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ORIGINAL PAPER

Greening Plastics Strategies: How Institutional Pressure and Sector Context Drive Multinationals' Responses

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Abstract
Plastic represents a growing environmental challenge, with increasing attention from governments, NGOs, and citizens. In recent years, business strategies have also begun to evolve in response. This research aims to gain a deeper understanding of how businesses implement sustainable plastic management practices across different industrial sectors (i.e. retail, food and beverage, home and personal care, and pharmaceutical) and the institutional pressures influencing their adoption. This study draws on 218 sustainability reports issued by 109 firms for 2017 and 2019. We applied content analysis and logistic regression and interpreted the results in light of the relevant literature. The results indicate that sustainable plastic management strategies differ across industrial sectors and have evolved over time. In addition, the analysis of institutional pressures indicates that coercive and normative forces are significant, whereas mimetic forces are not. The paper enriches institutional theory by showing how sector context shapes the relative salience of coercive, normative and mimetic pressures. Managers can use the sector pressure matrix we provide to benchmark their plastics portfolio, while policymakers can calibrate sector-specific regulations to accelerate adoption where voluntary uptake lags.

Keywords Sustainable plastic management · Institutional theory · Sustainability reporting · Circular economy

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Introduction

Plastic has long played a crucial role in supporting the global economy [1], yet its environmental impact has become a growing concern, with plastic pollution now recognized as one of the most significant global challenges (Rhein and Schmid, 2020). A major problem lies in plastic's non-degradability, which leads to persistent pollution in both terrestrial and marine ecosystems [2]. This issue is particularly severe in plastic packaging, the largest market segment for plastics [3]. The complexity of plastic packaging, often composed of multiple polymers, additives, coatings, and adhesives, makes its disposal and recycling highly challenging [4]. Forecasts suggest that virgin plastic production will continue to grow in the coming years, driven by increasing population and the lack of adequate infrastructure for waste management and recycling [1, 5]. The short lifecycle of plastic packaging, combined with improper disposal behaviors among consumers, has exacerbated the crisis [6, 7]. Without significant changes in production and consumption patterns, the rising demand for plastic will inevitably lead to higher levels of waste, highlighting the urgent need for more sustainable practices [8].

In response to this crisis, consumers and governments have been increasingly engaged in mitigation efforts [9, 10], but firms are also called upon to adopt circular economy principles, thereby contributing to solutions for plastic-related problems [11, 12]. Despite this growing awareness, how businesses address plastic-related challenges and the factors influencing their actions remain underexplored. Concerns about plastics raised by researchers, organizations, consumers, and governments are relatively recent [13], and academic research on how businesses manage plastics sustainably is still in its early stages [14].

This research aims to address this gap by analyzing data disclosed by companies in their sustainability reports. Environmental management disclosure provides insights into companies' environmental efforts [15], are valuable for understanding corporate pro-environmental behaviors, and have been used in previous studies to investigate circular economy adoption in manufacturing sectors [16]. Analyses of corporate plastic strategies remain fragmented in current research, with the field largely dominated by single-sector case studies,for instance, in fast-moving consumer goods [17]. Studies on SMEs tend to focus narrowly on specific types of plastic strategies [14, 18]. Although taxonomies of corporate plastic strategies exist, they are primarily based on literature reviews rather than on primary, cross-sector investigations [19]. Cross-sector and longitudinal data remain limited, leaving unresolved how businesses operating across different sectors address plastics in their environmental strategies.

The present study aims not only to examine how businesses approach plastics in their environmental strategies but also to explore the pressures driving firms to adopt these practices. Using institutional theory as the theoretical framework, the research investigates how various institutional pressures influence the adoption of sustainable plastic management practices. Recent regulatory frameworks have prompted companies to rethink their operations to address plastic-related issues. Additionally, increasing concern from public opinion, NGOs, and other stakeholders has intensified the pressure on firms to act [20]. However, we still lack a clear understanding of how institutional pressures shape corporate responses to the plastics challenge in a cross-sector and dynamic context. The analysis is based on 218 sustainability reports from 109 companies across four sectors (retail, food and beverage, home and personal care, and pharmaceutical) for the years 2017 and 2019. These reports were examined through content analysis. The findings reveal that sustainable plastic man-

agement practices vary significantly across sectors and have evolved over time. Furthermore, institutional pressures differ across industries, influencing how companies respond to the plastic challenge.

Literature Review and Theoretical Background

Numerous companies acknowledge the increasing environmental challenges posed by plastics and have adopted measures to mitigate them; the initiatives they pursue are broad and diverse. As corporate interest in these practices grows, business literature has started to map and categorize various levels of involvement in sustainable plastic initiatives [14, 19]. The term Sustainable Plastic Management (SPM) was recently introduced by Dijkstra et al. [19] and refers to "any technique along the waste hierarchy seeking to minimize the environmental damage of plastic material" that businesses may adopt. These strategies range from recycling end-of-life materials and implementing prevention initiatives (e.g. reducing packaging size) to substitution practices that involve using bioplastics instead of traditional plastics. They also include efforts to remove plastic from the environment through targeted campaigns.

However, the pace at which industrial innovations evolve often surpasses the capacity of academic research to track and conceptualize them within new business models [19, 21]. Bridging this gap requires empirical studies based on corporate sources, such as environmental reports or initiative databases that enable a systematic census and assessment of the various forms of SPM. In light of these considerations, our research seeks to provide insights into these practices and assess the extent to which they are adopted,this leads to our first research question:

RQ1: Which SPM practices are adopted by firms in different industries?

The growing interest in SPM practices is driven not only by the practices themselves but also by the factors that influence their adoption. According to institutional theory, companies' social, environmental, and economic activities are shaped by the broader institutional environment in which they operate [22]. This framework highlights the significant role of external forces, such as laws, regulations, and social expectations, in shaping corporate behavior. By aligning with these institutional expectations, companies adopt practices that mirror the prevailing standards in their context, enhancing their legitimacy and increasing their chances of survival [22, 23].

Institutional pressures from stakeholders can be categorized into coercive, normative, and mimetic pressures [22]. Coercive pressures arise from regulatory bodies and compel companies to comply with environmental laws and standards [24]. In Europe, for instance, the Packaging Waste Directive requires member states to recycle 55% of plastic packaging by 2030 [25], while the Strategy for Plastics in a Circular Economy introduces new packaging regulations, improves plastic recyclability, and increases demand for recycled content to reduce plastic waste. Moreover, the Directive on Single-Use Plastic products has banned certain items from EU markets since 2021 [25].

Normative pressures arise from stakeholders (e.g. customers, suppliers, NGOs, unions, and the media) whose shared values shape expectations of corporate behavior [26]. Because

reputation hinges on public perception, firms risk losing competitive advantage when they draw negative attention [24, 27]. With large campaigns against plastic launched by international stakeholders, plastic pollution has received widespread attention in recent years. Unsettling reports on the quantity of plastic entering the ocean, research on the prevalence and possible danger of microplastics, and photographs of marine life dying from ingesting or becoming entangled in plastic have all served as major catalysts for these initiatives [28]. Customers are becoming more and more sensible about this topic, and "plastic-free" movements are emerging worldwide [20].

Finally, mimetic pressure surfaces in uncertain contexts, pushing firms to copy competitors' strategies, a dynamic proven to shape environmental management [29–31]. Several businesses, for instance, are finding innovative methods to add value to post-consumer plastics, which represents a push for other companies to innovate their production processes [32]. One example is the surge of products created from recycled ocean plastics,a few companies started to experiment with producing consumer products with those materials, and then many other companies adopted the such practice as those are largely appreciated by customers [33].

Studies investigating the impact of institutional pressures on adopting environmental-related practices have not produced any consistent findings [14]. Some researchers, analyzing specific contexts, have determined a favorable association between institutional pressures and pro-environmental practices (e.g. [24]). Others, investigating other contexts, have found almost no association [34]. It is plausible to assume that institutional stimuli in some contexts may affect how companies respond to institutional pressures while in others not [35, 36]. Thus, a further objective of this study is to understand how distinct institutional forces influence firms in different industries to embrace SPM practices, which leads to our second research question:

> RQ2: How do coercive, normative and mimetic pressures shape sector-specific patterns of SPM adoption?

Methods

Our empirical research is based on a qualitative review of sustainability reports, complemented by panel-logit modelling of the coded data. We consider sustainability reports a reliable and comprehensive source of information on the SPM practices adopted by companies, as they serve as a key communication tool for informing various stakeholders about companies' annual progress toward sustainability. Previous academic studies have frequently used sustainability reports to gather evidence on companies' responses to institutional pressures [37, 38]. To ensure rigor in the selection process, the Global Reporting Initiative (GRI) framework was employed, as it is widely regarded in scholarly literature as a robust and effective reporting standard [39]. Only reports aligned with the most recent GRI standards, specifically the GRI G4 Guidelines or the GRI Standards Reporting Framework, and those that explicitly referenced the sustainable development goals (SDGs) were included in our sample.

Sampling

A purposive sampling strategy [40] was adopted to create a list of companies and gather a corresponding set of sustainability reports. The sampling process involved two main steps: identifying the relevant industrial sectors and determining the market scope (i.e., regional or global) of the selected companies.

First, we identified the industrial sectors to ensure a multi-sectoral perspective on SPM adoption and to explore sector-specific trends and perceived institutional pressures. We focused on sectors heavily dependent on plastics. Companies in the food and beverage and retail sectors were prioritized, as they are among the largest contributors to global solid waste and the primary users of single-use plastics [3, 41]. Additionally, the home and personal care industry—which includes companies producing household cleaning and personal hygiene products—was included due to its significant use of plastic in both packaging and product formulations [42]. Finally, we also include the pharmaceutical sector because, although it is a major consumer of plastics, particularly the medical-grade, single-use materials needed to guarantee sterile packaging and devices, its sustainable plastic management practices remain largely unexplored in the literature [43].

Regarding market scope, we decided to select multinational companies rather than those operating in specific countries. This decision was based on the assumption that multinational firms are exposed to a wider array of institutional pressures, enhancing the opportunity to capture diverse drivers influencing SPM practices.

To gain a longitudinal perspective, we opted to analyze companies over multiple timeframes. This approach allows us to track trends in SPM adoption and observe how institutional pressures evolve over time within the selected sectors. The years 2017 and 2019 were chosen for report collection. This decision was informed by key events that likely shaped business perceptions of plastics. Notably, in 2018, the European Union introduced the Plastic Strategy, a comprehensive policy framework aimed at promoting more sustainable consumption and production of plastics, recognized as one of the most significant global interventions in this area [44]. Hence, 2017 serves as a pre-policy baseline that is not yet influenced by the EU recycling targets, whereas 2019 allows observation of any changes subsequently initiated within firms. Moreover, Google Trends data, frequently used in academic research [45], revealed a surge in public interest in plastics during 2018 and 2019, with the term “plastic-free” peaking in early 2019. Accordingly, 2017 and 2019 were selected for analysis because this heightened attention may have served as a potential normative driver. In June 2021, we accessed the GRI database to select and download the relevant sustainability reports. An initial sample of 157 multinational companies from the four target sectors was identified. We excluded companies that did not provide reports on environmental activities for 2017 or 2019 or those whose reports were not available in English, resulting in the removal of 48 companies. Ultimately, the final sample consisted of 109 companies and 218 sustainability reports, forming the basis for our analysis (Table 1).

Coding

This research applied the content analysis method to systematically organize and classify the collected data [46]. Holsti [47] described content analysis as a systematic and objective technique for drawing inferences by identifying specific characteristics within messages.

Table 1 Number of companies included in the research

Sectors under analysis	Number of companies identified in the initial screening	Number of companies finally selected
Retail	42	34
Home & personal care	39	23
Food & beverage	33	27
Pharmaceutical	43	25
Total	**157**	**109**

Both quantitative and qualitative approaches were employed: (i) to quantify the content within the text, allowing patterns and trends to emerge, and (ii) to interpret the contextual meaning of this content [48]. This flexible methodology is particularly useful for managing large volumes of data and extracting meaning, making it well-suited to the objectives of this study [49].

Data were organized in a spreadsheet, grouping information according to recurring themes. The textual content of the sustainability reports was then coded based on the research framework. A codebook was created before starting the study of recovered sustainability reports. A codebook lists the codes that writers will employ in their qualitative research. It also defines these codes and provides examples of their application [50]. To provide an initial set of themes, the codebook was written using the major SPM practices identified by Dijkstra et al., [19] and institutional pressures identified by relevant studies [51–53]. These themes were then expanded upon and modified following the concepts discovered throughout the data analysis.

According to Bengtsson [54], the coding process defines the so-called units, defined as sentences or paragraphs containing aspects related to each other and able to respond to the purpose of the investigation. As a first step, a search query was developed using the term "plastic" to ensure all related terms were identified in each report. All text segments, containing the defined keywords, were extracted to get information on SPM practices and driving pressures. This screening was carried out for each company report, aimed at identifying the overall context in which practice and pressure took place. Using a coding approach [55], different SPM practices and institutional pressures were clustered and categorized. In more detail, we created 18 categories due to this inductive process, which was organized under main themes and sub-themes,in total, we coded 627 sentences.

We used two verification procedures to make sure the analysis was accurate. First, defining the categories aided in understanding the sustainability reports' data [56]. These criteria thus made it possible to standardize the codification procedure. During two sessions, researchers involved in the process explored adding new categories. Second, to obtain a shared understanding of the coding tree, the initial coded reports aided in assessing category clarity [57]. For the first 15 reports, a double-blind coding process was used to compare the categories developed by the two researchers. The inter-coder reliability coefficient (Cohen's K) calculated across the fourteen SPM categories ranged from 0.73 to 0.93, with an average of 0.87, indicating a high level of agreement.

Panel Construction and Logit Modelling Strategy

After completing the coding, we reorganized the data to test whether the three forms of institutional pressure predict the adoption of SPM practices. Rather than estimating separate logistic regressions for 2017 and 2019, we transformed the information into a two-wave longitudinal firm (i.e. 109 firms observed in 2017 and again in 2019). This design enables us to exploit within firm variation generated by the EU Plastics Strategy, but also to distinguish temporal effects from cross-sector differences.

In the constructed dataset, the dependent variable is defined at the firm–year level: it equals 1 when the report discloses at least one SPM practice and 0 otherwise. The independent variables representing coercive, normative, and mimetic pressures are operationalized as firm–year dummies derived from the qualitative coding (1 = evidence of the pressure, 0 = no evidence). A further dummy identifies the post-EU Plastic Strategy period. Finally, four sector dummies are included (using food and beverage as the reference category) to account for sectoral differences.

Results

SPM Practices Adopted by Companies

To address RQ1, Table 2 presents the SPM practices disclosed in sustainability reports across the four sectors for 2017 and 2019. From a temporal perspective, in just two years, sensitivity to SPM practices increased consistently in the sample of companies investigated, especially in the food and beverage sector (i.e. SPM was mentioned by just 56% of the companies sampled in 2017 while by almost 90% in 2019).

What appears from the table is also the fact that in some of the sectors analyzed, businesses are more sensitive to the topic than others. The pharmaceutical sector seems to be the one less interested in adopting SPM in comparison to others this is, of course, related to the peculiarity of the activities conducted by those firms and the necessity to consider firstly human-related risks connected with multiple-use plastics and recycled materials for instance [43].

A better representation of SPM practices implemented by companies in the four sectors under investigation is presented in Table 3.

A full description of the SPM is presented in Appendix 1.

Interesting trends emerge from the analysis. SPM practices implemented in the retail sector in 2017 and 2019 focused mostly on removing single-use plastic bags from their shops and stores. In 2017, companies belonging to the retail sector mentioned SPM practices connected with the management of end-of-life of their plastic waste and, in particular, stressing about their efforts in conducting separate waste collection in their stores. In 2019 the focus of the same companies evolved towards sustainable design initiatives aimed at revising their plastic packaging with specific reference to private label products. In particular, several companies in the sample declared their efforts in introducing recycled content in their packaging and reducing the weight of their plastic packaging.

Companies belonging to the sample operating in the home and personal care sector both in 2017 and 2019 declared their efforts to eliminate microplastics from their products.

Table 2 Number of companies implementing SPM practices in 2017 and 2019

		SPM practices in 2017		SPM practices in 2019		Increase in % of companies in the 2017–2019 period
Sectors under analysis	Number of companies analyzed	n° of business implementing SPM practices	% of business implementing SPM practices	n° of business implementing SPM practices	% of business implementing SPM practices	
Retail	*34*	19	56%	20	59%	3%
Home & personal care	*23*	15	65%	18	78%	13%
Food & beverage	*27*	15	56%	24	89%	33%
Pharmaceutical	*25*	4	16%	8	32%	16%

Increased efforts are also visible regarding the reduction in the use of virgin plastics, gradually substituted with recycled ones, and with the recourse in reusable packaging.

Companies belonging to the sample operating in the food and beverage industries greatly underlined their efforts in phasing out virgin plastics in their packaging by recurring to bioplastics and recycled plastics. Several companies in this sector also underlined their efforts in designing their packaging to be easier to recycle or compost; this is usually done by reducing the materials used in the packaging and by removing useless components.

Finally, companies belonging to the pharmaceutical sector showed their interest in SPM practices almost exclusively in reports collected for the year 2019. Some companies in this sector also underlined their efforts in designing their packaging to be easier to recycle or compost.

Institutional Pressures for the Adoption of SPM Practices

To address RQ2, we began coding the institutional pressures mentioned in the reports to examine their distribution. Some descriptive statistics help analyze the overall trend (Table 4).

As depicted in Table 4, several reports contain explicit references to coercive pressures as drivers of the implementation of SPM practices; references to normative pressures are mostly present in the reports analyzed, and very few companies, on the other hand, report mimetic pressures. In line with the analysis conducted above about the adoption of SPM practices in businesses, the increase in those practices between the two years goes together with the increase in pressures experienced by businesses.

Coercive Pressures

Coercive isomorphism can be exerted both formally and informally by entities on which a company relies. Some of the sentences available in the reports suggest that European regulations mostly exert coercive pressure. For instance, company #2 wrote that:

> our company "*is keeping the goals of the European Plastics Strategy in focus. Our company strategies are ahead of EU targets, highlighting our commitment to sustainable packaging*." [Retail].

European regulations are largely felt also by companies operating in the food and beverage sectors, a company (#59) explicitly mentioned that:

> *"we introduced compostable biodegradable straws in accordance to European regulation" (2019)* [Food & beverage].

Some businesses started enacting and improving SPM practices also to anticipate the next regulations that will probably be enforced. Indeed, by understanding the expectations an organization must address, a company can anticipate and proactively address the requirements of the environment. For instance, a company (#53) wrote that:

Table 3 SPM practices implemented in 2017 and 2019 by companies analyzed

Sectors under analysis	Year	Single-use disposable bags	Ban single plastic products	Removal of microplastics	Reduction in the weight of plastics	Mono-material	Bioplastics	Recycled plastics	Oceans recycled plastics	Reusable packaging	Easily recyclable/ composta-ble pack	Raising awareness	Clean up activities	Separate collec-tion in stores/ production plants	Take back	Re-cy-cling
Retail	2017	8	0	2	1	1	3	1	1	2	2	4	0	9	2	1
	2019	12	6	2	8	3	4	14	0	5	2	3	1	1	1	0
Home & personal care	2017	0	0	5	1	0	1	2	0	1	0	2	0	3	2	3
	2019	1	4	3	3	3	1	7	0	4	3	2	0	2	2	2
Food & beverage	2017	0	0	0	1	0	5	3	0	0	6	1	1	2	3	0
	2019	0	1	0	6	1	10	8	0	0	8	2	1	1	0	2
Pharmaceutical	2017	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
	2019	1	2	0	1	0	0	0	0	0	4	1	1	0	1	0

"*the new packaging regulation calls for higher recycling rates. This year our target for material recycling of plastic was further increased from 36 to 58 percent*" [Home and personal care].

Also, in the pharmaceutical sector, the importance of anticipating regulation seems to represent a strong pressure on SPM practices adoption, as stated by another company (#86):

we recognize *"that medical regulations around the world place significant constraints on the use of recycled materials"* [Pharmaceutical].

Normative Pressures

Normative isomorphism relates to the logic of appropriateness; trade associations, professional associations and, supply chain actors, customers, NGOs are examples of normative institutions, as they create codes of conduct that are perceived as appropriate. Sustainability reports analyzed suggest the influence of normative pressures in influencing companies in the adoption of SPM practices. Some of the reports investigated directly underline the role of particular stakeholders in the adoption of SPM practice. For instance, companies #3, #75 and #57 explicitly mentioned that:

Our company *"has established a number of priorities on plastic reduction based on in-store surveys conducted in France and Spain to identify customers' main concerns"* [retail].

"plastic is a growing concern for consumers, and we are working hard to make our products use less, better or no plastic" [food and beverage].

"The organization adapts to consumers' needs and concerns to redesign its packaging" [home and personal care].

Other companies prefer not to mention any specific stakeholders but refer to the environmental problems caused by plastics or the global attention about the phenomenon; for instance, a company (#92) states:

"with plastics accumulating across the globe, harming oceans and other ecosystems, we are focusing on phasing out non-business-critical single-use plastics" [Pharmaceutical].

Another company (#42) wrote that:

"the topic of plastics has gained significant attention both worldwide and, in our company" [home and personal care].

In some cases, the normative pressure is felt together with the normative pressure and presented as presented in the sustainability report of company #43:

Table 4 Institutional pressures identified in company reports

		Institutional pressures identified in 2017 reports			Institutional pressures identified in 2019 reports		
Sectors under analysis	Number of companies analyzed	Coercive	Normative	Mimetic	Coercive	Normative	Mimetic
Retail	34	4	3	0	4	3	1
Home & personal care	23	3	3	0	7	7	1
Food & beverage	27	2	11	0	4	12	2
Pharmaceutical	25	1	2	0	3	4	0
TOTAL	**109**	**10**	**19**	**0**	**18**	**26**	**4**

> *"with consumer expectations and legislation changing fast, we have to rethink the design of our products"* [home and personal care].

The normative pressures are exerted on businesses by other actors in the supply chain. For instance, a company (#48) operating in the home and personal care sector underlined the changes in operations of the buying partners (i.e. retailers):

> *"buying patterns are also changing their expectations on products"* [home and personal care].

Multiple stakeholders' pressures are also evident in the report of some companies as pressure for adopting SPM practices, for instance, company #6 wrote that:

> *"a jointly developed evaluation system has been coordinated with stakeholders for optimizing packaging"* [retail].

Mimetic Pressures

SPM practices can also generate mimetic pressure when leading firms within an industry adopt certain practices, setting a benchmark for others to follow. This process is further facilitated by the sharing of best practices across companies. However, compared to coercive and normative pressures, our analysis revealed limited evidence of mimetic pressures driving the adoption of SPM practices in the companies examined. Indeed, very few reports of companies directly mentioning mimetic pressures; some evidences are reported by companies #32 and #76:

> *"Companies are improving circular economy by reducing at minimum the amount of plastic in packaging and where possible avoiding it."* [retail];

> *"with consumer expectations and legislation and business models changing fast"* [food and beverage].

Table 5 Results from the logistic regression

SMP	Coef	Robust Std. Err	z	P>z	[95% Conf	Interval]
coercive	0.758	0.411	1.84	0.065	−0.048	1.566
normative	1.391	0.774	1.80	0.073	−0.127	2.909
mimetic	1.687	1.254	1.35	0.178	−0.770	4.146
yr2019	1.260	0.502	2.51	0.012	0.276	2.244
Sector (control)						
Home & Personal Care	−0.303	0.091	−3.31	0.001	−0.482	−0.123
Pharma	−5.021	0.255	−19.69	0.000	−5.521	−4.522
Retail	−1.268	0.155	−8.18	0.000	−1.572	−0.964
_cons	−0.384	0.232	−1.65	0.098	−0.839	0.071

Results from the Statistical Analysis

The logit regression results estimating the likelihood that a firm discloses at least one SPM practice under the three forms of institutional pressure are reported in Table 5. As shown in the table, coercive pressure is positively associated with SPM adoption ($\beta = 0.758$, $p = 0.065$). This finding is corroborated by the post-policy dummy for 2019 ($\beta = 1.260$, $p = 0.012$), aligning with the anticipated influence of the EU Plastics Strategy. Normative pressure exhibits an even larger effect ($\beta = 1.391$, $p = 0.073$). On the contrary, mimetic pressure is not statistically significant, indicating that imitation alone does not explain SPM strategies uptake. The sector controls reveal lower propensities (i.e. each marked by negative, significant coefficients) relative to the food-and-beverage baseline: Home & Personal Care ($\beta = –0.303$, $p = 0.001$), Retail ($\beta = –1.268$, $p < 0.001$), and Pharma ($\beta = –5.022$, $p < 0.001$).

Discussion

The logit regression results indicate that coercive pressures significantly and positively influence the adoption of SPM practices. The reports corroborate this pattern: many multinational corporations in our sample explicitly cite European regulations as a coercive impetus. Such results suggest that environmental protection policies advanced at the European level might also impact the strategies adopted by companies operating in other countries. This has been found to be true for other policies enacted at the European level; for instance, it has been found that the RoHS Directive[1] prompted producers to revise and modify their products to eliminate hazardous substances not only in countries where the regulation is enforced [58] but also beyond Europe [59]. From a theoretical perspective, our findings diverge from prior literature, which posits that coercive pressures are the primary drivers of firms' adoption of pro-environmental management practices [60–62]. In our case, normative pressures seem to be the ones mostly impacting the adoption of SPM practices in businesses. Thus, our research seems to confirm the literature suggesting that businesses are

[1] The Restriction of Hazardous Substances (RoHS) is the directive 2002/95/EC, this directive was amended by the RoHS 2directive (2011/65/EU). This directive is aimed at restricting the use of several hazardous materials (e.g., cadmium, lead, mercury, etc.) in the manufacture of various types of electronic and electrical equipment.

mostly influenced by normative pressures when it comes to adopting sustainability-related strategies [52, 63].

The logit regression results likewise show that mimetic pressures do not explain the adoption of SPM practices. This statistical outcome is a direct reflection of our qualitative findings, which identified only 4 of references to mimetic pressure, exclusively within the 2019 reports. Different factors may account for this outcome. First, as [64] suggested, mimetic pressure is most common in interactions between firms. In contrast, coercive and normative pressures are more closely related to interactions between a firm, its environment, and its stakeholders. This may explain our study's limited exertion of mimetic pressure. We suggest that mimetic pressures are harder to trigger because SPM practices are not yet widespread and, more importantly, are not strongly perceived by managers as a source of competitive advantage. Research indicates that the pursuit of a competitive edge is a key motivator for adopting environmental sustainability measures [65]. While some green practices, such as industrial symbiosis, offer clear win–win opportunities for businesses [53, 66], the same cannot be said for SPM practices, as their performance benefits across supply chains remain uncertain. For example, recent evidence from green-manufacturing supply chains indicates that mimetic cues, once embedded in structured supplier–customer collaborations, can acquire isomorphic force and yield tangible improvements in both environmental and operational performance [67].

A further explanation for the absence of explicit references to mimetic pressures relates to the nature of sustainability reports as public communication tools. It is plausible that firms intentionally underreport some behaviors [68], such as imitative ones, due to competitive secrecy or the desire to project an image of unique market leadership.

Separately, our analysis may not capture more subtle forms of mimicry. For instance, the exertion of mimetic pressures could have happened with various approaches, including informal peer visits, collaborations with other brands, and creating and sharing best practice case studies [52]. We found numerous references to initiatives like those, but the sentences were not explicit enough to consider those real mimetic pressures to adopting SPM practices. For instance, company #39 wrote in its report:

> *"The Group is also participating in the reflections led by the Ellen MacArthur Foundation through its New Plastics Economy initiative, of which it has been a core member since 2018"* [home and personal care].

Additional aspects can be interpreted by analyzing companies' SPM practices with the institutional pressures evinced in the sustainability reports. In particular, an over the average number of companies belonging to this sector in 2017 and 2019 focused mostly on removing single-use plastic bags from their shops and stores. This is coupled with the fact that companies in this sector mostly refer to coercive pressure in their reports (in 2017, the coercive pressures identified were greater than other pressures, while in 2019, the coercive pressures mentioned are equal to normative pressures). Even if no specific coercive pressure is mentioned, a reasonable explanation of such SPM practice adoption might be strictly related to the "Plastic Bags Directive" (Directive EU/2015/720) adopted to deal with the unsustainable consumption and use of lightweight plastic carrier bags. The Directive requires European Member States to take measures, such as national reduction targets, economic instruments, and marketing restrictions (bans), to reduce pollution from plastic bags.

After the adoption of such a directive in the European Union, similar initiatives emerged worldwide [69, 70].

A different situation is recognizable in the home and personal care sector. In such case, several companies declared their focus on eliminating microplastics from their products. This trend is also coupled with the fact that companies in this sector mostly refer to coercive and normative pressure in their reports. On the one hand, an explanation is such a trend might be connected with the beginning of works by the European Chemical Agency on a future restriction of microplastics in the European Union. In 2017 and 2019, home and personal care companies understood that potential new legislation was expected to impact their industry heavily. Thus, companies belonging to this sector seemed to anticipate a potential coercive stimulus. Support for such an explanation can be found in a sentence of a company belonging to this sector (#43):

> *"emerging regulation by governments to tax or ban the use of certain plastics requires us to find solutions to reduce the amount of plastic we use"* [home and personal care].

On the other hand, an explanation could be connected with consumers' increased sensitivity to microplastics (Wang et al., 2021). Also, in this case, some sentences in the environmental reports support such an interpretation. For instance, company #47 stated:

> *"acknowledging the environmental effects of these beads, particularly on marine life, we recognized that we could provide consumers with products that delivered a similar exfoliating performance without the need to use plastic."* [home and personal care].

A completely different situation emerges from companies belonging to the food and beverage industry. Companies belonging to the sample operating in the food and beverage industries greatly underlined their efforts in phasing out virgin plastics in their packaging by recurring to bioplastics and recycled plastics. The adoption of such SPM practices is coupled with an over the average number of references to normative pressures. The use of bioplastic could indeed be seen as an approach to respond to such pressures. Businesses promote bioplastic as a sustainable alternative because widely appreciated and seen as sustainable by customers even if bioplastic items can't be recycled in normal recycling facilities and can harm conventional plastic recycling streams if they pollute them [71, 72].

Phasing out virgin plastics in the food and beverage sector could also be connected with recent reputational issues faced by companies in this sector. For instance, for three years, Coca-Cola has been named the riskiest firm in the world for plastic pollution [73]. On six continents, a team of auditors gathered 475,000 pieces of plastic rubbish. Coca-Cola leads the group in terms of plastic trash production, followed by Nestle and Pepsi [74]. Thus, companies in this sector might have started to change their packaging strategies to avoid similar reputation damage. Also, in this case, some sentences support such an explanation. For instance, company #83 wrote:

> *"Customer concern over the environmental impact of the economy has grown, with the threat posed by global warming ever present in the media. Plastic in particular has become a key focus and we have responded by reducing the use of virgin plastic."* [food and beverage].

A particularly insightful case is the pharmaceutical sector, which, as shown in our sample, exhibits the lowest adoption of SPM practices. This apparent inertia might be interpreted not just as a lack of environmental awareness but rather as the result of a conflict between powerful, competing institutional pressures. Pharmaceutical firms operate within a field dominated by strong coercive force: stringent regulations on medical safety, sterility, and product integrity [75]. These regulations often mandate the use of medical-grade single-use plastics to prevent contamination risks [43]. The low SPM engagement in this sector, therefore, might not highlights an absence of pressure but a hierarchy among them, where health and safety imperatives currently override environmental ones.

Policy and Managerial Implications

Our study also makes it possible to identify targeted recommendations for policymakers and managers. Although our results show that firms seldom mention imitative pressures, this may stem from a lack of shared examples or demonstrably successful best practices. A European-level sectoral observatory could therefore classify SPM practices adopted by companies (e.g., recyclable design, plastic-free solutions, refill systems) and compile case studies, supported by verified environmental KPIs, to promote benchmarking and encourage imitation [52]. The goal would be to convert the initiatives of a few frontrunners into a recognized imitative pressure. Moreover, because the logit regression reveals pronounced sectoral differences, policy instruments could evolve toward sector-tailored regulation [35, 76]. For example, policymakers might introduce minimum recycled-content requirements for food packaging or offer voluntary roadmaps and reputational incentives for sectors that currently make limited use of SPM practices.

From a practical standpoint, our analysis yields several managerial implications. First, firms can benchmark their plastic strategies [19] against the sector trends highlighted in Table 3. The resulting matrix can serve both as a self-assessment tool for evaluating the implementation of SPM practices and as a basis for dialogue with stakeholders and investors regarding the plausibility of their environmental sustainability strategies.

Sector-specific reflections are also possible. In industries that interact more directly with consumers (i.e. retail and food and beverage) managers could pilot controlled experiments (e.g. living labs) on refill systems, reverse-vending schemes, and reusable packaging. Comparable suggestions apply to pharmaceutical companies, which are presently less engaged in SPM practices than other sectors. Here, managers might develop transition roadmaps that set milestones by packaging type and begin testing materials with limited regulatory risk, such as single-material blister packs.

Finally, the findings indicate that companies should prepare for evolving regulations by drafting forward-looking roadmaps, for example, to phase out certain materials (e.g., microplastics) while concurrently launching R&D projects on plastic alternatives [77].

Conclusion

The research examined the adoption of SPM practices in multinational companies operating in four key sectors: retail, food and beverage, home and personal care, and pharmaceutical. Using the institutional theory framework, our study also sought to identify the primary pressures influencing companies to adopt SPM practices.

Our findings indicate that the adoption of SPM practices varies markedly across sectors and changes over time. Normative and coercive pressures emerge as influential drivers of SPM adoption, exhibiting statistical significance in the logistic regression analysis. Regulatory initiatives at the European level, particularly those imposing economic instruments and market restrictions on specific plastic products, played a crucial role in shaping coercive pressures. Among various stakeholders, customers exerted the strongest normative pressures, encouraging companies to adopt sustainable practices. Conversely, mimetic pressures were relatively rare, possibly because SPM practices have not yet become mainstream or closely linked to a competitive business advantage.

Despite the relevance of these findings, some limitations must be acknowledged. One limitation of this study concerns the exclusive reliance on sustainability reports as the primary data source. These documents, while informative, are often crafted for public communication and may selectively emphasize certain institutional pressures to project a strong commitment to sustainability. As a result, they may underrepresent informal dynamics or internal motivations influencing corporate behavior. To mitigate this limitation, we included only reports aligned with the GRI Standards, which enhance transparency and comparability. Nonetheless, future research could strengthen the evidence base by incorporating complementary sources, such as interviews with company managers, corporate websites, public presentations, or third-party assessments. In addition, reported institutional pressures may sometimes reflect ex post rationalizations rather than actual causal drivers of change, raising the possibility of reverse causality.

A further limitation lies in the decision to analyze reports only up to 2019. While this choice is justified by the aim of capturing the impact of the EU Plastics Strategy, it inevitably excludes subsequent developments. In particular, the COVID-19 pandemic altered certain trends, such as increasing the demand for single-use plastics due to health and safety concerns. A future study could extend the time frame of the analysis to assess the resilience of corporate SPM strategies in response to such exogenous shocks.

Finally, future studies could apply alternative theoretical frameworks to better understand the motivations behind SPM adoption. While this research focused exclusively on external institutional drivers, internal factors such as managerial awareness and organizational culture remain underexplored. Integrating these internal dimensions could provide a more detailed understanding of adoption dynamics. In this regard, future research could enhance our sector pressure matrix by drawing on complementary theoretical perspectives, such as the resource-based view [78], stakeholder salience [79], or dynamic capabilities [80], to investigate how firm-specific resources, stakeholder relationships, and adaptive routines influence corporate responses to external pressures in shaping their sustainable plastic strategies.

Appendix 1 Description of SPM Practices

Single-use disposable bags: refers to activities connected with the removal from shops of single-use plastic bags.

Ban single-use plastic products: refers to activities connected with the ban from the market of single-use plastic (e.g. cutlery, plates, straws and stirrers, food containers, cups for beverages, beverage containers, etc.).

Removal of microplastics: refers to any action aimed at removing microplastics from a product or packaging (e.g. removing microplastics from skincare products).

Reduction in the weight of plastics: refers to any activities connected to the design of packaging to reduce the weight and the content of plastics.

Mono-material: refers to any activity aimed at realizing a packaging with just one single material.

Bioplastics: refers to the substitution of virgin plastics with bioplastics.

Recycled plastics: refers to the substitution of virgin plastics with recycled plastics.

Oceans recycled plastics: refers to the substitution of virgin plastics with recycled plastics coming from ocean/seaside clean-up activities.

Reusable packaging: refers to any design-related activity aimed at substituting traditional single-use packaging with reusable packaging.

Easily recyclable/compostable packaging: refers to any activities connected to the design of packaging that is easy to recycle or compost (e.g. reducing the materials and components of the packaging).

Raising awareness: refers to any campaign to raise awareness about environmental impacts connected to plastics.

Clean-up activities: refers to any plastic clean-up activities conducted, for instance, in parks, beaches.

Separate collection in stores/production plants: refers to any initiatives of separate plastic collection implemented by companies in stores or production plants.

Take back: refers to a take-back activity enacted by a company to collect end-of-life plastic packaging from consumers (e.g. installation of a plastic reverse vending machine).

Recycling: refers to recycling activities conducted directly by the company.

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Declarations

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