CSR performance and CSR disclosure persistency: Empirical evidence of the US hypercompetitive industry

Desempeño de la RSC y persistencia de la divulgación de la RSC: evidencia empírica de la industria hipercompetitiva de EE. UU.

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Abstract

The relationship between Corporate Social Responsibility (CSR) performance and CSR disclosure persistency should be necessarily examined to attract the attention of scholars amid empirical evidence. Therefore, this study aims to offer a novelty concerning the relationship between CSR performance and CSR disclosure persistency. The results obtained from the data of 83 companies (498 firm-year observations) operating in the American (US) hypercompetitive industry (i.e., software and hardware) from 2011 to 2016 showed that CSR performance is positively associated with CSR disclosure persistency. Furthermore, the differences between the industry membership (i.e., software vs. hardware industry) and the persistence of CSR disclosure were tested. The samples classified in the hardware industry were reported to face more environmental and social pressure, suggesting more propensity of engaging with persistent CSR disclosure over time than their peers in the software industry.

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Resumen

Nuestro estudio examina la relación entre el desempeño de la Responsabilidad Social Corporativa (RSC) y la persistencia de la divulgación de la RSC. La investigación acerca de cómo el desempeño de la RSC y la divulgación de la RSC están vinculados entre sí ha llamado la atención de los académicos contables, pero dicho estudio no ha mostrado evidencia empírica sobre cómo el desempeño de la RSC está relacionado con la persistencia de la divulgación de la RSC. De este modo, nuestro estudio ofrece una novedad acerca de la específica relación entre el desempeño de la RSC y la persistencia de la divulgación de la RSC. Empleando datos de 83 empresas (498 observaciones empresa-año) que operaban en la industria hipercompetitiva estadounidense (es decir, software y hardware) entre 2011 y 2016, descubrimos que el desempeño de la RSC está relacionado positivamente con la persistencia de la divulgación de la RSC. Además, analizamos si la membresía de la industria (es decir, bien de la industria del software o bien de la industria del hardware) comporta alguna diferencia con respecto a la persistencia de la divulgación de la RSC. Documentamos que las muestras clasificadas en la industria del hardware se enfrentan a una mayor presión medioambiental y social, lo que sugiere una mayor propensión a comprometerse con una divulgación persistente de la RSC a lo largo del tiempo en comparación con sus pares en la industria del software.

Introduction

Financial information can affect the decision to engage in Corporate Social Responsibility (CSR) reporting. Previous studies well documented and addressed this link, which has received little attention in the literature on the persistence disclosure of CSR information. Therefore, this study aims to fill in the gap by determining the role of CSR performance and hypercompetitive industry membership in driving the public's persistent disclosure of CSR information.

The study was motivated in two ways. First, CSR disclosure is a distinctive action of choice-based decision (Lennox, Francis, & Wang, 2012) of thorough cost and benefit analysis (Cormier & Magnan, 2015). Awareness should be made concerning the consequence of engaging with nonfinancial information disclosure through CSR report (Ashbaugh, Johnstone, & Warfield, 1999; Cormier & Magnan, 2015). However, since many studies investigated the determinant factors and motivation of companies, there is scant empirical evidence concerning what determines and motivates firms to engage with

persistent CSR disclosure. The extant literature investigated the voluntary disclosure of CSR information (Stanny, 2013), the determinants of nonfinancial information (Hackston & Milne, 1996; Braam, Weerd, Hauck, & Huijbregts, 2016), the motivation of disclosing CSR information as the tool of legitimacy (Cho & Patten, 2007; Faisal, Tower, & Rusmin, 2012; Bhattacharyya, 2015; Bowrey & Clements, 2019), as well as the value relevance of CSR reporting, i.e., environmental (Moneva & Cuellar, 2009). However, little consideration has been given to the issue in the previous stream of non-financial information disclosure. In this situation, the CSR persistency is mainly related to the practice since the companies that have dealt with the report decide to engage with the same activity in consecutive years.

Second, the disclosure of non-financial information can help companies to have better access to finance (Cheng, Ioannou, dan Serafeim, 2014) to lower the cost of capital (Dhaliwal, Li, Tsang, & Yang, 2011; Dhaliwal, Li, Tsang, & Yang, 2014), and increase analyst forecast accuracy (Simpson, 2010; Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012; Muslu et al., 2019). Therefore, the companies' benefits through their non-financial information disclosure may also motivate them to persistently engage with the disclosure in the following reporting year. The link between the potential role of CSR performance and the probability of companies engaging with CSR reporting to the prior year was also conducted. Besides, the companies operating in the hypercompetitive industry were investigated. The hypercompetitve industry is as an interesting setting of study given the rapid and dynamic competition among the players (Bogner & Barr, 2000; Wiggins & Ruefli, 2005). The software and hardware (semi-conductor) industries are the subsectors of the hypercompetitive industry (Lee, Venkatraman, Tanriverdi, & Iyer, 2010), which experience a quick escalation of competition based on the price-quality positioning and impact on the sustainability of economics, environmental, social or governance issues (USITC, 2018).

The association between selected companies incorporated in the US capital market's hypercompetitive industry (software and hardware) was investigated using the data collected from 83 companies. These two industries provide an ideal setting since the industry is rapidly growing and, to some extent, related to the massive utilization of environmental and social human resources, which increases the essence of persistent CSR disclosure to the public. Given the scant literature on the study of CSR disclosure persistency, it was also argued that the past impact due to environmental and social issues are relevant to strengthen the use of hypercompetitive industry. For instance, the report of agency news "The Guardian" on the "world's top firms that caused $2.2tn of environmental damage" documented that the impact of environmental damage by the companies operating in the high-tech industry was around 20.3 billion USD (Jowit, 2010). Moreover, a recent labor strike involving the Giant tech company Google has emerged as an iceberg phenomenon regarding social concern. As quoted from "The New York Times," workers were protesting the company's handling of sexual harassment. This action caused the tech giant to pay millions of dollars in exit packages to male executives accused of harassment (Wakabayashi,

Griffith, Tsang, & Conger, 2018). Given the example of two environmental and social issues, a notion was established that the problematic companies may deal with persistence CSR disclosure and consider the previous impact of the performance (i.e., environmental, social, and governance) as the tool to regain or fix organizational legitimacy. Therefore, CSR performance and industry membership should determine persistent CSR disclosure among companies in the hypercompetitive industry.

The main contribution is the literature development, which provides the link and first empirical evidence on the relationship between CSR performance and CSR disclosure persistency in the hypercompetitive industry. In particular, the study was proposed on the persistency of CSR performance-CSR disclosure and hypercompetitive industry membership-CSR disclosure. The obtained empirical investigation provides evidence in support of a positive association between CSR performance (CSRPerf) and CSR disclosure persistency (CSR_Pers). Furthermore, the evidence that industry membership (IND) in the hypercompetitive industry (1 when the companies belong to the semiconductor or hardware industry, 0 when the companies belong to the software industry) is positively associated with CSR disclosure persistency (CSR_Pers) concerning the nature of the US publicly listed companies operating in the stock exchanges.

The other part of this study is structured as follows. Section two reviews the relevant existing literature to generate the proposed hypotheses, while section three highlights the data, sample, and the method applied. Section four discusses the obtained results, and section five concludes the overall study.

Literature review and hypothesis development

Theoretical arguments

From the literature, CSR studies showed different paradigms which are divided into impression management (i.e., non-value-relevance) and incremental information school (value-relevance) (Merkl-Davies & Brennan, 2007; Usman, 2020b). In the non-value-relevance stream, Merkl-Davies & Brennan (2007) mentioned that managerial discretionary disclosure choice through CSR publication or sustainability report is deemed opportunistic, leading to impression management attempts. In contrast, the value-relevance stream argues that the study in this school of thought presumes CSR information to provide important and incremental information to improve investors' decisions (Miralles-Quiros, Miralles-Quiros, & Arraiano, 2017). Therefore, the plausible theoretical underpinnings to better understand the two competing positions were discussed. In particular, the CSR performance and CSR disclosure persistency nexus in the hypercompetitive industry were seen from the perspective of incremental information or value-relevance lens.

The study on CSR[2] disclosure is recently growing and attracts the significant attention of many academics and practitioners. Given the spread variation of attention, it is not surprising that several theories of CSR disclosure have arisen (Patten, 2002). For instance, the legitimacy (Suchman, 1995) and stakeholder theory (Freeman & McVea, 1984) have primarily adopted as the underlying argument of firms' motivation to engage with CSR disclosure practice and its relationship with CSR performance. These two theories are overlapped and interchangeably used (Patten, 2002; Michelon, Pilonato, Ricceri, & Roberts, 2016). They suggest that environmental, social, and governance CSR disclosure is the function of social and or political pressure.

In a study conducted by Suchman (1995), legitimacy was obtained through a generalized perception or assumption that the action of an entity is desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions. In this situation, nonfinancial reporting can be considered the legitimization tool to manage stakeholder perceptions of companies' impact (Faisal et al., 2012). Meanwhile, as indicated by Freeman & McVea (1984), stakeholder theory affirms the premise of legitimacy theory. This theory focuses on viewing the interconnection relationship between a business and its counterparties (i.e., customers, suppliers, employees, communities, investors, and so forth). Therefore, stakeholder theory is concerned with the companies' ability to create value for shareholders (Freeman & McVea, 1984; Friedman & Miles, 2002; Brammer & Pavelin, 2008). Given the interconnection between legitimacy and stakeholder theory, the following subsections exhibit the relationships among the primary variables of interest, which adopt the legitimacy and stakeholder theory as the fundamental base of the hypotheses' development.

Linking CSR performance and CSR disclosure persistency

Hypothesis one presumes that CSR performance score is positively associated with the persistence of CSR disclosure. As we adopt legitimacy theory, this theory points out society's generalized perception set of values or assumptions. The values are perceived as desirable and proper within the socially constructed norms (Suchman, 1995). Therefore, it was argued that the higher CSR performance is more likely to lead to a higher CSR disclosure persistency. In this situation, several empirical studies showed the persistence of nonfinancial information disclosure and its relation with analyst forecast accuracy (Simpson, 2010; Dhaliwal et al., 2012; Baumeister & Gutsche, 2017; Muslu et al., 2019). However, no previous study

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[2] Referring to the study of Bagnoli & Watts (2017) and Usman, (2020), we use the terminology of CSR report or CSR disclosure to generalize the various types of either stand-alone (ESG report, sustainability report, environmental report, social responsibility report, citizenship report, and so forth) or the combined CSR information in the annual report (annual report, integrated report, registrant report).

explicitly identified the relationship between CSR performance and disclosure persistency. The CSR performance appears to represent the companies' impact on its environmental, social, and governance-related activities. This shows that the positive or relatively higher CSR performance indicates a better performance as valued by the third-independent sustainability (CSR) ranking institutions (CSR rater companies and awards institutions, e.g., the ASSET4, Bloomberg, KLD, etc.). Bloomberg, Thomson Reuters ASSET4, and KLD analyzed the present information available to the public through the mechanism of voluntary disclosure. This means nonfinancial information becomes essential in determining and calculating the companies' potential for CSR-related impact (Benlemlih, Shaukat, Qiu, & Trojanowski, 2016; Usman & Yennita, 2018).

Particular study by Fekrat, Inclan, & Petroni (1996) highlighted the relationship between environmental performance as one of the surrogate indicators of CSR performance, and environmental disclosure as the indicator of CSR disclosure. However, there was no clear positive or negative significant relationship between the performance and disclosure. The study of Al-Tuwaijri, Christensen, & Hughes (2004) investigated the interrelation among environmental disclosure, environmental performance, and economic performance. The sample was obtained from 198 cross-sectional data of companies incorporated in the S&P 500 index, and the result reported that environmental disclosure is positively associated with performance.

Moreover, most CSR initiatives can be traced back to several legitimation strategies concerning the previous empirical evidence. For example, study of Lindblom (1994) identified four types of legitimation strategies potentially used by an organization to deal with different legitimation threats. First, inform the stakeholders concerning the intended improvement in performance. Second, seeking to change the stakeholders' perception of the event. Third, distracting attention away from the issue, and fourth, hanging external expectations about the performance. According to the legitimacy stream, companies engaging with voluntary disclosure (i.e., sustainability reporting and CSR reporting) is mainly driven due to the justification of tackling the legitimacy threats (Usman, Bernardes, & Kananlua, 2020). However, there is an inconclusive result of whether the voluntary disclosure can be adequate and substantive as a legitimacy tool. Some other empirical studies believed that CSR reporting can be ridden by impression management motives (Hooghiemstra, 2000; Cho, Michelon, & Patten, 2012; Craig & Brennan, 2012) and obfuscation (Rutherford, 2003). Voluntary disclosure (e.g., CSR report) can be deliberately used as the reputation risk management venue (Bebbington, Larrinaga, & Moneva, 2008; Usman, 2020b) and camouflaging tool without considering the substantial role of CSR engagement (Rodrigue, Magnan, & Cho, 2013; Michelon et al., 2016). These motives are generally driven by the companies' intention to manage the report users' perception that the companies have been dealing with proper CSR engagement to result in a higher CSR impact (performance). Bagnoli & Watts (2017) noted that the disclosure of CSR

reports will have value when (at least) some of the targeted audiences of the report can use the information to infer the actual level and firm's engagement of the CSR activities.

Hypothesis 1: The propensity of companies' engagement with persistent CSR disclosure is higher as the CSR performance increases.

Linking hypercompetitive industries and CSR disclosure persistency

The term hyper-competition was firstly introduced by Schumpeter (1976) in his work on innovation and change in the twentieth century. The focus was primarily on the dynamics of the private sector, in which the starting point of the idea was that "the new" consumers goods, markets, method of production, transportation, and new forms of industrial organization were the fundamental catalysts that set and kept the capitalist engine works. Historically, the concept of Schumpeterian in respect to traditional theories of strategic management adopts the theory of disequilibrium as the base framework (Wiggins & Ruefli, 2005). In other words, disequilibrium corresponds to creative destruction, where every company is threatened by rapid competition (Lee et al., 2010). As the companies incorporated in the software and hardware industries are encountering the similar circumstance of harsh competition and innovation race, it was conjectured that these two subindustries reflect the actual nature of the hypercompetitive industry.

Study by Amir & Lev (1996) examined the value relevance of financial and non-financial information for the investors in the semiconductor industry (cellular companies). They found that financial information such as earnings, book values, and cash flows are mostly irrelevant for the security valuation. Meanwhile, nonfinancial information such as growth proxy and market penetration are highly value-relevant. Simpson, (2010) further extended the setting of this study using the semiconductor industry. The financial analysts' response to the persistent practice of nonfinancial information disclosure in the wireless industry was explicitly investigated in the observed period from 1997 to 2007.

Furthermore, the association between analysts' forecast properties was examined with customer acquisition cost, average revenue per user, churn rate, minutes of use per subscribers, market share, and subscribers base. The results showed that analysts are more likely to underreact to customer acquisition cost, average revenue per user, and subscriber base. Therefore, Simpson (2010) provided evidence on the usefulness of persistent nonfinancial metrics information disclosure instead of the drivers of non-financial information disclosure.

In hypothesis two, the membership in one of the subsections of the hypercompetitive industry (i.e., hardware) was positively associated with the persistence of CSR disclosure. Since the two sectors (i.e., software and hardware) generate distinctive challenges allowing managers to act within a competitive environment, the central argument lies on the distinctive types of industry membership (software vs.

hardware) in the hypercompetitive environment directly tied to the demand for voluntary disclosure information (Bogner & Barr, 2000). Therefore, the companies operating in the environmentally and socially sensitive industries (ESSIs) and environmentally sensitive industries (ESIs) have more propensity to disclose nonfinancial information than their peers in Non-ESSIs and ESIs industries (Cho & Patten, 2007; Kolk, 2010). Those companies incorporating either ESIs or ESSIs face more significant social and environmental exposure. In this situation, the study question aims to investigate whether the companies operating in the hypercompetitive industry may face similar propensity. However, the context was narrowed by assuming that companies in the hardware or semiconductor industry may face greater environmental and social exposure than those peers operating in the software industry. Therefore, they need to anticipate the precautionary approach to environmental and social challenges to play a role in undertaking the environmental and socially responsible activities concerning the diffusion of technology adoption. Considering the discussion above, hypothesis 2 was developed to study whether industry membership in the hypercompetitive industry plays an essential role in driving the decision of persistent CSR-related information disclosure.

Hypothesis 2: The propensity of companies' engagement with persistent CSR disclosure is higher when the companies belong to the hardware industry.

Research method

Data and sample

The data on the availability of CSR reports, CSR performance score for each sample, and financial-related information was extracted from the Corporate Register, ASSET4, and Thomson Reuters EIKON databases. The American publicly listed companies (PLCs) in the hypercompetitive industry are considered the sample due to the nature of the hi-tech industry that is currently growing significantly (Lee et al., 2010). Furthermore, the hypercompetitive industry (population) was chosen considering the rapid and dynamic competition among the players in this industry. According to the reported data by the United States International Trade Commission (USITC, 2018), the companies in the information and technology (IT) industry aggregately provided global spending on IT computer and data processing service (software-hardware deployment and support), which was estimated up to $935 billion in 2018. Therefore, the software and computer services with technology hardware and equipment (semi-conductor) industries experience a rapid escalation of competition following the price-quality positioning and their impact (Bogner & Barr, 2000; Lee et al., 2010). In total, 83 companies were extracted, where 39 belonged to the software industry, and the remaining 44 belonged to the hardware industry (please refer to the appendix

Table A1 for further subindustry classification). Table 1 presents the stages taken in the sample selection procedure.

Table 1
Sample selection criteria

No	Criteria	N (n)	Firm-year obs	%
1	Companies operating in the software & computer service and Technology hardware & equipment industry (Total population; N).	1,111	6,666	100.00
2	Companies without CSR performance pillar scores data from the ASSET4 database.	(872)	(5,232)	(78.49)
3	Companies with incomplete CSR reports from 2011 to 2016 in the ASSET4 database. (We only take companies with at least three times (years) CSR publications during the period of observations).	(156)	(936)	(14.04)
4	Companies with complete observations (Total sample; n).	83	498	7.47

Notes: The final sample is calculated by deducting the population (1,111 x 6 years = 6,666 firm-year observations) with the companies without CSR performance pillar scores data (872 x 6 years = 5,232 firm-year) and companies with incomplete CSR reports (156 x 6 year = 936 firm-year). Finally, 83 companies were obtained, with the total number of firm-year observations standing for 498.

Variable definition

Additional information concerning variable definition, data forms, and their data source were provided to deal with the number of variables used in the analysis.

Table 2
Variables definition

No	Variable	Definition	Data form	Data source
Main variable				
1	CSR	The presence of Corporate Social Responsibility report	Binary	Corporate Register
2	CSR_Pers	The persistency of CSR disclosure over time	Binary	
3	CSRPerf	The mean score of environmental, social, and governance performance.	Continuous	ASSET4
4	IND	Industry group	Binary	EIKON
5	LEV	Leverage (total debt-to-total equity ratio)	Continuous	EIKON
6	SIZE	Logarithm natural of total asset	Continuous	EIKON
7	MBV	Market-to-book value	Continuous	EIKON
8	PV	Stock price volatility	Continuous	EIKON
9	AGE	Firms age	Continuous	EIKON
Additional variable used in the robustness test				
10	ENVPerf	Environmental pillar score performance	Continuous	ASSET4
11	SOCPerf	Social pillar score performance	Continuous	ASSET4
12	GOVPerf	Governance pillar score performance	Continuous	ASSET4

Source: Own compilations from prior studies.

As illustrated in Table 2, the variables are extracted from the Corporate Register, ASSET4, and Thomson Reuters EIKON databases. Previous seminal study as the most comprehensive provider of global CSR reports considers the Corporate Register (https://www.corporateregister.com/) (Simnett & Nugent, 2007). In addition, ASSET4 provides the data relating to nonfinancial information and sustainability (CSR) ranking, while Thomson Reuters EIKON offers thorough financial data information.

Regression model

A logit equation model was used to test the proposed hypotheses as follows empirically.

$$CSR\_Pers_{i,t} = \alpha + \beta1CSRPerf_{i,t} + \beta2IND_{i,t} + +\beta3LEV_{i,t} + \beta4SIZE_{i,t} + \beta5MBV_{i,t} + \beta6PV_{i,t}$$

$$+ \beta7AGE_{i,t} + \sum Year_{i,t} + \varepsilon_{i,t}$$

Logit regression was performed as the primary dependent variable that utilizes binary data (0,1). Moreover, Baltagi (2008) and Usman (2020a) highlighted that the logit model accommodates a potential empirical association test for the dependent variable scaled using binomial data. Therefore, the model was used to carry out the predictive analysis to describe the data and explain the relationship between the dependent binary variable (CSR_Pers) and one or more data ratio (CSRPerf), binary (IND), continuous (LEV, SIZE, MBV, PV, and AGE). Additionally, the use of the logit model is also due to the hypotheses, which examine the probability of companies dealing with persistent CSR disclosure (yes versus no) over the years.

Dependent variable

CSR persistency (CSR_Pers) is the dependent variable employed to operationalize the idea of non-financial information disclosure. This variable is measured using categorical data. For example, it was 1 when the company disclosed its CSR information in the previous year through an annual report or a stand-alone CSR report. Therefore, the companies consistently disclose their nonfinancial information in the consecutive year, and 0 when otherwise.

Independent variables

Two different independent variables were used to test the proposed hypothesis. The first is CSR performance (CSRPerf), and the second is industry membership (IND). CSRPerf denotes the average score of companies' environmental, social, and governance pillar scores extracted from the ASSET4

database. This variable takes a value from 0 (less positive impact) to 100 (high positive impact), and the second primary independent variable is IND. It is a categorical variable in which companies that belong to the hardware industry are marked 1 and 0 otherwise. In this situation, the companies operating in the hardware or semi-conductor industry are more likely to be more persistent in disclosing their nonfinancial information to the public than their peers in the software industry.

Control variables

To better deal with the endogeneity issue, this study also consider the importance of having control variables in the study model. Therefore, several firm-specific variables extracted from the accounting information of related companies were used. The first control variable is LEV (Leverage), the second is SIZE (companies' size), the third is MBV (market-to-book-value), the fourth is PV (price volatility), and the last is AGE (companies' age). The decision to employ control variables from the firms'-specific information (financial-related information) minimizes the impact of the potential endogeneity problem (i.e., omitted correlated variable bias). In addition, previous empirical studies reported that firm-characteristics information is a significant determinant when the companies deal with the decision to engage with sustainability or CSR reporting (Cormier, Magnan, & Van Velthoven, 2005; Usman, 2020a)

Results and discussion

The analysis was started by presenting the descriptive statistics to provide an initial assessment of the hypothesis as illustrated in Table 3.

Table 3
Descriptive statistics

Variable	Obs	Mean	Sd	p25th	p50th	p75th	Min	Max
CSR	498	0.450	0.49	0	0	1	0	1
CSR_Pers	498	0.341	0.47	0	0	1	0	1
CSRPerf	498	58.974	18.30	45.23	59.72	73.92	13.24	95.31
IND	498	0.530	0.49	0	1	1	0	1
LEV	498	33.151	287.86	6.14	33.50	81.87	-2122.17	1189.3
SIZE	498	15.751	1.31	14.83	15.52	16.36	12.87	19.26
ROE	498	18.589	40.15	5.79	13.87	21.03	-82.51	320.02
MBV	498	3.125	7.59	1.99	2.96	4.64	-53.91	25.62
PV	498	28.301	8.12	22.34	26.75	33.81	15.03	50.26
AGE	498	34.066	29.17	18	28	37	0	165

Note: The continuous variables (LEV, SIZE, ROE, MBV, and PV) have been winsorized.
Source: Own calculations using the data from the Thomson Reuter EIKON database.

Table 3 presents the descriptive analysis corresponding to the primary, independent, and control variables. The binary variables (CSR, CSR_Pers, IND) are interpreted as percentage values for the sake of easiness. The information concerning the presence of a CSR report is required to generate the dependent variable (CSR_Pers). As highlighted in Table 3, 45 percent (0.450) of the total sample reported their non-financial information as a stand-alone CSR report or a dedicated section in the annual report. In further investigation of the persistence of CSR report, 34.1 percent (0.341) of the total sample persistently delivered their CSR report to the public.

The main independent variables of this study are CSRPerf and IND. CSRPerf reflects the CSR impact assessed by the third-independent CSR rating institution (ASSET4). Table 3 showed that the value of CSRPerf stands for 58.97 percent on average. In terms of classification, there are two different industries in the hypercompetitive industry. The sample was then distinguished when it belonged to the hardware and software industries. In this situation, 1 was marked for hardware industry companies, and 0 for software industry companies. According to Table 3, IND shows that 53 percent of the total sample belongs to the hardware industry, and the remaining 47 percent falls under the software industry. In addition to this, the descriptive information concerning the control variables (LEV, SIZE, ROE, MBV, PV, and AGE) can be observed in the remaining set of variables.

Table 4 provides the information on the correlation analysis, and the main dependent variable is CSR_Pers. A moderately positive ($r= 0.566$) and significant ($p < 0.01$) correlation was observed between CSR_Perf and CSRPers. However, the obtained correlation matrix shows a positive ($r= 0.058$) but insignificant ($p > 0.05$) association between CSR_Pers and IND. The correlation analysis can be deeply seen for the control and the dependent variable. The leverage (LEV) shows a positive ($r= 0.090$) and statistically significant ($p < 0.1$) correlation with CSR_Pers. SIZE and ROE also indicate positive correlation and significant correlation ($r= 0.375$; $p< 0.01$ since $r= 0.098$; $p< 0.1$) with CSR_Pers. The following control variable is MBV and it shows positive ($r= 0.079$) but insignificant ($p < 0.05$) correlation with CSR_Pers. PV on the contrary report negative ($r= -0.150$) and significant ($p < 0.01$) correlation with CSR_Pers. The last control variable is AGE which reports a negative ($r= -0.033$) but statistically insignificant ($p > 0.05$) correlation with CSR_Pers.

Table 4
Correlation analysis

Variable	CSR_Pers	CSRPerf	IND	LEV	SIZE	ROE	MBV	PV	AGE
CSR_Pers	1								
CSRPerf	0.566***	1							
IND	0.058	0.004	1						
LEV	0.090*	0.05	-0.002	1					
SIZE	0.375***	0.543***	-0.041	0.07	1				
ROE	0.098*	0.039	-0.007	-0.044	0.092*	1			
MBV	0.079	0.078	-0.093*	0.806***	0.051	-0.099*	1		
PV	-0.150***	-0.316***	0.217***	-0.051	-0.341***	-0.238***	-0.054	1	
AGE	-0.033	0.079	0.297***	0.106*	0.081	0.124**	0.005	-0.212***	1

Note: *** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using the data from the Thomson Reuter EIKON database.

The primary analysis, which is meant to test the proposed hypotheses, was also analyzed. Then, to empirically test the hypotheses, a logit regression model was performed, in which binary variable (CSR_Pers) was used as the dependent variable. It conjecture that CSR_Pers is the function of CSR performance (CSRPerf), industry membership (IND), and a set of firm-specific variables as the surrogate indicator of financial information data that used for controlling the relationship between the primary variable of interest.

Main analysis

The main analysis is conducted by employing logit panel data, as shown in Table 5.

Table 5
Main analysis

VARIABLE	Predicted Sign	(1) CSR_Pers	(2) CSR_Pers	(3) Augmented Model
CSRPerf	+	0.127***		0.130***
		(9.395)		(9.304)
IND	+		0.626**	0.756**
			(2.391)	(2.382)
LEV	?	0.001	0.0001	0.001
		(0.844)	(0.151)	(0.825)
SIZE	?	0.298**	0.762***	0.324**
		(1.978)	(7.531)	(2.154)
ROE	?	0.012***	0.005*	0.012***
		(2.930)	(1.797)	(3.299)
MBV	?	-0.017	0.020	-0.013
		(-0.392)	(0.731)	(-0.317)
PV	?	0.070***	0.004	0.058***
		(3.383)	(0.213)	(2.601)
AGE	?	-0.013***	-0.011***	-0.019***
		(-3.099)	(-3.162)	(-3.943)
Constant		-20.44***	-17.12***	-21.10***
		(-6.912)	(-7.599)	(-6.943)
Observations		498	498	498
Year FE		YES	YES	YES
Firm FE		YES	YES	YES
Pseudo R^2		0.4828	0.2465	0.4922

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using the data from the Thomson Reuter EIKON database.

Table 5 displays the results of our main analysis. Using this table's information, hypothesis one and two were empirically tested. In testing hypothesis one, it was conjectured that the propensity of companies' engagement with persistent CSR disclosure (CSR_Pers) is more significant as the CSR performance (CSRPerf) gets higher. The result shows that CSRPerf is positively (β= 0.127) and significantly (p < 0.01) associated with CSR_Pers, which provides support for hypothesis one. Moreover, hypothesis two was tested, which assumes that the engagement with persistent CSR disclosure is higher when the companies belong to the semiconductor (hardware) industry. The obtained empirical output indicates that IND is positively (β= 0.626) and significantly (p < 0.05) associated with CSR_Pers. The test was also conducted using the augmented model by adding the main independent (CSRPerf and IND) and control variables in the same model. The result (see column 3) reports a pretty consistent output compared with the partial hypothesis testing in columns 1and 2. After being controlled by inserting control

variables, a sensitivity analysis was investigated to confirm the changes in the coefficient magnitude and Pseudo R^2 of the main independent variables.

Table 6
Sensitivity analysis using stepwise regression

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CSRPerf	0.117***	0.120***	0.120***	0.112***	0.115***	0.116***	0.125***	0.130***
	(10.86)	(10.84)	(10.64)	(8.904)	(8.507)	(8.614)	(9.088)	(9.304)
IND		0.565**	0.536*	0.571**	0.560**	0.552**	0.379	0.756**
		(2.071)	(1.949)	(2.064)	(2.027)	(2.029)	(1.326)	(2.382)
LEV			0.0008	0.0007	0.0005	0.0006	0.0005	0.0009
			(1.209)	(1.148)	(1.400)	(0.738)	(0.618)	(0.825)
SIZE				0.232*	0.214	0.214	0.294**	0.324**
				(1.719)	(1.530)	(1.533)	(2.081)	(2.154)
ROE					0.007***	0.007***	0.0107***	0.012***
					(3.073)	(2.829)	(3.642)	(3.299)
MBV						-0.006	-0.001	-0.013
						(-0.182)	(-0.026)	(-0.317)
PV							0.071***	0.058***
							(3.318)	(2.601)
AGE								-0.019***
								(-3.943)
Constant	-12.83***	-13.41***	-13.48***	-16.73***	-16.90***	-16.87***	-21.03***	-21.10***
	(-8.056)	(-7.807)	(-7.784)	(-6.415)	(-6.304)	(-6.340)	(-7.302)	(-6.943)
Observations	498	498	498	498	498	498	498	498
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R^2	0.4300	0.4370	0.4411	0.4466	0.4559	0.4560	0.4746	0.4922

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using the data from the Thomson Reuter EIKON database.

Table 6 presents the information concerning the sensitivity analysis. This test is performed by considering the stepwise regression technique. The Ordinary Least Square (OLS) regression was gradually tested with a fixed-effect model by starting it with simple regression and inserting a set of control variables into the model. The first main independent variable (CSRPerf) indicates a positive and significant association with CSR_Pers. The coefficient magnitude gradually increases, and the value's robustness is also depicted by the consistent effective results (p < 0.01). Therefore, hypothesis one is consistently supported even after being controlled by various control variables. The second main independent variable is IND, and the same procedure was followed as the test of hypothesis one. The obtained empirical output shows that the association between IND and CSR_Pers consistently remains positive and significant. This

293eig only appears when several control variables are gradually inserted, i.e., LEV, SIZE, ROE, and MBV. However, there was no significant association when PV was inserted (see 293eighte 7).

Interestingly, the significance of IND reappears when all control variables in the same model are inserted (see 293eighte 8). The sensitivity analysis results in Table 6 reaffirm that hypotheses one and two are statistically supported. Furthermore, the obtained empirical result using CSR_Pers is consistent when changed with the different dependent variable (i.e., the presence of CSR report). Since CSR report is binary while using CSR_Pers as the dependent variables, a logit regression analysis in an untabulated Table was performed to predict the probability of companies dealing with CSR disclosure as the function of CSR performance (CSRPerf), industry membership (Hardware), and several control variables. The obtained result using CSR report availability as the dependent variable agreed reasonably well, in which a positive relationship was found between CSRperf and CSR report.

Robustness test

The sensitivity analysis and the robustness test were considered by breaking down the variable of CSRPerf into several single measures of CSR performance scores to gain a more robust output. This information was provided in three primary scores, namely ENVPerf, SOCPerf, and GOVPerf. ASSET4 database assigned environmental, social, and governance disclosure scores to companies according to the data collected from various publicly available resources such as stand-alone sustainability reports, CSR section in the 293eigh reports, internet press releases, media coverage, and news. The environmental, social, and governance-related information is used to calculate the ENVPerf, SOCPerf, and GOVPerf performance pillar scores, 293eighted and scaled from 0 to 100 as the highest pillar scores. ASSET4 also considered the importance of industry-relevant score calculation, which captures the standardized cross-sector and industry-specific metrics. Technically, the scales pillar information is expressed as a percentage unit from 0 to 100 percent (Benlemlih et al., 2016). A thorough analysis of using independent environmental (ENVPerf), social (SOCPerf), and governance (GOVPerf) performance scores are available in Table 7.

Table 7
Robustness test using the alternate measure of CSR performance as the independent variables

VARIABLE	(1) CSR_Pers	(2) CSR_Pers	(3) CSR_Pers	(4) Augmented model
ENVPerf	0.077***			0.050***
	(8.191)			(6.494)
SOCPerf		0.066***		0.019*
		(7.808)		(1.867)
GOVPerf			0.111***	0.054**
			(4.913)	(2.364)
LEV	0.0006	0.0001	2.07e-06	0.0005
	(0.780)	(0.199)	(0.00324)	(0.565)
SIZE	0.411***	0.698***	0.734***	0.468***
	(2.763)	(6.016)	(5.384)	(3.122)
ROE	0.013***	0.010***	0.00546*	0.012***
	(4.453)	(3.729)	(1.928)	(4.420)
MBV	-0.009	0.012	0.0255	-0.006
	(-0.254)	(0.410)	(0.969)	(-0.151)
PV	0.049**	0.079***	0.0388**	0.073***
	(2.353)	(3.603)	(2.063)	(2.972)
AGE	-0.016***	-0.018***	-0.0114***	-0.016***
	(-4.017)	(-4.920)	(-3.218)	(-4.269)
Constant	-18.88***	-23.20***	-26.73***	-24.33***
	(-6.446)	(-8.536)	(-8.616)	(-7.204)
Observations	498	498	498	498
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Pseudo R^2	0.4952	0.4426	0.4021	0.5299

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using the data from the Thomson Reuter EIKON database.

Table 7 reflects the information of the robustness test by employing three different CSR performance scores, and this score is broken down based on its aspects. ASSET4 database generates the value of CSR performance (CSRPerf) score by averaging related companies' environmental, social, and governance pillar scores. Therefore, the relationship between the individual aspect of CSR (i.e., environmental, social, and governance) and the companies' decision to deal with persistent CSR disclosure will be persistently investigated. ENVPerf, SOCPerf, and GOVPerf as the extended measure of CSRPerf were also employed. According to Table 7, ENVPerf is positively (β= 0.077) and significantly (p< 0.01) associated with CSR_Pers. The same propensity can be found in the association between SOCPerf and CSR_Pers. Therefore, the coefficient value of SOCPerf is positive (β= 0.066) and statistically (p < 0.01) significant. GOVPerf also documents positive (β= 0.111) and significant (p < 0.01) association with CSR_Pers. The concurrent test using the augmented model shows consistent results, in which ENVPerf, SOCPerf, and GOVPerf are positively and significantly associated with CSR_Pers.

The final robustness test employed the lag model for one-year backward (t-1). The information was conjectured that the past CSR performance is associated with the decision to publish the CSR report for the following consecutive year (Usman et al., 2020). As shown in Table 8, the one-year lag variable was used for each continuous independent variable. The obtained empirical test reports that either CSRPerf or the broken down aspects of CSRPerf (i.e., ENVPerf, SOCPerf, and GOVPerf) are positively and significantly associated with CSR_Pers. The results using lag variables confirm the proposed hypotheses and the main analysis. The propensity of companies' engagement with persistent CSR disclosure (CSR_Pers) is more significant as the CSR performance (CSRPerf) gets higher.

Table 8
Robustness test using lagged variables as the alternate measure of CSR performance

VARIABLE	(1) CSR_Pers	(2) CSR_Pers	(3) CSR_Pers	(4) CSR_Pers	(5) Augmented model
$CSRPerf_{t-1}$	0.111***				0.052***
	(8.564)				(3.408)
$ENVPerf_{t-1}$		0.065***			0.033***
		(7.823)			(4.614)
$SOCPerf_{t-1}$			0.061***		0.014
			(7.420)		(1.508)
$GOVPerf_{t-1}$				0.104***	0.029
				(5.074)	(1.286)
LEV_{t-1}	0.003**	0.003***	0.002**	0.001	0.003**
	(2.473)	(2.849)	(2.441)	(1.481)	(2.493)
$SIZE_{t-1}$	0.307**	0.421***	0.636***	0.707***	0.276*
	(2.004)	(2.719)	(4.879)	(5.058)	(1.673)
MBV_{t-1}	-0.084***	-0.076***	-0.051**	-0.012	-0.091***
	(-2.950)	(-2.914)	(-2.119)	(-0.545)	(-3.063)
AGE_{t-1}	-0.018***	-0.017***	-0.022***	-0.015***	-0.020***
	(-2.932)	(-4.346)	(-5.773)	(-3.791)	(-4.437)
Constant	-11.09***	-10.82***	-13.48***	-18.99***	-12.45***
	(-5.112)	(-4.701)	(-6.398)	(-8.060)	(-5.164)
Observations	410	410	410	410	410
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Pseudo R^2	0.4101	0.4299	0.3993	0.3383	0.4912

Robust z-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: Own calculations using the data from the Thomson Reuter EIKON database.

Discussion

The association of CSR performance (CSRPerf) and industry membership (IND) in the hypercompetitive industry with the persistence of CSR disclosure (CSR_Pers) was investigated. It conjectures that CSRPerf

and IND are positively associated with CSR_Pers. Unlike previous study of Amir & Lev (1996) and Simpson (2010), this study proposes a new contextual investigation on the driving factors that may affect companies incorporating in the hypercompetitive industry to deal with persistence CSR disclosure. Particular study of Amir & Lev (1996) reported that nonfinancial information is more significant than financial information in the semiconductor industry. In addition, Simpson (2010) reported that nonfinancial information is more important for financial analysts in creating more accurate earnings forecasts. Even though there is no previous empirical evidence documenting the direct association between CSR performance and CSR disclosure persistency, this study can be linked to Amir & Lev (1996) and Simpson (2010) studies. In this situation, the CSR performance score released by the third independent CSR rating institution reflects the firms' CSR-related impact. Additionally, either environmental, social, or governance impact compiled as the average value of CSR performance pillar score in the previous year can trigger motivation to deal with CSR reporting in consecutive years.

Moreover, the observation period spans from 2011 to 2016, even though they may be a problematic issue in the presence of an economic downturn during the global financial crisis in 2011. This is important when the economic shock might affect the firms' behavior in dealing with persistent CSR disclosure. Lennox et al. (2012) mentioned that many corporate actions, particularly CSR publications, are discretionary. The CSR disclosure is a choice-based decision initiative the company takes according to their financial situations. Therefore, this potential problem was isolated by truncating and dividing the period of observations from six years in total into two different periods of subsample groups (i.e., group A is composed of the sample taken from 2011 to 2013, and group B is constructed by the sample taken from 2014 to 2016). In an untabulated report, the two groups' panel data analysis showed consistent results with the main examination.

This study reports the results of the empirical investigation conducted in the hypercompetitive industry. Two study questions were analyzed, in which the first accommodated the empirical test on the relationship between CSR performance and CSR disclosure persistency. At the same time, the second question facilitates the investigation of the association between industry membership and CSR disclosure persistency. Hypothesis one was proposed to address the empirical test on the first research question. CSR performance was positively associated with CSR disclosure persistency while investigated using CSR pillar score ranking released by the ASSET4 database. The main test shows that CSR performance (CSRPerf) is positively associated with CSR disclosure persistency (CSRPers). In addition, a robustness test was conducted by breaking down the average CSR performance score into several particular CSR performance scores to prove the robustness of the evidence empirically. The obtained empirical test shows consistent findings with the main analysis, in which environmental, social, and governance scores are positively associated with CSR disclosure persistency.

The second question was investigated by proposing hypothesis two. In this situation, the industry membership (IND) was positively associated with CSR disclosure persistency (CSR_Pers). The main analysis documented that those companies operating in the hardware or semiconductor industry are more likely to show a greater propensity to deal with CSR disclosure persistency over time. The results showed that the demand for nonfinancial information disclosure concerning environmental, social, and governance issues is more pronounced in the hardware industry than in the software industry. It was argued that the released new products to market in the prepackaged hardware industry are speedy and complementary. Two or more hardware products are considered complementarity when products mutually depend on each other (e.g., the main gadget such as phone, laptop with the supporting gadget such as charger, hands-free tools). Therefore, the production process is highly related. As produced by the semiconductor (hardware) industry players, the offered products utilize massive natural resources in supporting operational production activities. A particular dummy variable was generated and assigned value 1 in the software industry to prove this argument in an untabulated test. The obtained result was different from when 1 was given to those companies operating in the hardware industry (main analysis). Therefore, the software industry's robustness test showed no association with the propensity to deal with persistence CSR disclosure.

Conclusions

This study empirically examines the relationship between CSR performance and CSR disclosure persistency in the context of the US hyper-competition industry. By analyzing the data compiled from the different data sources provider (ASSET4, Corporate register, Thomson Reuters EIKON), support was obtained for the hypothesized positive relationship between CSR performance and CSR disclosure persistency. The result explains the dynamic of hyper-competition industry membership between the software and hardware industry, which exhibits the different pressures companies operating in these two industries face. Furthermore, it contributes to improving knowledge in the corporate CSR literature performance and disclosure by investigating the determinant factors driving the motive of dealing with persistent CSR disclosure over time. In line with previous empirical study in the semiconductor and wireless industry (Amir & Lev, 1996; Simpson, 2010), this study provides the extent of continuation to the value relevance of non-financial information disclosure. It also explains why companies persistently disclose their CSR reports based on the obtained CSR performance score as evaluated by the third independent CSR ranking companies (e.g., the ASSET4).

This study provides a timely response to broaden the relationship between the industry membership and CSR disclosure persistency. The study shed light on how the different industry

memberships (i.e., software vs. hardware) in the same hypercompetitive industry category face additional pressure concerning their environmental, social, and governance impact on stakeholders. The developed argument is that those companies operating in the hardware industry face more environmental, social, and political pressure than their software industry peers. This can be observed through the environmental and social impact that is more severe for those companies in the hardware industry (e.g., due to excessive natural resource exploitation and bad waste management by the end-users). This result is consistent with the theorization of legitimacy and stakeholder theories. Voluntary CSR-related information disclosure provides a visible legitimacy effort that companies are trying to show up and distinguish their impact compared with the competitors in the same industry.

This study should also be helpful to policymakers since CSR performance score is not the sole mechanism to promote persistent CSR disclosure. Industry membership also takes a role in defining the extent that environmental and socially sensitive industries (ESSIs) are related to more severe environmental, social, and governance pressure. Furthermore, through the mandatory provision of nonfinancial (CSR-related) information disclosure, the government may help the public identify and analyze the organizational impact resulting from companies' routine activities. A panel data from 2011 to 2016 was used to isolate the potential problem by including and excluding the global financial crisis impact of companies' decisions on CSR reporting. Considering several additional analyses, the obtained results convince the main analysis that the hypothesized relationship is robust in different alternate proxies of CSR performance score, sample groups, and time-varying tests. In addition, a recommendation for further study is also provided, and this current result utilizes the secondary data (CSR-related variables) of the ASSSET4 and Thomson Reuters. Finally, an empirical test comparing the CSR-related variables extracted from different data providers (e.g., Bloomberg, KLD analytics) can help to exploit the potential empirical findings. Therefore, future studies should be recommended to obtain a complete figure of the nexus between CSR performance and CSR persistency.

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Annex

Table A1
Appendixes

No	Companies in the hypercompetitive industries	
	Software & computer services	Technology hardware & equipment
1	EQUINIX	FORMFACTOR
2	ALSP.HLTHCR.SLTN.	GARMIN
3	RED HAT	SEAGATE TECH.
4	AKAMAI TECHS.	SILICON LABS.
5	SALESFORCE.COM	ON SEMICONDUCTOR
6	ALPHABET A	MARVELL TECH.GROUP
7	BAIDU 'A' ADR 10:1	VERIFONE SYSTEMS
8	LEIDOS HOLDINGS	CREE
9	IAC/INTERACTIVECORP	MICROCHIP TECH.
10	GARTNER 'A'	VIAVI SOLUTIONS
11	SYNOPSYS	ECHOSTAR
12	INTUIT	CISCO SYSTEMS
13	VMWARE	BROADCOM
14	TERADATA	XILINX
15	SYMANTEC	QUALCOMM
16	PTC - CSR	NVIDIA
17	VERISIGN	F5 NETWORKS
18	FORTINET	JUNIPER NETWORKS
19	AMDOCS	TECH DATA
20	COGNIZANT TECH.SLTN.'A'	CYPRESS SEMICON.
21	EBAY	MAXIM INTEGRATED PRDS.
22	AUTODESK	NETAPP
23	ORACLE	NCR
24	MICROSOFT	CIENA
25	CERNER	RAMBUS
26	ADOBE SYSTEMS	MOTOROLA SOLUTIONS
27	CADENCE DESIGN SYS.	TEXAS INSTRUMENTS
28	FAIR ISAAC	PITNE - OWES
29	NUANCE COMMS.	ANALOG DEVICES
30	CITRIX SYS.	HP
31	FACEBOOK CLASS A	APPLIED MATS.
32	ALTABA	HARRIS
33	ANSYS	WESTERN DIGITAL
34	CHECK POINT SFTW.TECHS.	CORNING
35	TIVO	TERADYNE
36	UNISYS	DIEBOLD NIXDORF
37	INTERNATIONAL BUS.MCHS.	INTEL
38	DXC TECHNOLOGY	SKYWORKS SOLUTIONS
39	CA	ADVANCED MICRO DEVC.
40		INTEGRATED DEVICE TECH.
41		LAM RESEARCH
42		APPLE
43		KLA TENCOR
44		MICRON TEKNOLOGI