Carter et al. 2020).

The second category of determinants is stakeholder pressure. Stakeholders hold companies accountable on their environmental safety, obligations and compliance (Sodhi and Tang, 2019). Stakeholders strive to integrate sustainability into business culture, and to build social processes of knowledge mobilisation to create sustainable knowledge for the community. Previous researchers (Wang and Dai, 2018; Kitsis and Chen 2019) argue that stakeholder pressure includes the ability and capacity of stakeholders to change organisational behaviour by influencing organisational decisions. We therefore, contend that stakeholders’ pressure coerces firms to comply with environmental regulations and improve sustainability practices.

The third category of determinants focuses on is the moderating effect that emanating from the interaction between the SSCM practices and stakeholder’s pressure. We argue that the interactive effect of the stakeholder pressure and SSCM practices exerts significant influence on SP. At this final stage an integrated model comprising SSCM practices, stakeholder pressure, and SP is developed. This paper contributes to strategies and policies required to facilitate the implementations of the recommendations by the intergovernmental Panel on Climate Change (IPCC) including the need for a paradigm shift in traditional consumption and production to reflect a balance between environmental safety, social justice and profitability. Particularly investment that seeks to promote carbon capturing and carbon dioxide removal are encouraged. Also, the emergency of integrated model offers investors and practitioners robust strategy to improve their wellbeing, decent work while taking actions to mitigate against climate change and its impacts. Our paper seeks to answer the following critical questions in order to add up to the existing knowledge stock.

(i) What are the relationships between SSCM practices and SP in the downstream petroleum sector?
(ii) To what extend do stakeholders’ pressure affect SP in the downstream petroleum sector?
(iii) What is the moderating effect of stakeholder’s pressure in between SSCM and SP in the context of the Ghanaian downstream petroleum sector?

The remaining sections of the paper are structured as follows: The phase two presents the theoretical framework and hypothesizes development. The third phase presents the research methodology, the fourth phase presents results and discussions and the final phase presents the conclusions and implications.

2. Theoretical background and framework

Our newly developed SP model is based on assumptions of Stakeholders’ theory and RBV. We have argued that for a firm to build a robust SP. It requires resources commitment and capability to put these resources to effective use. This is where RBV theory comes strong. Barney (2001) in his seminal work, RBV argues that resources are unevenly distributed as such some firms are uniquely positioned in terms of rare resources, valuable resources, and irreplicable resources are unique than the others. The theory further argues that these resources in aggregate form competitive advantage of a firm which can be used to derive SP. Again, SP requires leaving no one behind. Therefore, all stakeholders both primary and secondary in the Ghanaian petroleum value chain should be identified and properly managed to contribute positively to the sustainability agenda. In this study stakeholder is used broadly to describe group of individuals who can be affected by the activities of a company through the value creation process (Freeman et al., 2007). Freeman et al.(2010) argued that satisfactory answers to these questions are very imperative for a project success. Therefore, we argue that oil marketing and distribution companies should routinely conduct appropriate stakeholder’s analysis both direct and indirect in order to ensure that needs, aspirations and expectations of the stakeholder are incorporated in to the supply chain activities of the oil marketing and distribution companies in order to enhance sustainability of the downstream oil and gas value chain operations. We argue in this paper that stakeholders who are well organised can pressurise the companies involved to incorporate their expectations and needs. These two theories have been applied in previous related studies (Khalid et al. 2015; Jing and Jun 2017; Hong, Zhang, and Ding 2018; Kähkönen, Lintukangas, and Hallikas 2018). We have synthesised the two theories to develop an integrated model (as showed in Figure 1) A key external environmental variable (stakeholder pressure) will be taken into account and its moderating effect on these linkages will be examined on SSCM practices and SP, and examine the operating context in which SSCM practices in oil marketing and distribution are likely to influence SP. The Figure 2 shows the path co-
coefficient of the model while Figure 3 presents the factor loadings of the model.

2.1 Empirical review and hypotheses development

2.1.1 Economic dimension of SSCM and Environmental Performance (EP)

The first proposition of the study is that economic dimension of the SSCM has relationship with (EP) which is supported empirically (Svensson and Wagner 2015; Hamdy, Elsayed, and Elahmady 2018; Hourneaux, Gabriel, and Gallardo-Vázquez 2018; Solovida and Latan 2021; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022). Based on theories (stakeholder theory, RBV theory), it has been stated that the main objective of any business, company, or organisation is to generate profits and satisfy the demands of stakeholders. Therefore, SSCM should be integrated to ensure profits while effectively protecting the environment and society; corporate organisations should consider implementing sustainable practices in order to enhance profitability to maintain long-term improvements and financial stability of the company (Carter and Easton 2011). It appears that companies wishing to implement sustainable practices in their supply chains must balance the conflicting goals of generating profits, reducing negative environmental impacts, and meeting various social obligations. The relationship between SSCM practices and economic value...
creation. Thus, the economic sustainability endeavour to achieve greater economic benefits including financial performance, competitive advantage, cost minimisation, and profitability. Attaining these benefits come with a commitment towards knowledge sharing, optimisation of logistics, and cost efficiency strategies (Winter and Knemeyer 2013). Therefore, we hypothesise that:

**H1:** economic dimension of SSCM positively and significantly relates to EP

**H5:** Stakeholder’s pressure significantly moderates the relationship between economic dimension of SSCMP and SP

### 2.1.2 Environmental dimension of SSCM and Environmental Performance (EP)

The second proposition of the study is that environment dimension of the SSCM has relationship with EP which is empirically (Ageron, Gunasekaran, and Spalanzani 2012; Wang and Sarkis 2013; Das 2018; Hourneaux, Gabriel, and Gallardo-Vázquez 2018; Solovida and Latan 2021; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022) supported. Inferring from stakeholder’s theory, we contended that environmental dimension of SSCM focuses primarily on protecting the operating environment of the supply chain. Increased pressure from stakeholders to address environmental issues has led organisations to raise a wide range of environmental issues. However, the very nature of the process allows some companies to adopt sustainable practices (Bevilaqua et al. 2014). Companies should require their suppliers to adopt and adapt sustainability measures, such as sustainable use of natural resources, ethical behaviour, and reduction of greenhouse gas emissions. Greater attention should be paid to measures to manage different waste streams, as hazardous waste and emissions from different companies are the main cause of pollution and environmental damage. The environmental dimension of sustainable development is an important area of research for the SSCM. Environmental considerations provide more tangible benefits than social benefits (Banerjee 2003). The environmental dimensions of the triple bottom line of sustainable development encompass goals, plans, tools, and technologies to increase environmental responsibility and promote clean and green technologies (Klassen 2001; Varnäs, Balfors, and Faith-Ell 2009). Thus, our hypothesis is as follows:

**H2:** environmental dimension of SSCM positively and significantly relates to EP

**H6:** Stakeholder’s pressure significantly moderates the relationship between environmental dimension of SSCM practices and SP

### 2.1.3 Social dimension of SSCM and Environmental Performance (EP)

The third proposition of the study is that social dimension of the SSCM has relationship with environmental performance which is empirically (Sharma and Ruud 2003; Paurraj and Blome 2017; Solovida and Latan 2021; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022) supported. The social dimension relates to promoting strong, vibrant and healthy communities, creating housing that meets the needs of current and future generations, and ensuring quality development through the provision of accessible local services that reflect the needs of the community and promote health, social and cultural well-being. This applies to all areas of development, including urbanisation, agriculture, infrastructure, energy, water and transport (Baah and Jun 2019; Fantazy and Tipu 2019; Carter et al. 2020). Social dimension of sustainability has evolved to include important elements such as social equity, poverty reduction, human right, women and children right protection and general workers wellbeing. The proponents of social sustainability further argue that firms that operate in socially acceptable manner stand the higher possible chance of winning the solidarity of the people, and subsequently enhance its market share. Social sustainability has been regarded as precondition for human survival and development. The present study argues that oil and gas companies that enhance its social performance will drive sustainable competitive advantage and sustainability performance. Therefore, we hypothesise that:

**H3:** social dimension of SSCM positively and significantly relates to EP

**H7:** Stakeholder’s pressure significantly moderates the relationship between social dimension of SSCM practices and SP

### 2.1.4 Stakeholder’s pressure and EP

The fourth proposition of the study is that stakeholder pressure is related to environmental performance, which is empirically proven (Gonzalez-Benito and Gonzalez-Benito 2008; Sarkis, Gonzalez-Torre, and Adenso-Diaz 2010; Dai, Montabon, and Cantor 2014; Jakhar et al. 2020; Yuen et al. 2020; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022). Stakeholder pressure refers to the responsibility that a company must assume in the conduct of its business with respect to actions and decisions related to product design, raw material sourcing, production system use, and distribution networks (Parmigiani et al., 2011). Pressure from stakeholders (e.g. customers, governments, employees) facilitate firms’ socio-economic and environmental commitments. Stakeholders audit firms on environmental issues to ensure compliance with environmental regulations and (Sodhi & Tang, 2019), and embed sustainability in the corporate culture to create sustainable knowledge for the community using social processes of knowledge mobilisation (Chuang & Huang, 2018). Therefore, we formulate the following hypothesis:

**H4:** Stakeholders’ pressure positively and significantly relates to environmental performance

### 3. Research methodology

#### 3.1 Study setting

The Ghanaian petroleum industry currently consists of the oil and gas. The Ghanaian petroleum industry produces a wide range of products, from crude oil and gas to petrochemicals and the final product, bitumen. It is very important to many sectors of the Ghanaian economy and is therefore critical to
economic growth and development. The petroleum industry is by far the most important industry in Ghana in terms of infrastructure (Eshun and Amoako-Tuffour 2016). This industry was chosen for the following reasons; first and foremost, energy from this sector is the main driver of the Ghanaian economy, secondly, the development in renewable energy sources is still at their infancy level, and finally, all the environmental concerns and climate change related issues are mostly caused by oil and gas deployments and usages.

3.2 Population, unit of analysis and sampling procedure
Target population of the study comprised of oil and gas distribution and marketing companies in Ghana. The main inclusion criteria for the selection of the population were: Firms that have operated within the Ghanaian oil and gas value for five (5) years or better, and firm that are Ghanaian owned (including those with lead Ghanaian shareholder). The unit of analysis for the study is at the firm level although individuals answered the questionnaires. Using the rule of ten guidelines (Hair et al. 2014) the lowest number of participants acceptable for the study is 70, however 300 questionnaires were distributed and received 245 usable responses representing 81.7% rate. The actual 245 participants from the oil marketing and distribution companies in Ghana have been selected with the aid of stratified sampling strategy to select. The study adopted type of ownership as strata (public versus private) and within each stratum the participants were selected until the required sample size was attained. Random type sampling technique has been used in this study due to its sampling error reduction and fair representatives’ potentials.

3.3 Study design
The study used a quantitative research method to develop an integrated model that considers SSCM practices, stakeholder pressures, and SP in Ghana’s oil sector. Previous studies have argued that a quantitative research method is an appropriate research method if the ontology of the study is objective. This study used a quantitative research method, which is the use of numbers and statistics. More specifically, the study used a survey method. Researchers use the survey method when costs are limited and easy access to data is needed. This method is often used by small and large companies to understand and analyse emerging trends, market demand, perceptions and opinions. Collecting information through a tactfully designed survey can be much more effective than a random survey.

3.4 Variables and measures
The Table 1, presents the types of constructs, number of items, scale of measurement, and constructs sources. We developed a questionnaire based on the prior literature. For instance, Stakeholder pressure measurement items were adopted and modified from Jakhar et al. (2020), SSCM practices were adopted from adopted and modified Ortas et al. (2014), and SP measures were adopted and modified from Kähkönen, Lintukangas, and Hallikas (2018). A 5-point Likert type scale has been used to measure all the constructs in the study. The highest point of the scale has been scored 5-implying Strongly Agree while the lowest scale has been scored 1-implying Strongly Disagree as shown in the Table 1, economic dimension of sustainable supply chain has been measured with 9 items, environmental dimension has been measured with 3 items, Social dimension has been measured with 7 items, stakeholder pressure has been measured with 3 items, finally SP has been measured with 6 items. All the adopted questions were modified before deployments.

3.5 Instrument for data collection
We adopted structured questionnaire as the main data instrument for eliciting data from the participants. Questionnaires were used as they are commonly used in behavioural surveys to collect intentions, preferences, attitudes, and opinions. Other reasons for using questionnaires in this study were as follows: It is a quick and effective way to collect data from larger population, it is cost-effective compared to other instruments such as interviews, and it can be used to collect a large amount of information from relatively large sample. This study collected data from Oil Marketing and Distribution Companies in Ghana. The study used 5-point Likert type scale (where 5—implies that participants strongly agree to the items and 1 = Implies that participants strongly disagree to the items in question) to measure all the constructs of the study. Several others including (Appiah et al. 2021b) have argued that there 5-point Likert type scale has high predictive accuracy just like the 7-point, 9-point and −11 point scales. All the constructs were measured using an interval type scale except the demographic characteristics that were measured using categorical type scale.

3.6 Data analysis
Variance based PLS software version 3.2.8 was used to analyse the cross-sectional data collected from the Ghanaian oil marketing and distribution companies. The analyses were in two folds; first the construct validity was assessed through convergent validity (CV) and discriminant validity (DV)scores, and second the path coefficients and hypotheses testing were examined. Cronbach’s Alpha and Composite Reliability scores have been used to assess CV. CV was also assessed using the average variance extracted (AVE) score. On the other hand, DV measures the joint variance of variables of interest (Fornell and Larcker, 1981;
Netemeyer et al., 2003). DV has been measured using two approaches. First the square roots of the AVE estimates were used to estimate discriminant validity. Secondly, Henseler et al. (2015) approach was used which suggests that Monte Carlo stimulus-based Heterotrait-Monotrait Ratio (HTMR) Criterion provides a reliable estimate of discriminant validity, and further indicate that when the MTMT score is below 0.90, discriminant validity between two reflective constructs is established. After assessing the scale validations, the model structure was analysed with emphasis on the coefficient of determination (R-square) scores and T-values, the latter has been used to test the hypotheses of the study. The study has formulated two models to be tested. The direct and indirect effects. The direct effect model (without the moderator) measured the effect of SSCM practices on SP, and the indirect effect (Stakeholder pressure). The guideline by Kline and Dunn (2000) has been adopted to empirically test the moderating effects of the model. The moderating effect is basically about cross-multiplication of two or more variables, and analysing its combined effect on endogenous variable (i.e. ECO x SP, EN x SP, SO x SP).

4. Results and discussions

4.1 Descriptive results and factor loadings

With regards to the descriptive results, the study has revealed that all the composite means were greater than 4 and the corresponding standard deviations were less than 1. These results suggest that the statements in the measurement scales have been confirmed by majority of the participants with limited varying views. Again, the factor analysis assumes that there are a number of underlying variables, called factors that explain the relationship between these variables (which are smaller than the variables under consideration). Kaiser-Meyer-Olkin (KMO) is a rule of thumb for the interpretation of statistical data that tests whether the application of factor analysis to a data set is appropriate (Appiah et al. 2021c). For factor analysis to be effective, the KMO score must be at least 0.5 or better. Bartlett’s test of sphericity is expected to provide significant evidence that the variables in the population correlation matrix are not related. Moreover, the items loading must obtain 0.60 score or better otherwise the item is deleted. As showed in the Table 2, KMO test for the constructs exceeded 0.50 in all cases, all the Bartlett’s tests of sphericity were significant (p-value = 0.000), and the items loadings far exceeded the recommended 0.60. These results confirm that the measurement scale is valid as showed Table 2.

4.2 Discrimit validity and convergent validity

Constracts validity of the study were assessed using convergent and discriminant validity, as shown in Table 2. Convergent validity was assessed using Cronbach’s alpha and the CR scores. For example, the Cronbach’s alpha and the CR score exceed the recommended minimum of 0.70. In all these cases the minimum requirements were exceeded (as showed in the Tables 2 and 3). Convergent validity was also assessed using the AVE score. The results show that the AVE scores exceeded the minimum recommended of 0.5. Contrariwise, DV measures the joint variance of variables of interest (Fornell and Larcker, 1981; Netemeyer, 2003). DV has been measured using two approaches. First the square roots of the AVE estimates were used to estimate DV. As shown in Table 2,

| Table 2. EFA on sustainable supply chain management practices. |
|---------------------------------------------------------------|
| **Factor** | **Mean ± SD** |
| Economic Dimension |  |
| ECD1 | 0.932 ± 0.50 |
| ECD2 | 0.918 ± 0.52 |
| ECD3 | 0.967 ± 0.54 |
| ECD4 | 0.915 ± 0.55 |
| ECD5 | 0.915 ± 0.50 |
| ECD6 | 0.943 ± 0.58 |
| ECD7 | 0.974 ± 0.56 |
| ECD8 | 0.966 ± 0.55 |
| ECD9 | 0.938 ± 0.56 |
| Composite Score | 4.54 ± 0.51 |
| Eigenvalue | 7.973 |
| % of Variance | 88.589 |
| Cronbach’s Alpha | 0.984 |
| KMO = 0.913, Chi-Square = 3340.884, df = 36, p-value = 0.000 |
| Social Dimension |  |
| SD1 | 0.975 ± 0.50 |
| SD2 | 0.876 ± 0.50 |
| SD3 | 0.851 ± 0.53 |
| SD4 | 0.963 ± 0.47 |
| SD5 | 0.975 ± 0.50 |
| SD6 | 0.784 ± 0.46 |
| SD7 | 0.964 ± 0.52 |
| Composite Score | 4.50 ± 0.51 |
| Eigenvalue | 5.867 |
| % of Variance | 83.809 |
| Cronbach’s Alpha | 0.966 |
| KMO = 0.735, Chi-Square = 2353, df = 5, p-value = 0.000 |
| Environmental Dimension |  |
| ED1 | 0.956 ± 0.43 |
| ED2 | 0.942 ± 0.54 |
| ED3 | 0.911 ± 0.50 |
| ED4 | 0.955 ± 0.39 |
| Composite Score | 4.37 ± 0.60 |
| Eigenvalue | 3.544 |
| % of Variance | 88.598 |
| Cronbach’s Alpha | 0.957 |
| KMO = 0.747, Chi-Square = 825.960, df = 6, p-value = 0.000 |
| Stakeholders Pressure |  |
| SP1 | 0.985 ± 0.48 |
| SP2 | 0.988 ± 0.49 |
| SP3 | 0.953 ± 0.52 |
| Composite Score | 4.49 ± 0.56 |
| Eigenvalue | 2.857 |
| % of Variance | 95.229 |
| Cronbach’s Alpha | 0.974 |
| KMO = 0.725, Chi-Square = 911.403, df = 3, p-value = 0.000 |
| Sustainable (environmental) Performance |  |
| SP1 | 0.804 ± 0.58 |
| SP2 | 0.961 ± 0.60 |
| SP3 | 0.970 ± 0.59 |
| SP4 | 0.935 ± 0.48 |
| SP5 | 0.911 ± 0.55 |
| SP6 | 0.896 ± 0.53 |
| Composite Score | 4.58 ± 0.49 |
| Eigenvalue | 5.018 |
| % of Variance | 83.642 |
| Cronbach’s Alpha | 0.960 |
| KMO = 0.812, Chi-Square = 1615.996, df = 15, p-value = 0.000 |
the square root of AVE is larger than the intra-correlation scores of the constructs. Secondly, Henseler et al. (2015) find that the Monte Carlo stimulus-based HTMR criterion provides a reliable estimate of discriminant validity, and further conclude that when the MTMT score is below 0.90, discriminant validity between two reflexive constructs is established. As showed in the Table 3, all MTMT scores between variables were below 0.90, indicating that discriminant validity has been established. Discriminant validity was again demonstrated by the cross-loading test, which showed that the elements load each construct more than the other constructs. The results indicate that the convergent and discriminant validity of the study construct is adequate and reliable. The correlation matrix results presented in Table 4 showed that multicollinearity was not a major problem in the study.

### 4.2.1 Path coefficient and hypotheses testing

As indicated in the Table 5, the models’ fitness was assessed using R-square and Adjusted R-square values revealed 56.5% and 67.5% respectively for the direct and indirect models. The results showed that economic dimension of sustainability practice has significant and positive effect (β = 0.334, P-value < 0.05) on environmental performance. There is enough evidence to support H1. Again, results showed that environmental dimension of sustainability practice has significant and positive effect (β = 0.208, P-value < 0.05) on environmental performance. There is enough evidence to support H2. Moreover, that social dimension of sustainability practice has significant and positive effect (β = 0.271, P-value < 0.05) on environmental performance. There is enough evidence to support H3. The result showed that stakeholders’ pressure significantly (β = 0.006, P-value < 0.05) moderates the relationship between environmental dimension and environmental performance. There is evidence to support H6. Likewise, the result showed that stakeholders’ pressure significantly (β = 0.102, P-value < 0.05) moderates the relationship between social dimension and environmental performance. There is an evidence to support H7. However, the results showed that stakeholder’s pressure has negative and insignificant effect (β = −0.051, P-value > 0.05) on environmental performance. There is no evidence to support H4, therefore we reject it. Meanwhile, result showed that stakeholders’ pressure failed to significantly (β = −0.348, P-value > 0.05) moderate the relationship between economic dimension and environmental performance. Therefore, we reject H5.

### 5. Discussion

The study has revealed that SSCM practices such as environmental, economic, and social are positively related to SP. Moreover, stakeholder’s pressure positively and significantly relates to SP. Again, stakeholders’ pressure significantly affects performance.
moderate the relationships between environmental and social dimensions of SSCM practices and SP. These results largely agree with previous studies (Kumar and Rahman 2016; Dey et al. 2019; Sun et al. 2020; Alonso-Martinez, De Marchi, and Di Maria 2021; Rajesh, Rajeev, and Rajendran 2022; Sachin and Rajesh 2022) on the relationship between SSCM practices and SP. The results show that economic dimension of sustainability practice has significant and positive effect on environmental performance (Ageron, Gunasekaran, and Spalanzani 2012; Wang and Sarkis 2013; Das 2018; Hourneaux, Gabriel, and Gallardo-Vázquez 2018; Solovida and Latan 2021). There is enough evidence to support H1. Again, results showed that environmental dimension of sustainability practice has significant and positive effect on environmental performance. There is enough evidence to support H2. Moreover, that social dimension of sustainability practice has significant and positive effect on environmental performance. There is enough evidence to support H3. We conclude that SSCM practices exert significant effects on SP. These results are consistent with previous related studies (Ageron, Gunasekaran, and Spalanzani 2012; Wang and Sarkis 2013; Das 2018; Hourneaux, Gabriel, and Gallardo-Vázquez 2018; Solovida and Latan 2021). Therefore, SSCM should be integrated to ensure profits while effectively protecting the environment and society; corporate organisations should consider implementing sustainable practices in order to enhance profitability to maintain long-term improvements and financial stability of the company (Carter and Easton 2011). It appears that companies wishing to implement sustainable practices in their supply chains must balance the conflicting goals of generating profits, reducing negative environmental impacts, and meeting various social obligations. A number of prior studies highlight the role of SSCM practices in the creation of economic value. Thus, the economic sustainability endeavour to achieve greater economic benefits including financial performance, competitive advantage, cost minimisation, and profitability. Attaining these benefits come with a commitment towards knowledge sharing, optimisation of logistics, and cost efficiency strategies. (Winter and Knemeyer 2013). Moreover, companies should require their suppliers to adopt and adapt sustainability measures, such as sustainable use of natural resources, ethical behaviour, and reduction of greenhouse gas emissions. Greater attention should be paid to measures to manage different waste streams, as hazardous waste and emissions from different companies are the main cause of pollution and environmental damage. The environmental dimension of sustainable development is an important area of research for the SSCM. Environmental considerations provide more tangible benefits than social benefits (Banerjee 2003).

The result showed that stakeholders’ pressure significantly moderates the relationship between environmental dimension and SP. There is evidence therefore to support H6. Likewise, the result showed that stakeholders’ pressure significantly moderates the relationship between social dimension and SP. There is evidence to support H7. These results are consistent with prior studies (Gonzalez-Benito and Gonzalez-Benito 2008; Czajkowski, 2017; Jakhar et al. 2020; Yuen et al. 2020). Stakeholder pressure refers to the responsibility that a company must assume in the conduct of its business with respect to actions and decisions related to product design, raw material sourcing, production system use, and distribution networks (Parmigiani et al., 2011). Pressure from stakeholders (e.g. customers, governments, employees) has a positive effect on companies to proactively develop and renew their resources and capabilities to implement environmental measures (Murillo-Luna et al., 2008). Increased pressure from stakeholders to address environmental issues has led organisations to raise a wide range of environmental issues. However, the very nature of the process allows some companies to adopt sustainable practices (Bevilacqua et al. 2014). Stakeholders audit firms on environmental issues to ensure compliance with environmental regulations and (Berrone et al., 2013; Sodhi & Tang, 2018), and embed sustainability in the corporate culture to create sustainable knowledge for the community using social processes of knowledge mobilisation (Bennet & Bennet, 2008; Chuang & Huang, 2018).

6. Conclusion and implications
This paper has emerged Stakeholders’ and RBV theories to develop an integrated model to explain the relationship between SSCM practices and SP by examining the extent to which pressure from stakeholders could strengthen the proposed model in the context of downstream petroleum supply chain where such studies remain largely unexplored. The major findings of the study are that SSCM practices such as environmental, economic, and social are positively related to SP. Moreover, stakeholder’s pressure positively and significantly relates to SP. Again, stakeholders’ pressure significantly moderate the relationships between environmental and social dimensions of SSCM practices and SP. The findings add to the prior knowledge by shedding light on the implications of SSCM practices in oil marketing and distribution in emerging market context. The implications of the study have been discussed below:

6.1 Policy implications
This paper contributes to strategies and policies required to facilitate the implementations of the recommendations by the IPCC including the need for a paradigm shift in traditional consumption and production to reflect a balance between environmental safety, social justice and profitability. Particularly investment that seeks to promote carbon capturing and carbon dioxide removal are encouraged. Also, the emergency of integrated model offers investors and practitioners robust strategy to improve their wellbeing, decent work while taking actions to mitigate against climate change and its impacts. The outcome of the study could be used to strengthen existing government policies in diverse ways. It has been discovered that SSCM practices relate positively to SP which is strengthened with stakeholder’s pressure. The government of Ghana should endeavour to upscale the sustainability policies in the oil and gas sector. The sustainability requirements with respects to environmental concerns, social issues and economics affairs should be enforced this is where the role of the stakeholders is critically needed. Government should consider imposing high
penalties on non-adherence of the mandatory policy requirements. Government agencies should be strengthened to enable carry out their mandate effectively. For instance, the adoption and implementation of ISO 14000 certification for environmental compliance and auditing as well as SA8000 (social responsibility standards) have not been adequately enforced in the Country. Government of Ghana through its ministries and agencies should renew their commitment to ensure that oil and gas distribution companies in the country comply within the sustainable practices in order to enhance sustainability development.

6.2 Practical implications

The emergency of a newly integrated model to explain and guide sustainability practices in the context of downstream oil and gas sector in emerging economy is the main practical implication of the paper. Moreover, the study provides insights into how stakeholder’s pressure in the form of organisational pressure and regulatory stakeholders’ pressure reinforce corporations to practice SSCM. The study therefore, suggests that managers and owners should encourage to integrate the stakeholder’ expectations in the process of developing strategies in order to enrich their value creation processes. There is also the need for business owners and investors to facilitate the integration of producers, suppliers and consumers in order to upscale the drive towards SP. Despite the numerous contributions offered by the study, it is not without limitations. It is strongly suggested that future researchers should be encouraged to adopt our framework and undertake a comparative study between company’s public and private firms to ascertain the differences in terms of effects among SSCM practices, stakeholder pressure and SP.

6.3 Theoretical implications

Our newly developed SP model is based on assumptions of Stakeholders’ theory and RBV. We have argued that for a firm to build a robust SP. It requires resources commitment and capability to put these resources to effective use. Again, SP requires leaving no one behind. Therefore, all stakeholders both primary and secondary in the Ghanaian petroleum value chain should be identified and properly managed to contribute positively to the sustainability agenda. The outcome of the study contributes to integrating RBV and Stakeholder’ theory to better our understanding on SSCM practices and SP in the context of oil and gas supply chain. While the stakeholder theory explains why firms exist and their responsibilities RBV on the other hand attempts to explain competitive resources that are rare, valuable, inimitable, and irreplaceable which could be merged to form an integrated strategy (SRBV). Relatedly, the study has established that stakeholder pressure indirectly predicts SP through an interaction with SSCM practices.

6.4 Limitations and suggestions for future studies

This study has certain limitations. The study was limited to only the oil and gas distribution and marketing companies within the downstream value chain. It is suggested that future researchers should include other companies in the midstream and upstream of the value chain. Moreover, a comparative study between Ghana indigenous companies and multinational companies within the oil and gas sector with respect to SSCM practices, stakeholder pressure, and SP be encouraged. Again, future studies should consider exploring other contextual factors what could either moderate or mediate the relationships between SSCM and SP.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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