Research article

Institutional theory and circular economy business models: The case of the European Union and the role of consumption policies

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ABSTRACT

The circular economy (CE) has been gaining traction in recent years as it promises a change for good, in terms of environmental, social, and economic benefits. The major changes required to implement circular economy business models (CEBMs), can prove to be especially difficult for organisations. This study provides a holistic analysis of the effect of CE institutional policies on the development of CEBMs in organisations, by exploring not only production-oriented policies, which have been the focus of previous research, but also consumption policies. Consumption policies, in the form of regulatory and information policies, are oriented towards consumers and have the potential to affect the demand for CE products, which in turn affects the development of CEBMs in organisations. The paper is framed within the institutional theory and the context of the European Union. Our results reveal that consumption policies have a positive, albeit diminishing, effect on the CEBMs. Our paper finds that regulation is the most impactful policy, having a larger impact than production policies. Our results highlight the important role of institutional policies in fostering consumers' demand for CE products and of consumption policies as tools to be employed by governments in fostering CEBMs and achieving sustainability.

1. Introduction

The increasing environmental concerns that society faces require radical changes in the way we consume and produce energy, water, and other natural resources. In this environmental crisis context, the circular economy (CE) is gaining interest not only from academia, but also from governments, businesses, and society. This is reflected, for instance, in government initiatives such as the European Circular Economy Action Plan or the Chinese Circular Economy Promotion Law (European Commission, 2015; Lieder and Rashid, 2016) or in initiatives by key companies such as Google or Renault (Esposito et al., 2016; Bocken et al., 2017). This recent popularity of the concept of the CE is not only due to a need to address the climate crisis, but also because the CE promises a change for good, as it is widely accepted that adopting CE can bring environmental, social, and economic benefits (Lewandowski, 2016). The use and reuse of resources, as well as the consequent decrease in total resource inputs, energy, emissions, and waste leaks, could lessen the detrimental effects on the environment while maintaining prosperity and growth, striking a better balance between the economy, the environment, and the society (Geissdoerfer et al., 2018; Manninen et al.,

2018). Hence, the circular economy can help address more than one of the challenges identified by the UN Sustainable Development Goals.

The implementation of circular economy ideas frequently necessitates new visions, strategies, and policies, as well as a profound rethinking of product conceptions, service offerings, and the reformulation of business models for long-term solutions (Bocken et al., 2016; Lewandowski, 2016). These major changes to incorporate circular economy business models (CEBMs), can prove to be especially difficult for organisations. Therefore, as argued by Huamao and Fengqi (2007) and Del Río González (2009), policy is a fundamental driver in realising a circular economy, where government bodies act as facilitators helping organisations to overcome the key lock-ins for achieving a CE in the current economic and industrial systems (Genovese et al., 2017). Governments and institutions have traditionally developed a portfolio of policies aimed at the production and consumption systems (Ariti et al., 2019; Levänen et al., 2018; Milios, 2018; Kosow et al., 2022). With regard to policies that target the production side, there is substantive evidence supporting a positive effect of policies on the implementation of CE models in organisations (Arranz et al., 2022; Wang et al., 2019; Merli et al., 2018; Phan and Baird, 2015). Conversely, for policies targeting

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consumption, there is a comparatively scarce literature with inconclusive results (Liobikienė and Dagiliūtė, 2016; Milios, 2018; Pollex and Lenschow, 2020). First, only 19% of the literature describing the circular economy examined topics related to consumption (Kirchherr et al., 2017a). Moreover, less than 12% of the literature about CE investigates how to transition toward a CE from a policy perspective (Millar et al., 2019; Merli et al., 2018; Bigano et al., 2016; McDowall et al., 2017), with most of these studies focusing on qualitative research that has produced contradictory and difficult to compare results (Delmas and Toffel, 2004; Ahrens and Ferry, 2018; Zapata and Zapata Campos, 2019; Wang et al., 2019). Second, it is not sufficiently clear whether consumers would engage in the circular economy or not, this is, due to cultural barriers or lack of consumer acceptance that create certain inertia that can hinder policies of institutions aimed at the diffusion of CEBMs (Abbey et al., 2015; Hobson and Lynch, 2016; Kirchherr et al., 2017b). Third, unlike production policies that directly support companies in the development of CEBMs, consumption policies are oriented towards consumers, and it is not clear, according to Mont and Heiskanen (2015) and Milios (2018), whether this type of policies implies a direct or indirect effect on organisations. In this sense, Ferasso et al. (2020) emphasise the importance of further investigating the interplay between institutions and CEBM transformations, as well as the role of government policies promoting "green" and sustainable societies.

Following the lack of evidence on the consumption side and the recent calls for more research taking a policy perspective on the analysis of the CE, in this paper, we examine how CE consumption policies affect the development of CEBMs. We contribute to the literature on CE by providing a holistic analysis of the impact of government policy framework on the development of CEBMs. For this purpose, our paper evaluates the impact of consumption and production policies both in isolation and jointly. This contributes to the existing CE literature by allowing to understand the relative importance of each of the policies. This, in turn, has important implications for institutions as they can target their efforts in the most impactful policies. We approach the research questions from an institutional theory perspective, which has been frequently employed to explain firms' adoption of organisational practices (Scott, 2005; DiMaggio and Powell, 1983) particularly in the environmental literature (Gao et al., 2019; Wang et al., 2019; Arranz et al., 2022).

To study the effect of CE consumption policies, this paper focuses on the European Union (EU) context, employing data from the EU survey on Public Consultation on the Circular Economy database composed of 744 organisations. Particularly, this paper is focused on the Circular Economy Action Plan (CEAP) adopted by the European Commission, which aims to help the EU in the transition towards a circular economy while decreasing the reliance on natural resources and creating long-term sustainable growth and employment. The case of the EU is interesting because it introduces initiatives throughout the whole product life cycle, both legislative and non-legislative measures, focusing on areas where EU intervention delivers real added value. These areas include how products are designed, the promotion of circular economy processes, stimulation of sustainable consumption, and waste prevention.

2. Conceptual framework

2.1. The circular economy and consumption

The CE is a cyclical system that seeks to minimise waste by converting end-of-life goods into resources for new products (Stahel, 2016; Reike et al., 2018). Closing material and product loops can lead to a process of continuous utilisation of resources. Following Kirchherr et al. (2017a), the CE "is an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. It operates at the micro-level (products, companies, consumers), meso-level (eco-industrial parks), and macro-level (city, region, nation,

and beyond), with the aim of accomplishing sustainable development, thus simultaneously creating environmental quality, economic prosperity, and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers." (p. 229). The circular economy supposes a transformational and radical process of change from a linear to a circular economic model, where every production phase represents a systemic shift at all levels, and where businesses and consumers act as enablers.

The literature on CE has traditionally concentrated on questions related to the production side. For instance, investigating circular business models (Rizos et al., 2017), exploring the development of circular value propositions strategies (Lewandowski, 2016), examining the advantages of CE models (Geissdoerfer et al., 2017), or, studying waste management (Ghisellini et al., 2016; McDowall et al., 2017). Compared to this, substantially less scholarly attention has been paid to how CE policies may influence consumption and consumers (Kirchherr et al., 2017a) and to understand the changes brought by these policies (Repo et al., 2018). The CE could translate into substantial changes in the daily lives of people and organisations (Hobson and Lynch, 2016; Chatzidakis and Shaw, 2018). For instance, engaging in behaviours such as restoring and returning goods, which imply giving up the notion of ownership and newness (Schor, 2016; Tunn et al., 2019). Some of these changes have raised some problems around consumer adoption and acceptance, deterring the diffusion of CEBMs among consumers. After examining companies in Europe, Kirchherr et al. (2017b) suggested that the apathy of consumers and lack of awareness were the "main impediment regarding a transition towards CE" (p. 7). Similar issues were raised by Rizos et al. (2016) in the case of SMEs seeking to develop circular business models and strategies. They suggested that the "lack of support from demand networks" (p.10) discouraged eco-innovations such as CEBMs from being introduced. This lack of understanding of consumers and consumption in the CE has deterred the development and implementation of CE policies aimed at consumption, narrowing the environmental scope of CE policies (Liobikienė and Dagiliūtė, 2016; Milios, 2018; Pollex and Lenschow, 2020). Hence, understanding how policies affect consumers in a CE is crucial for companies to develop CEBMs, as without consumers there is no market.

2.2. Institutional theory and the CE

This paper draws from institutional theory, which has been used widely in the literature to explain firms' adoption of organisational practices (Liang et al., 2007; Berrone et al., 2013; Gao et al., 2019; Wang et al., 2019). Institutional theory postulates that organisations are not self-contained entities, but rather are shaped by norms, constraints, shared cognitions, structures, and social expectations from relevant parties (Scott, 2005; DiMaggio and Powell, 1983). According to DiMaggio and Powell (1983), North (2010) and Scott (2005), institutional pressures force organisations to acquire shared conceptions and procedures. The institutional context in which an organisation is englobed limits its operations and influences its strategic responses (North, 2010). The process of aligning the strategy and the behaviour of organisations with the expectations of institutions has been defined as an institutional isomorphism (Scott, 2005).

From an operational point of view, institutional scholars have identified a set of "institutional pressures" that by defining and shaping organisations' actions, push organisations to be similar to each other, leading to an "institutional isomorphism" (Scott, 2005). The key mechanisms by which institutional isomorphism occurs are the regulatory, normative and cognitive factors proposed by Scott (2005). The regulatory factors focus on the establishment of policies, supervision and a reward system. The normative factors include values and norms. Values refer to the concepts or necessities that the different actors prefer and the diverse criteria employed to compare and evaluate structures or behaviours. The cognitive factors emphasise the importance of the culture. Organisations obtain institutional legitimacy when they satisfy the

different types of institutional pressures (Scott, 2005), so as institutional pressure increases, organisations become more similar to each other as they aim to obtain legitimacy. For instance, regulatory isomorphism can be originated in governmental institutions, which have the power of requiring organisations to comply with different regulations (DiMaggio and Powell, 1983).

Institutional theory has become a well-established theory with a large body of literature, rich with concepts and models to explain the influence of institutions on organisations (Greenwood et al., 2011; Stål, 2015), and in particular, it has become the theoretical framework for the research on organisations' strategies of climate change (Greenwood et al., 2011; Smets and Jarzabkowski, 2013; Alonso-Almeida et al., 2021; Battilana et al., 2009; Elliot, 2016; De Jesús and Mendoça, 2018). That is, derived from the necessity of creating a sustainable environment and mitigating the incidents derived from environmental pollution, governments have introduced different institutional pressures (Alonso-Almeida et al., 2021), and as a response, as well as to obtain institutional legitimacy, organisations have adopted proactive environmental strategies to reduce their environmental impact (De Jesus et al., 2019; Dorado, 2005). Organisations can incur fines when they are under legal supervision, which can affect the legitimacy of their commercial operations (Bansal, 2005).

In this paper, we consider two dimensions of institutional pressures, namely consumption and production policies. CE consumption policies include both legislative policies, which regulate the market, and non-legislative measures, which refer to informative policies (Pollex and Lenschow, 2020; Levänen et al., 2018; Milios, 2018). Fundamentally, these policies are intended to promote the consumption of CE-compatible products, by influencing the consumer from both a compulsory and informative point of view. The second dimension refers to CE production policies that directly support the development of CE models in companies, establishing a distinction between policies that support product development and those that affect the design of the process (Ghisellini et al., 2016; Bressanelli et al., 2019; Arranz et al., 2022).

With regard to production policies, several studies have highlighted the role of institutions play in the development of CEBMs (Wang et al., 2019; Li and Yu, 2011). The development of CEBMs implies two important challenges (Linder and Williander, 2017; Kirchherr et al., 2017b; Katz-Gerro and López Sintas, 2019; Bressanelli et al., 2019). The first challenge refers to the complexity of the design and creation of products congruent with the CE model (Scarpellini et al., 2020). Previous studies have identified market complexity, the uncertainty of the process, and the management of organisational resources for innovation as challenges and barriers for the development of CE products (Demirel and Kesidou, 2019; De Jesus and Mendoça, 2018). Institutional policies have been employed to alleviate the challenges involved in the production of CE products (Daddi et al., 2020). For example, an institutional impulse in the form of financial support, with the aim of supporting technical uncertainty (production policy), can help in the implementation of CE models in firms (Del Río González, 2009). The second challenge stems from the closed supply chains, which are a pillar of the CE model (Schaltegger et al., 2016; Lüdeke-Freund et al., 2019; Kirchherr et al., 2018). The CE model encompasses not only all tasks involved in the design, production, distribution, and usage of products, but also comprises the maintenance, reuse, recovery, and recycling. In other words, it embraces producer organisations, as well as users and third parties (e.g., organisations devoted to the management of waste or suppliers of raw materials), intending to facilitate the development of CE-compatible products and processes. Lewandowski (2016) noted the importance of collaboration and cooperation among organisations for the implementation of closed-loop systems. However, partnership-building is not without difficulties (see, for example, Arranz et al., 2016). Finding the right partner, coordinating tasks, and preventing and resolving conflicts may inhibit organisations' interest in implementing CE models through cooperation. Previous literature has

found that institutional support can help mitigate the challenge that cooperation poses in the development of CEBM in firms (Ren et al., 2019; Liao, 2018). For example, as indicated by Zhu and Sarkis (2007) competitive (mimetic) pressures can encourage the sharing of ideas and learning experiences among partners which can lead to better economic returns when implementing CE practices.

As indicated in previous sections, the literature on CE policies targeted at consumption is comparatively scarce and with a lack of conclusive results (Ahrens and Ferry, 2018; Zapata and Zapata Campos, 2019). Existing studies such as Repo et al. (2018) investigate CE consumption policy acceptance in terms of congruence with consumer perceptions, which provide interesting but limited policy application guidelines for policymakers. On the other hand, other articles focus more on strategies for consumption policy design, communication, and acceptance (see, for example, Mugge et al., 2017; Catulli et al., 2013).

2.3. The role of the EU in the sustainable development of society

In this context, the EU has not overlooked the significance of the institutional push to establish a society that is sustainable and competitive within the European Union framework. The EU has created the Circular Economy Action Plan (CEAP), comprising 54 measures that lay down the framework for implementing CE at an institutional level (European Commission, 2019). Over the years, the EU has invested significant resources through the CEAP to "help stimulate Europe's transition towards a circular economy, boost global competitiveness, foster sustainable economic growth and generate new jobs" (European Commission, 2015). This institutional pressure of the EU tries to include actions and initiatives across the whole product life cycle, "it targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented, and the resources used are kept in the EU economy for as long as possible" (Within, 2015). However, there is an important dichotomy in the EU's CEAP between the strategy (which is holistic) and the actions taken as policies mainly focus on solutions on the production side with consumption policies barely addressed, despite their important implications for a circularity transition (Friant et al., 2021; Von Homeyer et al., 2021; Geiger et al., 2021; Kosow et al., 2022). Hence, policies such as the "Right to repair" legislation of the EU (Svensson-Hoglund et al. 2021; Hernandez et al., 2020) receive little attention from institutions and legislators. This has led to lax legislation on the consumption side of the CE or even to ambiguous policies. For example, the "Right to repair" legislation has been criticised for the imprecise meaning of the provision of maintenance and reparability necessities in terms of "fair and reasonable conditions", which leads to uncertainty for both businesses and consumers with regard to CEBMs (MacAneney, 2018; Svensson-Hoglund et al. 2021).

3. Research questions

Previous studies indicate that governmental policies as a form of institutional pressure can modify organisations' procedures and actions (DiMaggio and Powell, 1983; Scott, 2005). In fact, for production-side policies, scholars have consistently found a positive impact of policies on the development of CEBMs (Wang et al., 2019; Merli et al., 2018; Phan and Baird, 2015). However, as compared to the vast literature studying the production side, there is little evidence on consumption-related CE policies, which is fuelled by little large-scale empirical evidence (Abbey et al., 2015; Hobson and Lynch, 2016; Kirchherr et al., 2017a). This lack of evidence on the consumption side impedes a holistic understanding of the impact of CE policies and the evaluation of the role of public institutions in promoting CEBMs in organisations. Following the existing gap in the literature with regard to consumption policies, our first research question is:

RQ1. How do consumption policies affect CEBMs?

Our second question relates to the type of relationship between (consumption) policies and CEBMs. Most environmental and institutional theory research assumes that the nature of the relationship between policies and CEBMs is positive and monotonic (Sharma, 2000; Colwell and Joshi, 2013). However, this research often ignores the possible non-linearity of the relationship, providing a potentially incorrect analysis as this implicitly assumes that the benefit of these policies is ad infinitum (Bansal and Roth, 2000; Clemens and Douglas, 2006; Colwell and Joshi, 2013; Delmas and Toffel, 2008). Thus, our second research question is:

RQ2. Are there any non-linear effects on the relationship between consumption policies and CEBMs?

Moreover, it is also important to not only consider institutional policies in isolation, but also understand their joint effect on CEBMs. In this sense, Greenwood et al. (2011) note that it is necessary to understand the interactions of the various policies in their performance and their effects on policy targets. Milios (2018) indicate that not only it should be investigated if such policies affect, but also how they affect, to understand which variables are more significant and if there are synergistic effects between them. Thus, our final two research questions are:

RQ3. How do different consumption and production policies interact in their effect on CEBMs?

RQ4. Which of the different consumption and production policies is the most important for the development of CEBMs?

4. Methodology

4.1. Data

For the analysis of our research questions, we employ data from the EU survey on *Public Consultation on the Circular Economy*. The survey, which is the most recent one at the European level regarding CE, was conducted in 2015 and included data from 744 organisations (European Commission, 2015). The survey was conducted in the 27 EU Member States, Norway, Iceland, Switzerland, and Liechtenstein (Fig. S1 displays the distribution of observations across countries).[1] The survey aimed to explore the impact of EU policies on the implementation of the CE models in European organisations. The survey covered international organisations, private enterprises, civil society organisations and professional organisations.[2] The survey included questions on the production and consumption phases, markets for secondary raw materials, and enabling factors among others.

4.2. Measures

4.2.1. Dependent variable

Our dependent variable is the organisations' degree of development of the CEBM. We follow previous studies (e.g.: Bocken et al., 2016; Massa et al., 2017; Pieroni et al., 2021) and conceptualise CEBM with the following items of the circular economy of organisations that narrows or reduces the flow of natural resources both in terms of product creation and in the process (see Table S1 in the supplementary materials for a detailed list of items).

These items are assessed using a Likert scale regarding their level of importance, in which 4 corresponds to very important and 1 not important. The dependent variable CEBM is built as a cumulative index of the different items, which allows measuring the breadth of CEBM and keeping the type of measuring scale (Costantini et al., 2017). This method is adequate for our sample as there is a high correlation among the items, and their scales are consistent with each other.[3]

4.2.2. Explanatory variables

The main independent variables of interest refer to the different EU policies on the CE targeted at consumption and production. The questionnaire looks at the importance (on a Likert scale of 1, not important, to 4, very important) of the different policies for achieving the CE. We create six variables, 3 for the consumption side and 3 for the production side. These variables are an index that ranges from 0 to 1, with higher scores indicating higher importance.

Regarding the consumption side, the first variable is regulation, which relates to legislative measures to regulate the consumption of CE-compatible products to promote the CE. The second variable, information, relates to non-legislative or informative measures aimed at encouraging the production of products that align with the CE. We further create the variable consumption that is an aggregate of both the regulation and information measures. Table S1 shows the specific items (regulatory and informative measures) that compose these measures.

Regarding the production side, the first variable, product, refers to policies that affect the development of CE-compatible products. The second variable, process, refers to policies that aim at developing CE production processes. The third variable, production, is the aggregation of the product and process policies. Table S1 in the supplementary material shows the specific items (product and process policies) that compose these measures.

We create each of the above-mentioned variables as an aggregated index of the different policy items as per the definitions above. The index ranges from 0 to 1 and reflects the level of importance of that set of measures for the CE, with values close to 0 referring to low or no importance.

We control for different aspects of the organisations that can affect the CEBM. We control for the level of awareness that organisations have about the CE initiative, the utilisation of environmental management schemes, and the level of internationalisation of the organisation. We create the variable awareness as an index from 0 to 1, with 1 reflecting a high level of awareness of the CE initiative and 0 no awareness. We construct the variable environmental management as a binary variable equal to 1 if the organisation employs an environmental scheme (e.g., the EU eco-label, or the Eco-Management and Auditing Scheme). We generate the variable MNC as the number of countries in which the organisation operates to reflect the level of internationalisation. We also include a set of dummies indicating the country of location of the organisation.

4.3. Model

We employ a Poisson regression model to account for the count data nature of our dependent variable CEBM, with robust standard errors clustered by type of organisation (civil society organisation, international organisations, private enterprises, and professional organisa-

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[1] The data is part of the Flash Eurobarometer from the European Commission. The sampling procedure for this sample is probability stratified. In this case, the target population is subdivided into separate and mutually exclusive segments (strata) that cover the entire population. Independent random samples are then drawn from each segment.

[2] The composition of the sample in terms of the number of observations is as follows: international organisations (41), civil society organisations (135), private enterprises (222), and professional organisation (346).

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[3] We also created with these items a new variable using factor analysis with principal components and Varimax rotation. The correlation of this resulting variable with our cumulative index variable is 0.995, supporting the creation of the dependent variable as a cumulative index. The main advantage of the cumulative index as compared to factor analysis is that there is no loss of explained variance.

tion).[4] We present four main sets of regressions. The first set of regressions focuses on the effect of consumption and production policies on CEBM (Tables 2 and 3, respectively), exploring the possibility of interaction between the regulation and the information type of policies and non-linearities in their relationship between policies and the dependent variable. For these two tables, the first specification includes the variables of control only. The second and fourth specifications are parsimonious in the sense that they only include the variables of control and the individual policies (i.e., regulation, information, product, and process) each on a separate regression. The third and fifth specifications build on the second and fourth and also include the quadratic term of the policies, thus, exploring any non-linearities. Specification six includes both the regulation and information (product and process) policies and their quadratic terms in one regression. Finally, the last two specifications include the interaction terms of the regulation and information (product and process) policies, first on isolation (specification 7) and then with the quadratic terms (specification 8). The full model (specification 8) is as follows:

$$CEBM_i = \beta_1 * Regulation_i + \beta_2 * Regulation_i^2 + \beta_3 * Information_i + \beta_4$$
$$* Information_i^2 + \beta_5 * Regulation_i * Information_i + \beta_6 * Regulation_i^2$$
$$* Information_i^2 + \beta_7 * Organisation\ characteristics_i + \varepsilon_i \quad (1)$$

$$CEBM_i = \beta_1 * Product_i + \beta_2 * Product_i^2 + \beta_3 * Process_i + \beta_4 * Process_i^2 + \beta_5$$
$$* Product_i * Process_i + \beta_6 * Product_i^2 * Process_i^2 + \beta_7$$
$$* Organisation\ characteristics_i + \varepsilon_i \quad (2)$$

where i indicates the organisation.

Equation (1) refers to Table 2 and equation (2) to Table 3.

The second set of regressions focuses on the interaction of consumption and production policies on their effect on CEMB. The independent variables of interest are the consumption and production policies aggregated. As before, we explore the interaction of consumption and production, and the existence of a non-linear relation with the CEBM. As with the previous two Tables, Table 4, builds from simple specifications to a full specification as follows:

Table 1
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
CEBM	744	31.176	13.667	0.000	48.000
Regulation	744	0.566	0.305	0.000	1.000
Information	744	0.698	0.275	0.000	1.000
Product	744	0.570	0.306	0.000	1.000
Process	744	0.634	0.232	0.000	1.000
Consumption	744	0.619	0.268	0.000	1.000
Production	744	0.613	0.227	0.000	1.000
Envir. mangt.	744	0.289	0.454	0.000	1.000
MNC	744	1.687	3.542	0.000	29.000
Envir. Awareness	744	0.294	0.079	0.000	1.000

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[4] We choose Poisson models over negative binomial models as Poisson models require weaker assumptions and provide the correct point estimates even if the variance is not correctly specified. In contrast, negative binomial models require the correct specification of the likelihood. We use the Poisson models to present the main results and employ the negative binomial models as a robustness check.

$$CEBM_i = \beta_1 * Consumption_i + \beta_2 * Consumption_i^2 + \beta_3 * Production_i + \beta_4$$
$$* Production_i^2 + \beta_5 * Consumption_i * Production_i + \beta_6 * Consumption_i^2$$
$$* Production_i^2 + \beta_7 * Organisation\ characteristics_i + \varepsilon_i \quad (3)$$

Finally, Table 5, presents a disaggregated analysis of the interactions of the specific consumption (regulation and information) and production (product and process) policies, as well as the non-linearities in these interactions. The setup is similar to the above, and we omit the equation for brevity.

5. Results

5.1. Descriptive statistics

Table 1 and S4 show the descriptive statistics and the pairwise correlation of the variables of interest. The average CEBM score is 31, out of a maximum of 48 points. On average organisations in our sample have regulation and product policies with a mild intensity (0.57) and an average intensity of information and process policies of 0.7 and 0.63, respectively. Moreover, approximately 29% of the organisations in our sample make use of an environmental scheme. The organisations in our sample display a relatively low level of awareness regarding the CE initiative as the average score is 0.29 out of 1, with 1 being highly aware. The organisations in our sample have a local nature as the average number of countries in which they operate is 1.67. With regards to the geographical distribution of our sample, Belgium, the UK and Germany are the countries with the greatest representation. Figs. S2 and S3 show the average reported level of development of CEBMs and consumption and production scores by countries. We observe a large variability across countries, with the differences between countries being significant.[5]

5.2. Regression results

Tables 2–5, present the results corresponding to the Poisson regressions for the development of CEBM for consumption, production, consumption & production (aggregated), and consumption & production (disaggregated), respectively. Table S5 provides a summary of the main coefficients of interest, together with the semielasticities, and the turning points for the quadratic terms.

We find the coefficient for regulation policies to be positive and significant. The semielasticity of regulation suggests an increase in the development of CEBM of 1.160 (see Table 2, column 3, and Table S5) for a move from no regulation to a high level of regulation CE policies, which corresponds to a 3.7% increase at the sample mean.[6] Moreover, the sign of the quadratic term, which is significant, indicates a non-linear relation between CE regulation policies and CEBM. In particular, since the turning point is bigger than the theoretical maximum of 1, CE regulation policies have a strictly positive, but diminishing effect on CEBM. A similar analysis is conducted for information, where we find the coefficient to be positive and significant with a semielasticity of 0.958, which corresponds to a 3.1% increase in the development of CEBM at the sample mean. The quadratic term is also positive and

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[5] To check the differences across countries for the CEMBs, consumption and production scores variables we conducted ANOVA tests. The differences across countries are significant in all cases: CEMBs (F-stat: 4.140; p: 0.000), consumption (F-stat: 2.810; p: 0.000) and production (F-stat: 4.300; p: 0.000).

[6] Table S2 presents the semielasticities, where one unit increase in the independent variable is associated with an X increase in the dependent variable. For instance, for Table 2, column 3 (regulation) the semielasticity is 1.160, so that a one unit increase in regulation (i.e. from no regulation to high regulation), increases the development of CEBMs by 1.16. This corresponds to a 3.7% increase for the sample mean (i.e., the average organisation in our sample has a CEBMs score of 31.176, so that 1.16/31.176 = 0.037 or 3.7%).

Table 2

Poisson regression for the development of the CEBM: Consumption.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Regulation		1.210*** (0.079)	2.477*** (0.311)			1.178*** (0.134)	2.119*** (0.377)	2.633*** (0.497)
Regulation sq.			−1.163*** (0.236)			−0.292*** (0.080)		−0.639*** (0.187)
Information				1.285*** (0.123)	3.210*** (0.490)	2.272*** (0.675)	1.330*** (0.228)	2.263*** (0.641)
Information sq.					−1.614*** (0.332)	−1.320*** (0.451)		−0.858** (0.388)
Regul.*Info.							−1.609*** (0.428)	−2.320*** (0.670)
Regul.*Info. sq.								1.011*** (0.381)
Envir. mangt.	−0.035 (0.069)	0.026 (0.016)	0.002 (0.010)	−0.039 (0.048)	−0.054 (0.048)	−0.007 (0.007)	−0.001 (0.007)	−0.010 (0.012)
MNC	−0.016** (0.006)	−0.006 (0.004)	−0.008* (0.004)	−0.015*** (0.004)	−0.014*** (0.004)	−0.008** (0.004)	−0.008* (0.004)	−0.008** (0.004)
Envir. Awareness	0.602* (0.325)	0.290*** (0.068)	0.148*** (0.026)	0.162 (0.199)	0.233 (0.214)	0.164*** (0.058)	0.172*** (0.062)	0.182** (0.074)
Constant	3.452*** (0.158)	2.670*** (0.039)	2.468*** (0.066)	2.529*** (0.208)	2.050*** (0.285)	1.954*** (0.217)	1.939*** (0.199)	1.770*** (0.256)
Observations	744	744	744	744	744	744	744	744
Log likelihood	−4616.748	−3415.210	−3342.408	−3678.977	−3544.632	−3143.267	−3136.281	−3113.859
R-sq.	0.069	0.311	0.326	0.258	0.285	0.366	0.367	0.372
Location dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses. Standard errors are robust and clustered at the organisation type level. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 3

Poisson regression for the development of the CEBM: Production.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Product		1.193*** (0.037)	2.667*** (0.409)			1.885** (0.807)	2.488*** (0.085)	4.256*** (0.775)
Product sq.			−1.322*** (0.331)			−0.843 (0.649)		−1.298** (0.612)
Process				1.372*** (0.246)	3.025*** (1.146)	2.016 (1.290)	2.104*** (0.099)	3.713*** (0.456)
Process sq.					−1.460* (0.796)	−1.114 (0.917)		−1.282*** (0.469)
Prod.*Proc.							−2.374*** (0.146)	−4.724*** (0.389)
Prod.*Proc. sq.								2.260*** (0.274)
Envir. mangt.	−0.035 (0.069)	−0.006 (0.018)	−0.033** (0.015)	−0.035 (0.068)	−0.044 (0.063)	−0.035* (0.020)	−0.019 (0.018)	−0.034 (0.027)
MNC	−0.016** (0.006)	−0.007 (0.004)	−0.009* (0.005)	−0.014*** (0.003)	−0.015*** (0.003)	−0.009** (0.004)	−0.012** (0.005)	−0.011** (0.004)
Envir. Awareness	0.602* (0.325)	0.068 (0.066)	0.030 (0.072)	0.472 (0.325)	0.566* (0.331)	0.160 (0.159)	0.154 (0.125)	0.114 (0.169)
Constant	3.452*** (0.158)	2.808*** (0.027)	2.534*** (0.086)	2.512*** (0.316)	2.077*** (0.517)	1.922*** (0.290)	1.579*** (0.081)	1.102*** (0.077)
Observations	744	744	744	744	744	744	744	744
Log likelihood	−4616.748	−3482.644	−3379.771	−3816.889	−3731.427	−3167.159	−3069.168	−3008.676
R-sq.	0.069	0.298	0.318	0.230	0.247	0.361	0.381	0.393
Location dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses. Standard errors are robust and clustered at the organisation type level. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

significant, with the turning point at 0.995, indicating a (mostly) positive and diminishing effect of CE information policies on CEBM. Regarding the interaction of the consumption policies, the coefficient is negative and significant and positive and significant for the quadratic term, indicating that regulation and information policies attenuate each others' effect which diminishes with the intensity of the policies (see Fig. S4 in the supplementary material). In fact, when both regulation and information policies are in place, their semielasticities decreased by 27% and 79%, respectively. Our results also indicate that regulation has an impact four times greater on CEBM than information.

We find product and process policies to have a strictly increasing but diminishing effect on CEBM, with elasticities equal to 1.159 and 1.172, which correspond to a 3.7% and 3.8% increase in the development of

CEBM at the sample mean, respectively. Moreover, when acting jointly, product and process have a much-attenuated effect on the development of CEBM (see Fig. S5). In this case, the semielasticities are reduced to 0.816 and 0.325, which is more than a 29% and 72% decrease in their effect. Our results also indicate that product has a much higher impact (more than 2.5 times) on CEBM than process.

When we look at the aggregate effect of consumption and production, we find that each of the policies has a positive (but diminishing) effect on the development of CEBM, with semielasticities of 1.437 and 1.696, which correspond to 4.6% and 5.4% increase in CEBM at the sample mean. Consumption and production have a joint attenuating effect on the development of the CEBM (see Fig. S6), which turns positive for higher levels of policy intensity (i.e. values bigger than 0.8,

Table 4
Poisson regression for the development of the CEBM: Consumption and production aggregated.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Consumption	1.547*** (0.124)	3.512*** (0.587)			2.057*** (0.652)	2.467*** (0.206)	3.576*** (0.605)
Consumption sq.		−1.677*** (0.426)			−0.889* (0.459)		−1.424 (0.958)
Production			1.803*** (0.200)	4.498*** (0.538)	3.085*** (0.556)	2.489*** (0.324)	4.420*** (0.725)
Production sq.				−2.285*** (0.356)	−1.853*** (0.406)		−2.354** (1.002)
Consum.*Production						−2.468*** (0.341)	−3.022*** (1.067)
Consum.*Production sq.							1.890*** (0.468)
Envir. mangt.	0.013 (0.012)	−0.011 (0.010)	−0.020 (0.037)	−0.035 (0.035)	−0.023* (0.012)	−0.012 (0.014)	−0.026* (0.015)
Countries	−0.008* (0.004)	−0.009** (0.004)	−0.008** (0.003)	−0.012*** (0.004)	−0.010** (0.004)	−0.009** (0.004)	−0.010** (0.004)
Envir. Awareness	0.145*** (0.045)	0.082** (0.039)	0.212 (0.179)	0.319* (0.175)	0.164*** (0.049)	0.110 (0.070)	0.160* (0.086)
Constant	2.411*** (0.076)	1.957*** (0.189)	2.315*** (0.202)	1.567*** (0.234)	1.352*** (0.286)	1.339*** (0.175)	0.865*** (0.307)
Observations	744	744	744	744	744	744	744
Log likelihood	−3256.377	−3145.637	−3364.790	−3221.041	−2930.083	−2950.931	−2893.478
R-sq.	0.343	0.366	0.321	0.350	0.409	0.405	0.416
Location dummies	Yes	Yes					

Standard errors in parentheses. Standard errors are robust and clustered at the organisation type level. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

which corresponds to approximately 33% (consumption) and 19% (production) of the organisations in the sample). When acting jointly, the semielasticities of consumption and production are 0.840 and 0.551, respectively, a 42% and 68% decrease. The effect of consumption on CEBM is approximately 1.5 times bigger than that of production.

In line with the aggregate effect, the disaggregated analysis of consumption (regulation and information) CE policies, and production (product and process) policies, indicates a decrease in the marginal positive effects of these policies on the development of CEBM when applied combined. Except for the case of the interaction of regulation and product (the turning point of the interaction term is 0.783), we do not see any relevant positive synergies between the different types of consumption and production policies (see Figs. S7–S10). Looking at the transitivity of our pairwise analysis, our results indicate that regulation is the most important factor, followed by product and process, with information being the least important factor for the development of CEBM.

5.3. Robustness checks

First, we checked the robustness of our questionnaire and answers. Following Podsakoff et al. (2012) and Spector (2006), the common method bias (CMB) and the common method variance (CMV) were tested. These analyses show the constructs that represent 92.827% of the variance. As the first factor is below the recommended threshold of 50% (i.e., 22.425% of the variance), we can affirm that both CMB and CMV are not a concern in our model.

Second, we have re-estimated our models employing negative binomial regressions and linear regressions. Tables S1–S9 show the results for the negative binomial regressions with robust standard errors clustered by type of organisation. The results confirm the analysis from the Poisson regressions. We also run linear regression models with robust standard errors clustered by type of organisation, for which we log transform the dependent variable.[7] Tables S10–S13 show the results which are in line with our main analysis employing Poisson regressions.

Third, we have run additional robustness checks that specifically control for variation esteeming from the type of organisation. Our results are in line with our main analysis (results available upon request). Finally, we also re-run the results clustering the standard errors by location (instead of by type of organisation). The results, which are

available on request, are in line with the main results.

6. Discussion

Our results indicate that the different consumption policies (regulation and information) have a positive impact on CEBMs. In line with the institutional theory that shows how institutional pressures have a positive effect on organisations as they seek legitimisation (Scott, 2005), our results support previous empirical evidence that show an effect of institutional pressures (Greenwood et al., 2011; Smets and Jarzabkowski, 2013; Alonso-Almeida et al., 2021; De Jesús and Mendoça, 2018). In particular, our work emphasises regulation as a coercive mechanism of institutional pressure. Hence, our results show that regulations on consumption modify consumers' behaviour and demand for products that comply with the CE (Aragon-Correa and Leyva-de la Hiz, 2016; Kesidou and Demirel, 2012; Berrone et al., 2013), and information fosters an environmental consciousness in consumers which can act as a driver for demand of CE products (Albino et al., 2009). These findings show a parallelism with the studies on the area of eco-innovation, which generally find a positive impact of EU measures in the development of eco-innovation (Horbach, 2016; Triguero et al., 2013; Kemp and Foxon, 2007). Our results also align with stakeholder theory, which notes that institutional pressures exerted on the consumption side have a direct impact on consumers and drive the demand for CE products (Horbach, 2016; Rennings and Rammer, 2011). Similarly, our findings provide support for Tukker et al. (2017), which suggest that firms are pivotal in enabling sustainable consumption and production (SCP). This is a relevant finding as it acknowledges the impact of CE consumption-oriented policies on the development of CEBMs as compared to previous literature that overlooked these policies in favour of production-oriented policies (Milios, 2018; Friant et al., 2021). Moreover, our results question previous studies that depict consumers as passive and rational economic agents as our results suggest a more engaging and active consumer in terms of CE products (Ghisellini et al., 2016).

Furthermore, our results show that the impact of consumption policies is positive but diminishing with the intensity of the policies. This can be explained by previous studies suggesting that excessive environmental regulation does not achieve a change in CE adoption and may lead to reallocating of R&D to pollution management (Lanoie et al., 2011; Eiadat and Fernández Castro, 2018). In this sense, the continuous strengthening of environmental regulation may not lead to increases in the responsiveness of consumers but, in fact, they might create resistance that hampers the demand of CE products and thus the adoption of CEBMs in organisations (Schor, 2016; Tunn et al., 2019). In terms of

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[7] Note that we log transform the CEBM+1, as to avoid getting missing values for observations for which CEBM is equal to zero.

Table 5
Poisson regression for the development of the CEBM: Consumption and production disaggregated.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regulation	0.400*** (0.065)	0.477** (0.187)	1.629*** (0.128)	2.457*** (0.276)	2.002*** (0.210)	2.897*** (0.368)					0.521 (0.359)	−1.178 (0.729)
Regulation sq.		−0.081 (0.094)		−1.092** (0.455)		−1.032*** (0.237)						0.902*** (0.226)
Information	0.535*** (0.121)	1.790*** (0.589)					1.805*** (0.033)	3.659*** (0.421)	2.027*** (0.176)	3.721*** (0.299)	1.942*** (0.325)	4.787*** (0.763)
Information sq.		−1.055** (0.413)						−1.567*** (0.460)		−1.543*** (0.393)		−1.900*** (0.438)
Product	0.531*** (0.113)	1.405* (0.769)	1.571*** (0.189)	2.604*** (0.593)			2.427*** (0.090)	4.188*** (0.803)			1.932*** (0.215)	3.333*** (1.203)
Product sq.		−0.759 (0.576)		−1.311*** (0.182)				−1.676*** (0.440)				−1.079 (0.894)
Process	0.450** (0.178)	0.973 (0.961)			1.575*** (0.315)	2.764** (1.292)			2.093*** (0.260)	2.772*** (0.963)	1.035** (0.419)	1.645 (1.425)
Process sq.		−0.496 (0.695)				−1.334 (1.121)				−0.832 (0.774)		−0.801 (1.154)
Regul.*Prod.			−1.597*** (0.237)	−2.022*** (0.587)							−0.630*** (0.198)	0.445 (0.672)
Regul.*Prod. sq.				1.291*** (0.098)								−0.663* (0.347)
Regul.*Proc.					−1.605*** (0.286)	−2.198*** (0.822)					0.394 (0.434)	2.125 (1.761)
Regul.*Proc. sq.						1.213*** (0.418)						−1.256 (0.889)
Info.*Prod.							−2.026*** (0.096)	−3.651*** (0.504)			−1.336*** (0.175)	−3.762*** (1.175)
Info.*Prod. sq.								1.884*** (0.155)				1.856*** (0.706)
Info.*Proc.									−1.856*** (0.293)	−2.771*** (0.639)	−1.249** (0.487)	−3.065** (1.469)
Info.*Proc. sq.										1.330*** (0.238)		1.766* (0.947)
Observations	744	744	744	744	744	744	744	744	744	744	744	744
Log likelihood	−3083.253	−2926.916	−3153.885	−3109.641	−3158.159	−3116.142	−3015.101	−2930.289	−3354.404	−3299.679	−2861.298	−2790.989
R-sq.	0.378	0.410	0.364	0.373	0.363	0.372	0.392	0.409	0.323	0.334	0.423	0.437
Location dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses. Standard errors are robust and clustered at the organisation type level. *p < 0.1, **p < 0.05, ***p < 0.01. The control variables include: Environmental management, MNC, environmental awareness and a constant.

information, studies in the area of marketing and psychology have noted that high volumes of information usually result in consumers' information overload, which in turn, impedes individuals' information processing systems (e.g., Malhotra, 1982; Lee and Lee, 2004). Overall, our results suggest that an excess of information and a complex regulatory framework can overwhelm consumers, which might reduce their demand for CE products, reducing the effectiveness of institutional pressures. These findings also help explain some of the phenomena observed within institutional theory studies. That is, there is a delay in changing norms and practices, which takes longer than regulatory measures to see outcomes, and the important difficulties of changing cognitive views of consumers. Following Scott (1995), policies aimed at consumption and product changes can be viewed as regulatory measures to alter behaviours in consumption and product development, while policies targeting process changes can be seen as utilising institutional changes to impact the norms and routines of organisations. Lastly, policies aimed at information seek to change cognitive views of the circular economy. Hence, this phenomenon is captured within the positive but diminishing effect with the intensity of the policies observed in our analysis. In line with Alonso-Almeida et al. (2021) that indicate that institutions introduce diverse pressures, our results justify the existence of a diversity of regulatory mechanisms: the ex-ante, which aims for an isomorphic alignment of organisations (Scott, 2005), and ex-post, that lead to stricter supervision in light of regulations' failure (Bansal, 2005).

These findings are interesting because they contrast past institutional research that assumed a linear relationship between the institutional pressures and the development of CEBMs (e.g., Bansal and Roth, 2000; Sharma, 2000; Clemens and Douglas, 2006; Colwell and Joshi, 2013; Delmas and Toffel, 2008). Hence, these results provide further empirical evidence to support the findings of other related environmental research literature (see, for example, Eiadat and Fernández Castro, 2018 or Van Leeuwen and Mohnen, 2017) that conclude that the relationship between firm environmental responsiveness and institutional pressure is nonlinear. It is worth noting that our results, however, do not corroborate Eiadat and Fernández Castro (2018) claims that this relationship follows an inverted U-shaped curve, rather our results suggest that the impact is positive but diminishing with the intensity of the policies. These results can be justified as well through the variability of the strategic behaviour of organisations, where regulations trigger a proactive reaction in organisations, or the reactive behaviour of organisations as a consequence of following the regulations (Marín et al., 2012). In this sense, the reactive behaviour is very common among organisations complying with environmental regulations due to the double externality characteristic of eco-innovations (De Marchi, 2012). Di Marchi (2012) indicated that eco-innovation aims at solving an environmental problem, but implies an internal cost for organisations, which can represent a hurdle in organisations' adoption of environmental regulations.

Our results also provided interesting insights regarding the interaction of consumption and production policies. We find that consumption and production policies attenuate each other's effects. That is, while the overall effect of each of the policies is positive, the impact of each of the policies when another policy is present is not as strong as when the policies are taken in isolation. Previous literature suggests that this can be due to the overload multiple policies can create on consumers and organisations. From an organisational point of view, previous studies have indicated that multiple external stimuli can compete for the resources and attention of the organisation, reducing the individual effectiveness of each of them (Kim et al., 2016; Ocasio, 1997). Multiple policies increase the number of objectives organisations need to reach (Kim et al., 2016), so a problem in the distribution of attention might arise (Ocasio, 1997). These organisational studies rely on individual behaviour to the exposure of multiple stimuli to derive their theory, so that a similar overload is likely to occur with consumers. This is in line with the non-linear effects found on individual regulatory and informational policies, where "too much" of a given policy did not necessarily

have a positive effect on the development of CEBMs. Moreover, our results indicate that the regulations targeted at consumption have a greater effect than the regulations targeted at production. This is in line with innovation literature that indicates that the development and implementation of eco-innovations represent both an internal and external risk to organisations (Demirel and Kesidou, 2019). With regards to the internal risks derive from the costs to finance the innovation projects and from the technical risk of not obtaining the desired results; as for the external risks, these derive from the non-acceptance of the innovation by the market. Thus, the regulations that target consumption are an important driver for the development of CEBMs in light of the risks posed by production.

Finally, our results also suggest regulation as the most important factor for the development of CEBM, followed in importance by product and process, with information with the least importance. On the one hand, this aligns with institutional theory research, that argues that coercive pressures (or regulatory pressures) have a larger and compulsory effect on organisations compared to normative or mimetic pressures (such as information policies), which tend to have a laxer effect (Scott, 2005; Li and Yu, 2011; Haque and Ntim, 2018; Wang et al., 2019). Hence, explaining the higher importance of regulation with respect to information policies. On the other hand, these results contrast previous with prior research which highlights the key role of production policies to achieve CE in organisations (see, for example, Merli et al., 2018; Phan and Baird, 2015).

7. Conclusion

Prior research that examines the impact of institutional pressures on the development of CEBMs has largely focused on the role of policies targeted at production (Milios, 2018; Friant et al., 2021). Our paper expands this analysis to include consumption policies. Our paper results suggest that consumption policies are relevant in the development of CEBMs, with positive effects across both regulatory and informational policies. In fact, our results suggest that regulatory policies are more important than production policies in fostering the development of CEBMs.

Our results have several contributions. First, our paper contributes to institutional theory (DiMaggio and Powell, 1983; North, 2010; Scott, 2005) corroborating that institutional pressures affect the behaviour of organisations, which align their strategies with the institutional expectations in a process of institutional isomorphism (Scott, 2005) aiming for legitimisation (North, 2010). Second, our results extend the institutional theory by providing empirical evidence on the effect of institutional pressures in aligning organisations. Thus, institutional pressures will be moderated by the greater proactivity or reactivity of organisations and their capacity to absorb information. Moreover, our results show how the effectiveness of institutional pressures is affected by the combination of various regulations. In line with Ocasio (1997), the diversity of institutional pressure objectives affects their effectiveness, leading to an overcoming effect in organisations. Third, our work extends previous literature applying institutional theory to environmental problems by exploring the channels by which CE-related policy framework affects the circularity of firms' business models. In the context of the institutional theory, the paper offers a comprehensive understanding of the role that institutions and governments have undertaken (particularly in the European Union) in the introduction of CEBMs through a portfolio of policies, which reflects the growing importance of CE initiatives, and the crucial role national and supernational institutions can take to foster CEBMs. Our paper helps in explaining the complex institutional policy framework, clarifying the typology and portfolio of policies that institutions may develop for fostering the implementation of CEBMs, and at the same time, showing how they act. In particular, our results highlight the prominent role that regulation of consumption has on the development of CEBMs, providing large-scale empirical evidence as compared to qualitative-based evidence presented by previous studies

(Zapata and Zapata Campos, 2019).

We also contribute to the literature on CE, in particular to the literature examining the consumption side of CE (Hobson and Lynch, 2016; Repo et al., 2018). Our paper contributes by providing a more nuanced understanding of CE consumption policies, both in isolation and in interaction with CE production policies. Departing from previous research on the CEBM that considers consumers as passive agents, we follow the stakeholder theory, which argues that consumers are proactive agents with defined attitudes towards the purchasing and consumption of CE products (Demirel and Kesidou, 2019). Considering consumers as active agents with regard to CE, allows us to provide a more holistic understanding of the CEBM, by complementing existing studies that mostly focused on the production side.

7.1. Implications

Our results provide some important implications for environmental policy. Unlike previous research, our paper highlights the importance of consumption policies for the development of CEBMs, noting the potential complementarity and synergistic effects between consumption and production policies. In fact, our results suggest that policymakers should employ the full range of consumption and production policies to induce complementarities and synergistic effects in the development of CEBMs in firms. However, policymakers should consider the level of intensity, as excessive environmental regulations and high volumes of information can overwhelm consumers, reducing their demand for CE products, and thus the effectiveness of institutional pressures. Our results also suggest that consumption policies, in particular those related to regulation, which have long been relegated in favour of other policies, should be more actively employed as part of the CE portfolio of measures. From a policy view, this means that policies such as the EU's "Right to repair" (Svensson-Hoglund et al. 2021; Hernandez et al., 2020) or France's "reparability index" on electronics (Maitre-Ekern and Dalhammar, 2016) should receive more attention as tools for enabling CEBMs by public institutions. Our results speak to the EU's efforts to progressively incorporate CE production policies in many economic sectors, by noting the necessity to complement these policies with consumption policies if a paradigm shift to a CE transition is to be achieved. Furthermore, our results suggest that other countries and/or supranational institutions can emulate the diverse and comprehensive policy mix exerted by the EU as an institutional entrepreneur, which leads to a higher level of CEBM adoption in organisations, as shown by our findings.

Finally, our results highlight the importance of public institutions and institutional pressures as engines fuelling the transformation of business towards a force for good, contributing to addressing negative environmental impact (Ferraro et al., 2015; George et al., 2016). In this sense, our results also note the important role of public institutions in reaching the UN Sustainable Development Goals, contributing to the transition of businesses, as suppliers and producers, and societal systems, as consumers (IPCC, 2018; Köhler et al., 2019).

7.2. Limitations

As with any research, our paper is not free of limitations. While exploring both consumption and production policies, our paper does not distinguish between the governmental levels from where the policies are originated. As indicated by Alonso-Almeida et al. (2020), there is a source of complexity in the interaction between different policies esteeming from the diversity of institutions and organisations that promote the development of CE, and their need to coordinate. For example, the European Union, as a supranational institution, needs to coordinate with national institutions for the implementation of CE policies. Future research might want to provide a more fine-grained analysis that disaggregates the policies not only by the area of action, but also by the type of institution introducing the policies.

Moreover, limitations also esteem from the data employed. First, the

results from our analysis focus on the European Union, so the results might not be translatable to other geographical contexts. Future research might want to explore the role of consumption policies on the development of CEBMs in these other contexts. Second, our data is cross-sectional so that, while including several organisational-level controls in our analysis, we are restricted to the extent we can control for individual fixed effects. This needs to be kept in mind when interpreting the results. Future research could look at collecting data for multiple periods as to exploit a panel setup. Finally, it should be pointed out that data used from the survey relies on self-assessed measures by the organisations, meaning that this study assesses the potential influence of CE policies on organisations solely from the perspective of EU businesses. While this does not detract from the validity of the findings or their contribution to the existing body of literature, future research could aim to analyse the ex-post impact of these policies on firms.

Credit author statement

All authors contributed equally.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvman.2023.117906.

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