Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

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MASTER´S FINAL WORK

DISSERTATION

STRATEGIC APPROACHES TO DEPENDENCE ON RESOURCES AND SUPPLIERS

ANA SOFIA DA SILVA LOPES REGO

MARCH - 2023

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SUPERVISION:
ANA SARA MARTINS DORES GONÇALVES

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ABSTRACT

Recycled Polyethylene Terephthalate, known as Recycled PET, or rPET, is the recycled product of the virgin plastic material PET (Polyethylene Terephthalate). The European Union has announced new regulatory measures that set a target for the usage of rPET in packaging (25% by 2025).

The low availably of rPET, its concentration amongst few suppliers, as well as the need for complying, has resulted in supply chain disruptions in which companies are exposed to dependence on the supply of rPET. In attempt to mitigate supply risks, reduce financial impacts, and ensure survival, companies have found themselves in need to manage their relationships with suppliers and define appropriate strategies.

This study examines the reaction to the issue of dependence on supply (resources and suppliers), brought by the EU rPET legislation, and seeks to offer insights into what are the most adopted strategies amongst companies under these conditions. For this purpose, it was conducted a survey directed towards companies operating in the food and beverage industry and whose operations and products fall under the announced regulations. The sample consists of a total of 26 companies under those conditions. The results suggest that the most adopted strategy is compliance. That is, the findings insinuate that amongst the companies experiencing, to some extent, dependence on supply (rPET and its suppliers), the most common strategic approach is to maintain a locked-in position, in which they comply with contractual terms and conditions demanded by the supplier.

Keywords: Buyer-supplier relationships; Dependence on suppliers; Resource dependence; Strategic behavior; Recycled PET

RESUMO

O Tereftalato de Polietileno Reciclado, conhecido como PET reciclado ou rPET, é o produto reciclado do material virgem PET (Tereftalato de Polietileno). A União Europeia anunciou novas medidas regulatórias que estabelecem um objetivo para o nível mínimo de incorporação do rPET em embalagens (25% até 2025).

A escassez do rPET e a sua concentração entre poucos fornecedores, assim como, a obrigatoriedade das empresas em cumprir as diretrizes europeias, têm resultado em disrupções na cadeia de abastecimento, em quais as empresas são expostas à condição de dependência de fornecimento do rPET. De modo a mitigar riscos de fornecimento e reduzir os impactos financeiros acrescidos com a dependência de recursos e fornecedores, é recomendado que as empresas giram as suas relações com os fornecedores e definam estratégias adequadas.

Este estudo explora a solução ao problema de dependência de fornecimento (recursos e fornecedores), dirigida pela legislação da União Europeia sobre o rPET, e procura gerar *insights* sobre quais as estratégias mais adotadas pelas empresas subjugadas a essas condições. Para alcançar este propósito, foi realizada uma pesquisa direcionada a empresas que, operam dentro da indústria alimentar e de bebidas e cujas operações e produtos estão sujeitos às regulamentações anunciadas. A amostra é composta por um total de 26 empresas caracterizadas pelas condições mencionadas. Os resultados sugerem que a estratégia mais adotada é a conformidade. Isto é, os resultados da investigação insinuam que, entre empresas com um certo nível de dependência do rPET e dos fornecedores de rPET, a abordagem estratégica mais comum é a de aceitação e cumprimento dos termos e condições contratuais exigidos pelo fornecedor.

Palavras-chave: Relação com fornecedores; Dependência de fornecedores; Dependência de recursos; Estratégias empresariais; PET reciclado

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1. INTRODUCTION

The European Union's food and beverage industry has been impacted by the attempt to establish a compulsory target for rPET. This is centered on the recently announced legislation dictating all PET products placed within the European Union's market must comply with a mandatory percentage of at least 25% of rPET by 2025 and 30% by 2030. This governmental intervention restricts the minimum amount a company can purchase of this resource, rPET, which combined with the low market capability to increase supply in the short run, has created an unproportionate number of buyers and suppliers in the market. The increase in competition for rPET and its concentrated control, can affect the relationship with rPET suppliers by generating a scenario of dependence, and in which the buyer's exposure to suppliers' bargaining power can result in unfavorable purchase agreements distressing quantity, quality, and price. As a response, it might be beneficial to focus on supplier relationship management and understanding what strategies are available and best suitable. When developing an effective business strategy, knowing the external market conditions, and acknowledging variables influencing internal financial success, enables organizations to properly prepare and adapt for supply chain disruptions. This being said, the main objective of the literature presented in this paper is to identify the conditions and variables that determine dependence on suppliers and resources, and to identify recommended strategic approaches for companies that want to mitigate it. The resource dependence theory presents one of the main theoretical frameworks for comprehending the determinants of dependence. It assists in compartmentalizing the business and its internal situation to improve the process of examining potential problem-solving strategies (Davis & Cobb, 2010; Delke, 2015; Drees & Heugens, 2013;). Nonetheless, the solution to the mentioned dependence problem is still at a rudimental stage as it is generally agreed by academics that the buyer will frequently be subjected to suppliers' demands and will therefore face difficulty in designing a strategy whose implementation significantly improves their competitive advantage.

The relationship between the level of dependence and the choice of strategy has led academics to segregate their recommendations in line with the variables of supply risk and financial impact. For this, academics generally support the use of the Kraljic matrix.

From a firm's perspective, the segmentation of strategies as a response to different needs may also be proven helpful in conducting a more accurate benchmarking analysis.

The goal of this paper is to provide insights into what strategies companies under the EU rPET legislation are adopting to mitigate buyer-supply relationship disruptions. It focuses on the problem of dependence upon resources and key suppliers and aims to find what strategies companies adopt to fight this. To achieve the purpose of this research, to explore strategies used by businesses under this condition, a survey was conducted amongst companies vouching for the following criteria: operating in the food and beverage industry; commercializing products affected by the new EU rPET legislation. A total of 26 responses were collected.

This research is relevant for companies under the criteria above and the problem of dependence on rPET and suppliers of rPET, as it provides insight into their competitor's strategic behavior. Besides, it might help organizations to discover new strategies and evaluate whether to employ them, as well as, assessing behavioral and strategic performance trends.

Moreover, this paper wishes to shine a light on the topic of sustainable plastic packaging and to raise awareness on the impacts of new sustainability regulations that aim to reduce or ban environment-endangering products (as is the case of the EU rPET legislation). Organizations should prepare their business operations and consult with supply management strategies to indulge current and future disruptions in an economy moving towards circularity and to which green supply purchasing is a fundamental response tool.

This research paper is subdivided into five chapters: Introduction; Literature Review; Methodology; Analysis and Discussion of Results; and Conclusion. The Introduction provides an overview of the study's purpose and importance. In the Literature Review chapter, it is discussed the concepts of green supply chain management and circular economy, supplier-buyer relationships in the presence of bargaining power and dependence, strategic approaches to mitigating dependence on suppliers, and the study's conceptual framework. The following section, Methodology, describes the research design and methods. The Analysis and Discussion of Results include a theoretical framing of the problem and market contextualization, legislative setting and background data, SGD 12 - Responsible Production and Consumption, dependence on rPET and rPET suppliers, sample profile, strategies adopted, determinants of dependence, and a discussion of results. Finally, the Conclusion chapter

presents the main findings of the study, limitations, and suggestions for future research.

2. LITERATURE REVIEW

In the literature review chapter, it is presented a theoretical background that helps to understand the disruption in the supply chain from moving towards a circular economy, the conditions in supplier-buyer relationships that lead to dependence on resources and suppliers, and the recommended solutions that mitigate the negative consequences of dependence, from a strategic management planning point of view.

2.1 Green Supply Chain Management and Circular Economy

Organizations operate within environments that strongly influence each other's processes and activity outcomes. The interconnection between organizations in a chain of values is one of the most important factors for explaining inter-organizational behavior. Given its relevancy, this topic is heavily explored in supply chain management theories (Welford and Gouldsoa, 1993). Supply chain management assists in developing a framework that optimizes the flow of materials and services by improving operational activities in performance, efficiency, and profitability.

Recently, the emergence of green supply has forced companies to reconfigure their supply chain, and as such, has brought the previous concept to be rethought and linked to sustainability. Green supply chain management theories highlight interactions between a company and its suppliers are key process points requiring proactive approaches to premeditate opportunities and threats. As a result, new sustainable purchasing strategies are proposed as environmental regulations increase (Bowen et al, 2001; Green et al., 1996; Srivastava, 2007).

While moving towards a green supply chain, the inclusion of processes such as waste collection, sorting, remanufacturing, recycling, and redistribution contributes to the growth of a circular economy, a framework that shifts an industry's supply chain to a closed-loop system. (Kahjuria et al, 2022; Atasu & Boyaci, 2008). Consequently, it creates new revenue streams associated with the incorporation of new processes that become necessary steps to placing a product on the market (Taleb & Farooque, 2021). Since the transition to a circular economy forces the inclusion, elimination, and disruption of market activities, it may lead to instability and unpredictability (Wijkman & Skånberg, 2015). It has also been appraised that circular economies create path

dependency and impose constraints in decision-making, which represent an obstacle for supply chain members when they wish to modify operations, change materials in usage, and reformulate corporate strategies (Korhonen et al, 2018).

2.2 Managing supplier-buyer relationships in the presence of bargaining power and dependence

The Resource Dependence Theory is primarily built around the assumptions that: organizations are interdependent; companies are dependent on other supply chain members to secure supply; resources are limited, hence there is competition for them; power in buyer-supplier relationships is not always evenly distributed; and markets are volatile and allow for adaptation (Cook, 1977; Pfeffer & Salancik, 1978).

It has been concluded that dependence on resources and suppliers exists when at least one of the following conditions are true: the resource is financially important for the firm; non-substitutability; concentrated control (Pfeffer & Salancik, 1978).

To understand different levels of dependence, Pfeffer and Salancik (1978) have broken down relationships bounded by dependence into two categories: symmetric and asymmetric. The first is observed when there is mutual dependence amongst parties and, therefore, firms recognize each other's value and wish to sustain long-term relationships. The second category takes place when there is unbalanced control over a resource, which allows for one player to determine the terms and conditions of the transactions, meaning the firm possessing the resource deemed more valuable can impose self-interests upon the other company (Caniëls et al, 2018; Buchanan, 1992). Asymmetric relationships, given the low risk of retaliation from the weaker half, are more prone to generate power imbalance and opportunist behaviors (Joshi, 1998; Ramsay, 1996). Here, power is used to appropriate supply chain management gains by, for example, raising prices and lowering quality. However, the existence of bargaining does not necessarily mirror the degree to which power is used. One of the main supporting arguments for this is that the supplier (dominant party), recognizes a higher satisfaction level when building long-term relationships with its buyer. Satisfaction can be associated with trust, commitment, the ability to easily resolve conflicts, steady profitability, reduced logistics costs, improved inter-organizational cross-capabilities, and minimization of environmental and social impact (Caniëls et al, 2018; Govindan et al., 2021). From this logic derives the belief that overall uncertainty related to supply,

for example, price and quantity volatility, can be solved with the nourishment of long-term relationships (Crook & Combs, 2006).

Most literature findings indicate that, when dealing with dependence, it is preferable to employ less intrusive techniques and act in a cooperative or compliant manner (Provan, et al 1980; Williamson, 1985; Joshi, 1998). Cooperation is increasingly recommended as the number of suppliers decreases and the degree of interdependence increases. When using this tactic, the constrained firm should search for setting high relational norms associated with common goals and values for adequate behavior, which in turn should increase righteous actions, trust, transparency, and commitment (Das et al., 1998). Compliance, however, is only recommended as a short-term approach, to avoid conformity and attempts from the dependent party to induce further exploitation (Galaskiewicz, 1985). Nevertheless, some authors defend that more proactive approaches are more effective in fighting power discrepancies and provide the following strategic solutions: temporarily halt purchases or other exchanges with the provider; look for substitute suppliers or resources; and engage in diversification techniques, in which the firm chooses to purchase the resource from various sources (Pfeffer & Salancik, 1978).

Nonetheless, it is generally acknowledged amongst academics that strategic decisions made by a dependent firm almost always result in non-significant impacts on the overall outcome, furthermore, when both resource dependency and supplier's bargaining power exist intensively, compliance is, in most cases, the only viable position the reliant firm can implement.

2.3. Strategic approaches to mitigating dependence on suppliers

Peter Kraljic's model (1983) presents a tool for procurement strategies whose goal is to maximize profit margins and minimize supply risk by determining how the company should strategically position itself. Different strategies are designed for each quadrant on the matrix and should provide the best strategic scenario.

The product in exchange can fall into one out of four categories: non-critical; leverage; bottleneck; or strategic. Non-critical items appear when the product has a minimal impact on the financial performance of the buying company and the supply risk is low, meaning, for example, that it has no significant impact on profit margins and, it exists abundantly in a market with a high number of suppliers. In this case, purchasing

strategies should focus on reducing logistic, administrative, and transactional costs (Lambert & Schwieterman, 2008). One way to accomplish this is to create a pool of orders for various products and place it alongside the same supplier (Caniëls & Gelderman, 2005). In the presence of leverage items, distinguished by a low supply risk and a large profit impact, the emphasis should be on maximizing value while minimizing expenses (Lambert & Schwieterman, 2008). This can be achieved by negotiating in competitive biddings and regularly swapping suppliers. Additionally, short-term contracts are advised in this situation as businesses should aggressively look for the best offer (Caniëls & Gelderman, 2005). Looking into bottleneck items, these are ones with high supply risk but low financial impact and are associated with situations in which the product can only be delivered by one to a few suppliers. Here, since the goal is to eliminate supply risk volatility and ensure continuity of supply (Lambert & Schwieterman, 2012), the advised measures are the establishment of contracts with suppliers that guarantee a pre-agreed level of stock delivered and finding product alternatives (Caniëls & Gelderman, 2005). Lastly, strategic items are categorized by high financial impact and high supply risk usually because the item is scarce. In this situation, it is proposed that the company adopts a collaboration strategy alongside suppliers and develops strong long-term bonds that improve product quality and delivery reliability (Caniëls & Gelderman, 2005; Lambert, 2008). Strategic partnerships are also presented as a way of maintaining access to resources since they can either: reduce competition arising from the discrepancy between the number of buyers and suppliers; increase organizational control through operational expansion; or help foster long-term growth profitability (Pfeffer & Salancikl, 1978). Looking in-depth at this approach, it is suggested the co-creation of the product with the supplier as well as the engagement in a merger or acquisition, nonetheless, some authors have pointed out that the second solution is to be avoided in most cases and that its recommendation typically overlooks obstacles, underlying problems, and further disruptive ramifications (Gadde and Snehota, 2000). As an alternative, it is proposed that the firm first opts for less invasive agreements such as joint ventures and trade associations, which help to partially contribute towards more stable and predictable transactions. (Pfeffer & Salancik, 1978).

2.4. Conceptual framework

To understand the problem addressed in this research, it was considered as the following three main determinants of dependence: financial importance; non-substitutability; and concentrated control (Table I). The relationship between these variables and an organization's dependence on resources and suppliers, as well as its concepts, was developed by the authors Pfeffer and Salancik (1978).

The strategic approaches identified in the literature and whose research will be conducted upon are presented in Table II.

Table I – Determinants of dependence

Constructs	Definition	Authors of reference
Financial importance	Extent a resource impacts a company's ability to generate revenue or control costs	Pfeffer & Salancik (1978)
Non-substitutability	Degree to which a resource cannot be replaced by alternatives	Pfeffer & Salancik (1978)
Concentrated control	Degree of control a few suppliers hold over a resource	Pfeffer & Salancik (1978)

Table II – Strategies

Constructs	Definition	Authors of reference
Switch to alternative products	Seek alternative products (resource substitutes)	Caniëls & Gelderman (2005)
Compliance	Meeting the demands of the supplier	Kraljic (1983)
Cooperation	Establish a mutually beneficial relationship with the supplier	Kraljic (1983)
Negotiation	Influencing a supplier's behavior by bargaining over the terms of exchange	Caniëls & Gelderman (2005)
Alliance	Ally with other buyers (broad cooperation with other buyers)	Pfeffer & Salancik (1978)
Diversified purchasing	Purchasing a resource from multiple sources	Pfeffer & Salancik (1978)
Pooled purchasing	Pooling resources with other buyers	Caniëls & Gelderman (2005)
M&A	Acquiring or merging with another company	Caniëls & Gelderman (2005)

Through the examination of the literature, it was possible to gather strategies based on the organization's internal capabilities and external conditions. It is presented

below (Figure I) an organized structure of strategies, segregated by the level of supply risk and profit impact (high or low). This framework is an adaptation from Caniëls and Gelderman (2005), initially proposed by Kraljic (1978) and earlier developed by Gelderman and van Weele (2002). Kraljic (1978) defines supply risk as the likelihood of an event occurring that impacts the supply of resources and financial impact as the degree to which a resource impacts a company's ability to create profit.

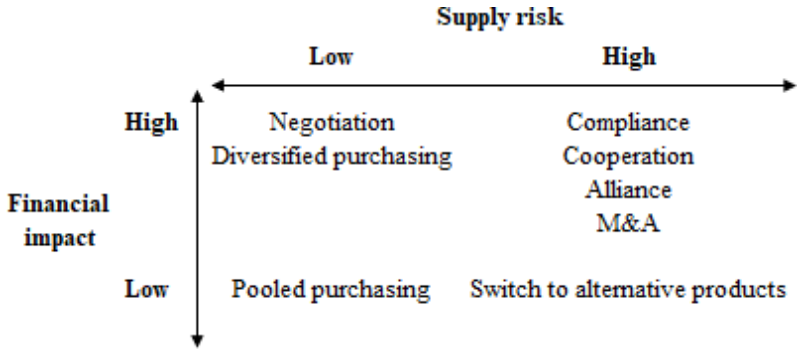

Figure I - Summary of strategies allocated in Kraljic's quadrants

Source: Adapted from Kraljic (1983), Gelderman and van Weele (2002), and Caniëls and Gelderman (2005)

3. METHODOLOGY

The goal of this paper is to explore what strategies companies adopt when they face dependence on resources and suppliers. The approach carried out throughout this project is exploratory research and it intends to, after having identified a problem, investigate real actions taken to solve it. As previously mentioned, the research is carried out in light of the EU rPET legislation.

The research approach employed in this study, therefore, included: identifying what the European legislation dictates regarding PET; identifying which industries are covered by this legislation; preparing a questionnaire to send to companies in these affected industries; and analyzing the responses with the aim of finding out their current situation regarding negative impacts and how they are strategically dealing with the matter.

Data collection should involve the identification of samples that present relevant information for the study (Ryan, 2006), thus, the primary triage for sample sorting was investigating the specifications of the EU Directive covering the topic in question.

This was followed by the identification of the affected countries, industries, and companies, which allowed to select applicable participants whose inputs would help responding the research's objective. The next phase included the design of an online questionnaire, later sent to the previously identified companies, that was the support for collecting primary data.

The questionnaire was designed according to the conceptual framework and can be subdivided into three parts. The first part aims to categorize and characterize the respondent firm, and to confirm if the commercialized products are affected by the 2025 EU mandatory rPET legislation. The second part aims to understand the level of exposure of the company to the problem of dependence surrounding the supply of rPET/ rPET packaging. Using determinants of dependence and underlying bargaining power to help frame the company on the existence of dependence (represented in Figure I) and its degree by inquiring on the financial importance of rPET supply, accessible alternatives to the product, and available supplier substitutes. The third part aims to understand what the adopted strategic approaches and measures are being undertaken to mitigate the identified problem. The following strategies were presented to the participant: switch to substitute products; compliance; cooperation; negotiation; alliance; diversified purchasing; pooled purchasing; M&A.

To obtain a coherent investigation, it was only considered businesses operating in the same industry, with highly standardized rPET requirements. As such, the population was defined by vouching for the following criteria: companies operating in the European Union's Food and Beverage industry; companies commercializing products under the EU 2025 PET legislation. Using the data platform ORBIS Europe, a list composed of a total of 216 companies was selected (Appendix V).

In light of a mono-method quantitative approach, the primary data was collected through a survey in a cross-sectional temporal horizon. The questionnaire was developed through the Qualtrics platform (Appendix I), and a pre-test was conducted by sending it to 3 procurement directors from companies located in Portugal that follow the looked-for conditions. Afterward, the questionnaire was then sent to 216 companies via email (Appendix V)

The sample consists of 26 companies operating in the European Union's food and beverage industry. The respondent's core business location is spread across 14 different countries, all members of the European Union, reflecting a diversified sample

of businesses. The response rate was approximately 8,3%. Anonymity regarding the companies composing the sample will be honored throughout the research.

The treatment of data was performed using the SPSS software as a tool to assess responses and compute descriptive statistics (Appendix II and III). Furthermore, it was conducted an inferential test (correlation test) (Appendix IV) to assist in understanding the reliability of the sample (Ganesh & Kumar, 2015), in terms of supporting literature conclusions on the relationship between the variables determining dependence and the strategic approaches, using Pearson's correlation coefficients as measurement. To allow computation, the constant variables were excluded from this analysis.

4. ANALYSIS AND DISCUSSION OF RESULTS

4.1. Theoretical framing of the problem and market contextualization

This sub-chapter aims to contextualize the topic under analysis by presenting the research problem and placing it alongside both a theoretical background and the current market environment.

4.1.1. Legislative and market background data

The European Union, to fight environmental damage caused by single-use plastic products (SUPs), has announced new rules to target the issue of plastic litter. This includes a 25% target for recycled content in plastic bottles by 2025 and 30% by 2030. The Directive 2019/004 and 95/62/EC of the European Parliament and the Council indicate that soft drinks PET bottles will contain a minimum of 25% recycled material on average (and 30% by 2030).

These beverage containers also fall under the European Union Regulation (EC) No 1935/2004, which outlines a set of requirements regarding the safety and biocompatibility of all Food Contact Materials manufactured and sold within Member States, one of which is a 5% ceiling on the amount of non-food graded recycled plastic that can be incorporated into food graded ones. This, added to the difficulty in setting apart labels and caps, presents a difficulty in increasing the number of available recycled PET. Because of this matter, Directive 95/62/EC also provides guidelines on how to increase collection rates and quality of recycled material while minimizing the struggle

of safe recycling, stating that the incorporation of Deposit Return Schemes for beverage bottles alone can help the recycling business and consequently the companies that are obliged to comply with the legislative targets.

Post-consumer PET bottles and rPET colorless flakes registered in January 2022 an approximate price of 970€ and 1750€ per ton, respectively, representing an increase of 273% and 119%, in comparison to April 2021. This increase in prices of 2021 is, to some extent, a consequence associated with the higher levels of contamination during the COVID-19 pandemic which consequently limited the amount of post-consumption plastic available for recycling purposes. Furthermore, the increase in energy prices and transportation during this period also explains the trends of these prices. (PRE, 2022)

4.1.2. SGD 12 – Responsible Production and Consumption

SDG 12 – Sustainable Development Goal for Responsible Production and Consumption – aims, amongst others, to encourage businesses to adopt sustainable practices, integrate sustainable reporting, and change consumption patterns. It emphasizes waste management and the establishment of control activities to minimize waste production and invest in treatment plants that increase recycling and reusage (CSD, 2011; UNEP, 2015). Seeing that the disposal of waste endangers marine life and aggravates climate change (Ford et al, 2022; Gall & Thompson, 2015; Khajuria et al., 2022), when acting towards the first goal, it also helps achieving the SDG's 13 (Climate Action) and 14 (Life Below Water).

Single-use plastics for food and beverage consumption have been widely accepted for years. They're practical, safe (limits contamination), light, durable, and affordable. These characteristics have persuaded an overwhelming production and consumption which, connected to its long-lasting decomposition, has carved out one of the biggest environmental challenges we are currently facing. The invasion of single-use plastics in our ecosystems has motivated governments to implement policies that decrease and eliminate these events. Practices such as landfilling disposal have proven negative impacts on soil productivity, water quality, and air purity and can pose health threats to both humans and animals due to the hazardous chemicals these polymers release into food and water (Zhe et al, 2021).

Although some consumers have shown a positive response to the supply of environmental-friendly packaging, the extent of their commitment is unclear as retail

prices increase. Nonetheless, packaging has become an increasingly significant component of competitive advantage as regulators and consumer markets demand new designs as a response to growing sustainability concerns.

Legal accountability has proved to be more effective than relying on corporate social responsibility and consumers' environmentally conscious decisions (Porter & Linder, 1995). The government can successfully attempt to align environmental goals with profitability through market intervention (Grant, 2010), as regulations are a way to increase companies' awareness of harmful practices and incentivize innovation to correct inefficiencies. This is one of the underlying rationales behind the European Union's adoption of the OECD's Polluter Pays Principle (OECD, 2022) throughout its entire jurisdiction (EU, 2019; EU, 2022), holding the producer responsible by internalizing negative externalities costs associated with the activities it holds.

Measures that encourage the implementation of a quantity floor on recycled plastic to ensure companies' compliance and participation in processes such as collecting, salvaging, and revaluing plastic which, once at a market level, results in material circularity, a concept widely perceived as beneficial for sustainable development (Lonca et al, 2020). Recycling is viewed as one of the most viable solutions to mitigate the environmental risks associated with production and consumption, however, its optimization requires standardization of materials used in packaging manufacturing. (Walker et al, 2021). Deposit Return Schemes have been installed throughout Europe to help bottle collection operations, which is stated to increase the availability and reduce the price of recyclable materials (Toffel, 2003). However, since its adoption hasn't been consistent throughout all Member States, the shortfall in PET collection has consequently induced overdemand and price inflation within the recycled PET exchange market.

Although some academics state that circularity ultimately decreases the input of virgin materials and increases the input of recycled materials (Kahjuria et al, 2022), others argue that within a complete circular economy, waste flows may shrink over time, and since companies are dependent on the existence of waste, it can increase the overall virgin resource use (Korhonen et al, 2018). This statement has as its first premise the fact that plastic components lose quality over time and have a finite number of usages possible before the need for disposal, which means there's a limit to the economic value extracted from the recycling activity and its associated processes (Kahjuria et al, 2022).

4.1.3. Dependence on rPET and rPET suppliers

Within a complete circular economy, companies find themselves dependent on the existence of recycled material. Without increases in virgin inputs, waste flows may shrink over time and the quantity available of recycled material may surpass its demand and consequently, prices may increase (Kahjuria et al, 2022).

The insufficient quantity of rPET in the market available for purchase and its concentration amongst only a few suppliers has led several companies to become dependent on rPET suppliers. The overdemand added to the non-existence of an rPET price ceiling, means this unbalanced supply and demand has brought rPET prices to inflate. Since the inclusion of the resource into the final packaging is a mandatory requirement, companies that depend on the resource for their finished product must compete to stay in business. Most have found themselves in a bind where they must either pay the high price in full or devise strategies to get suppliers to absorb some of it.

4.2. Sample profile

The sample consists of 26 companies that operate in the food and beverage industry and commercialize inside the European Union's market (Table III).

In terms of business size, according to the European Commission's current recommendation of scope and definition, the sample contains 9 micro companies, 8 small to medium companies, and 9 large companies, which means each category accounts for 34,6%, 20,8% and 34,6% of total responses, respectively (Table IV).

The respondents' core business location is spread across 14 different countries: Austria, Belgium, Bulgaria, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, and Sweden (Table V).

Note that all companies incorporating the sample commercialize products that are subject to the 2025 EU mandatory rPET legislation, which verifies the reliability of the sample by assuring the profile characteristics fall under the investigation problem and whose solutions are, therefore, relevant for the research purpose.

Table III – Respondent's profile: Industry

Industry	Frequency	Percent
Food and Beverage	26	100,0

Table IV – Respondent's profile: Company dimension

Company dimension	Frequency	Percent
Micro	9	34,6
Small and Medium	8	30,8
Large	9	34,6
Total	26	100,0

Table V – Respondent's profile: Country

Country	Frequency	Percent
Austria	1	3,8
Belgium	1	3,8
Bulgaria	1	3,8
France	1	3,8
Germany	4	15,4
Greece	1	3,8
Hungary	1	3,8
Ireland	1	3,8
Italy	4	15,4
Netherland	1	3,8
Norway	1	3,8
Portugal	2	7,7
Spain	4	15,4
Sweden	3	11,5
Total	26	100,0

4.3. Strategies adopted

Looking at the graphic below (Figures II), we can see that compliance is the most widely used strategy as an approximate total of 38% of the companies (total of 10 companies) adopted this strategy. Following, cooperation was the second most widely used approach, with a rate of adoption of about 23% (total of 6 firms). About 15% (4 companies) have taken on the strategy of switching to alternative products. The next most prevalent strategies, adopted by 3 companies each (12%, respectively), are alliance and diversified purchasing. As observed, no corporation showed to have embraced any of the following strategies: M&A; negotiation; pooled purchasing.

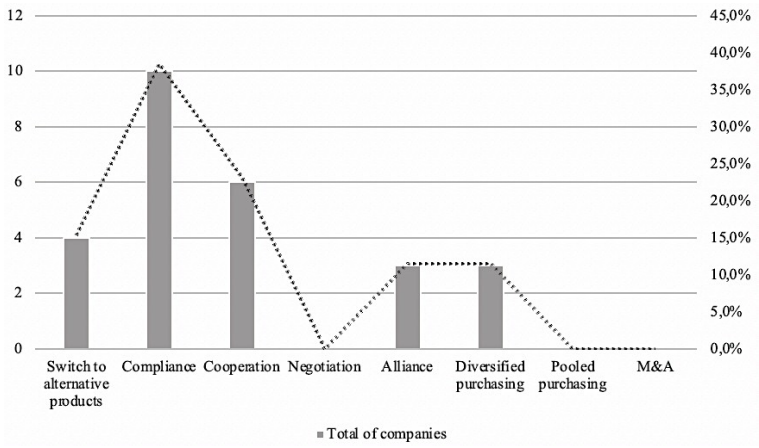

Figure II - Strategies adopted by companies (total number and percentage)

The cross-tabulation of the company dimension and the strategies used, presented in Table VI, reveals that 50% of the companies who decided to move to alternative products are small to medium-sized businesses, compared to about 25% of micro businesses and 25% of large businesses. In terms of compliance, small and medium-sized businesses embraced this technique the least (20% of all adopters), while large and micro businesses adopted it the most (40% each). Cooperation showed to be most adopted by small to medium companies (50%), followed by large companies (33%) and micro companies (17%). Small and medium-sized businesses were the only ones to use the alliance strategy. No micro company used a diversified purchasing approach, and small to medium-sized and large enterprises businesses adopted this method at the highest rates, 67% and 33% respectively.

Table VI – Company dimension per adopted strategy

Strategies	Micro company		Small and Medium company		Large company	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Switch to alternative products	1	25,00	2	50,00	1	25,00
Compliance	4	40,00	2	20,00	4	40,00
Cooperation	1	16,67	3	50,00	2	33,33
Negotiation	0	0,00	0	0,00	0	0,00
Alliance	0	0,00	3	100,00	0	0,00
Diversified purchasing	0	0,00	2	66,67	1	33,33
Pooled purchasing	0	0,00	0	0,00	0	0,00
M&A	0	0,00	0	0,00	0	0,00

4.4. Determinants of dependence

Regarding dependence, findings reveal financial importance is the most present among companies (53,8%), followed by non-substitutability (30,8%) and concentrated control (23,1%) (Table VII).

By observing the frequency of each determinant of dependence per strategic approach (Table VIII), it seems that companies that have adopted the approaches of switching to product alternatives and diversified purchasing have rPET as a financially important resource and are not able to substitute rPET neither find alternative rPET suppliers. The strategies of compliance, cooperation and alliance were adopted when the variable of financial importance was at a higher frequency others (non-substitutability and concentrated control). Looking at the companies that adopted compliance, 90% of have rPET as a financially important resource, 70% have rPET as non-substitutable and 60% are not able to find alternative suppliers. As for cooperation and alliance, these levels are approximately 100%, 67% and 67%, respectively.

Table VII – Determinants of dependence

	Frequency	Percent
Financial importance	14	53,8
Non-substitutability	8	30,8
Concentrated control	6	23,1

Table VIII – Determinants of dependence per adopted strategy

Strategies	Financial importance		Non-substitutability		Concentrated control	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Switch to alternative products	4	100,00	4	100,00	4	100,00
Compliance	9	90,00	7	70,00	6	60,00
Cooperation	6	100,00	4	66,67	4	66,67
Negotiation	0	0,00	0	0,00	0	0,00
Alliance	3	100,00	2	66,67	2	66,67
Diversified purchasing	3	100,00	3	100,00	3	100,00
Pooled purchasing	0	0,00	0	0,00	0	0,00
M&A	0	0,00	0	0,00	0	0,00

The correlation analysis (Table IX) shows the relationship between the variables of dependence and the adopted strategy. Note that correlations not relevant to this analysis (correlations between variables of dependence), as well as constant variables

("negotiation", pooled purchasing", "M&A"), were excluded from the table (see Appendix IV for the complete correlation matrix). It appears that the variables financial importance, non-substitutability, and concentrated control are, individually, positively related to all strategies that were adopted, which supports the examined literature findings of Pfeffer and Salancik (1978). Financial importance presents a strong positive correlation with the following strategies: switching to alternative products (r=0,395; p<0,05); compliance (r=0,573; p<0,01); and cooperation (r=0,507; p<0,01). Non- substitutability shares a strong positive correlation with switching to alternative products (r=0,586; p<0,01), compliance (r=0,588; p<0,01), and diversified purchasing (r=0,497; p<0,01). As for concentration of control, it is observed a strong positive correlation to switching to alternative products (r=0,778; p<0,01), compliance (r=0,693; p<0,01), cooperation (r=0,567; p<0,01), and diversified purchasing (r=0,659; p<0,01). Forming an alliance has a weak positive relationship with all variables of dependence: financial importance (r=0,334); non-substitutability (r=0,243); and concentrated control (r=0,374). These three correlations are not statistically significant (p>0,05).

Table IX – Correlation Table

Correlations

	Financial importance	Non-substitutability	Concentrated control
Switch to alternative	,395*	,586**	,778**
Compliance	,573**	,588**	,693**
Cooperation	,507**	0,369	,567**
Alliance	0,334	0,243	0,374
Diversified purchasing	0,334	,496**	,659**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.5. Discussion of results

The aim of this research is to explore strategic approaches and solutions adopted by companies facing dependence-based relationships with resources and suppliers.

Compliance was shown to be the most adopted strategy amongst companies. As seen in literature, it is expected that, when supply risk is high (presence of few suppliers in the market, scarcity, or limited alternatives of the resource), accepting suppliers' demands is the most adopted behavior (compliance). Moreover, the findings support the

statement that this strategy is expected to be adopted when the financial impact of a resource is high. The availability of a resource, as well as its concentrated control amongst suppliers, increases companies' concerns of ensuring continuity of supply, thus, tendentially, the purchasing company has no better alternative other than adopting a compliant position by accepting the suppliers' terms and conditions. The high rate of adoption of this strategy amongst large companies may reflect their need to reduce risk of reputational damages related to failure of legal compliance.

Cooperation is also anticipated to be implemented when both supply risk and financial impact are significantly high. Findings show that all companies adopting this strategy classify rPET as important to their profitability. This can mean that, although the product is scarce and there is a need to ensure supply, the resource's financial weight motivates companies to chase survival (or increase profit margins), by moving out of a locked-in partnership and into a collaboration strategy. One practical example of implementing this strategy could be to sign a long-term contractual agreement with a supplier to guarantee stability in supply and eliminate volatility associated with suppliers´ bargaining power exploitation.

Although changing the resource for an alternative (perceived or not as a perfect substitute) is a strategy in which every adopter is affected by all three dependence variables, the current limitations on available alternatives for rPET can reflect the lower use of this approach than initially predicted. This phenomenon may also be explained by the need for higher investment in design development and consumer research. Changing the materials used in the final product may require modifying the package design, which in turn, may result in significant changes to the consumer's perception of the product.

Diversified purchasing can be exemplified by a scenario in which the company decides to purchase the resource from multiple suppliers. Adopting this strategy in a market with suppliers' concentrated control over a resource, although challenging, it seems to further motivate companies to use this approach, as it reduces reliance on a single supplier. To successfully implement this strategy, the company should closely monitor market fluctuations and suppliers in order to guarantee the best procurement allocation. This high adoption of this strategy may express companies' high exposure to the markets' volatility in price and supply and their need to develop a backup supplier in order to secure supply and avoid legal and reputational damages.

It was found that negotiation and pooled purchasing tactics were not adopted by companies. This supports the idea that these techniques are mostly used when the supply

risk is minimal. Negotiation strategies reflect the companies' attempt to use their bargaining power, in discussions with suppliers, to obtain the best cost-optimal deal. Nonetheless, given the high supply risk, it seems reasonable that companies are reluctant to indulge in this tactic, due to the risk of the counterparty perceiving it as invasive and, consequently, deciding to suspend supply or intensify its initial demands. It is interesting that no large organization has followed this strategy, as it would appear they would be tempted to negotiate since they typically have reputational power and represent a high share of the supplier's revenue.

A pooled purchasing's strategy primary focus is to maximize cost savings. As an example, a company can choose to collaborate with other buyers to place the sum of their order to the same supplier, in order to increase its importance and help in assuring supply and better price deals. This solution may be best suited for micro or small to medium-sized companies since they typically have lower purchasing volumes and are, therefore, more vulnerable in competing for the resource. The fact that one of the strategies with the highest adoption rate is the development of alliances with other buyers, as in opposed to pooled purchasing, it may seem that companies are more willing to cooperate at a broader scale of operations in order to enhance competitiveness and increase innovation besides of only satisfying low procurement costs. This can mean companies are adopting a long-term view and attempting to solve the supply chain disruption arising from the rPET legislation accordingly.

At last, a corporation that chooses to form a joint venture with an rPET producer to co-create the desired product and reduce supply risk volatility is an example of participating in M&A transactions. The findings indicate that no corporation employed this, which could suggest companies share the belief that it presents a strategy too disruptive to the core business, as previously seen in literature, and may not be appealing to the corporations to embrace.

5. CONCLUSION

5.1. Main findings and contributions

Dependence on a resource and its suppliers can be a consequence of, amongst others, the limited availability of the resource and the concentration of the resource on a single or small number of suppliers. Laws that impose the usage of a resource tend to

increase those dependence variables. Furthermore, they increase suppliers' bargaining power used in buyer-supplier relationships. Companies can use procurement strategies and supplier relationship management tools to plan and execute the strategy that provides them with the best outcome. Although some authors present recommendations, the question of how the negative impacts associated with dependence can be mitigated by a dependent firm still through strategic management still remains at a rudimental stage and with little existent literature that presents empirical evidence through real case scenarios.

The goal of this paper is to provide insights into what strategies companies adopt when they are dependent on a resource and its suppliers. The research was conducted amongst companies operating in the food and beverage industry (inside the EU market) and that commercialize products affected by the European Unions' upcoming targets for rPET, which states that all PET containers placed on the European Union's market should contain at least 25% recycled plastic by 2025.

It was collected a sample composed of 26 companies under this legislation and market conditions. It was found that the most adopted strategic approach is to comply with suppliers' demands (compliance), followed by cooperation with suppliers and switching to alternative products. On the other side, besides M&A, negotiation, and collective procurement, which were found to not be adopted by any firm, the formation of an alliance with other buyers and diversified purchasing were the least adopted strategies.

This research includes a market analysis of the strategies being used by businesses operating in the EU food and beverage industry. Knowing that dependence on a resource and its suppliers is a scenario experienced by other industry players, this paper raises awareness for this problem and hopefully leads companies to investigate more deeply into ways to mitigate it using strategic management. The findings offer insights into the strategic initiatives used by other companies in the sector. This facilitates the ability to identify trends and aids in locating applicable solutions and stimulating new ideas. It can also be used as a benchmarking tool to perform better-informed management decisions and attempt to increase competitive advantage over industry rivals by analyzing their strategies.

Exploring the issue of supplier dependence, as a result of the impact of rPET mandatory targets, is important from both a corporate and public regulatory entity point of view, as it can measure and highlight the challenges faced by businesses. In this regard, it is of public interest to assess whether actions, such as the placement of a price cap on

rPET, are required for the continued financial viability of a significant number of businesses.

5.2. Limitations of the study

This study is exposed to the limitations of collecting data through a close-ended questionnaire. Conducting an open-ended questionnaire can allow to explore and identify other measures, not taken into consideration in this research, to lessen dependence on supply. Furthermore, exploratory research has limitations regarding testing and establishing a cause-and-effect relationship between variables.

Another limitation is the accuracy in quantifying and measuring the degree of actual dependence on suppliers and rPET, which may affect the analysis between the level of dependence and the choice of strategies.

Additionally, the fact that the mandatory targets of rPET are only set for establishment as from the year of 2025, this can mean companies, at the time the survey was conducted, may not yet be proactively thinking on strategic positionings or are still unprepared to put in place the strategy they wish to implement.

5.3. Suggestions for future research

This paper can serve as a starting point for other researchers to increase academic relevance in results by conducting follow-up research once the EU rPET legislation is active. This could allow the exploration of the changes in strategic behavior due to the enforcement of the rPET mandatory targets. Moreover, this could help to explore the proactiveness of businesses to deal with disruptions of this nature. It is also proposed for a qualitative open-ended interview to be performed in order to better understand their line of thought as well as their specific internal conditions that have led them to adopt the strategy.

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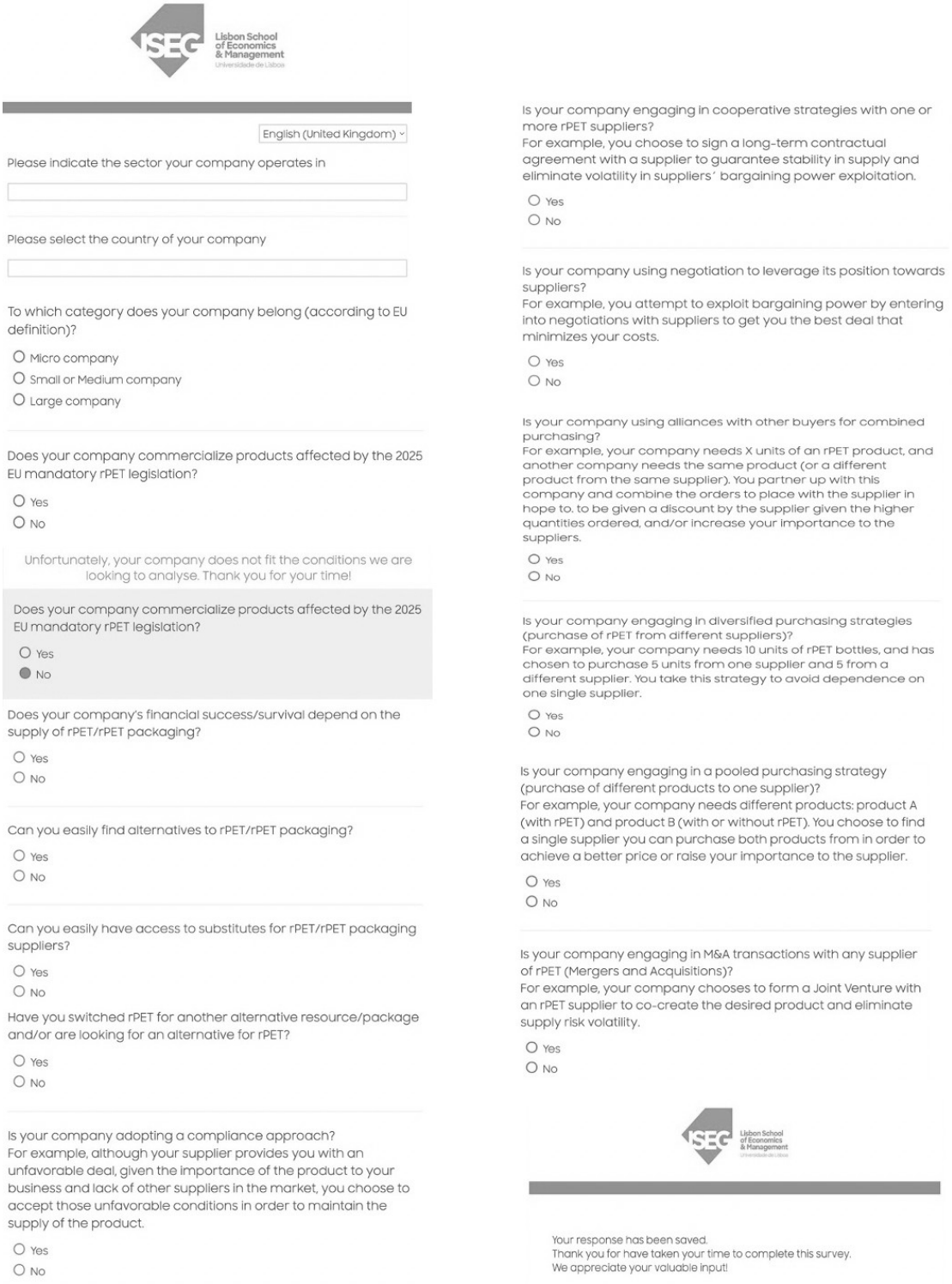
APPENDICES

Appendix I – Questionnaire



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English (United Kingdom)

Please indicate the sector your company operates in

Please select the country of your company

To which category does your company belong (according to EU definition)?

- Micro company
- Small or Medium company
- Large company

Does your company commercialize products affected by the 2025 EU mandatory rPET legislation?

- Yes
- No

Unfortunately, your company does not fit the conditions we are looking to analyse. Thank you for your time!

Does your company commercialize products affected by the 2025 EU mandatory rPET legislation?

- Yes
- No

Does your company's financial success/survival depend on the supply of rPET/rPET packaging?

- Yes
- No

Can you easily find alternatives to rPET/rPET packaging?

- Yes
- No

Can you easily have access to substitutes for rPET/rPET packaging suppliers?

- Yes
- No

Have you switched rPET for another alternative resource/package and/or are looking for an alternative for rPET?

- Yes
- No

Is your company adopting a compliance approach?
For example, although your supplier provides you with an unfavorable deal, given the importance of the product to your business and lack of other suppliers in the market, you choose to accept those unfavorable conditions in order to maintain the supply of the product.

- Yes
- No

Is your company engaging in cooperative strategies with one or more rPET suppliers?
For example, you choose to sign a long-term contractual agreement with a supplier to guarantee stability in supply and eliminate volatility in suppliers´ bargaining power exploitation.

- Yes
- No

Is your company using negotiation to leverage its position towards suppliers?
For example, you attempt to exploit bargaining power by entering into negotiations with suppliers to get you the best deal that minimizes your costs.

- Yes
- No

Is your company using alliances with other buyers for combined purchasing?
For example, your company needs X units of an rPET product, and another company needs the same product (or a different product from the same supplier). You partner up with this company and combine the orders to place with the supplier in hope to. to be given a discount by the supplier given the higher quantities ordered, and/or increase your importance to the suppliers.

- Yes
- No

Is your company engaging in diversified purchasing strategies (purchase of rPET from different suppliers)?
For example, your company needs 10 units of rPET bottles, and has chosen to purchase 5 units from one supplier and 5 from a different supplier. You take this strategy to avoid dependence on one single supplier.

- Yes
- No

Is your company engaging in a pooled purchasing strategy (purchase of different products to one supplier)?
For example, your company needs different products: product A (with rPET) and product B (with or without rPET). You choose to find a single supplier you can purchase both products from in order to achieve a better price or raise your importance to the supplier.

- Yes
- No

Is your company engaging in M&A transactions with any supplier of rPET (Mergers and Acquisitions)?
For example, your company chooses to form a Joint Venture with an rPET supplier to co-create the desired product and eliminate supply risk volatility.

- Yes
- No

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Your response has been saved.
Thank you for have taken your time to complete this survey.
We appreciate your valuable input!

Appendix II – Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Switch to alternative products	26	0	1	0,15	0,368
Compliance	26	0	1	0,38	0,496
Cooperation	26	0	1	0,23	0,430
Negotiation	26	0	0	0,00	0,000
Alliance	26	0	1	0,12	0,326
Diversified purchasing	26	0	1	0,12	0,326
Pooled purchasing	26	0	0	0,00	0,000
M&A	26	0	0	0,00	0,000
Financial importance	26	0	1	0,54	0,508
Non-substitutability	26	0	1	0,31	0,471
Concentrated control	26	0	1	0,23	0,430
Valid N (listwise)	26				

Appendix III – Frequency Table: Strategies adopted

Strategy	Frequency	Percent
Switch to alternative products	4	15,4
Compliance	10	38,5
Cooperation	6	23,1
Negotiation	0	0,0
Alliance	3	11,5
Diversified purchasing	3	11,5
Pooled purchasing	0	0,0
M&A	0	0,0

Appendix IV – Correlation Analysis

Correlations

	Financial importance	Non-substitutability	Concentrated control	Switch to alternative products	Compliance	Cooperation	Alliance	Diversified purchasing
Financial importance	--							
Non-substitutability	,511**	--						
Concentrated control	,507**	,753**	--					
Switch to alternative	,395*	,586**	,778**	--				
Compliance	,573**	,588**	,693**	,539**	--			
Cooperation	,507**	0,369	,567**	,525**	,505**	--		
Alliance	0,334	0,243	0,374	,513**	0,209	,659**	--	
Diversified purchasing	0,334	,496**	,659**	,847**	,457*	,659**	,623**	--

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Values in Pearson's correlation coefficients. Constant variables ("negotiation", "pooled purchasing" and "M&A") were excluded from the analysis.

Appendix V – List of companies

AB InBev	Boursin	Ferrarelle	Pracastello
Abbey Well	Brecon Carreg	Ferrero	Prosumos
Accademia Olearia srl	Bridélice	Franco Fresco	Radenska
Aceites Garcia de la Cruz S.L.	Brisa	Franken Brunnen	Rafael Alonso Aguilera S.L.
Aceites Oro Bailen Galgon 99 S.I	Brpssard	Frankfood	Rauch
Acqua di Nepi	Buitoni	Frantoio Batta	Refresco
Acqua Fabia	Buxton	Frol	Refrigor
AG Feeding	Cadbury	Galo	Remy Cointreau
Agraria Riva del Garda	Cadum	Galo	Reveg Fruit
Águas de Monchique	Cajoline	Gerolsteiner	Rincon de la Subbetica
Albi	Candia Viva	Giovanni Batta	Rippoldsauer
Almazaras de la Subbetica S.L.	Capri Sun	Glenpatrick Spring	RMF Group
Amazonia Bio	Carlsberg	Grand Mère	Romerquelle
Amora	Carranco	Granini	Rosbacher
Andros	Cassegrain	Gufresco	S.C.A. San Vicente
Ankerkraut	Cerés	Happy Dat	Sabor Bio LDA
Antarctica	ChaiKola	Heinz	Sabores do Pomar
Apfelsaft & Apfelmost Quendler	Chante Clair	Hella	Salus Vidago
Apollinaris	Charal	Henniez	San Benedetto
Appelsientje	Chiltern Hills	HIPP Organic	San Pellegrino
Aproz	Ciccolella Soc. Agr.	Hispania Food Company XXI	Sangemini
Aqua-Pura	Claudia	Innocent	Santal
Aquafina	Coca-Cola Enterprise	Interjiuice	Sarl Moulin Oltremonti
Argolis Juices	Connétable	Jaffo Juice	Seven Up
Arla Foods	Contrex	Juice and Word S.L.	Societa Agricola Sergio delle Monache Srl
Armonie	Cooperl	Knolive Oils S.L.	St. Michaelis
Aroden Hispania S.L.	Copella	L'arbre vert	Strathmore
Atelier Zelda	Cortijo de Suerte Alta sl	La Latière	Sulfar
Auchan	Cristalp	Lactails	Sumol + compal
Autêntico	Crodo Lisiel	Liening Wildfruchtverarbeitung	Sunquick
Az. Agr. Cosmo Di Russo	Crodo Valle d'oro	Lipton	Talina
Azienda Agribiologica Rosso	D'aucy	Luso	Tenuta Querciamatta
Badoit	Dananone	Masoni Becciu di Deidda Valentina	Terra Creta
Bahlsen	De Cecco	Miceli & Sensat	Terraliva
Ballygowan	Del Monte	MONINI S.P.A.	Tommaso Masciantonio
Banania	Delacre	Monster Energy	Tropicana
Barilla	Dolce Idea	Monte Rosso Stancija - Estate	Tunisian American Olive Oil Company
Bébé Cadum	Domus Capital AS	Muela Olives S.L.	Uljara Vodnjan Agroprodukt
Béghin Say	DOP	Naleczowianka	Unilever
Bénédicta	Dr. Beckmann	Nestlè	Valser
Bénenuts	Ducros	New Sevegep LTD	Valvert
Bevcraft Group	Eau Ecarlate	Nocco	Vergers Tissot
Bioksan	Ebly	Nutis	Vernera
Biolane	Ekoterra Food	Olinorte Producao Agricola LDA.	Vichy Nouvelle
Biomelan Produkt	Elle & Vire	Opg Chiavalon	Vichy Original
Bjorg	Emilia Foods	Orhei-Vit	Vital
Blédina	Energydrinks4u	Passugger	Vittel Bonne
Blife	EntreMont	Pedras Salgadas	Voslauer
BN	Essentia	Penacova	Vraí
Boario	Evian	PepsiCo Inc.	Vranken-Pommery Monopole
Bonduella	Fachingen	Perrier	Wasa
Bongrainsa	Fanta	Peterstaler	Waterdrop
Bonne Maman	Fattoria Ambrosio	Pinsami	Yoplait
Bourjois	FDB Geen	Pleno	Zapetti

Caption: List of companies, operating in the Food and Beverage Industry, to which the questionnaire was individually sent to.

Source: ORBIS Europe