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Analysing the determinant factors of the sustainability profile of Fintech and Insurtech companies

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ABSTRACT

The revolution that Fintech has represented in recent years has allowed it to take advantage of the challenges posed by new technologies and big data. In this context, the present paper analyses the sustainable profile of current FinTech and InsurTech companies based on a group of determinants defined from three dimensions: CO_2 emissions; obtaining green certificates and sustainability rankings; alignment with sustainable development goals (SDG). Using the KBW and Nasdaq FinTech Index and the NASDAQ Insurance Index (IXIS), we composed a panel of 95 companies over a 10-year period (2010–2019) with economic-financial variables, and data about green certificates and sustainability indices. The applied methodology is based on dynamic (GMM-SYS) and static (PCSE) panel data models. The results show that the fintech companies that are larger, more profitable, less indebted and younger report on CSR and encourage volunteering and have a more sustainable profile.

1. Introduction

FinTech represents not only a set of changes in financial services, but also a true revolution in this field that companies must necessarily connect to if they wish to stay in the market (Gomber et al., 2018). Its development is changing the way and form of financial operations and services. The competitive advantages of regional entities due to their direct contact with clients will be blurred as Fintech entities increase. In fact the information provided by these new technologies is already decisive for granting loans (Flögel and Beckamp, 2020).

Fintech development has evolved in recent years and has made important changes in this sector, such as creating new automatic digital experiences like Robo-Advisor techniques (Anshari et al., 2022) or adapting to the rise of cryptocurrencies (Deshmukh et al., 2021). The exponential growth of this sector during the pandemic that derived from Sars Cov-2 resulted in the appearance of new projects to seek financing by the creation of cryptocurrency, whose emergence has been favoured by the increased widespread implementation of Fintech (Rangkuti et al., 2020; Suryanto et al., 2020). This has resulted in decentralised finance emerging (DeFresulted ini), which is a set of applications based on blockchain networks that allow transactions between individuals without intermediaries (Zetzsche, 2020).

In addition, the integration of cryptocurrencies in the financial world is increasingly accepted. Bank of America, Jp Morgan or Deutsche Bank, among others, already operate with Bitcoin and offer financial services based on this currency. New financial intermediaries are even appearing, such as Exchanges (Binance, Coinbase or Kraken, among others), which offer more financial possibilities for buying, selling, storing and staking both fiduciary and encrypted currencies, whose daily capitalisation volume exceeds two billion dollars (CoinMarketCap, 2022).

New technologies and big data pose challenges in data processing and its subsequent dissemination (Ignatyuk et al., 2020). These authors also point out that the application of Fintech, together with methods to process vast amounts of data, will facilitate the development of environmental businesses. It will also promote a more efficient use of resources, which will allow green companies' investments to increase.

In this big data context with decentralised finance, cryptocurrencies and new technologies, we wonder if the current FinTech and InsurTech companies have a sustainable profile through active policies about disclosure on environmental information. To do so, we seek to define the sustainability profile of this type of companies by analysing their determinants, which have been traditionally associated with the size of companies, their age, or the quality and quantity of reported information about the environment and sustainability. In addition to these, in this work we analyse the impact of the number of certifications and indices issued to entities, as well as their compliance and relationship, in

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relation to sustainable development goals (SDG).

After this introduction, the work is distributed into four sections. The literature review and hypotheses development are presented in the next section. In the third section come the used variables, the selected sample and the followed methodology. The fourth section presents the results of all the performed analyses. Finally, the main conclusions are provided.

2. Literature review and hypotheses development

Research into reporting corporate social responsibility (CSR) is a relatively recent topic of growing interest and literature works (Monteiro and Aibar-Guzmán, 2010; Iatridis, 2013; Lock and Seele, 2013). However, as far as we know, there is no literature that studies the sustainable profile of Fintech companies.

The disclosure of environmental information responds to a multifaceted nature (Tagesson et al., 2009). For this reason, previous research works have included in their analyses both variables linked with the characteristics of the companies and specific items in environmental or corporate governance reports (Naser et al., 2006; Wahba, 2008; Liu and Anbumozhi, 2009; Silva-Gao, 2012; Iatridis, 2013).

Two alternative theories are taken from the previous literature that justifies the degree of disclosure of corporate social information. On the one hand, the voluntary disclosure theory, which establishes that companies have a proactive environmental strategy, encourages companies to report to investors to differentiate them from their competitors (Clarkson et al., 2008; Monteiro and Aibar-Guzmán, 2010; Bakar and Ameer, 2011; Silva-Gao, 2012; Iatridis, 2013; Alberici and Querci, 2016; Hickmann, 2017; Córdova et al., 2018). This theory establishes that the companies with the best environmental performance have incentives to disclose environmental information. Notwithstanding, Shah et al. (2019) affirm that, although sustainable development has become a slogan for commercial and financial practices worldwide, the agency problem (Friedman, 1970) still exists. On the other hand, socio-political theories state that companies disclose social and environmental information to inform stakeholders and change perceptions of their performance. They specifically seek legitimacy by addressing their socio-political concerns (Carnevale et al., 2012; Andrikopoulos and Kriklani, 2013) or respond to stakeholders and the demand for socio-environmental information (Naser et al., 2006; García- Sánchez, 2008; Wahba, 2008; Liu and Anbumozhi, 2009; Lock and Seele, 2013; Shah et al., 2019).

Empirical research has confirmed the complexity of the phenomenon by finding several factors that influence both the quality of disclosure and environmental performance. According to the previous literature, we posit 10 hypotheses, whose development is as follows.

The stock market and its public scrutiny requiret the environmental disclosures of listed entities to be precise and strategic (Gamble et al., 1995). In other words, the market encourages companies to take care of the environment (Wahba, 2008; Mae Matsumura et al., 2014) and punishes misleading and poor quality information. Some works (Ratanajongkol et al., 2006; Lock and Seele, 2013; Alberici & Querci, 2016) state that financial companies report less environmental information because their direct environmental impact is milder. However, we understand that stakeholders are interested in environmental information and are specific to the analysis to evaluate the company, which is why listed companies must provide high-quality disclosures. Monteiro and Aibar-Guzmán (2010), Carnevale et al. (2012), Krishnamurtia and Velayuthamn (2017) and Alcaide González et al. (2022) support this opinion, albeit with country-specific differences. Thompson and Cowton (2004) state that financial institutions are more susceptible to the stakeholder theory than other companies because they are more sensitive to reputational risk. The current paper of Fintech entities in the economic system confers them much more visibility than other types of companies. Therefore, we formulate the following hypothesis:

H1. Fintech companies (*FinTech*) focus their efforts and image on promoting sustainability in comparison to Insurtech companies.

Company size is one of the most frequently cited variables to explain environmental disclosure. Broadstock et al. (2017) points out that the largest listed companies show a non-linear relation with carbon emissions that initially increases with the company's performance and then decreases. However, most of the research (Naser et al., 2006; Clarkson et al., 2008; Stanny and Ely, 2008; Wahba, 2008; García-Sánchez, 2008; Liu and Anbumozhi, 2009; Monteiro and Aibar-Guzmán, 2010; Andrikopoulos and Kriklani, 2013; Iatridis, 2013; Ortas et al., 2014; Liesen et al., 2015; Zorio-Grima et al., 2015; Alberici & Querci, 2016, Córdova et al., 2018; Alcaide González et al., 2020) finds a positive association between the size of companies and their ability to disseminate environmental information. Following socio-political theories, we assume that large companies have more financial and technical resources to invest in environmental information. Patten (2002), Berthelot et al. (2003) and Stanny and Ely (2008) support this idea and argue that larger companies should take actions and make efforts to promote sustainability to avoid possible conflicts given their greater visibility and media coverage. According to the previous reasoning, we formulate the following hypothesis:

H2. There is a significant relation between company size (*SIZE*) and the promotion of sustainability.

Most of previous literature focuses on the link between companies' environmental disclosures and their profitability. However, unsolved debate about the nature of their relation is longstanding. On the one hand, some studies (Clarkson et al., 2008; Stanny and Ely, 2008; long Tagesson et al., 2009; Liu and Anbumozhi, 2009; Bakar and Ameer, 2011; Silva-Gao, 2012; Iatridis, 2013; Ortas et al., 2014), based on the voluntary disclosure theory, argue that profitable companies are more likely to disclose high-quality information. This is to show their best management capacity, their contribution to protect the environment, for interested parties' informative well-being, and to differentiate themselves from their competitors. On the other hand, in the agency theory context, Friedman (1970) points out that the company's social performance negatively affects its profitability. Birindelli et al. (2019) corroborate this explanation, and Andrikopoulos and Kriklani, (2013) emphasise that increased profitability weakens companies' incentive to achieve legitimacy through environmental information. Alberici and Querci (2016) point out that these companies limit themselves to ineffective declarative-narrative disclosures (Ahmad and Mohamad, 2014), and do not report achieved results. Furthermore, authors likes Clarkson et al. (2008,; Monteiro and Aibar-Guzmán (2010), and Córdova et al. (2018) do not find a statistical association between companies' financial performance and their level of environmental reporting. Considering this open debate, we formulate the following hypothesis:

H3. There is a significant relation between companies' profitability (*ROA*) and their activity in promoting sustainability.

Following firms' financial structure, their indebtedness limits their ability to act in the long term. On this matter, Andrikopoulos and Kriklani (2013) emphasise that an increase in leverage reduces the resources that companies allocate to essential actions for environmental information. Specifically, Córdova et al., 2018, corroborate this explanation by evidencing a negative relation between indebtedness and annual variation in CO_2 emissions. However, other authors (Naser et al., 2006; Clarkson et al., 2008; Iatridis, 2013; Birindelli et al., 2019) show a positive association, whereby the most indebted companies make their managers take more effective environmental actions. This explanation would be linked with the stakeholder theory. Thus we can assume that it would fall more in line with the industrial profile of the companies in our sample (Fintech and Insurtech). Finally, other works, such as Liu and Anbumozhi, (2009), do not show a significant relation between indebtedness and environmental information disclosure. So we go on to formulate the following hypothesis:

H4. The most indebted companies (*LEV*) are more active in promoting sustainable actions.

Company age can also be a determining factor for disclosing environmental information. New generations better relate to technology, which can help to improve living standards following SDG (Schinckus, 2020). The growth of SDG (United Nations, 2015) has modified universities' behaviour patterns (De la Poza et al., 2021). It has led them to include studies related to sustainability in their undergraduate and graduate programmes (El-Jardali et al., 2018). For this reason, we understand that new graduates will be more environmentally aware than their ancestors. This leads to new entrepreneurs developing companies with a more sustainable spirit. The few research works that have studied this impact (Wahba, 2008) do not show a significant relation. Nor did Liu and Anbumozhi, (2009), find a significant relation despite defining it as the number of years as a listed company. However, we posit the following hypothesis.

H5. Company age (*AGE*) is negatively related to promoting sustainability.

Corporate governance strategies should facilitate Fintech companies' environmental performance. According to socio-political theories, companies disclose socio-environmental information to inform stakeholders and to change perceptions of their performance (Clarkson et al., 2008). For example, Liao et al. (2015) point out that an environmental committee significantly impacts GRI reports. However, the presentation of these reports, *per se*, does not directly impact companies' sustainability performance (Belkhir and Bernard, 2017). So although a combined risk and an audit committee may involve fewer carbon emissions reports (Krishnamurtia and Velayuthamn, 2017), having a CSR committee is significantly linked with better environmental performance (Iatridis, 2013). Like these authors, Córdova et al. (2018) also evidence a positive relation between both the CSR committee and CSR reporting on environmental disclosure and, in South America, Birindelli et al. (2019) corroborate this positive impact of CSR reporting for the EMEA region (Europe, Middle East and Africa). Nevertheless, Carnevale et al. (2012) in European countries and Belkhir and Bernard (2017) in US companies do not provide any evidence for a direct association between CSR reporting and sustainable performance. Taking into account Fintech companies' environment and characteristics, we formulate the following two hypotheses:

H6. The companies with a CSR committee (*CSRcom*) are more active in promoting sustainability.

H7. The companies that issue a CSR report (*CSRrep*) are more active in promoting sustainability.

Other corporate governance variables, such as the director's ownership, board size or the concentration of ownership affect the scope of environmental information being disclosed (Tauringana and Chithambo, 2015). The above-mentioned authors find positive links between these variables and carbon reports. In addition, Birindelli et al. (2019) corroborate the positive impact of board size on sustainable performance. Accordingly, we posit the following hypothesis:

H8. The companies with a bigger board size (*BoardSize*) dedicate more resources to promote sustainability.

In addition, we understand that the companies that are active in sustainability by means of initiatives like waste reduction are also involved in promoting their sustainable image (Iatridis, 2013). Therefore, we expect them to be more prone to sustainable actions and, hence, we posit the last two hypotheses:

H9. The companies committed to their employees' voluntary work (*EmployeeEVW*) are more sustainable.

H10. The companies that take initiatives to reduce waste (*WasteReduction*) and their impact on the environment are more active in promoting sustainability.

3. Materials and method

In this section, we describe the dependents and independent variables. Then we detail how the sample was prepared by starting from the KBW and Nasdaq FinTech index, and the NASDAQ Insurance (IXIS) index. Finally, the followed methodology is introduced.

3.1. Variables description

The main goal of this paper is to analyse the sustainable profile of Fintech and Insurtech companies. We can approximate this profile by three different dimensions: (i) CO_2 emissions; (ii) obtaining green certificates and sustainability rankings; (iii) alignment with SDG. In this way, we compute different panel data models depending on the dimension to be analysed. Thus, the following dependent variables are considered.

- **DuCO$_2$Etotal**: dummy variable that takes a value of 1 in year *t* if the company reports its total CO_2 emissions, and 0 otherwise
- **DuCO$_2$Scope1**: dummy variable that takes a value of 1 in year *t* if the company reports Scope 1 CO_2 emissions, and 0 otherwise
- **DuCO$_2$Scope2**: dummy variable that takes a value of 1 in year *t* if the company reports Scope 2 CO_2 emissions, and 0 otherwise
- **DuCO$_2$Scope3**: dummy variable that takes a value of 1 in year *t* if the company reports Scope 3 CO_2 emissions, and 0 otherwise
- **CO$_2$Total**: total CO_2 emissions (in tons) in year *t*
- **CO$_2$Scope1**: CO_2 emissions (in tons) in year *t* according to Scope 1 emissions
- **CO$_2$Scope2**: C_{O2} emissions (in tons) in year *t* according to Scope 2 emissions
- **QCert**: number of the Company's green certificates in year *t*. We consider the following certificates: LEED, BREEAM, Carbon Neutral, EPA Energy Star, NABERS, Carbon Disclosure Project, RE100, SASB and ISO14001
- **Du1cert.**: dummy variable that takes a value of 1 if the firm is certified in year *t* by at least one of the considered green certificates, and 0 if not certified
- **QSustRank**: number of sustainable indices in which the company is included in year *t*. We consider the following indices: Green Ranking 2010-17, CSR Rep Track 2012-18 and Finance Yahoo Sustainability 2020. For Finance Yahoo Sustainability, only the data for 2020 were available and extended to the whole study period. The Global100 index was excluded because no firm in the sample is included in it
- **Du1SustRank**: dummy variable that takes a value of 1 if the firm is included in year *t* in at least one of the three sustainability considered indices, and 0 otherwise
- **Du1SDG**: dummy variable that takes a value of 1 if the firm takes actions in at least one SDG according to its CSR report in year *t* for $t =$ 2016, 2017, 2018 and 2019, and 0 otherwise
- **QSDG**: number of SDG in which the company takes action according to its CSR report in year *t* for $t = 2016, 2017, 2018$ and 2019
- **SDG1-17**: dummy variable that takes a value of 1 if the firm takes actions in this particular SDG according to its CSR report in year *t*, and 0 otherwise. SDG6 is not included in the analyses because no firm in the sample reports about it

In order to evaluate the 10 hypotheses, we use the following subrogates. Variable *FinTech* is a dichotomous variable that takes a value of 1 for every *t* when the firm is a Fintech company according to the Nasdaq classification, and 0 otherwise. We proxy the firm's size with the natural logarithm of total assets (*SIZE*). For the firm's economic and financial structure, we consider two independent variables: *ROA* and *LEV*. Profitability is calculated as operating income over total assets (*ROA*), while the company's indebtedness is obtained as total debts divided by total

assets (*LEV*). We also consider *company's AGE*, which was calculated since the year it was founded.

Regarding some corporate governance variables, *CSRcom* is a dummy variable that takes a value of 1 if the company has a CSR committee in year t, and 0 otherwise. We consider that it takes a value of 0 when data are missing, as in (Córdova et al., 2018). The variable *BoardSize* is defined as the total number of board members at the end of the fiscal year. The independent variable *CSRrep* takes a value of 1 when the company publishes a separate CSR report or contains a section in its annual report.

Sustainable actions are considered and proxied by dummy variables *EmployeeEVW* and *WasteReduction*, which take a value of 1 if the company fosters employee engagement in voluntary work during working hours or in the company's NGO project, and if the company reports about any initiatives to recycle, reduce, reuse, replace, treat or phase out total waste, and 0 otherwise, respectively.

Table 1 describes the variables used to explain how actively companies promote sustainability. They include economic-financial attributes of companies and related corporate information. The source of information is also shown.

In addition, to control the impact of possible macro-economic or legislative events that could influence the company's ability to promote sustainability, dichotomous year variables are included.

3.2. Sample

The sample includes the main Fintech and Insurtech companies. Companies were identified from the reference indices. Thus 49 Fintech companies were identified from the KBW and Nasdaq FinTech (KFTX) Indices and 51 companies from the NASDAQ Insurance Index (IXIS). Three non-listed companies were removed from the sample, as well as two firms with a double quote. The final sample is made up of 95 firms for a 10-year period (2010–2019) with 950 observations.

The economic and financial variables were obtained from the Eikon database. The data about green certificates, sustainability indices and SDG were hand-collected. However, there are no complete data available for some variables and years. As Table 2 shows, some dependent and independent variables have fewer observations.

In summary, the average age of the companies in the sample is 44 years, with a minimum of 4 and a maximum of 179 years. The average board size is made up of 10.53 members, 12% have a CSR committee, and 15.8% publishes a CSR report or includes detailed information in their annual report.

As regards CO_2 emissions (Table 2), only 70 and 63 firms report Total and Scope 1, respectively. Note that all the companies that report CO_2 emissions according to Scope 1 do so according to Scope 2. Approximately 25% of the firms are certified for at least one green certificate and more than 31% are included in at least one of the three analysed sustainability indices.

By paying attention to the coverage of SDG since the 2030 Agenda was addressed as an action plan in September 2015, we only have data available on SDG for a 3-year period (2016–2019, Table 2). In our sample, the most covered SDG are SDG5 and SDG8 because more than 10% of the firms in our sample report information on them.

Table 1
Descriptive variables.

Variable	Description	Source
FinTech	FinTech companies	KBW and Nasdaq FinTech
SIZE	Natural logarithm of total assets	Manual from EIKON
ROA	Operating income/total assets	Manual from EIKON
LEV	Total liabilities/total assets	Manual from EIKON
AGE	2020, less the year of foundation	Manual from EIKON
CSRcom	CSR Committee in the company	Manual from EIKON
CSRrep	CSR report in the company	EIKON
BoardSize	Board of Directors size	EIKON
EmployeeEVW	Commitment to voluntary work	EIKON
WasteReduction	Waste reduction initiatives	EIKON

Table 2
Descriptive statistics.

Independent	Obs	Mean	S.D.	Min	Max
FinTech	950	0,4842105	0,5000139	0	1
SIZE	836	7.712858	2.094898	−2.590267	12.52847
ROA	820	0.0553667	0.2273246	−3.685479	0.8314396
LEV	833	0.6857268	0.3569964	−1.373556	4.807806
AGE	950	44.87368	40.83384	4	179
CSRcom	950	0.12	0.3275798	0	1
CSRrep	430	0.1581395	0.3652968	0	1
BoardSize	430	10.53953	3.763655	1	36
EmployeeEVW	430	0.5395349	0.4990151	0	1
WasteReduction	430	0.2860465	0.4524378	0	1
Dependent	**Obs**	**Mean**	**S.D.**	**Min**	**Max**
DuCO2total	950	0.0736842	0.2613939	0	1
DuCO2Scope1	950	0.0663158	0.2489644	0	1
DuCO2Scope2	950	0.0663158	0.2489644	0	1
DuCO2Scope3	950	0.0621053	0.2414738	0	1
CO2Total	70	102549	117850.4	5617	499902
CO2Scope1	63	12288.34	12135.09	0	62084.1
CO2Scope2	63	98476.25	118106.3	12087	480078
QCert	950	0.5715789	1.345732	0	7
Du1cert	950	0.1968421	0.3978214	0	1
QSustRank	950	0.3421053	0.5351854	0	3
Du1SustRank	950	0.3157895	0.4650744	0	1
Du1SDG	380	0.1210526	0.3266185	0	1
QSDG	380	1.002632	3.071272	0	14
SDG1	380	0.0657895	0.2482406	0	1
SDG2	380	0.0473684	0.2127057	0	1
SDG3	380	0.0578947	0.2338522	0	1
SDG4	380	0.0763158	0.2658527	0	1
SDG5	380	0.1052632	0.3072968	0	1
SDG7	380	0.0368421	0.1886224	0	1
SDG8	380	0.1026316	0.3038772	0	1
SDG9	380	0.0552632	0.2287944	0	1
SDG10	380	0.0710526	0.2572515	0	1
SDG11	380	0.0473684	0.2127057	0	1
SDG12	380	0.0868421	0.2819748	0	1
SDG13	380	0.0894737	0.2858026	0	1
SDG14	380	0.0157895	0.1248246	0	1
SDG15	380	0.0263158	0.1602837	0	1
SDG16	380	0.0394737	0.1949758	0	1
SDG17	380	0.0789474	0.2700121	0	1

Source: the authors.

3.3. Data models: Panel Corrected Standard Errors (PCSE)

Panel data allow of the same units of a cross-section to be monitored during an interval (Wooldridge, 2002). Panel data offer the possibility of controlling certain unobserved characteristics of selected companies. Specifically, Arellano and Bover (1990) or Hsiao (2007) distinguish several advantages over cross-sectional data, such as improving the efficiency of econometric estimates by containing more degrees of freedom and wider sample variability, being better able to control the complexity of each unit's behaviour or decreasing measurement errors by having several observations from a firm. For that reason, and as Cormier et al. (2005) begins to analyse environmental disclosure using panel data to test their respective hypotheses, the previous literature has often employed panel data (Carnevale et al., 2012; Córdova et al., 2018; Birindelli et al., 2019). The main objective of using panel data models is to capture the non-observable heterogeneity that affects variations in sustainability promotion (Cormier et al., 2005) and cannot be detected with temporal series or cross-section studies.

This study includes 95 companies over a 10-year period and a weak Sargan test (1958) statistic. We identify a possible overidentification problem. Following Roodman's (2009) recommendation, we do the estimation using static panel data models. According to the non-significance of the Hausman tests (1978) and the significance of the

Breusch and Pagan Lagrangian multiplier tests, it is recommended to apply random effects in most of the regressions. In these cases, random effects are preferable because they are both consistent and efficient (Baltagi, 2011). However, in those cases in which fixed effects are preferable to random effects, the significance of the model's F test also corroborates its selection compared to pool data.

However, note that as the Wooldridge test has verified the existence of autocorrelation of order one, and the Modified Wald test noted the presence of heteroscedasticity. To correct these problems, a robust estimation of all the regressions was done using the Panel Corrected Standard Errors (PCSE) technique. Beck and Katz (1995) and Bailey and Katz (2011) point out that this method is more accurate than Feasible Generalised Least Squares (FGLS) estimators.

Besides, temporary dichotomous variables were added with one for each year in the sample. Thus, we captured the common events to all the companies during the study period and managed to reduce significant biases in the estimation. It is also important to note that as none of the resulting VIFs (variable inflation factors) exceeded 10 in any regression, multicollinearity is not considered to be a serious problem. In addition, according to the correlation matrix, no Pearson's correlation coefficient exceeds 50%.

In order to identify which factors, have a significant influence on the sustainable profile and the level of disclosure of CSR data by Fintech and Insurtech companies, we carried out a multivariate analysis with the following multiperiod regression model:

$$A\&Psust_{it} = \beta_0 + \beta_1\, FinTech_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 LEV_{it} + \beta_5 AGE_{it} + \beta_6 CSRcom_{it} + \beta_7 CSRrep_{it} + \beta_8 BoardSize_{it} + \beta_9 EmployeeEVW_{it} + \beta_{10} WasteReduction_{it} + YEAR_{2010-19} + \varepsilon_{it} \quad (1)$$

where, $YEAR_{2010\text{-}19}$ represents a vector of dichotomous variables for each year, and $\varepsilon_{it=}\ \mu_i + \vartheta_{it}$ is the random error term for company i in moment t, and is composed of two orthogonal components: μ_i (the combined effect, which varies between companies and periods of time); ϑ_{it} (individual effect, which is characteristic of the company). All the analyses were performed with the Stata 12 software.

4. Findings and discussion

This paper aims to analyse the sustainability profile of Fintech and Insurtech companies from three points of view. Therefore, we divided the presentation of the results according to the three studied dimensions: CO_2 emissions (Table 3, Models 1 to 6); obtaining green certificates and sustainability rankings (Table 4, Models 7 to 10); alignment with SDG (Table 5 and, Models 11 to 25).

Table 4
Empirical results per certificate and ranking in the PCSE model.

Explanatory variables	QCert (7)	DuCert (8)	QSustRank (9)	Du1SustRank (10)
FinTech	4.82***	4.40***	−0.99	−0.22
Size	4.96***	3.77***	1.59	4.60***
ROA	2.30**	0.73	0.36	2.10**
LEV	−1.73*	−0.40	−0.24	−1.57
AGE	−0.21	−1.34	−0.39	−0.21
CSRcom	2.60***	2.41**	0.20	0.11
CSRrep	2.56***	1.67*	−0.66	0.13
BoardSize	−1.35	0.48	1.75*	1.57
EmployeeEVW	2.04**	2.18**	−0.57	−0.40
WasteReduction	2.00**	2.78***	−1.14	−0.63
YEARS	YES	YES	YES	YES
Obs/groups	426/69	426/69	426/69	426/69
Hausman test	7,12	12,26	4,81	8,54
R-squared	0.2206	0.1782	0.1217	0.3055
Wald *(chi2)*	107.25***	155.69***	70.62***	172.64***

Robust standard errors in brackets. *, **, *** For the 10%, 5% and 1% significance level, respectively.
Source: The authors.

4.1. Results for CO_2 emissions

Table 3 shows the results of the estimation of the model proposed in Equation (1) using the PCSE technique for the first dimension of the sustainability profile. Firstly, *FinTech* is significant and positive in four of the six estimates. Specifically, Fintech companies disclose more information about Scope 3 CO_2 emissions than Insurtech companies. Besides, the last three regressions (Models 4, 5, and 6) show a statistically bigger volume of emissions in Fintech companies compared to Insurtech. As expected, Fintech companies appear to have a more developed sustainable profile than Insurtech ones.

Regarding *size*, all the regressions confirm its statistically positive effect, except for CO_2Scope1 (Model 5). This indicates that larger companies have a significantly more sustainable profile, which falls in line with most of the previous literature (Clarkson et al., 2008; Stanny and Ely, 2008; Wahba, 2008; García-Sánchez, 2008; Liu and Anbumozhi, 2009; Monteiro and Aibar-Guzmán, 2010; Andrikopoulos and Kriklani, 2013; Iatridis, 2013; Ortas et al., 2014; Liesen et al., 2015; Zorio-Grima et al., 2015; Alberici & Querci, 2016; Córdova et al., 2018).

The *ROA* results contradict the existing debate in the previous literature. On the one hand, it shows a significant and positive relation

Table 3
Empirical results per CO_2 emissions in the CSE model. No model for DuCO_2Scope2 is reported because it is exactly the same as DuCO_2Scope1 because all companies that report CO_2 emissions according to Scope 1 are the same as those that do this according to Scope 2.

Explanatory variables	DuCO2 Total (1)	DuCO2 Scope1 (2)	DuCO2 Scope3 (3)	CO2 Total (4)	CO2 Scope1 (5)	CO2 Scope2 (6)
FinTech	−0.32	0.04	2.60***	6.47***	6.69***	4.70***
Size	3.67***	4.65***	4.10***	5.39***	0.44	3.89***
ROA	0.55	1.80*	1.12	−1.13	0.21	−1.75*
LEV	−1.74*	−1.81*	−1.08	1.74*	−0.75	1.75*
AGE	−0.57	−0.54	−0.13	−4.01***	4.12***	−4.37***
CSRcom	4.12***	3.68***	2.71***	1.65*	1.95*	1.86*
CSRrep	3.65***	2.68***	3.36***	2.86***	3.60***	2.10**
BoardSize	−2.20**	−1.98**	−2.52**	2.45**	−0.31	2.96***
EmployeeEVW	0.69	0.63	1.83*	−1.01	−4.86***	0.37
WasteReduction	3.03***	2.05**	2.03**	0.60	0.33	0.98
YEARS	YES	YES	YES	YES	YES	YES
Obs/groups	426/69	426/69	426/69	70/13	63/12	63/12
Hausman test	3,95	1,05	2,43	3,13	18,14***	39,30***
R-squared	0.4665	0.2954	0.3078	0.6226	0.7234	0.6414
Wald *(chi2)*	167.78***	106.58***	110.60***	123.90***	187.42***	95.61***

Robust standard errors in brackets. *, **, *** For the 10%, 5% and 1% significance level, respectively.
Source: The authors.

Table 5
Empirical results per SDG in the PCSE model.

Explanatory variables	QSDG (11)	Du1SDG (12)	SDG1 (13)	SDG3 (14)	SDG4 (15)	SDG5 (16)	SDG7 (17)	SDG8 (18)	SDG9 (19)	SDG10 (20)	SDG11 (21)	SDG12 (22)	SDG13 (23)	SDG17 (24)
FinTech	3.40***	1.65*	3.24***	3.50***	2.81***	3.67***	2.24**	2.08**	3.25***	3.20***	2.98***	1.64*	2.96***	0.68
Size	4.41***	3.30***	3.72***	3.24***	2.38**	4.18***	2.01**	4.47***	2.89***	3.65***	2.04**	4.87***	3.69***	3.48***
ROA	1.82*	1.70*	1.94*	1.17	2.10**	1.67*	−1.64	2.66***	0.47	1.86*	0.31	1.51	1.78*	1.24
LEV	−1.43	−2.25**	−1.76*	−1.04	−2.35**	−1.24	1.44	−2.22**	−0.27	−1.44	0.10	−1.38	−1.24	−2.00**
AGE	−1.76*	−0.82	−2.24**	1.11	−2.90***	−1.51	−3.75***	−0.43	−2.84***	−2.65***	−0.21	−0.44	−1.65*	0.04
CSRcom	0.62	1.55	0.01	−1.32	0.88	1.42	2.61***	0.74	0.26	0.84	−0.14	0.56	1.59	1.69*
CSRrep	1.85*	2.66***	0.70	0.99	2.09**	1.76*	1.65*	2.54**	1.10	1.78*	2.20**	1.19	2.24**	1.88*
BoardSize	−0.43	−2.19**	−0.15	−0.48	−0.54	−0.95	0.40	−0.82	0.37	−0.25	0.65	−1.27	−0.92	−2.89***
EmployeeEVW	3.10***	3.52***	2.44**	1.29	3.42***	2.90***	3.70***	3.04***	3.14***	3.02***	1.67*	2.76***	2.25**	1.96*
WasteReduction	−0.50	−0.43	0.22	0.33	−0.81	−0.34	−2.51**	−0.95	−0.88	−0.70	−0.90	0.62	0.02	0.93
YEARS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs/groups	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69	211/69
Hausman test	8,27	7,23	2,50	3,42	5,39	5,02	0,00	5,64	4,83	3,18	11,91	5,45	9,50	7,62
R-squared	0.3485	0.4941	0.2018	0.1705	0.3433	0.3800	0.2588	0.3760	0.2067	0.2995	0.2228	0.3362	0.4311	0.4270
Wald (*chi2*)	73.63***	98.92***	25.95**	20.51*	55.08***	73.46***	22.85**	77.96***	27.08**	46.43***	22.07*	52.83***	75.62***	61.77***

Robust standard errors in brackets. *, **, *** For the 10%, 5% and 1% significance level, respectively.
Source: The authors.

when we take the dummy variables as a dependent one (Model 2), which would indicate that companies with better economic performance disclose more CO_2 emissions information (Clarkson et al., 2008; Stanny and Ely, 2008; Tagesson et al., 2009; Liu and Anbumozhi, 2009; Bakar and Ameer, 2011; Silva-Gao, 2012; Iatridis, 2013; Ortas et al., 2014). On the other hand, when considering the CO_2 emissions level as tons, the opposite effect is significantly shown (Andrikopoulos and Kriklani, 2013; Alberici & Querci, 2016; Birindelli et al., 2019), and is linked with the agency theory of Friedman (1970).

LEV is also a relevant variable on the sustainability profile of companies measured in terms of CO_2 emissions. However, in line with the previous literature, contrary effects are distinguished. On the one hand, there is a statistically negative effect on models 1 and 2, which shows that the most indebted companies report less information about their emissions. This would imply that the agency problem (Friedman, 1970) persists in listed companies (Andrikopoulos and Kriklani, 2013; Córdova et al., 2018). At the same time, a positive relation is established (Models 4 and 6), which indicates that indebtedness encourages the disclosure of environmental information (Naser et al., 2006; Clarkson et al., 2008; Iatridis, 2013; Birindelli et al., 2019) and, therefore, its sustainable profile is higher. *AGE* is only statistically relevant in the models that use quantitative dependent variables, albeit with a contradictory sign depending on the scope. Regarding the total CO_2 emissions and those of Scope 2 (Models 4 and 6), the oldest companies report a statistically lower volume of emissions than the younger ones.

This demonstrates that the new generations of entrepreneurs have a more sustainable profile (El-Jardali et al., 2018).n the other hand, the oldest companies are those that, contrary to expectations, show a more developed sustainable profile when measured with Scope1 (Model 5).

The results about the corporate governance variables are interesting. Regarding *CSRcom* and *CSRrep*, in both cases a statistically positive effect is achieved in all the regressions. In line with Clarkson et al. (2008), Iatridis (2013), Krishnamurtia and Velayuthamn (2017), Córdova et al. (2018) and Birindelli et al. (2019), the companies with a CSR committee and publish a CSR report have a more sustainable profile. *BoardSize* is also significant in all the regressions, except for CO_2Scope1 (Model 5).

In the first three models, the companies with a smaller board size report more sustainable CO_2 information. In contrast, for the total CO_2 emissions and those of Scope2, the firms with a larger board size have a more sustainable profile (Tauringana and Chithambo, 2015; Birindelli et al., 2019).

EmployeeEVW is the least relevant indicator of corporate governance. It is only significant in models 3 and 5, and with opposite signs. The companies committed to their employees' voluntary work have a higher sustainable profile for reporting Scope3. This effect is negative on the sustainable profile and is related to more CO_2 emissions according to Scope 1. Finally, *WasteReduction* is significant and positive in the first three regressions (Models 1–3). As expected, this indicates that the companies that take waste reduction action and initiatives display better sustainable behaviour (Iatridis, 2013).

4.2. Results for green° certificates and sustainability rankings

Table 4 presents the results of the sustainability profile of the studied listed companies from the green certificates (Models 7 and 8) and sustainability rankings (Models 9 and 10) Dimension. Here we focus on companies' sustainable performance and how it allows them to obtain a specific green certificate (LEED, BREEAM, Carbon Neutral, EPA Energy Star, NABERS, Carbon Disclosure Project, RE100 and ISO14001) or be included in a sustainability ranking (Green Ranking, CSR Rep Track, and Finance Yahoo Sustainability). Although the four models are globally significant, the models for green certificates achieve better results than those for sustainability rankings.

As regards green certificates, models 7 and 8 have coincidences for six significant variables.

FinTech is positively significant for green certificates (Models 7 and

8), following the CO_2 emissions results (Models 4 to 6), but it is not significant in the sustainability rankings models (Models 9 and 10). This indicates that Fintech companies statistically obtain more green certificates than Insurtech ones. *Size* maintains its expected positive relation in three of the analysed four models. This shows that larger companies' environmental performance is better (Clarkson et al., 2008; Stanny and Ely, 2008; Wahba, 2008; García-Sánchez, 2008; Liu and Anbumozhi, 2009; Monteiro and Aibar-Guzmán, 2010; Andrikopoulos and Kriklani, 2013; Iatridis, 2013; Ortas et al., 2014; Liesen et al., 2015; Zorio-Grima et al., 2015; Alberici & Querci, 2016; Córdova et al., 2018), which allows them to obtain green certificates (Models 7 and 8) and be included in some sustainability rankings (Model 10). Similarly, economic profitability (*ROA*) shows a positive effect on their environmental performance (Clarkson et al., 2008; Stanny and Ely, 2008; Tagesson et al., 2009; Liu and Anbumozhi, 2009; Bakar and Ameer, 2011; Silva-Gao, 2012; Iatridis, 2013; Ortas et al., 2014). This expected effect is contrary to Friedman's agency theory (1970) and indicates that the companies with the best results invest part of their resources in improving their environmental image. This would allow them to obtain more green certificates and be included in the main sustainability rankings.

Leverage maintains the statistically negative effect shown on CO_2 emissions (Models 1 and 2), although is only a determinant factor for those companies that obtain more green certificates (Model 7). This relation coincides with expectations and indicates that as indebtedness increases, listed companies reduce their environmental resources (Andrikopoulos and Kriklani, 2013; Córdova et al., 2018). This leads to worse sustainable performance and results in a poorer sustainable profile. When measuring this impact with sustainability rankings (Models 9 and 10), it is not significant (Liu and Anbumozhi, 2009). AGE is not statistically significant in any of the four models (Wahba, 2008), as shown in Table 3 (Models 1–3).

The corporate governance variables show consistent behaviour with the previous results, but with some nuances. Firstly, both *CSRcom* and *CSRrep* maintain their expected positive relation, which falls in line with Clarkson et al. (2008), Iatridis (2013), Krishnamurtia and Velayuthamn (2017), Córdova et al. (2018) and Birindelli et al. (2019). This indicates that having a CSR committee and preparing an annual CSR report are determinant factors for obtaining not only green certificates, but more of them (Models 7 and 8). However, this effect is not statistically corroborated in the sustainability rankings (Models 9 and 10).

BoardSize is only statistically relevant in Model 9 according to the effect observed in CO_2 emissions (Models 4 and 6). This indicates that companies with a bigger board size manage to be included in more sustainability rankings and, therefore, improve their environmental profile (Tauringana and Chithambo, 2015; Birindelli et al., 2019). The last two corporate governance variables are statistically relevant for obtaining green certificates (Tauringana and Chithambo, 2015). Specifically, those companies committed to their employees' voluntary work and take initiatives to reduce waste (Iatridis, 2013) achieve a powerful sustainable profile.

However, these variables are not significant for sustainability rankings (Models 9 and 10). This suggests a better alignment with responsible initiatives for green certificates than for sustainability rankings.

In summary, the largest Fintech companies with the best economic performance that are less indebted, have a CSR committee and publish a CSR report take actions to promote their employees' voluntary work and encourage waste reduction obtain more green certificates and, therefore, have a richer sustainable profile.

4.3. Results for SDG

Table 5 shows the results obtained for the third dimension, which analyses the sustainability profile of listed companies from their alignment with SDG. It is important to note that the models estimated with dependent variables SDG2, SDG14, SDG1, and SDG16 are not globally significant and are, therefore, not reported. It should be noted that the first two models refer to the amount of SDG that a company is aligned with (Table 5, models 11 and 12). Models 13 to 24 measure the probability of reporting about actions related to one particular SDG.

The results show a similar trend in significant relations. However, some interesting differences should be highlighted. Firstly, except for SDG17 (Model 24), *FinTech* is statistically relevant in all the regressions, as in CO_2 emissions (Models 3 to 6) and green certificates (Models 7 and 8). This indicates that Fintech companies align with more SDG and have, therefore, richer sustainable performance than Insurtech companies. This may suggest that the market encourages this type of listed companies to raise environmental awareness (Wahba, 2008; Mae Matsumura et al., 2014) because it penalises their poor quality information.

Size is also significant in all the models. Indeed it becomes the most decisive variable on the environmental performance of the listed Fintech and Insurtech companies for the three considered dimensions. Their expected direct relation is confirmed, and this is consistent with most previous research (Clarkson et al., 2008; Stanny and Ely, 2008; Wahba, 2008; García-Sánchez, 2008; Liu and Anbumozhi, 2009; Monteiro and Aibar-Guzmán, 2010; Andrikopoulos and Kriklani, 2013; Iatridis, 2013; Ortas et al., 2014; Liesen et al., 2015; Zorio-Grima et al., 2015; Alberici & Querci, 2016; Córdova et al., 2018).

As regards *ROA,* contrary to the current debate in the literature, it shows a statistically positive relation in all the estimates (Clarkson et al., 2008; Stanny and Ely, 2008; Tagesson et al., 2009; Liu and Anbumozhi, 2009; Bakar and Ameer, 2011; Silva-Gao, 2012; Iatridis, 2013; Ortas et al., 2014), except for six SDG, where it is not significant. Thus conversely to Friedman's agency theory (1970), the most profitable companies have more resources and use them in their sustainable performance, which is measured in this case by their alignment with SDG. This relation had already been observed in both CO_2 emissions (Model 2) and green certificates/sustainability rankings (Models 7 and 10).

LEV is also confirmed as a relevant variable. According to our expectations, a statistically negative relation is observed for the probability of following the 2030 Agenda (Model 12) and for the likelihood of aligning with SDG1, SDG4, SDG8 and SDG 17. Unlike the differences observed in both the literature and CO_2 emissions (Models 4 and 6), this result shows that indebtedness limits the resources allocated to environmental disclosure (Andrikopoulos and Kriklani, 2013; Córdova et al., 2018) and, therefore, reduces firms' sustainable performance to meet SDG.

Unlike the previous results, *AGE* seems a relevant variable when considering alignment with SDG. Its expected negative effect is distinguished in all the models. This corroborates how younger Fintech and Insurtech companies have a more sustainable profile than older companies. This relation confirms the impact of the environmental education revolution that universities worldwide are involved in has on new generations (El-Jardali et al., 2018). However, it should be noted that this negative relation is not statistically significant for six SDG: SDG3, SDG5, SDG8, SDG11, SDG12 and SDG17.

The corporate governance variables evidence a significant positive effect on the sustainable profile of Fintech and Insurtech companies. The companies with a CSR committee and issue an annual CSR report align significantly with the 2030 Agenda for Sustainable Development. Specifically, having a CSR committee is only significantly related to compliance with SDG7 and SDG17.

Annual reporting on CSR is statistically aligned with 12 of the contemplated 16 SDG. These relations confirm not only the expected effect of these variables, but also the results from the previous literature (Clarkson et al., 2008; Iatridis, 2013; Krishnamurtia and Velayuthamn, 2017; Córdova et al., 2018; Birindelli et al., 2019). It is important to note that, after size and Fintech, CSRrep is the variable that becomes significant in more models, which corroborates its determining effect on the sustainable performance of such listed companies.

BoardSize shows a statistically negative relation when focusing on alignment with the 2030 Agenda. As observed with CO_2 emissions (Models 1 to 3), but contrary to the literature (Tauringana and

Chithambo, 2015; Birindelli et al., 2019), larger boards evidence a poorer sustainability profile. However, this is only shown particularly in SDG17, and is statistically irrelevant in the other SDG.

EmployeeEVW is the most relevant corporate governance variable about SDG. It shows similar behaviour to *CSRrep*, but also establishes a statistical relation with SDG1 and SDG12. In all cases, its expected positive effect is confirmed, as previously observed in both CO_2 emissions (Model 3) and green certificates (Models 7 and 8), except for SDG3, which is not significant. This shows that the companies which engage in their employees' voluntary work achieve a more developed sustainable profile that is, in this case, measured by their alignment with SDG. The statistically positive relation between this variable and SDG8 is particularly interesting because its objectives include promoting decent work.

Finally, *WasteReduction,* alignment and CSRcom are the only non-significant variables aligned with SDG (Models 11 and 12). Their expected positive relation (Iatridis, 2013), observed in CO_2 emissions (Models 1 to 3) and green certificates (Models 7 and 8) is not manifested in any individually considered SDG.

Furthermore, it is worth noting the unexpected negative relation with SDG7, whereby the companies that take more initiatives to reduce waste take fewer actions to ensure access to affordable, reliable, sustainable and modern energy.

In summary, the younger and larger Fintech companies are, with better economic performance that prepare a CSR report and take actions to promote their employees' voluntary work are better aligned with the 2030 Agenda have, therefore, a richer sustainable profile. However, unlike that observed for green certificates, level of indebtedness, having a CSR committee and taking initiatives to reduce waste do not evidence a significant effect on fulfilling sustainable objectives.

4.4. Robustness

To treat outliers, we considered different approaches. Firstly, robustness tests were carried out by replicating all the models according to 1% winsorization for all the dependent and independent variables. The unreported results are consistent with those reported in Tables 3–5. Regressions retain their joint significance and maintain both the sign and importance of all the variables in all the estimated models, except in models 3, 8 and 24, where the *EmployeeEVW* variable is no longer significant. The same occurs with the *BoardSize* and *ROA* variables because they are no longer relevant in models 19 and 21, respectively.

The sample is an unbalanced panel. In particular, 2010 and 2011 are the years with the fewest observations. For this reason, we replicated the analysis after discarding both these years, which verified that all the models maintained their joint significance. They also retained the relevance and sign of all the variables studied, except *CSRrep* and *CSRcom* in Model 6, where they are not significant.

It should be noted that we left in the sample the observations of companies with years prior to their official foundation as a current organisation. Here the aim was to better observe each organisation's evolution because they came from acquisitions or mergers by other companies. For this reason, we replicated the analysis by ruling out these companies. The results (not reported) for all the models are consistent.

Finally, additional robustness tests were performed by considering alternative definitions for some independent variables: *SIZE*, measured as the natural logarithm of market capitalisation, *LEV*, measured as total liabilities divided by total equity, and total assets to total equity. The non-reported results of the 26 models maintain their joint significance and do not substantially vary in either the significance of the estimated coefficients or the sign of their estimated effects.

5. Conclusions

The constant change in the Fintech world, which implies the appearance of robot-advisor techniques and all the financial services created from the cryptocurrency boom, encouraged us to evaluate the profile of Fintech companies.

The companies of the Fintech sector, as a growing branch of the financial industry, play a crucial role in developing new business models and providing solutions for sustainable finances. They are critical agents in the development of the green economy. Furthermore, FinTech is a crucial financial inclusion driver for the foundation of sustainable growth. The potential growth linked to achieving the SDGs has been estimated at $12 trillion by 2030. This requires an effective and sustainable financial system. The issues the SDGs address are central to governments, regulators, investors, and consumers necessary for decent and secure business and collective development in the coming years. The current trend of governments and supranational organizations to promote, through subsidies and tax deductions, sustainable behaviors are answered by companies that can take advantage of these actions to turn them into competitive advantages. This would show a still permanent agency problem in most traditional companies.

However, more is needed to know about the sustainable profile of companies in the Fintech sector primarily responsible for achieving the SDGs and whether it can be said that the industry works towards reaching the SD Goals. Thus, the previous literature review allowed us to know which determinants have been most frequently associated with firms' responsible and sustainable behavior. This work measures the sustainability profile from three dimensions: CO2 emissions, green certifications and indices, and alignment with SDG.

The present work contributes to the scarce literature about the link between Fintech and Sustainability. To our best acknowledge, this is the first empirical study that analyzes Fintech & Insurtech compliance and its relationship to the SDGs, allowing us to measure the sustainability profile of the industry and compare the firms according to their willingness to report their sustainability actions. Thus, it bridges the gap in the literature about the need for assessments of SDG performance achieved by the Fintech industry. Hence, it measures the sustainability profile of companies of the emerging branch of the financial sector with a notorious impact in developing a sustainable economy.

This paper aims to determine how many Fintech companies have moved beyond simply offering kind words and support for the SDGs and embedded the Goals into the core strategy of their entire business. This study supports accountability in the Fintech industry by implementing actions towards SDG achievement visible.

In general, Fintech companies' size significantly and positively influences the sustainable profile they adopt, regardless of how we measure it. In addition, Fintech firms are more likely to behave responsibly and sustainably than Insurtech ones. The sign of economic profitability and indebtedness indicates that, with some exceptions, the behavior of the most profitable and least indebted Fintech companies is more sustainable. Despite companies' age not being significant when we associate it with green indices and certificates, it shows a negative relation, which indicates that as companies age, their sustainable behavior decreases, mainly manifested in alignment with SDG.

The companies in this sector with a CSR committee, particularly those that issue CSR reports, are positively associated with a sustainable profile. Particularly the latter, together with encouraging employees' volunteer work, are the most relevant corporate governance factors, mainly when the sustainability profile is measured by aligning with SDG. These results, aligned with socio-political theory, would show that companies respond to social demands and develop CSR departments taking stakeholder demands into account, but they do not seem to be based on the legitimacy of their decisions. On the other hand, the size of the board and actions taken to reduce waste are not relevant variables. Lastly, in addition to volunteering actions and initiatives, the impact of waste reduction is a factor that promotes responsible behavior and image in Fintech firms. These relationships could shed light on the sustainable behavior of Fintech companies, which would show a proactive and voluntary attitude to differentiate themselves from their competitors.

Our findings suggest that there remains plenty of work to be done if the financial sector is committed to meeting the goals and benefiting from them. Our study provides insights into a topic that has been under-researched so far: the sustainable profile of the Fintech industry.

The study has relevant implications for Fintech companies, especially those interested in obtaining a more sustainable profile; as our analyses reveal, having a CSR committee, promoting employees' voluntary work, and encouraging waste reduction leads Fintech companies to obtain more green certificates.

Moreover, CSR commitment can serve as a mechanism to enhance a firm's trustworthiness. This result can act as a stimulus to recognize CSR in governance, supervisory, and investment decisions. Also, managers must consider CSR reporting as a strategy for building and maintaining good relationships with shareholders and potential investors.

Furthermore, our results can be used in the decision-making process of investors, policymakers, competitors, and other stakeholders concerned about sustainability in the financial sector. Hence, these actors could support throughout their decisions the progress of a more sustainable profile within the financial sector and specifically in the Fintech & Insurtech industry if they wish to stimulate not only economic but also environmental & social goals such as women's empowerment or employees' well-being.

This study allows managers to assess and compare their organizations to the benchmark and better understand existing differences. In addition, our results also have implications for the Fintech firm's managerial decision concerning embedding the SDG into operations across their business to shape their business strategy.

From the point of view of investors, the study is relevant since our findings show that the most profitable companies use their additional resources to build a more sustainable profile which can be measured by their position in the sustainability ranking and green certificates.

The companies must understand that reporting information throughout the CRS report is crucial for a better image and understanding of their strategy for achieving SDGs.

One of this study's significant limitations is the reduced access to firms' sustainability information. Despite the importance of SDSs, Agenda 2030 was addressed as an action plan since September 2015, and many sample companies did not report their SDG actions in their CSR or did not perform SDG actions. Another study limitation is the short period that the SDG information has covered, only the three years 2016–2019. In line with this, extending the sample for future research would be advisable. Hence, the benefits that derive from applying these new technologies, together with increasing resources through green government policies, will enable more Fintech and Insurtech to appear in forthcoming years and will make it possible, which is particularly interesting for the number of observations linked with the variables of corporate governance and alignment with SDG.

Also, for future research, it will be interesting to analyse the performance of those firms that include specific qualitative ambitions linked to the SDGs and study their quantitative KPIs for each SDG and how those are related to its societal impact. This would allow us to continue studying the sustainable profile of Fintech companies as a behavioral model that leads the financial sector and is followed by more traditional entities. Finally, measuring the impact of green certificates and sustainability rankings on the firm performance and, precisely, the difference pattern behavior to external market shocks among diverse, sustainable profiles will be interesting. In this way, how investors react to such information in their decision-making process.

CRediT authorship contribution statement

Paloma Merello: Conceptualization, Methodology, Software, Validation, Funding acquisition. **Antonio Barbera:** Formal analysis, Investigation, Software, Writing – original draft, Visualization. **Elena De la Poza:** Conceptualization, Methodology, Supervision, Writing – review & editing, Funding acquisition, Resources.

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.

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