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FIRM LEVEL CIRCULARITY IN THE FACE OF CLIMATE RISK: HOW PUBLIC ATTENTION AND POLICY STRINGENCY PUSH FIRMS

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ABSTRACT:

- Objectives: We explore how firm level circularity is influenced on one hand by the public attention a firm receives, as in the search intensity on Google, and on the other hand by the environmental policy stringency it experiences in its home country. Additionally, we want to see whether these effects are influenced by the climatic risk, as in the catastrophes caused by the climate crisis a country experiences.
- Theoretical framework: This research under the overarching topic of circular economy is framed within stakeholder theory, arguing that public attention is a form of stakeholder pressure, as well as within institutional theory, as policies and regulations define the context a firm is situated in.
- Methodology: We construct a panel with data from 1794 firms from 35 countries, drawing from four different data sources, for the years 2017-2021, and fit a fractional logit model.
- Results: We see that both the attention a firm receives online as well as the regulatory stringency have a positive influence firm level circularity. Moreover, in countries with higher climatic risk, we see that these effects are amplified.

Keywords: firm level circularity; public attention; environmental policy stringency; climate risk

1. Introduction

In today's 4.0 society, where digital technologies have become intrinsically connected with our everyday life, making us dependent of smart phones and global information networks for basically all facets of our existence (Dufva and Dufva, 2019), the incredible amount of information we are presented with each day courts for our attention. We have gone from an "information economy" to an "attention economy" (Carpentier, 2023), where human attention has become both a valuable good as well as a source of information on customers' preferences and habitudes (Bueno, 2017). Selling an image, both on a personal level as on a corporate level, is crucial.

The year 2025 was ranked again among the top-three hottest ever recorded years (Copernicus Climate Change Service, 2026), and there continue to be extreme weather events at concerning levels (Otto et al., 2025), as a consequence of the human-made climate crisis. Even the rich and privileged global North has been starting to experience first-hand the atrocities that the future holds for us: the floods in the German Ahrtal in 2021, leaving 135 dead[1]; the torrential floods in Valencia (Spain) in 2024, leaving 229 dead[2]; or the 2025 wildfires that ravaged Los Angeles (United States of America), killing an estimated 440 people[3], just to name a few recent events. In light of these circumstances, it is vital that the way humanity produces and consumes makes a hard shift from the linear way of resource extraction, manufacturing and consumption. The circular economy (CE) envisions an economy that works within the planetary boundaries, by reducing, reusing, recycling and recovering materials throughout the supply chain (Kirchherr

[1] https://reportage.wdr.de/chronik-ahrtal-hochwasser-katastrophe#chronik-hochwasser-im-ahrtal. Accessed on 26.01.2026.

[2] https://www.rtve.es/noticias/20241129/mes-dana-lluvia-cronica/16350435.shtml Accessed on 26.01.2026.

[3] https://news.climate.columbia.edu/2026/01/12/its-been-one-year-since-wildfires-devastated-los-angeles-what-have-we-learned/ Accessed on 26.01.2026.

et al., 2023). To reach the CE, it is imperative that firms comply with environmental regulations and implement a series of environmental strategies, which in part are marked by the institutional context the firm is situated in.

Recent research has focused on how public attention (PA) as in online search intensity of specific terms related to environmental issues influence company behavior (Zhou and Ding, 2023) and stock market returns (El Ouadghiri et al., 2021; Schuster et al., 2023) or how media coverage and visits to the Wikipedia page of a firm influences their disclosure of environmental information (Pope et al., 2024). Cheng and Liu (2018) analyzed the effect of PA as in the online search intensity on firms on the environmental performance of these same firms, but limited to Chinese firms and the Chinese search engine Baidu.

The importance of PA in environmental factors is evident, and similarly, the strictness of environmental policies is decisive in influencing corporate environmental behavior, as has been demonstrated in Barbaglia et al. (2023) in terms of the relocation choices of firms, or González Sánchez et al. (2025) related to the financial investment decisions and corporate environmental responsibility actions. However, little is known yet on the influence environmental policy stringency (EPS) has on firm circularity.

This research takes PA as well as a firm level variable, but takes a novel approach by broadening the scope to firms from 35 countries and worldwide online search activity on the search engine Google, taking into account the interconnectedness of a globalized world. Additionally, by amplifying this scale of analysis, we advance CE research, which is a research field dominated by case studies. The objective of this paper is to analyze how the PA a firm receives, as well as the EPS it experiences in their home country, influences their firm level circularity. Furthermore, we analyze whether these effects are impacted by the climate risk (CR) the home

country is exposed to. We aim for a global picture, including firms from as many countries and industries as possible.

The paper is structured the following way: in section 2 we develop the hypotheses. In section 3 the methodology and the variables employed are explained, and in section 4 the results of the empirical analysis are presented and in section 5 the conclusions.

2. Hypotheses development

2.1. Stakeholders and institutional voices

PA denotes the resources that people, media and society devote to a certain topic (Newig, 2004). It is both a valuable commodity and a valued resource, offering information on the habits and preferences of consumers (Bueno, 2017). With the exponential increase in the use of the internet and social media in recent years, and the consequent explosion of information produced, distributed, and consumed, the attention of consumers, suppliers, business partners, and other stakeholders is a resource for which it is important to compete. However, the attention that different organizations can capture through these media is often fleeting. Therefore, the attention received from the public can be considered a double-edged sword: desirable on the one hand, but also subjecting the organization to scrutiny. For this reason, its allocation and preservation are a central issue in organizational design (Simon, 1969), and since the advent of the internet, it has generated a whole new genre of data-focused business models, valued in trillions of US dollars (Carpentier, 2023).

Previously, the academic literature worked mainly with the *methodology of events* in the context of PA, measuring directly the impact of environmental crises caused by certain organizations (e.g., oil spills, accidents in chemical factories) in stock market performance or indexes and portfolios, taking as granted that an environmental catastrophe contributes without a doubt to an intensification of PA (El Ouadghiri et al., 2021). Nowadays, we can observe in the literature

the tendency to treat PA more as a company-level variable, allowing to make affirmations on how variables such as stakeholders pressure influences organizational behavior (Pope et al., 2024).

Under the frame of stakeholder theory, PA falls under the *secondary* stakeholder group, as a form of social pressure (González-Benito and González-Benito, 2006; Schuster et al., 2023), together with other external stakeholders such as non-governmental organizations and the media. The effect of stakeholders' requirements on corporate environmental actions have been widely studied, for example by Darnall et al. (2010); Ferrón Vilchez et al. (2017); González-Benito and González-Benito (2006) or Shahzad et al., (2020), as well as the role of stakeholders in the advancement of the CE (Baah et al., 2022; Sahu and Choudhary, 2025; Tapaninaho and Heikkinen, 2022). Under this approach, some previous research concludes that at a certain point of accumulated attention (traditional media coverage, polls and interviews), a scale effect forms, related to the size of the group manifesting interest, posing new challenges and questions for the formulation of corporate strategies (Wang and Xia, 2022).

The corporate response to pressure from different stakeholder groups is cited among the main drivers of the adoption of CE by firms (de Jesus and Mendonça, 2018; Tura et al., 2019). However, the approach of measuring PA through the online search intensity of a firm, in the context of firm level circularity, has not been explored yet, to the best of our knowledge. In this regard, and following the stakeholder pressure approach, we consider that if the intensity of PA is high, the company will view this as pressure from target stakeholders, resulting in a positive response in its circular strategy. Therefore, we consider that there is a positive relationship between PA and the circular strategy at the company level. Based on the above, we formulate the following hypothesis

H1: There is a direct and positive effect of PA on firm level circularity.

Institutional theory asserts that the conduct of organizations is mainly impacted by the institutions it is surrounded by (Dimaggio and Powell, 1983). More precisely, organizational behavior is influenced by environmental forces, such as pressure from governments and regulators, through legislation, regulation and policies (Herold, 2018), what is called coercive isomorphism. In this regard, the legal framework in which organizations operate is fundamental to the development of a circular strategy (Hartley et al., 2023). For example, the lack of legislative support and restrictive product regulations are among the main barriers cited for circular business model innovation (Geissdoerfer et al., 2023) and the general adoption of the CE (Pasqualotto et al., 2023).

Institutions mechanize their forces in several ways. We found in the stringency of environmental policies the best proxy to collect the institutional pressure toward circularity. Based on Botta and Koźluk (2014) work, EPS could be defined as the higher explicit or implicit cost incurred by the company as a result of polluting or harming the environment. This stringency can either be reached with straightforward instruments like taxes or emission limits, but also for example through technological support policies such as subsidies to research and development. EPS is therefore a direct translation of the green commitment of the institutional environment (González Sánchez et al., 2025).

Recent studies have shown how country-level factors, which actually include the legal framework, affect several variables close to CE measures, such as the ESG (Environmental, Social and Governance) information disclosed by organizations (Baldini et al., 2018). González Sánchez et al. (2025) showed that firms located in countries with higher EPS scores, also exhibited a greater corporate environmental responsibility. Barbaglia et al. (2023) argue that a greater EPS may offer opportunities and incentives to firms with an already sustainable orientation, influencing their choice in relocations. In the same vein, EPS has been shown to play a significant role in the attainment of a CE at a national level, particularly through non-

market-based policies such as emission limits (Arthur et al., 2023). At the company level, EPS is also expected to have a positive effect on the circular economy. Specifically, if institutional pressure in the environment in which the organization operates is high, i.e., if EPS exerts pressure through explicit and implicit costs, companies will develop and implement more circular measures. As a result, a positive relationship between EPS and firm circular level will be expected. Following these arguments, we hypothesize:

H2: There is a direct and positive effect of EPS on firm level circularity.

2.2. The moderating role of the climate situation

From the institutional framework, some authors analyzed factors with a similar positive impact on firms operating in specific markets, such as cultural persistence (Zucker, 1987) or the modernization of society (Meyer and Rowan, 1977). The results obtained show that the environment in which the company operates determine, among other factors, its technological level (Leyva-de la Hiz et al., 2019), its level of digitalization (Ahmadova et al., 2022) or its level of sustainability (Christmann, 2004). We aim to extend the theory by exploring possible contingencies that may strengthen the impact that PA and EPS have on firm level circularity. We claim that CR may be a moderator. The arguments we develop below suggest that CR, understood as the incidence of the climate crisis on people and therefore on institutions, operates in combination with pressures (people and institutions), intensifying their effects on companies. In this regard, it is to be expected that the CR of the environment in which the company operates will have a positive moderating effect on the relationships justified in the previous sections, for the following reasons:

According to availability heuristics (Tversky and Kahneman, 1973), dramatic or easily recalled events are often overemphasized and more readily available in peoples' memories. Humans that have experienced the direct impacts of climate change through its hazards, are more likely to

consider it a serious threat compared to those that have not (Dablander, 2025). Globally, worry and societal awareness about the climate crisis are mounting, but the availability of environmental concerns is not uniform globally (Knight, 2016). The *Peoples' climate vote report* (Flynn et al., 2024) states that a majority of the global population is feeling more worried about climate change, but especially those people situated in the least developed countries and in regions reporting worse than usual extreme weather events, are among the most worried.

A study by Todaro et al. (2021) investigated the influence of climate change awareness and perceived climate risk exposure on the climate actions of corporate managers, showing that both factors had a positive influence in the adoption of measures such as modifications in the supply-chain or production means. In line with the argument of availability heuristics, in the corporate setting, the interpretation of environmental risks can be heavily influenced by the readily available narrative, through media, competitors or stakeholder pressures, influencing the prioritization of issues.

Finally, given that awareness of needs for sustainable practices, such as the growing concern about product components or increased knowledge through environmental education programs in schools, is a driver of CE implementation (Prieto-Sandoval et al., 2018; Tura et al., 2019), we argue that an increase in CR positively moderates the effect of PA on firm level circularity, hypothesizing as follows:

H3: CR positively moderates the relationship between PA and firm level circularity.

According to the multiple streams framework, focusing events or major crises can be the occasions during which problems become pressing, creating an opportunity for advocates to attach solutions to these same problems. The *problem stream*, the *policy or solution stream* and the *politics stream* come together, thus opening a fruitful policy window (Kingdon, 2014), in which the government can substantially change legislation. CR, which in this case would

represent the problem stream, has been shown to enhance governmental attention to environmental issues (Rao et al., 2025). In a similar line, people all over the world, but particularly those from more climatic vulnerable regions and least developed countries, as well as those from the biggest greenhouse gas emitting countries, are calling for their countries to strengthen commitments to address climate change (Flynn et al., 2024), showing that peoples' pressure on their governments is related with their experience of CR. Therefore, we argue that an increase in CR positively moderates the effect of EPS on firm level circularity. Ensuing the previous discussion, we formulate the following hypothesis:

H4: CR positively moderates the relationship between EPS and firm level circularity.

Insert Figure 1 about here

Figure 1 graphically presents the theoretical model presented in this section.

3. Methodology

3.1. Sample selection

To test our hypotheses, we constructed a dataset by combining information from four different data sources: LSEG (formerly Refinitiv Eikon), Google Trends, the OECD and Germanwatch.

To select the firms used for the sample, we match these datasets following a meticulous process. Firstly, a trial sample of the variables used to measure firm-level circularity (see section 3.2.1) was downloaded from LSEG's ESG database, from 2018 to 2020. The three years were selected because they represent the three central years of the overall time period chosen (2017-2021), which was conditioned by the availability of the other variables employed. The firms that had less than 70% availability in each of the three years were eliminated, resulting in a sample of 5274 firms. For these 5274 firms, the data for all 5 years was downloaded, and the process was

repeated. Limited by the data availability of our exogenous variables (some countries were not represented), it resulted in a final sample of 1,794 firms across 35 countries and 78 NACE divisions (Tables 1 and 2). This final sample resulted in a balanced panel data of 7588 firm-year observations for the period 2017–2021.

Insert Tables 1 and 2 about here

3.2. Obtainment of variable data

3.2.1. Circularity Indicator

To measure firm level circularity, a measure based on ESG data available in LSEG was elaborated, following similar approaches by Esposito et al. (2024) or Dadak et al. (2025). LSEG was chosen as a database because it is widely used in empirical research (see Delgado-Ceballos et al. (2023), Just et al. (2023)) and a leading data provider, adopted both by practitioners and scholars due to its extensive coverage, establishing it as a primary source for ESG data (Del Vitto et al., 2023). The circularity indicator (CI) is a composite variable that uses 39 equally weighed indicators related with management, resource use, pollution and firm processes, which are based on a previous literature review on firm circularity measurement, constructing thus a firm level CI based on secondary data. The CI is a measure with values between 0 and 1.

3.2.2. Public attention

To measure PA, we use the *Google Search Volume Index* (GSVI), which gives the worldwide reach of the Google search engine usage. The GSVI is a relative measure, giving normalized values between 0 and 100, assigning 100 to the date in the time interval given where the searches of the keyword in question reached its maximum, and 0 when it is below a certain threshold. It is argued that by searching in Google information on a company or an event implies

that the user is actively interested in the searched company or phenomenon, investing their time voluntarily in it (El Ouadghiri et al., 2021).

To obtain the data for the GSVI, the Python package Trendspy (Marienko, 2018) was used. The common names of the companies included in the sample as given by LSEG were employed as search terms, after deleting suffixes like “Ltd”, “AG” or “SA” from them. As Google Trends only allows for the comparison of maximum of 5 search terms, to be able to compare all of our companies, some further normalization was performed, using one search term as a base. PA is thus a positive, continuous variable.

3.2.3. Environmental Policy Stringency

To measure EPS, the EPS index elaborated by the OECD was employed. The EPS index covers the years from 1990-2020, across 40 countries, allowing for monitoring progress, benchmarking and empirically evaluate what impact environmental policies truly have (Kruse et al., 2022). It allows to summarize a pool of very diverse laws, from market-based policies (such as the CO2-emissions trading schemes) to non-market-based policies (such as emission limits) to finally technological support (e.g., government grants for research in renewable technologies) into one single figure, making cross-country comparison possible. Recently, authors have used this measure to analyze its impact on the eco-efficiency of countries (Satrovic et al., 2025), cost of debt of firms (González Sánchez et al., 2025) and the attainment of a CE at country level (Arthur et al., 2023). The EPS is a measure with values between 0 and 6.

3.2.4. Climate Risk

To measure the risk to which a country is exposed climatically, the CR index was employed, a measure elaborated by the independent organization *Germanwatch e.V.*, assessing how climate-related extreme weather events affect countries. The effects considered for this index are the consequences for human life (as in number of deaths), as well as those of economic nature

(losses in absolute and in relative terms). The index is backward-looking, meaning that the data employed stems from two years prior to the date of the index (Adil et al., 2025; Eckstein et al., 2021). The index was elaborated yearly starting in 2006, up until 2021[4], after which the index publication was paused until 2025, due to data availability issues. For the normalization of the climate risk variable, the linear min-max scaling method was used, following the guidelines of the OECD (2008). Given that the original variable has an inverse relationship with risk (lower values indicate greater criticality), a negative polarity transformation was applied to ensure that the value 0 represents the minimum risk and 1 the maximum.

3.2.5. Control variables

- *Size.* Company size is a continuous variable and measured as the natural logarithm of the number of full-time employees. The data was obtained from LSEG Workspace. The variable was chosen because on one hand, larger firms are confronted with more social and political pressure, and on the other, they have access to greater economic and financial resources to invest into sustainable actions (Aravind and Christmann, 2011; de Villiers et al., 2011; Esposito et al., 2024).
- *Performance.* This company-level control variable is measured by the Return on Equity (ROE). The data was obtained from LSEG Workspace. This variable is chosen because profitable firms have a higher likelihood of carrying larger environmental costs (de Villiers et al., 2011).
- *Age.* This company-level control variable is measured with the number of years since the date of incorporation of a firm. The data was obtained from LSEG Workspace. This variable is chosen because on one hand, it proxies the effect of experience and infrastructure gained by the firm over time, necessary to manage sustainability issues at

[4] For the year 2021, no indicator was available for the United States, therefore we used the average of 2020 and 2025.

a lower cost (de Villiers et al., 2011), however older facilities are also likely to use older equipment and technologies, which may negatively affect environmental performance (Aravind and Christmann, 2011).

- *Country wealth.* It is measured with the gross domestic product per capita, for the country in which the headquarters of the company are located. The data was obtained from Our World in Data (Bolt and van Zanden, 2024; Mathieu and Rodés-Guirao, 2022). The number of companies was tabulated per continent to give an overview in Table 1.
- *Industry.* Sector dummies for each of the 78 divisions contained in our sample according to the NACE classification at second level. The number of companies per sector was tabulated in Table 2 using NACE classification at first level.

Insert Table 3 and 4 about here

Table 3 summarizes all the variables employed in this research, whereas Table 4 details the correlation matrix and the descriptive statistics of all the variables used in the empirical work.

3.3. Analytical model

To prepare the data for the analysis, the exogenous variables PA and EPS were lagged 2 years, to coincide with third exogenous variable CR, which is lagged 2 years by nature of the underlying dataset. Standardized coefficients were employed. To perform the analysis, Stata/MP 19.0 was employed. As the dependent variable of the model is a fraction falling between 0 and 1, a fractional logit model was employed. Following Trzebiatowski et al. (2025) and the suggestions for panel data by Papke and Wooldridge (2008), generalized linear models was employed, specifying binomial distribution and logit link function. Year and industry fixed

effects were included in the models. As a robustness check, the data was also analyzed with cluster robust standard errors, accounting for the nestedness of panel data (Antonakis et al., 2010), and the findings and conclusions remain unchanged.

4. Results

4.1. Preliminary results

Table 4 presents the results of pairwise correlations and the descriptive statistics. We observe that companies located in countries with a greater exposure to CR tend to perform worse in firm circularity, as well as those located in the richer countries. We also see that richer countries tend to have more stringency in environmental policies, but they are also more exposed to CR. Bigger and older companies tend to perform better in firm circularity, as well as those located in countries with greater policy stringency. Finally, countries with more climate risk seem to have lower policy stringency in environmental topics.

4.2. Fractional logit regression results

Table 5 presents the results of the fractional logit analyses. Model 1 estimates the influence of the control variables, Models 2 and 3 the individual effects of respectively PA and EPS. Models 4 and 5 add the interaction effects with the CR in isolated form and, finally, Model 6 joins all the variables.

Insert Table 5 about here

Hypothesis 1 states that PA positively affects firm level circularity. Positive and significant values in Model 2 (persistent in Model 6) allow us not to reject our first research hypothesis. These results are in line with previous studies that have explored the relationship between the

attention received from the public by a firm and its environmental protection behavior (Zhou and Ding, 2023), or stakeholder pressure and CE (Jakhar et al., 2019).

The positive and significative results of Model 3 (persistent in Model 6) allow us not to reject hypothesis 2, which states that EPS positively affects firm level circularity. These results are as well in line with previous research, such as by Arthur et al. (2023).

Hypothesis 3 states that CR positively moderates the relationship between PA and CI, and hypothesis 4 does the same but for the relationship between EPS and CI. The positive and significant coefficients of respectively interaction terms in Model 4 and 5 (persistent in Model 6) allow us to not reject these hypotheses.

5. Conclusions and limitations

In this research, we explored how PA, as in the online search intensity a firm experiences, drives firms to be more circular, confirming that stakeholder pressure is an important driver of firm level circularity. We investigated as well the effect EPS has on firm circularity, showing that firms with their headquarters in countries with stricter environmental regulation perform better in this regard. Finally, we analyzed whether these effects see themselves exacerbated by the CR a country is enduring, as in the climate change induced environmental catastrophes it suffers. We find that with greater CR, the effect of PA and EPS on firm level circularity is greater.

This study seeks to analyze how PA, understood as the search intensity on a global online search engine, affects the level of circularity at the company level. The results obtained show how PA has a direct and significant effect on corporate CE. From the stakeholders' perspective, PA is understood as pressure from target interest groups on the company, seeking a corporate response towards more circular behavior. The positive and significant effect is explained as a substantive (vs. symbolic) response by the company, i.e., the company understands PA as a

requirement from stakeholders who are pressuring it to implement circular measures (Aragón-Correa et al., 2008).

Along the same lines, the business environment can also affect companies' environmental behavior. Specifically, institutional pressure can influence the level of circularity implemented in companies, as has been verified in this study. Notably, the level of rigor of the institutions in which companies carry out their activity is a trigger for circularity measures. These results are in line with previous literature: Some studies have shown how the location of companies is decisive for their environmental impact. Specifically, studies like De Beule et al. (2022) or Ben-David et al. (2021) show that the most polluting companies will locate in places where environmental policy is less restrictive, in so-called pollution havens. The results obtained in this study are in line with this argument, since institutions with higher standards in terms of environmental policy will require companies to make an extra effort in terms of circular measures.

Similarly, the consequences of climate change can also influence the behavior of companies. This study attempts to analyze how the state of the climate, understood as the environmental catastrophes experienced by the country, aggravate the effect of stakeholder pressure and the institutional pressure on the level of circularity implemented by firms. These results are in line with previous literature. Some studies have shown how CR influences firm behavior, such as Ozkan et al. (2023) or Todaro et al. (2021), who showed that firms and managers responded to climate-related risk by engaging in more corporate social responsibility actions.

The use of an index that measures circularity at the company level is one of the main contributions of this study. As detailed in previous literature, few studies measure circularity at the company level at such large scales. In general, the literature has relied on proxy variables that did not fully reflect the level at which circularity was implemented in the company, as well

as on mostly case studies with small sample sizes. In this study, we have measured circularity through 39 items that allow us to analyze, in a concrete and concise manner, the level of circularity in companies. By employing secondary data sources, we amplify firm circularity measurement to a global scope, lifting CE research out of small case studies. This research also contributes to the current research about CE, by triangulating information as it employs four different data sources. Additionally, we advance research on public attention by measuring it at firm level and at a global scale.

5.1. Limitations and future lines

During the data collection process, several limitations were encountered, mainly due to the nature of the indicators employed. One of the aims was to give a global picture, including firms from as many countries as possible. However, one of our explanatory variables, the EPS, is only produced for 40 countries. Additionally, the last time it was published was in the year 2020. The CR index was published only until 2021, and then paused until recently. The CR index is also limited in itself, as it relies on data collected by different organisms, which are more or less reliable and precise depending on the country. Another limitation is the use of variables from LSEG in our composite indicator as endogenous variable, which often oversimplify concepts and can be quite untransparent. Finally, the GSVI that we use to measure PA only captures search itself, but not the intention behind. It gives no clue about why user searches a certain term, limiting sentiment analysis (Jun et al., 2018).

As a future line of research, we propose analyzing companies' responses to pressure from stakeholders from a symbolic vs. substantive perspective. In other words, when addressing stakeholder requirements, some companies will want to respond quickly and in the short term, limiting their actions to the disclosure of environmental information that is not entirely accurate. This dishonest behavior, defined as greenwashing, could be a new line of future work.

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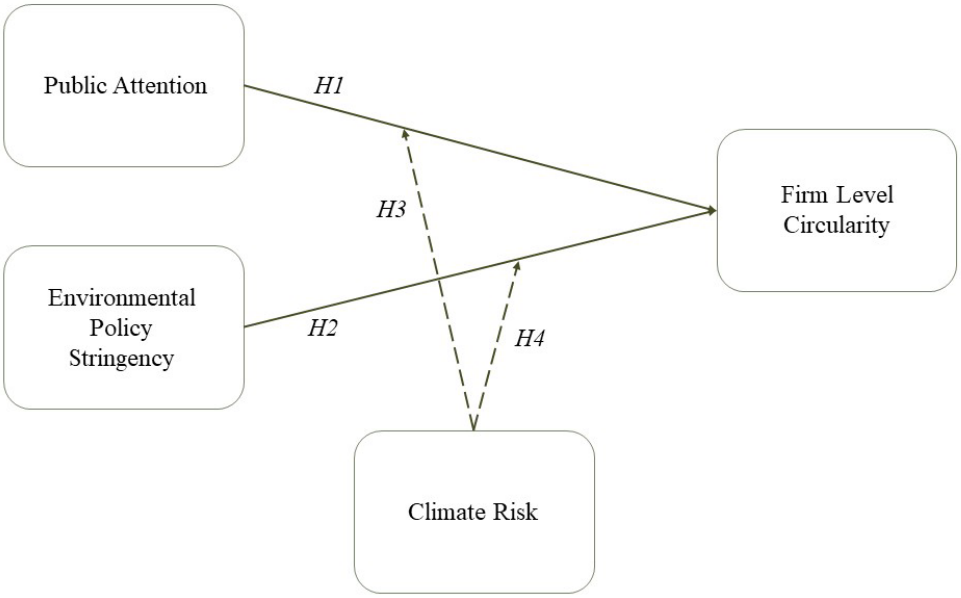

Figure 1: Theoretical model

Table 1: Tabulation of continent

Continent	Freq.	Percent
Africa	17	0.950
Asia	386	21.520
Europe	460	25.640
North America	867	48.330
Oceania	16	0.890
South America	48	2.680
Total	**1794**	**100.000**

Table 2: Tabulation of industries

Industry	Freq.	Percent
Agriculture, Forestry and Fishing	2	0.110
Mining and Quarrying	141	7.860
Manufacturing	571	31.830
Electricity, Gas, Steam and Air Conditioning	93	5.180
Water Supply	15	0.840
Construction	69	3.850
Wholesale and Retail Trade	89	4.960
Transportation and Storage	79	4.400
Accommodation and Food Service	24	1.340
Publishing, Broadcasting, Content Production	29	1.620
Telecommunication, Computer Programming	79	4.400
Financial and Insurance	365	20.350
Real Estate	103	5.740
Professional, Scientific and Technical Services	55	3.070
Administrative and Support Services	27	1.510
Education	4	0.220
Human Health and Social Work	25	1.390
Arts, Sports and Recreation	21	1.170
Other Services	3	0.170
Total	**1794**	**100.000**

Table 3: Summary of variables employed

Variable	Abbreviation	Description
Dependent variable		
Circularity indicator	CI	Composite variable using 39 equally weighed indicators, own elaboration based on data obtained from LSEG Workspace.
Independent variables		
Public attention	PA	Google Search Volume Index for the common name of the companies in the sample, own elaboration based on data obtained from Google Trends.
Environmental policy stringency	EPS	Individual country score covering different environmental policies, elaborated by the OECD.
Climate risk	CR	Climate Risk index elaborated by Germanwatch e.V., transformed in such a way that 0 indicates minimum risk and 1 the maximum climate risk experienced by a country.
Control variables		
Size		Number of full-time employees (LSEG Workspace)
Performance		Return on equity (LSEG Workspace)
Age		Years since date of incorporation (LSEG Workspace)
Country wealth		GDP per capita (Our World in Data)
Industry		Sector dummies for the 78 divisions at NACE 2 level (LSEG Workspace)

Table 4: Descriptive statistics

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Obs.	Mean	Std. Dev.	Min	Max
CI								7588	.40	.19	0	1
PA	0.078***							7581	14.15	88.05	0	3005.1
EPS	0.192***	0.009						6880	2.94	.68	.61	4.72
CR	-0.244***	0.021*	-0.195***					7433	.7	.24	0	1
Size	0.250***	0.075***	0.054***	-0.001				7588	31112.11	61157.76	0	798000
Performance	0.040***	0.001	-0.002	0.001	0.043***			7588	13.8	73.68	-4120	1034.85
Age	0.236***	0.044***	0.052***	-0.101***	0.107***	0.020*		7588	31.85	29.23	0	213
Country wealth	-0.169***	0.002	0.333***	0.119***	-0.116***	0.011	-0.043***	7588	43195.71	15481.01	7960.8	135490.38

**** p<0.01, ** p<0.05, * p<0.1*

Table 5: Generalized linear model regression estimates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PA		0.023**		0.016**		0.012**
		(0.007)		(0.004)		(0.004)
EPS			0.149**		0.119**	0.119**
			(0.009)		(0.010)	(0.010)
CR				-0.156**	-0.169**	-0.168**
				(0.007)	(0.009)	(0.009)
CR x PA				0.049**		0.056**
				(0.006)		(0.006)
CR x EPS					0.052**	0.053**
					(0.010)	(0.010)
Size	0.228**	0.227**	0.232**	0.233**	0.239**	0.239**
	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)
Performance	0.015*	0.015*	0.015	0.015	0.014	0.014
	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Age	0.075**	0.073**	0.080**	0.062**	0.068**	0.069**
	(0.007)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)
Country wealth	-0.070**	-0.070**	-0.121**	-0.059**	-0.063**	-0.065**
	(0.008)	(0.008)	(0.010)	(0.008)	(0.010)	(0.010)
Time dummies	YES**	YES**	YES**	YES**	YES**	YES**
Industry dummies	YES**	YES**	YES**	YES**	YES**	YES**
Number of observations	7570	7563	6862	7408	6862	6855

*Dependent variable: Circularity index; ** p<.01, * p<.05; Standard errors between parentheses.*