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Investigating the Relationship Between Green Supply Chain Purchasing Practices and Firms' Performance

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Abstract:

Purpose: This research aims to identify the green purchasing practices that manufacturing companies have been using and investigate the relationship between those practices and company overall performance. This paper focuses on green-purchasing practices, such as green products, green suppliers, environmental collaboration with suppliers, green packaging, and reverse logistics, to ensure sustainable practices in the supply chain, and the influence of those practices on firm's performance was investigated from the perspective of managers perception.

Design/methodology/approach: A qualitative approach was adopted, based on eight case studies. Data was collected from semi-structured interviews with procurement managers from Portuguese manufacturing industry and from reports, websites and companies' internal documentation. To analyze the impact of green purchasing practices on company overall performance a conceptual model was proposed.

Findings: The findings support two of the five research hypotheses. According to managers' perceptions, companies implement green procurement practices such as environmental collaboration with suppliers, green packaging, and reverse logistics, and evidence shows that green procurement practices improve overall company performance.

Research limitations/implications: While the sample included organizations from several economic sectors, it was based on a sample of eight case studies and the findings may not be valid in different sectors. This research focuses on green procurement from a country's perspective, which reduces the ability to generalize the findings to other countries.

Practical implications: Managers might utilize the results of this study to develop and implement green purchasing practices and enhance organizations' overall performance via their adoption.

Social implications: This research contributes to the current discussion in green supply chain literature.

Originality/value: This study contributes to the existing body of research on the effects of implementing green purchasing practices into the procurement function.

Keywords: green purchasing, performance, green practices, supply chain, case studies, Portugal

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1. Introduction

While many non-core operations are outsourced, the purchasing function over the years has developed into a more strategic approach due to a growing trend for focusing on core activities (Giunipero, Hooker & Densloe, 2012). The procurement function provides a significant opportunity to integrate environmental considerations into all processes and units of a company and helps to reduce the environmental impact caused by business (Appolloni, Sun, Jia & Li, 2014). Being purchasing the starting point in a supply chain, and having implications downstream along the supply chain, the implementation of the environmental and social practices, should start at this phase (Rao & Kondo, 2010). In academia and business, the interest in the cross-disciplinary area of green purchasing/procurement (GP) research continues to grow mainly motivated by environmental and financial performance in response to competition, regulation, and community demands (Che-Razak & Ibrahim, 2020). For most of the companies environmental awareness has become a must rather than a choice (Ghosh, 2019), causing the revision of their production processes and supply chains with respect to environmental aspects since they are seen as the source of environmental problems (Yildiz-Çankaya & Sezen, 2019).

Considered as one of the green supply chain management (GSCM) practices that influence companies' environmental awareness (Laosirihongthong, Adebanjo & Tan, 2013; Bin, Rong & Hong-Jun, 2008), GP main goal is to manage the environmental impacts caused by the organisations, through the collaboration with suppliers in order to create environmentally-friendly products and to reduce or eliminate hazardous items and reduce waste, encourage the recycling and recovery of the purchased materials (Zhu, Sarkis & Lai, 2007, 2008a,b; Carter & Carter, 1998; Bowen, Cousins, Lamming, & Faruk, 2006; Hervani, Helms & Sarkis, 2005; Sarkis, 2006; Preuss, 2005; Rao, 2004; Rao & Holt, 2005; Chen, 2005). Most studies on GSCM practices were conducted in Asia, specifically in China. In Europe only 16 articles were conducted and only 10 out of 100 articles were exploratory (case studies) in nature (Che-Razak & Ibrahim, 2020). Also, China, USA and India dominate this discipline in terms of their impact and number of publications (Tseng, Islam, Kariab, Fauzib & Afrin, 2019; Jabbour & Stefanelli, 2021), which justifies the need to do more studies in Europe using exploratory research. Despite the large number of studies conducted in the field of sustainability in supply chains, only a few have investigated the green purchasing practices (GPP) affecting the focal company performance (Tate, Ellram & Dooley, 2012).

The present study explored the deployment of GPP and procurement manager's perception of the impact of those practices on overall company performance. Therefore, this work addresses two major research questions:

1. What are companies main GPP?
2. How do GPP affect the company performance?

This paper is organised as follows to answer the above questions: Section 2 reviews the literature concerning the green procurement practices performance, and five proposals for investigation are suggested, Section 3 proposes a theoretical framework, Section 4 introduces the methodology of the study followed by the analysis of the results developed according to the eight case studies, and the analysis of the results are presented in Section 5. Discusssion of the results are made on Section 6 and conclusions, future research and limitations of the empirical data analysis are presented in Section 7.

2. Literature Review

Purchasing can be placed as the starting point of the flow of materials within an organisation, the first step in value chain, and organisation's success relies on its ability to integrate various green practices and purchasing activities (Preuss, 2002; Carter, Ellram & Ready, 1998; Carter, Kale & Grimm 2000), which may serve as a gatekeeper for a company to ensure and promote green activities, policies, and procedures (Foo Kanapathy, Zailani & Shaharudin, 2019; Yee, Shaharudin, Ma, Zailani & Kanapathy, 2021). To manage the risk posed by supply chains, organisations should choose the right suppliers, establish practices to ensure sustainability of their purchases, preserve their reputation, reduce reputational and operational risks and maximises overall values to the buyer organisation (Gualandris & Kalchschmidt, 2016; Miemczyk & Luzzini, 2019). GP can be defined as a set of environmentally friendly procurement procedures to reduce and eliminate sources of waste and promote green practices, such as recycling and reusing purchased material without affecting performance requirements via

successful interactions with suppliers in monitoring and cooperating (Min & Galle, 1997, 2001; Hsu, Tan, Zailani & Jayaraman, 2013; Hsu & Hu, 2008; Zhu et al., 2007, 2019). Corporations, like General Motors, Ford, and Toyota, stress that they are working with suppliers to do considerably more than those firms alone to reduce environmental impacts. Nokia employs questionnaires to audit their suppliers. Other companies organise conferences and workshops for suppliers to raise awareness on GPP (Zhu Sarkis & Lai, 2019; Pinto, 2020). One of GP most debated topics is whether a green business has a cost to business. There are different views on this subject. The first view is that GP has a positive impact on company performance. For instance, Hallikas, Lintukangas and Kähkönen (2020) stated that the introduction of sustainable procurement strategies increases company procurement performance and enhances reputational and operational risk management performance. For Rao and Kondo (2010) businesses would get both the short-term and long-term benefits of greener processes and suppliers by improving product and input material sustainability. Supplier's sustainable practices led to greener processes and influence the firm's sustainability performance (Saqib & Zhang, 2021). Therefore, if corporations undertake green purchases, environmental and business performance would be achieved (Silva-Rosa, Abdala & Cesarino, 2019). Reducing environmental and health risks, waste disposal costs and enhancing the business's image are all aspects that GP can enhance, which can increase companies market competitiveness due to customer awareness of the benefits of purchasing green products (Min & Choi, 2019). GP improves environmental performance of suppliers and help to incorporate recycling and waste reduction initiatives by coordinating with suppliers the development of new products or processes (Bowen et al., 2006). For Rao and Kondo (2010) once companies implement green purchasing, it would lead to environmental and consequently to business performance. According to Chin, Ab-Malik, Huam, Zuraidah & Tan (2020) green product, green process and green supplier are significantly and positively related to environmental performance. Results has shown that greening the suppliers has positive impact on green innovation and green purchasing capabilities whereas green innovation and green purchasing capabilities have a positive impact on environmental, competitive advantage and financial performance accordingly (Najmi, Maqbool, Ahmed & Rehman, 2020). According to Rao (2019), there is a positive link between customer acknowledgment about how companies are greening their supply chain and companies economic and environmental performance. Collaboration with suppliers on environmental targets, improving waste reduction programs, and developing new sources of waste reduction by engaging in this kind of collaborative activities is beneficial for the company's image as a green company (Sangode & Metre, 2019). It is recommended that companies devoted time and money with stakeholders' awareness campaigns, including its suppliers and customers, such as, encouraging consumers to use eco-labels, even that more than 46% of the consumers are unaware of the eco-labels (Modak & Roy, 2014). Companies that have implemented formal environmental management systems can also reduce their costs and increase competitive advantage through the reduction of waste, energy and water consumption and improve operational and environmental performances (Pinto, Alawiya & Mariotti, 2017; Melnyk, Sroufe & Calantone, 2003; Famiyeh, Adaku, Amoako-Gyampah, Asante-Darko & Amoatey, 2018). GPP result in better environmental and financial performance and has a positive correlation with financial success (Zhu and Sarkis, 2004; Zhu, Geng, Tsuyoshi & Hashimoto, 2010; Nguyen & Nguyen, 2021). The relationship between companies' sustainable practices and sustainable performance are reinforced by the supplier's collaboration in initiatives related to environmental protection (Chen & Baddam, 2015; Chen, Tang & Jia, 2019). Zailani, Jeyaraman, Vengadasan and Premkumar (2012) analysed the effects of firm's environmental purchasing on operational, economic, environmental and social aspects and they found that environmental purchasing has a positive and significant relationship with operational, economic, and social performances while showing no association with environmental performance. The implementation of GPP has a beneficial influence on operating performance of the purchasing function, although this effect is higher in the context of long-term partnerships with suppliers (González-Benito, Lannelongue, Ferreira & Gonzalez-Zapatero, 2016). For organisations concerned with long-term financial competitiveness, effective purchasing management help to strengthen supply chain, increase the number of customers and also improve customer service (Dubey, Bag, Ali & Venkatesh, 2013). Additionally, was found that green, social and ethical practices influence companies' stock price in long-term, focal organisation operating performance, and can bring economic benefits (Kim & Chae, 2021). The second perspective argues that green purchasing itself cannot promote firm's performance. GP has a negative or no substantial influence on organisational performance, according to Klassen and McLaughlin (1996). In a study on Pakistanis

manufacturing sector, was found that GPP has a considerable negative influence on firm's financial performance (Khan, Jian, Yu, Golpîra & Kumar, 2019; Khan & Quianli, 2017). For Green, Zelbst, Meacham and Bhadauria (2012) environmentally friendly procurement has little effect on environmental performance, but it can improve economic performance. And suggests that GSCM do not directly affect economic performance, but can improve it indirectly. Moreover, GP is an essential antecedent of manufacturing companies' overall economic performance although is not significantly related to organisational performance (Min & Galle, 2001). According to Galeazzo, Ortiz-de-Mandojana and Delgado-Ceballos (2020), GP does not have a beneficial influence on financial performance, and according to Pinto (2020) it is not possible to conclude the existence of a positive or negative relationship between green practices and economic performance. Islam, Turki, Murad and Karim (2017) believe that sustainable procurement practices and financial performance have a very weak and insignificant relationship. There was no correlation identified between GP and environmental performance in the research conducted by Yildiz-Çankaya and Sezen (2019). Most likely, this is because of the GP procedures are more concerned with the environmental performance of suppliers. Additionally, it was found that the GPP are not related to business sustainability since the GP dimension is an external element of GSCM framework (Zhu et al., 2007). A study by Sahoo and Vijayvargy (2021) suggests that non-significant impact of GPP on environmental, operational and economic performance. In reviewing and consolidating the literature, this research proposed five practices that have been commonly accepted: green product, green suppliers, environmental collaboration with suppliers, green packaging, and reverse logistics, practices which can help companies carefully plan for GP and improve their overall performance as you can see on Table 1.

Practices	Description
Green products	Green products meet the requirements for product composition, labelling, and stewardship. Requirements include the reduce, reuse and recycle (3R) procedures, and need to comply with the stringent requirements of the purchasing regulations. Regarding the product content labelling, all ingredients on the product label need to be properly listed. Product stewardship requires company's strong commitment to managing health, safety, environmental and social impacts of the purchased materials throughout life product cycle stages considering current technical and scientific conditions in order to maximise economic benefits (Monroe, 2014; Chin et al., 2020; Sdrolia & Zarotiadis, 2019).
Green suppliers	Green suppliers include the work carried out by focal firms, as well as the selection, assessment, and auditing of suppliers taking into consideration environmental aspects (Beamon, 1999; Seuring & Müller, 2008).
Environmental collaboration with suppliers	Participative direct involvement between the focal firm and its suppliers to develop environmental solutions for the reduction of environmental impact in supply chains (Vachon & Klassen, 2008; Lee, Kim & Choi, 2012; Zhu et al., 2007; Grekova, Bremmers, Trienekens, Kemp & Omta, 2016).
Green packaging	Green packaging is the suitable packaging that can be reused, recycled or degraded, and does not cause human and environmental contamination throughout the product life cycle. It includes all actions that enhance an organisation's environmental performance and its supply chain (Rao, 2004).
Reverse Logistics	Comprises the return of goods or materials for recycling, reuse, reprocessing/remanufacturing, repair and rehabilitation or safe disposal of goods and materials that closes the cycle from the point of consumption until the end of the supply chain (Carter & Ellram, 1998; Hervani et al., 2005; Zhu et al., 2007; Vachon & Klassen, 2008)

Table 1. Green purchasing practices

3. Proposed Framework

The proposed framework as seen in Figure 1 was developed based in the available literature review, through the identification and analyze of relevant articles. This model provides a holistic view between the implementation of GPP and impact on performance.

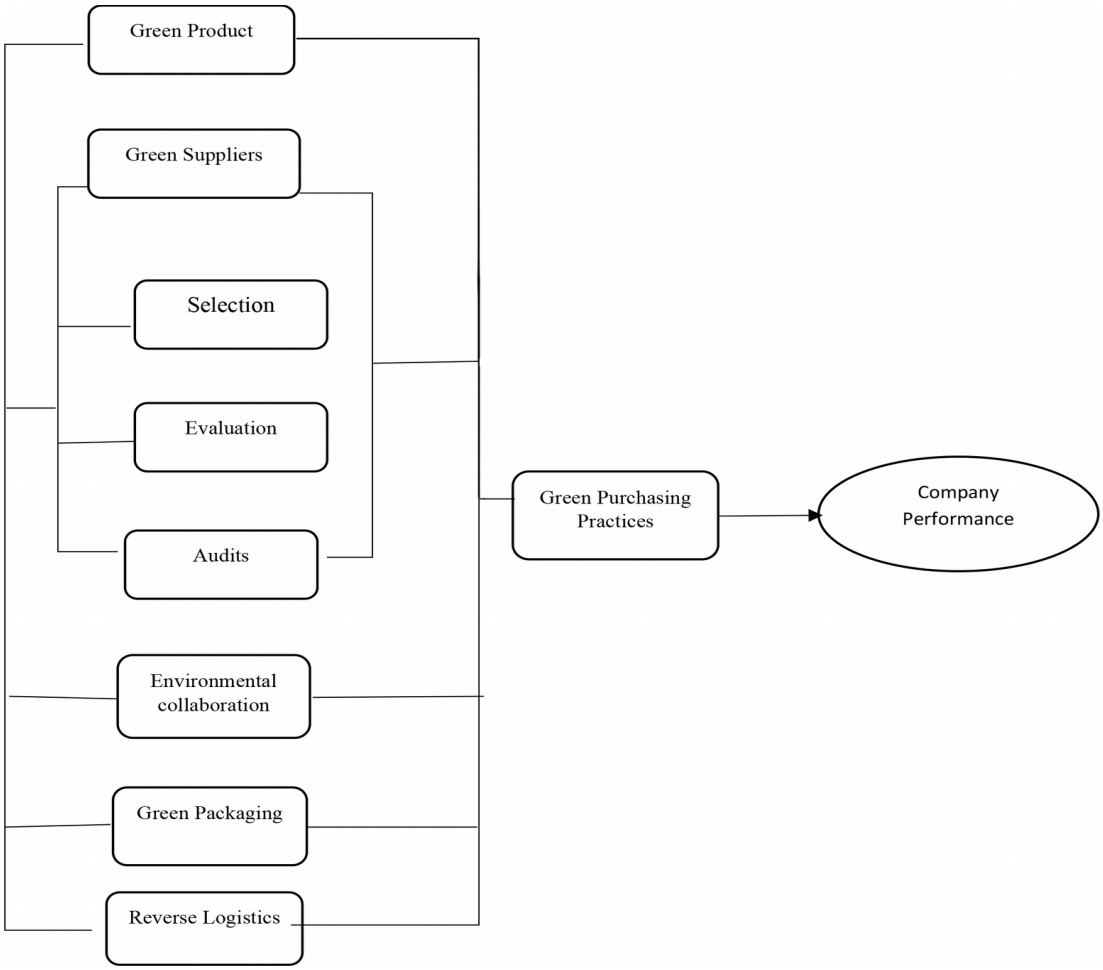

Figure 1. Proposed Framework

The performance was analysed according to the manager's perception of the impact of GPP on overall focal company performance. To theorise the influence of GPP on company's performance in the manufacturing context, the following five propositions were derived for primary data collection:

P1: Companies implement green product practices.

P2: Companies implement green supplier practices.

P3: Companies implement environmental collaboration with suppliers.

P4: Companies implement green packaging and reverse logistics.

P5: The implementation of GPP positively influences the focal company's overall performance.

Using data from eight case studies the research propositions were tested in different manufacturing sectors, for better understanding how GPP are deployed in the Portuguese manufacturing industry.

4. Methodology

A case study approach was adopted to collect qualitative data. Although this technique has inherent weaknesses, which cannot be overcome, such as sampled size limitations and subjective researchers' interpretations (Eisenhart,1989; Yin, 2009) the case study technique is frequently used to analyse organisations supply chain management (Pagell & Wu, 2009; Zhu et al., 2007). Many examples of case studies with three to 11 scenarios are available in operations and supply chain management research (Pagell & Wu, 2009; Walker & Jones, 2012; Pinto, 2020). The study sample consists of eight medium and large firms located in Portugal. Companies were selected taking into consideration their commitments with the three sustainability pillars – economic, environmental, social and the certification of their management systems, through the analysis of websites, social reports, news on social

media, newspapers, and TV. Semi-structured face-to-face interviews based on an interview protocol were conducted and respondents were invited to answer the open-ended questions. Yin (2009) pointed out that a good interview protocol reduces bias caused by different interviewers and respondents and supports interviewees in using appropriate response techniques. The interviews were of different lengths and performed onsite for an average of 70 minutes. Eight participants took part in the interviews. These interviews were recorded, transcribed, coded and classified to enable systemic topics to emerge. The companies' names have been anonymised to encourage open responses. Technical visits to the factory floor were done. Cross-case analyses were used to evaluate evidence, findings, and outcomes with existing literature. Triangulation using secondary data sources was carried out to improve the validity and reliability of the research (Yin, 2009). Secondary data was gathered on reports and websites, including annual reports, sustainability reports, environmental, social, and safety policy, code of conducts, journal publications, and confidential internal procedures provided by the companies. The main characteristics of the selected companies are shown on Table 2.

	Companies Characterization				Data Collection		
Company	Industry	Annual Turnover	Number of employees	Management Systems	Role of interviews	Documents, Sites and public talks	Observation in Loco
C1	Glass	95 ME	350	ISO 9001, ISO 14001, ISO 22001, OHSAS 18001, SA 8001, Sustainability Report	Procurement Manager	-Company's website -Annual -Sustainability Reports -News from magazines and newspapers -Company confidential procedures and plans -Integrated Management Systems Manual	-Visit the company to conduct the study -Technical visit to the factory floor
C2	Cork	318 ME	927	ISO 9001, ISO 14001, ISO 2200, HACCP, Sustainability Report	Procurement Manager	"	"
C3	Automotive components	84,4 ME	348	ISO TS 16949, ISO 14001, OHSAS 18001, ISO 27001	Procurement Manager	"	"
C4	Wood-based panels	1.321 ME	177	ISO 9001, ISO 14001, OHSAS 18001, ISO 50001, PEFC , FSC, Sustainability Report	Procurement Manager	"	"

Company	Companies Characterization				Data Collection		
	Industry	Annual Turnover	Number of employees	Management Systems	Role of interviews	Documents, Sites and public talks	Observation in Loco
C5	Office and commercial furniture	8.62ME	122	ISO 9001, ISO 14001, OHSAS 18001,	Quality, Environmental, Health & Safety Manager	"	"
C6	Drinks	498 ME	1500	ISO 9001, ISO 14001, OHSAS 18001, ISO22001, Sustainability Report	Procurement Manager	"	"
C7	Automotive assemblage	216ME	190	ISO TS 16949, ISO 14001, OHSAS 1800, NP4457, OEKO-TEX Standard 100	Logistics Manager	"	"
C8	Automotive textile	44 ME	182	ISO 9001, ISO 14001, OHSAS 18001	Procurement Manager	"	"

Table 2. Characteristics of the Sample

5. Analysis of the Results

The purpose of this section is to identify the GPP used by companies and explore the manager's perception of those practices on company overall performance. More specifically, this section aims to validate the proposed theoretical framework and the five propositions associated with it to answer the two research questions presented in the Introduction section: 1) What are companies main green purchasing practices? and 2) How do green purchasing practices affect the company performance?

5.1. Green Product

According to C1 Procurement Manager, a strategic procurement plan is prepared annually for all the purchase segments. The plan, which is revised quarterly, includes a supplier's risks analysis, according to five types of risks, and they are planning to include the social risk. There are technical specifications for all products, which are sent to suppliers to fulfil the requirements. Specific policies and procedures are defined and documented for materials and services, named 'special follow-up products' (critical for the final product quality). In addition to technical requirements, other requirements can be requested to the suppliers. For example, in the case of cardboard compliance with the legislation for food products, the type of packaging, the absence of chemical products, among others, are included. There are some environmental concerns, namely in the use of recycled card and the existing requirements in the code of conduct; however, according to Procurement Manager, it is not a driver. Environmental and social issues related to products and suppliers are considered fundamental, considering the principles and values defined by the company, namely those related to compliance with legislation. According to C1 Procurement Manager: "…it is completely unthinkable, not acceptable to collaborate with suppliers that are not aligned with Company principles and values, the necessary measures are implemented if non-ethical behaviors are found, and this applies to the products that they are providing. We (suppliers and focal company) must work together throughout the buying phase to achieve an environmentally friendly production and better performance." In addition, according to the code of conduct, the suppliers are advised to ensure that their suppliers, in turn,

implement suitable procedures considering the environmental and social aspects. Components of the different products are properly label and listed to comply with the stringent requirements of the purchasing regulations. On company C2 a procurement policy exists for cork and non-cork products. Procurement Department is centralised and works in collaboration with procurement managers of the different industrial units. The products are divided into categories, with general and specific documentation for each industrial unit, and technical specifications are sent to the different suppliers. Most of the suppliers are located in Portugal, which is one of the company's commitments in terms of social responsibility practices, as can be seen on the company website, in which, whenever possible, give preference to local suppliers who provide raw material according to good sustainability practices – social and environmental, in terms of their origin and exploration processes. There is a specific plan for sustainability, based on balanced scorecard, where objectives and actions related to sustainability at an environmental and social level are defined in detail and rigorously, associated with a set of indicators, time, and responsibilities. The 3R policy is used among all company operations, including purchasing the different products needed to produce the final product, not only to minimise the environmental impact, but to reduce waste management costs. All the components are properly controlled and labelled to comply with European and Portuguese legislation.

For C3, the procurement policy and procedures are defined at the headquarters, as well as the portfolio of suppliers. However, C3 has the autonomy to select new suppliers according to their needs. According to the Procurement Manager, purchases are classified as direct and indirect. Direct purchases include all products incorporated in the final product to be sent to the customer and services related to the final customer, such as assembly services and surface treatments. Indirect purchases include stationery products, energy, and services unrelated to the final product, such as maintenance activities. Direct purchases are mostly from Spanish suppliers and indirect purchases, almost 100%, from national suppliers, with preference given to local suppliers. For the Procurement Manager: "…the procurement department is essential for companies survival. Companies' profits are linked to the negotiations with suppliers' and not downstream with customers. In the automotive industry, purchase volumes are very high, so reducing the price by two to three cents in one product is very significant for the company." As a supplier of the automotive industry, this company follows the strict requirement from this industry and strict regulations related with REACH Directive. For all the purchase products, the 3R policy is considered to reduce costs of waste management and reduce environmental impacts, and all products are properly labelled according to European and Portuguese legislation.

For C4, products negotiations are centralised at the headquarters of the company group. A central database contains the global purchasing procedures as well as the approved suppliers for different products and the technical and product safety data. Wood is the main raw material used to produce the final product, and according to the company's values, there is a commitment to eco-efficiency and a sustainable way to obtain raw materials. For that purpose, this company use the wastes from the wood industry, waste of wood products in the end of their useful life (e.g., pallets, boxes, furniture), and forest products of lesser value, such as: small-sized round wood or materials resulting from forest management operations (e.g., thinning trees). Regarding other products used to produce the final products, there is the concern to purchase products that are less harmful to the environment and workers, to reduce the waste and decrease costs.

C5 does not have a formalised procurement policy. However, the procurement department identifies all needs, quantities to be ordered, deadlines to be met, quality, and the costs of the products/materials to be purchased. Products requirements are sent to the suppliers, and technical specifications exist for the main products; whenever possible, purchases are made from suppliers that are included on the list of approved suppliers, as described in the company internal procedure.

For C6, the inclusion of environmental and social criteria in the purchasing process is evident in the company sustainability strategy. In this context and according to the Sustainability Report, in partnership with the leading suppliers, within the scope of responsible procurement, several initiatives were developed, such as continuity of optimisation and weight reduction actions in plastic packaging, incorporation of national and local labour in the renovations and works in progress; implementation of activities to support the sustainable production of barley and hops. Initiatives to reduce material consumption (e.g., plastic, glass, carton) and reduce the weight of main glass,

and plastic bottles are implemented. Product specifications are sent to the suppliers. C7 purchasing and logistics division integrate planning, logistics, procurement and supplier quality assurance departments. The procurement policy is defined by the Group Headquarters. Objectives and indicators are defined annually, such as rejection rate, delivery times, speed of response, price, innovation and flexibility, among others, to comply with the company strategy. According to the company code of conduct: "…the employees must keep in mind that the choice of suppliers and service providers must be based not only on economic and financial indicators, commercial conditions, the quality of goods and services, but also on the ethical behavior of suppliers, namely adherence to the code of conduct." For C8, procurement policy is defined by the Group Headquarters in Japan. According to the Procurement Manager, they classified the suppliers as national and non-national suppliers. The first ones are approved in Portugal, representing 20% of the total suppliers, and the second ones are approved by the company group, the main supplier. The Kaizen philosophy, typical of the Japanese culture, which promotes improvement through knowledge and constant awareness of suppliers, is used. The relationship established with the suppliers is based on mutual trust, is maintained throughout the life of the project; according to the Japanese culture, "…there is a long-standing relationship with suppliers, they are company partners, there is mutual growth between company and suppliers, as they understand the way of working, and the company's culture it is a true partnership." According to the Procurement Manager, products are developed to minimise environmental impacts, complying with customer requirements and legislation related to the automotive industry, as in the case of End-of-Life Vehicles (ELV) law, to prevent waste, to promote the reuse, recycling, and other forms of recovery of ELV according to REACH Directive. Was found that the eight organisations, whenever is possible, purchase environmentally friendly products, including reducing, reuse, and recycle procedures, and they comply with Portuguese, EU, and international requirements purchasing regulations. However, none of the companies manage the impact of the purchased materials from the supplier until the end of the product life cycle. Therefore, according to the case studies, Proposition 1 is not supported:

P1: Companies implement green product practices.

5.2. Green Suppliers

For C1, the code of conduct is a requirement for suppliers' selection, who should comply with national laws and regulations and with international conventions on the protection of the environment, working conditions and child labour. First-tier suppliers must be committed to the code of conduct; if not, they are excluded from the suppliers' list. The company first tiers suppliers must communicate requirements from the code of conduct to all their suppliers, and it is their responsibility to guarantee that their suppliers comply with all the requirements defined in the code of conduct. Procedures to select, evaluate and audit suppliers are implemented only for first-tier suppliers. It is not mandatory the certification of management systems by ISO 14001 or any other standard. The company considers five factors for the selection and evaluation of suppliers, in addition to price and purchasing conditions; another factor is the organisational system, which aims to assess the internal supplier organisational capabilities, such as the certification of management systems. As a result of the evaluation, follow-ups with suppliers, actions, audits, and technical visits are established to ensure compliance according to the annual plan. In the audit reports, there is a specific field to comment on the degree of compliance with requirements established in the code of conduct. After conducting audits or visits to suppliers, in case of non-compliance, a monitoring plan is carried out. For the Procurement Director "…our most relevant concerns are not at the environmental level but the social level since most suppliers are certified by the quality or environment management standards or have environmental licensing." Around 80% of suppliers are from Portugal and Spain. At C2, procedures to select, evaluate and audit suppliers are implemented by the company only for first-tier suppliers. Environmental and social responsibility indexes are measured through a survey sent to the suppliers. Among others, the following requirements are considered: reduction of waste and effluents, handling chemicals in an environmentally safe manner, and contributing to recycling, which weigh 10% in the final evaluation. It is required for suppliers to have the ISO 9001 certification and the product's civil liability insurance. "Our company is the biggest exporter in the world, and we can influence our suppliers to implement environmental and social practices." Suppliers are classified in A, B, and C, and D. Audits are planned annually or quarterly, according to product criticalness and previous years' audits. The audit report is sent to the supplier to implement action plans for correction/prevention in non-conformities and

they are subject to follow-up actions. For C3, the main requirement for supplier selection is the ISO/TS 16949 standard certification. If not, an ISO 9001 standard certification is required, and also an audit valid for three years. The second requirement is to be competitive in price, quality, and payment conditions. Subsequently, other requirements are analysed, such as, possibility of long-term agreement, risk mitigation experience, among others. In case of equality, preference is given to the supplier who has a certified environmental management system (ISO 14001). Supplier evaluation only includes first-tier suppliers and includes, among others, the following criteria: quality of the product and certified management systems. Suppliers with no certified management systems, are subject to special approval. A sustainability questionnaire is sent to suppliers who do not have a certified environmental management system, which includes environmental, health, safety, and social aspects. Audits made to the first tiers supplies are subject to annual planning, with an average of ten audits per year. In case of non-compliance, the supplier is required to prepare an action plan. If suppliers do not comply with the plan, they are excluded from the list of approved suppliers. For the Procurement Manager, "…suppliers are business partners, so in audits, an effort is made to understand the concerns and problems of suppliers in order to mitigate the risk, since the failure in a supplier can have serious consequences for the company." In this company there is a supplier development program whose objective is to improve the supplier's performance, so every month the Procurement Department performs a concise analysis of the problems of the previous month and plans and actions are defined with the suppliers. For C4 Procurement Manager, economic criteria are fundamental for supplier selection, namely the payment conditions. For inclusion of new suppliers in the list of approved suppliers, depending on the importance of the products, samples for testing may be requested, and, after results, provisional inclusion of the supplier in the list is decided.

There is an internal procedure to evaluate the first-tier suppliers, who are evaluated as A, B, C, or D, according to the classification obtained in the following parameters: quality, environmental and hygiene management, health and safety, complaints, compliance with deadlines, among others. The new suppliers are temporarily included for one year in the list of suppliers, and after one year, the periodic evaluation is carried out, and the definitive inclusion is decided. Around 40% of company suppliers are Portuguese, and the vast majority are Spanish. All suppliers have certified quality management systems (ISO 9001), and some have environmental and safety management system certification. No audits are carried out on suppliers, but certificates are requested. For the Procurement Manager "…through the certificates we trust on suppliers, I want to believe that their suppliers also do not work with suppliers that are not sustainable, we believe that they follow the procedures." For C5, the selection of suppliers is, in the first instance, commercial, where price, delivery time, and quality of the product are considered according to the requirements. If three conditions are met, tests are carried out to check the quality of the product depending on the product in question. If approved, it is subject to evaluation during a trial period depending on the number of supplies. Suppliers with a management system, or certified product are preferred, but, according to the interviewee, "it is only a criterion of differentiation, it is not an exclusion criterion." Most of the company's suppliers are national (93%), giving preference to local suppliers for the purchase of stationery and metallic structures. The criteria for selecting suppliers for C6 vary depending on the volume of contracts. Suppliers with less impact need to sign a document defining purchase, quality, legal, and safety requirements. For those with the greatest impact, audits may be carried out, depending on the volume of business and the type of product or service to be purchased, with an interdisciplinary team participating in the process of collecting, analysing, and discussing proposals with suppliers. Certification of management systems is not required but can be used as an advantage when choosing a supplier. Integration of environmental, safety, and energy criteria is planned to be included in suppliers selection, 'we would like, and we are working on it'. According to an annual audit plan, the strategic suppliers (packaging and raw materials) and first-level service providers are evaluated and audited, with audits focusing on quality issues. Although environmental and safety issues are included on the checklist, these are not mandatory requirements. Service providers who are permanently on-site are audited according to an annual plan. 80% of expenses in 2019 were incurred by Portuguese suppliers. However, the interviewee says: "…we formally do not favor local or national suppliers. There are no defined objectives for purchasing from national or local suppliers. If the price is lower and good quality, we choose that one; we have to be pragmatic." According to C7 Logistics Manager, the demand and subsequent selection of suppliers is triggered by a market need, continuous improvement, or a need derived from a new project. Suppliers are subject to a first visit to check their capacity and working conditions.

After verifying that the product is in line with the company's needs, the supplier is asked to carry out a self-assessment, which is limited to completing audit inquiries, focused on quality, financial and environmental parameters. These first surveys provide a view of the supplier's self-analysis. After that, an audit is carried out by an audit team, where, in addition, other aspects, environmental issues are highlighted, for example, compliance with legislation, separation and disposal of waste, social responsibility and safety, "…everything that is safe for us is critical, not only because we faced two fires in our factory, but it is a risk in any company. Safety is something that we always emphasize in audits because there is always room for continuous improvement." Company profile, management, development capacity, purchasing process, and supply guarantees after completing a given project are also checked in the audit. The supplier's evaluation is subject to annual planning but only for the first-tier supplier, according to the following criteria: logistics, quality, development and purchases, and financial conditions. Suppliers are classified in A, B, and C. Around 80% of purchases are from European and Asian suppliers. The majority of first-tier supply companies (95%) belong to larger international business corporations, who have certified environmental and safety management systems, "…in the automotive industry, suppliers are partners, a partnership relation is imperative to face the requirements of this industry, the fluctuations in constant orders, the need to reduce sales prices, quality requirements and the need to reduce costs and stocks." For C8, the purchasing process starts with selecting supply proposals that best suit the company's needs by the Procurement Department. The supplier's classification is based on the answer to a preliminary survey, which contains a set of questions in three areas: quality, environment, and safety. If the supplier is certified by one of the reference standards, ISO 9001, ISO 14001, or NP 4379, they do not need to fill out the survey. In cases of no response or when doubts arise regarding the content of some responses to preliminary inquiries, audits are carried out. These audits can confirm or change the score obtained in the preliminary survey. According to the total score obtained by each supplier, they are classified as A, B, or C. Only first-tier suppliers are selected, evaluated, and audited. Supplier evaluation, according to: the quality of supplies, rate of non-compliant materials and warranty claims, and compliance with agreed delivery times assessment is carried out monthly and quarterly and communicated to suppliers. Environmental and social criteria are not directly considered. Compliance with legislation, such as the REACH directive, labelling, and packaging of hazardous substances, is already common in the company. We found that some of the companies are also including social aspects in supplier selection, evaluation, and audits. All the companies studied had formal procedures to select, evaluate, and audit the suppliers, including environmental aspects; however, are only implemented for the first-tier suppliers.

Therefore, we consider, that this practice is not fully implemented the Proposition 2 is not supported:

P2: Companies implement green supplier's practices.

5.3. Environmental Collaboration with Suppliers

The environmental collaboration with suppliers is conducted, according to C1 to improve the quality of the final product, through technical interventions to improve raw materials, "…we do, and we have this concern, from the perspective of maintaining a sustainable and long relationship." Despite the existence of an annual audit plan, as mentioned previously, there is a concern to get in direct contact with suppliers when they do not comply with environmental and social legislation, "…is not acceptable to work with suppliers who do not meet the requirements and there is a concern to pass this message on to suppliers." Despite the existence of a set of rules of environmental conduct, which commits suppliers to use natural resources effectively and the most appropriate available technologies to prevent or minimise environmental impacts, committing to integrate aspects of sustainability in its decision-making process must be done in its decision-making process the near future. The environmental collaboration with suppliers in C2 is reflected in supporting suppliers to optimise the use of energy, namely in terms of costs and minimise environmental impact. According to the Procurement Director, "…we are supporting suppliers to use energy in an efficient way because it is an area that we are very good, we have already been considered as a case study in Portugal." Regarding cork suppliers, free technical advice is provided to cork oak forest producers to adopt better forest management practices and preserve biodiversity. In these cases, the forest properties that benefited from this advice opted to certify the respective forest management systems by FSC. Work and collaboration with the suppliers are implemented to encourage best practices in treating industrial effluents, one of the main issues in this sector. C3 implements different types of programs for supplier's development, which the

main goal is to improve the suppliers' environmental performance. Action plans are defined between focal company and suppliers, involving visits to the supplier facilities and awareness actions. For the C4 Procurement Manager, there is collaboration with the suppliers to minimise waste and environmental impact. An example provided was the change in the packaging of the final products. Focal company and supplier unified efforts to minimise the use of plastic, eliminating the plastic surrounding the pallet and replaced by a recycled plastic tape "… these issues are already imperative at the company, this concern exists not only because of environmental issues but mainly due to cost reduction." For C5 environmental collaboration with suppliers is reflected in working with suppliers to purchase chemicals with less environmental impact and safer for employees because, on companies' process, chemicals are the products with more environmental and safety impacts. "…we worked with tints that had phenol which has very harmful effects for workers health, and we wanted to replace those products with environmentally friendly and safer ones for workers. The tints that we currently use are free of heavy metals." A letter is sent to all first-tier suppliers, requesting them to comply with all legal requirements applicable to the activity, to improve the environmental performance of products and services, and consider the advantages of implementing an environmental management system following the requirements of ISO 14001 or EMAS. For C6 there is a joint effort with suppliers to reduce the environmental impact of packaging and reduce costs. Several partnerships with suppliers were made to optimise and reduce weights, especially in plastic packaging. The 'Plastic Zero' project was extended to several plastic products, focusing on secondary plastic packaging. Specific actions with suppliers aimed to improve operational efficiency, optimise the supply chain, reduce the use of materials, or develop value-added solutions, having a positive impact on the environment, both upstream and downstream. Besides this project, C6 developed several different projects with the main goal to reduce costs and minimise the impacts on the environment, such as the weight reduction of glass bottles, all the raw materials used to produce these glass bottles are 100% recycled and reusable. For C7, the environmental collaboration with suppliers is only reflected in developing new products to develop raw materials that cause less environmental impact. There are no joint plans to improve supplier's environmental performance. Returnable packaging is used on company C8 for suppliers located close to the factory and for frequent deliveries, such as the Portuguese and Spanish suppliers. For other suppliers, where the supply is occasional and whose location is not close to the plant, in the case of suppliers from Turkey and Japan, returnable packaging is not used since the costs are very high; in that case, internal reuse of the packaging is made. Different projects are developed with suppliers for returnable packaging. A set of initiatives are implemented to promote sustainable practices in suppliers, namely environmental practices and awareness actions two/three times a year (e.g., quality week, the environment day, and other initiatives). There are also occasional collaborations with suppliers to promote, improve, and share knowledge between focal company and suppliers to improve companies' performance. "…Suppliers are our partners, so if every day we are working together, we may be able to do something for the environment. If suppliers fail, we also fail with them." As a result, and to optimise the supply chain, improve operations efficiency, and reduce, reuse, and recycle the material used several collaborations with the suppliers were found, which can positively impact the focal firm and the supply chain.

Therefore, we consider, the Proposition 3 is supported:

P3: Companies implement environmental collaboration with the suppliers.

5.4. Green Packaging and Reverse Logistics

As for green packaging and reverse logistics, C1 implement practices mainly to reduce packaging costs and environmental impacts. Compliance with the standards associated with the European Directive on packaging and packaging waste, such as prevention at source, reuse, and recycling of material, is a challenge that the company integrates into its procurement policy. For example, big bags and oil drums are reused, and all other packages, when possible, are reused or sent for recycling. Glass, as an ideal material for recycling, can be infinitely recycled, and its return, closing the cycle, is accomplished through the incorporation of the hull (used glass) in the production process. In their production process C1 is using around 3% of recycled glass. According to the C2, most of the packaging material used by the company is made of cardboard and wooden pallets. They work with a subcontractor to manage pallets more efficiently, and almost all pallets are reused. Some products are transported between the different industrial units in the same plastic boxes, "…this is not just an environmental issue, but a cost issue because packaging at the company represents an important cost." Chemical's containers of 1,000 litres are reused,

and pallets returned to the suppliers. Cork is a 100% natural product, and although it is biodegradable, it is possible to reuse and incorporate it in the manufacturing process to produce products based on cork, other than stoppers. For this purpose, a recycling project called 'Green Cork' was implemented in a partnership with a non-profit organisation and other public and private organisations, with the main goal to collect corks stoppers to finance the plantation of native trees. For C3, since the responsibility of product transportation belongs to the focal company, products are regularly transported between focal company, suppliers, and customers, in returnable plastic packaging. It is the case for Portuguese and Spanish suppliers. The packaging is made of cardboard because it is more economical since the cost of returning plastic packaging is very high. C3 follows European and Portuguese legislation on the management of ELV, which states that the different products produced by the company should not contain prohibited substances to prevent the production of waste and the promotion of reuse, recycling, and other forms of recovery of ELV. Some of the materials used in packaging in C4 are wooden pallets, recycled plastic straps, wooden bars, and cardboard for product identification. Through collaboration with suppliers, they implement practices that cause less environmental impacts and are more cost-effective. For example, since the card was only used to identify and not protect the product, a solution was found in collaboration with the supplier to use a thinner card that causes less environmental impact which is also more economic. Whenever possible, the wooden pallets sent to customers are returned. According to the last Sustainability Report, wood-based panels can be recycled and transformed into new products at the end of their useful life, thus re-entering a continuous recycling cycle, however, still there is no initiative to recover the products after end-of-life cycle, they are working on that. At C5, there are practices to return the packaging materials since most projects include the transport and the company makes the assembly of the products on customers' sites. Therefore, the residues from the packaging (cardboard, plastic, and wooden pallets) and from assembling activities made on customer's sites are collected and transported to the factory to be properly separated and recovered. According to the Director of Quality, Environment, and Safety, the final product resulting from the transformation of wood is a natural product, which can be recycled and used in other supply chains. Occasionally, in the event of replacement, products may be returned for recovery. C6 is responsible for placing packaged products of various formats on the market: glass and plastic bottles, cans, and barrels. Managing glass, plastic bottles, cans, and barrels was transferred to 'Sociedade Ponto Verde', a private and non-profit organisation to promote the selective collection and recycle packaging waste in Portugal. In recent years, several projects have been developed by C6 to improve the performance of product packaging, particularly at the environmental level, as well as concerning the weight of the packaging and easy opening, among others. For two main products, the glass package now is lighter, eco-efficient and all materials used in its process are 100% recycled and recyclable. In the context of packaging innovation, it is important to highlight the Lightweight project resulting from a partnership with the main supplier, creating the lightest plastic bottle on the national market, resulting in a reduction of 248,000 in annual plastic consumption. Whenever possible, the option is to purchase products in bulk or reusable containers. When it is not possible, all recycled products are segregated and sent to the approved companies. According to C7 Logistic Manager, there are some practices for using reusable packaging. For example the 1,000 litres containers and wooden euro pallets are reused in collaboration with the main raw materials suppliers. All recycled products are segregated and sent to approved companies. The cost-benefit ratio is always considered. In the packages sent to customers, the pallets are also collected and reused. But it can be used for energy recovery. Special packaging plastics with less environmental impact and a certain type of boxes are used to optimise transport. As for the final product, it is impossible to incorporate it in the production process; however, several partnerships with customers are in process to develop new products, replace raw material or components used for quality improvements in current products, and reduce environmental impacts. As a supplier for the automotive industry, products are manufactured according to ELV Directive, which aims to dismantle and recycle the different components used. For C8 Procurement Manager, one of the priorities is the implementation of reusable or returnable packaging, which has been developed in recent years by using Kanban methodology. The use of returnable packaging depends on the product to be transported and the location of the suppliers. Returnable packaging is used for suppliers located close to the factory and frequent material deliveries, such as Portuguese and Spanish suppliers. For other suppliers, where the supply is occasional and whose location is not close to the plant, like suppliers located in Turkey and Japan, returnable packaging is not used since the costs are very high. However, internal reuse of the packaging is made. For the Procurement Manager, there must be a cost-benefit ratio, "…the ideal would be supplying directly in the production line, and we have agreements with some suppliers to do that,

but there are cases that is very difficult to do it, not only because of the type of components but also due to the suppliers capacity and to the final cost of the product." As a supplier for the automotive industry, C8 is producing its products according to ELV Directive. Green packaging and reverse logistics practices are implemented by the companies not only because packaging is a relevant cost for all companies but because they need to comply with Portuguese and European Union law to prevent and reduce the impact of packaging and packaging waste on the environment and reduce waste arising from ELV. Therefore, the case studies evidence supports Proposition 4:

P4: Companies implement green packaging and reverse logistics.

5.5. Green Purchasing Practices and Performance

For C1, one of the main goals of GPP implementation is to improve the quality of the final product through the quality of the materials used in the production process. "Using green practices with our suppliers and buying green products to incorporate them in the production process, we can improve the quality of the final products, which in consequence will increase customers satisfaction, and will result in sales increment and better performance. Another important consequence of implementing green practices in the purchasing department is that we can attract more customers because the new trend is searching for greener products. Also, we can attract more investors and other stakeholders, which in the end can improve the overall performance of the organization." According to C2: "…the application of sustainable practices is essential and brings economic benefits for both players in this industry. We work with cork, which is a sustainable raw material, everything we can avoid that is harmful to us, we avoid as much as possible, we will not take a risk with our suppliers, we have competitors, so we need to guarantee the supply chain sustainability". The implementation of GPP for C3, positively affects the company's performance, "…there is a win-win relationship since a sustainable supplier represents a lower risk for the company and consequently, it will be a better partner maintaining a more lasting relationship, which brings advantages for both." For C4 there are some trade-offs in implementing GPP "…the price to paid for the product is higher, however the product is more environmentally friendly and does not present risks to the environment, especially for employees' health and safety." According to C4, the market tends to seek sustainable products that do not affect the environment, and in his opinion, there is no doubt that it is an advantage for the company in terms of performance, and "…it is not possible to manage a company without sustainability practices, and everything starts with the suppliers, who influence the performance of the company not only in terms of quality but also through the minimization of the environmental impact created by manufacturing activities. The competition in the market is very strong, and the competitors are always trying to find something to expose us to customers and community judgment." At C5, there are no performance indicators to evaluate GPP on company performance, but according to the interviewee perception, there is a positive relationship between green upstream practices and overall performance. Buying greener products will have less impact on the environment, increase workers safety and consequently workers productivity which will have impact in overall company performance. The relationship between the implementation of GPP and company performance for the C6 is positive because there is a great diversity of positive direct and indirect impacts: cost reduction through waste reduction, process efficiency improvement, increasing employee motivation with effects on improving productivity, improving image and reputation in the market, risk approach, and communication with stakeholders, among others. For C7, "…if suppliers implement green practices, their performance will increase, the risk decrease, and our performance will also be better. Suppliers are business partners, and the fact that suppliers are sustainable is also reflected in the company's overall performance." The impact of GPP practices, namely in the first level suppliers, for C8 Procurement Manager, is positive in terms of competitive advantage for the supplier and the focal company. For this company the main goal for the adoption of green practices is to reduce the costs and make more profit in the medium/long-term since, in the short-term, the return on investments is not visible, "…but our opinion is that companies exist not only to make a profit but also to have a long life and this is only possible if they adopt sustainable practices." Table 3 summarises procurement managers' perceptions regarding the relationship between GPP and the impact on company performance.

Company	Overall Performance	Impact
C1	Positive	Quality of the product, customer satisfaction, increase sales
C2	Positive	Risk reduction, firm competition
C3	Positive	Risk reduction
C4	Positive	Risk reduction, minimize environmental impact, firm competition, improve quality of the final product, enhance workers safety
C5	Positive	Minimize environmental impact, increase workers safety
C6	Positive	Risk reduction, increase reputation, cost reductions, increase employee's motivation, increase stakeholders' interests
C7	Positive	Risk reduction, better performance
C8	Positive	Competitive advantage, long term survival

Table 3. Relationship between GPP and performance

Therefore, the case studies evidence supports Proposition 5:

P5: The implementation of GPP positively influences the focal company's overall performance.

Table 4, summarizes the findings, and outlines the supported and not supported propositions obtained from the cross-analysis of the eight case studies.

#	Propositions	Supported	Not supported
1	Companies implement green product practices		✓
2	Companies implement green supplier practices		✓
3	Companies implement environmental collaboration with suppliers	✓	
4	Companies implement green packaging and reverse logistics.	✓	
5	Green purchasing practices improve focal company's performance	✓	

Table 4. Propositions supported and not supported

6. Discussion

This study allowed an assessment of the accuracy of the proposed theoretical framework, explored the views of GPP by procurement managers in various organisations and sectors and their effect on the overall performance. Considering the results obtained after cross analysis of the eight case studies, we found that the two of five propositions were supported by the outcomes. Green product and green suppliers' practices are not fully implemented by the companies and environmental collaboration with the suppliers, green packaging and reverse logistics are fully implemented by the focal companies, and according to managers perception GPP has a positive relationship with overall companies' performance in increasing organisations competitive advantage by reducing the risk, improving customer satisfaction, improving quality of the final product, enhancing competition, reducing environmental impacts, improving safety and health conditions and employee's motivation. Regarding green product, which includes requirements related with product composition, labelling and product stewardship, was found that, whenever is possible, companies purchase environmentally friendly products, consider reduce, reuse and recycle procedures and comply with Portuguese, EU and International requirements purchasing regulations, however cost and quality of the product are the main drivers in their decision to purchase. Since none of the companies manage the impact of the purchased materials from supplier until the end of the product life cycle, led us to state that companies studied do not fully implement green product practices. For Bhupendra and Sangle (2018) companies that implement product stewardship strategy creates 'differentiation' advantage. According to Sellers (2016) product stewardship is essential to the success of a multinational business, and is at the core of company's value generation, and by managing companies' products environmental, health and social

impacts, companies can improve their performance and minimise risks. Gaps in stewardship can have catastrophic consequences for a product, reputation, and companies bottom line, since effective product stewardship can build a brand, open new markets, and support the commercialisation of innovative new products (Sellers, 2016). A study on supply chain resilience published by the World Economic Forum (http://www3.weforum.org/docs/WEF_RRN_MO_BuildingResilienceSupplyChains_Report_2013.pdf) provides additional evidence of the value of product stewardship. As news of disruptions leaks, it can affect stock prices even before public announcement. After public announcement of a supply chain disruption the stock value of a publicly traded company drops by 7% on average, and stock prices typically require months to recover. A robust, right-sized product stewardship can build a brand, open new markets, and support the commercialisation of innovative new products (McDonald, Clarke, Huang & Seitanidi, 2019). Research suggests that product stewardship contributes to competitive advantage, and it helps an organisation to gain exclusive access to valuable resources (Hart, 1995), and greening the product can improve company environmental performance which in turn enhances competitive advantage (El-Kassar & Singh, 2019; Rehman, Kraus, Shah, Khanin & Mahto, 2021). For green supplier practices, which include supplier's selection, evaluation, and audits, we found that companies only implement these practices to first tier suppliers, as result the Proposition 2 was not supported. Some of the companies in our study implement, according to Tachisawa and Wong (2014), an indirect approach, it means that to manage sub-suppliers implementation of green practices organisations use its first tier suppliers. First tier suppliers are requested to communicate the code of conduct to all their suppliers, and it is their responsibility to guarantee that their suppliers comply with all the requirements defined in the code of conduct. Companies should pay more attention to this practice, because and according to several authors, can bring several benefits, such improvement of environmental reputation, cost and time, and consequently increasing their competitive advantage (Kuei, Madu, Chow & Chen, 2015). For the success on green practices trust between first-tier supplier and second-tier supplier is critical (Grimm, Hofstetter & Sarkis, 2014; Grimm, Hofstetter & Sarkis, 2016), and can bring several benefits, such improvement of environmental reputation, higher margins, reduction of cost and time, increase competitive advantage and avoid potential damage of corporate reputation (Kuei et al., 2015; Dou, Zhu & Sarkis, 2018). In some companies such as Apple, Dell, Honda, IBM, and Toyota managers never make decisions about products components without directly contact the sub-suppliers, adopting in this case a direct approach (Choi & Linton, 2011). Important to notice that in the implementation of environmental program for sub-suppliers, first-tier supplier with the high buyer power more likely expects a positive reaction (Dou et al., 2018). Issues with suppliers' ethical performance may cause irreparable damage to focal firms reputation. Companies should implement sustainability practices since improve ethical suppliers' performance which in turn affects positively focal firm performance (Mani & Guanasekaran, 2021). For all companies studied, the majority of suppliers are geographically located in Portugal and Spain, which facilitate the implementation of green practices, the organisation of training programs auditing, enhance collaboration, and reduce transportation costs in line with several studies found in the literature review that geographical location (close distance proximity) among supply chain members is very important and has several benefits (Awaysheh & Klassen, 2010; Grimm et al., 2014; Gopalakrishnan, Yusuf, Musa, Abubakar & Ambursa, 2012; Hoejmose, Grosvold & Millington, 2013). Regarding environmental collaboration with suppliers, we found that focal companies develop and implement several activities with their suppliers to reduce environmental impacts. Green et al. (2012) and Zhu et al. (2007) found that environmental collaboration with suppliers can provide cost savings however does not result in environmental sustainability improvements for the focal firm. Other authors found that collaborating with suppliers improve environmental sustainability, ensure the continuity of supply and reduce supplier risk (Pagell & Wu, 2009; Zhu et al., 2007). As a result, can have a positive impact on the supply chain in optimising the supply chain, improve operations efficiency, reduce, reuse and recycle the material (Grekova et al., 2016). As well as, sharing information, through integration and cooperation, with suppliers can result in environmental improvement and competitive advantage for the focal company (Vachon & Klassen, 2006a,b; Carr & Kaynak, 2007; Prajogo & Olhager, 2012; Handfield, Wlaton, Sroufe & Melnyk, 2002). In fact, several authors (e.g., Grimm et al., 2014; Dou et al., 2018) recognise that building trust between focal companies and suppliers is essential to improve the performance. Environmental collaboration with suppliers can enhance the focal firm's performance not only directly, but also indirectly, by stimulating the focal firm to implement more environmentally sustainable practices that in turn contribute to the firm's performance

(Grekova et al., 2016). Was found that focal companies develop and implement several green packaging and reverse logistics practices. Two companies studied, have specialised teams collaborating with suppliers to search new innovative and less costly solutions to reduce the impact of packaging on the environment. The level of implementation of these practices depends on the sector, transportation costs and waste management. According to several authors (e.g., Zaman & Shamsuddin, 2017; Bouzon, Govindan & Rodriguez, 2018; Yaw, Ebenezer & Esther, 2020), reverse logistics practices such as the repair, reuse, remanufacturing, recycling, and proper disposal of waste reduce the negative impact on the environment, and by reducing the carbon emissions and solid waste improves environmental and societal health status (Bouzon et al., 2018), promoting cleaner production leading to efficient production (Yaw et al., 2020). According to interviewees GPP has a positive relationship with overall performance increasing organisations competitive advantage by reducing the risk, improving customer satisfaction, improving quality of the final product, enhancing competition, reducing environmental impacts, improving safety and health conditions and employee's motivation. These results confirm the findings that green purchasing is highly linked to company performance, and with environmental performance (Carter et al., 2000; Laosirihongthong et al., 2013), has a positive correlation with financial success (Zhu and Sarkis, 2004; Zhu et al., 2010), and there is a positive link between customer acknowledgment about how companies are greening their supply chain and companies economic, operational and environmental performance (Rao, 2019; Quyen, 2020; Yang, Wang, Gu & Xie, 2021). Sustainable procurement strategies enhance reputational and operational risk management performance and may increase a company's market competitiveness due to customer awareness of the benefits of purchasing green products (Min & Choi, 2019). The empirical research of Silva-Rosa et al. (2019) also shows that greening suppliers can lead to green process, followed by company environmental and business performance. In a more recent studies, Chin et al. (2020) show that green products, green processes, and green supplier practices all have a significant and positive impact on business environmental performance and if organisations examine and analyse their suppliers' sustainability they may improve their environmental, social, and economical performance and Hallikas et al. (2020) establish that companies that invest in sustainability in their procurement improve their procurement and supply management performance. We found that the firm's purchase volume also works as a factor to pressure suppliers to adopt environmental practices as noted by Min and Choi (2019) that firms with greater purchasing power can pressure their suppliers to adopt environmental programs by promising an elevated purchasing volume. Additionally, was found that green, social and ethical practices influence companies' stock price in long-term, focal organisation operating performance, and can bring economic benefits (Kim & Chae, 2021).

7. Conclusions, Future Research and Limitations

The main goal of this study was to identify the GPP currently adopted by Portuguese manufacturing companies to ensure that those practices are success fully implemented in the supply chain and in the focal company and to analyse the manager's perception of GPP impact on overall performance.. The data was collected using semi-structured interviews and through the collection of secondary data from publications, websites, and companies' internal documentation. A cross-case analysis was developed to identify the GPP implemented and to determine the relationship between green SC practices and overall performance. This study concludes that, although organisations consider environmentally friendly products and are doing some collaboration practices with their suppliers, product stewardship is not implemented, and the cost and quality of material purchase are, still, the main drivers. For green supplier practices proposition which includes supplier selection, evaluation, and audits was not supported, since companies studied only implement these practices to first-tier suppliers. Regarding environmental collaboration with suppliers between the focal firm and its suppliers, we conclude that focal companies develop and implement several activities with their suppliers to reduce environmental impacts, supporting Proposition 3. Several green packaging and reverse logistics practices such as repair, reuse, recycling, and proper disposal of waste were identified. It was also possible to conclude that according to managers' perceptions, the adoption of GPP has a positive impact on the overall company performance by reducing the risk, improving customer satisfaction, improving quality of the final product, enhancing competition, reducing environmental impacts, improving safety and health conditions and employee's motivation. Further, Portuguese firms need to strengthen product stewardship and collaborations with second-tier suppliers to retain their competitive advantage. Moreover, the adoption of GPP relies on the company's product, strategy, size, financial resources, and customer

demands, and the firm's purchase volume also works as a factor to pressure suppliers to adopt environmental practices. This research contributes to the current discussion in green supply chain literature by identifying the GPP used in different sectors of Portuguese economy and the relationship with overall organisation performance. Managers might utilise the results of this study to develop and implement GPP and enhance organisations' overall performance via their adoption. Despite the significant managerial contributions, this study still suffers some limitations which may provide directions for future research. For example, while the sample included organisations from several manufacturing sectors, it was based on just a sample of eight case studies and the findings may not be valid in different sectors. This study focuses on green procurement from a country's perspective, which reduces the ability to generalise the findings to other countries. Future studies can be done by replicating this research with firms in other manufacturing sectors or employing this approach to small and medium-sized companies, which represent the majority of the Portuguese economy. Another recommendation is that research may be conducted on companies in the service sector to explore how GPP differs across manufacturing and service sectors. Another suggestion for carrying out future work would be the use of longitudinal case studies. This approach would help analyse the implementation and structural dimensions of GPP and overall performance over time. Future research may collect larger samples of empirical data.

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