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The impact of the United Nations global compact on firm performance: A longitudinal analysis

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ABSTRACT

The United Nations Global Compact (UNGC) is one of the most important corporate social responsibility (CSR) initiatives aimed at aligning companies' strategies and operations with principles that involve human rights, labor, environment, and anti-corruption. The purpose of this paper is to shed light on the relationship between UNGC adoption and firm performance. Starting from a literature analysis, we develop eight research hypotheses, three of them related to the effects of UNGC on performance (labor productivity, sales growth, and profitability), and five related to contextual factors that might affect them. We empirically test these hypotheses through a structured longitudinal event study analysis and an ordinary least square multiple regression, using balance sheet data of a cross-country and cross-industry sample of 810 companies gathered from the Standard and Poor Capital IQ's Compustat Global and North America datasets. The results demonstrate a significant positive impact of UNGC adoption on sales growth and profitability, whereas no significant impact emerged on labor productivity. In terms of affecting factors, country development and cultural features affect the impact on sales performance, whereas UN vendorship affects the impact on profitability. The study contributes to the scientific debate by developing and empirically testing a comprehensive theory-grounded framework on the impact of UNGC on firm performance. It also provides significant insights of relevance for managers, firms, regulatory bodies and policy makers.

1. Introduction

Over the last three decades, Corporate Social Responsibility (CSR) principles have become central in the strategy and operations of many companies (Rasche, 2009a; Ciliberti et al., 2008). A contributory factor has been the scandals that have significantly affected some well-known multinationals, such as Adidas, Apple and Nike (Sartor et al., 2016; Goebel et al., 2012). Literature has investigated the main initiatives for CSR governance, including the United Nations Global Compact, Global Reporting Initiative, ISO 26000, FLA Workplace Code, and SA8000 (Jastram and Klingenberg, 2018). This growth of CSR initiatives is related to a stronger awareness of social and environmental issues in both companies and institutions and across society, as well as in research. A substantial body of academic studies has analyzed, besides other aspects, the benefits that may be accrued from investments in CSR initiatives, such as the improvement of the corporate image or of the economic-financial performance (Post, 2012; Xie et al., 2019). This debate remains open because empirical studies are relatively few (Lee and Tang, 2018). Moreover, empirical studies show conflicting results: both positive (Eccles et al., 2014; Coulmont and Berthelot, 2015; Rodriguez-Fernandez, 2016) and negative relationships (Brammer et al., 2006; Renneboog et al., 2008) between CSR and firms' performance have been found. The ambiguity surrounding the CSR pay-off is at least partially explained by the methodological difficulties in measuring CSR overall return (Gjølberg, 2009) and the number of different auditable and non-auditable certifications/initiatives that relate to CSR activities and initiatives.

This study focuses on the impact of a specific CSR initiative: the

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United Nations Global Compact (UNGC). Consinstent with previous UNCG studies (e.g., Jastram and Klingenberg, 2018), we considered UNGC as a CSR standard/initiative. We however acknowledge that according to the definitions of CSR and sustainability (e.g., Van Marrewijk, 2003), UNCG might also be considered a broader sustainability standard/initiative (since it includes also environmental aspects).

By including more than 13,500 organizations operating in 170 countries, the UNGC is today the world's largest CSR initiative (United Nations Global, 2016; Cetindamar and Husoy, 2007). UNGC is presented as a voluntary initiative, meaning a self-regulatory agreement that encourages organizations to monitor their social performance (Steelman and Rivera, 2006). UNGC covers issues concerning human rights, labor, the environment, and anticorruption (UNGC, 2016; Orzes et al., 2018). The number of participants is continuously growing: the prestige and the prominence of United Nations (UN) has obviously contributed to its wide adoption.

The UNGC, announced by the UN Secretary-General Kofi Annan at the 1999 World Economic Forum, is a framework providing broad guidelines to implement social practices. It is based on ten principles addressing issues in the areas of human rights, labor, environment and anti-corruption. UNGC derives its principles from the Universal Declaration of Human Rights, the International Labor Organization's (ILO) Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the UN Convention against Corruption. Companies that want to become UNGC participants are required to prepare a Letter of Commitment expressing adherence to the ten principles. Moreover, they must provide a report called Communication on Progress (COP) on a yearly basis.

Since its inception, the UNGC has attracted the attention of several scholars. According to the literature reviews of Rasche et al. (2013) and Orzes et al. (2018), the outcomes from this initiative represent one of the major lines of research, besides its operational implications and the motivations and contextual factors affecting its adoption. Conceptually, the potential outcomes of UNGC are several and include: reputation advantages, social and environmental performance improvement, and superior attractiveness for investors. However, how this wide range of potential benefits may translate into better economic and financial performance is a questioned and controversial issue. The few empirical studies exhibit some methodological limitations; first and foremost, the analyzed samples are often small and/or country specific. In addition, they show conflicting results.

There is therefore the need for further rigorous studies aimed at analyzing empirically the impact of UNGC. The specific research questions of this study are the following: (1) *What are the effects of UNGC implementation on economic and financial performance of participant firms?* and (2) *What are the contextual factors affecting the relationship between UNGC adoption and firm performance?*

Building on the literature on UNGC, we develop eight research hypotheses, three of them related to the effects of this initiative on different elements of firm performance (i.e., labor productivity, sales growth, and profitability), and five related to the contextual factors that might affect them (i.e., country development and cultural features, labor intensity, UN vendorship, and environmental sensitivity of the sector in which companies operate). We empirically test these hypotheses through a structured longitudinal event study analysis and an ordinary least square (OLS) multiple regression. A similar approach was adopted by Lo et al. (2014) to study the effects of OHSAS 18001 on firm performance and by Orzes et al. (2017) to study the effects of SA8000.

To formulate the research hypotheses, we relied on two relevant theory bases, respectivelySignaling Theory (ST) and Resource Based View (RBV). These are amongst the most commonly used theoretical perspectives in studies about the UNGC (e.g., Janney et al., 2009 for ST; Ayuso et al., 2016 for RBV). In particular, ST was selected as the UNGC certification can be seen as a signal to the market to provide value to the customers, so it is an appropriate basis to consider the external impacts of the certification; RBV, in contrast, mainly focuses on internal resources and can support the formulation of hypotheses oriented to internal impacts of the certification. Our paper contributes to the scientific debate by developing a coherent and comprehensive framework to capture the impact of UNGC on firm performance grounded on these two theories and by empirically testing the hypotheses above through a longitudinal empirical analysis on a large sample of public listed companies across countries at different states of development. Consistent with previous studies on UNGC (e.g., Berliner and Prakash, 2015; Rodriguez-Fernandez, 2016) and on other CSR initiatives (e.g., Lo et al., 2014; De Jong et al., 2014; Orzes et al., 2017), we focused on firms listed on stock markets because (1) they are more likely to adopt CSR initiatives (e.g. Qi et al., 2013) and (2) accurate and cross-country comparable data are readily available (Takahashi and Nakamura, 2010).

Besides these contributions, this intriguing field of investigation provides additional interest connected to the nature of the institution that developed the UNGC standard (i.e., the United Nations) and the weak requirements for the approval and maintenance of this initiative (e.g., the absence of third-party audit). An institution with the recognition of the UN can generate significant reputational benefits for companies joining the UNGC. On the other hand, the lack of selectivity and the absence of monitoring mechanisms leaves rooms for opportunistic temptations and for symbolic rather than substantial adoptions. What some scholars call "decoupling" (Knudsen, 2011) can take place: companies could join UNGC without modifying their processes and without significant behavioral change or improvements. A rigorous empirical study can help to clarify not only the actual impact of UNGC on performance, but also indirectly shed light on the extent of the true adoption of UNGC practices.

The remainder of this paper is organized as follows. In section 2 we summarize the literature background. In section 3 we formulate our research hypotheses and describe the framework of the study. Next, we present the methodological steps of our analyses (Section 4) and the related results (Section 5). Finally, we conclude with the discussion of the results (Section 6) and with the contribution of the paper to research, practice, policy, and discuss its limitations (Section 7).

2. Background

Orzes et al. (2018) have recently carried out a systematic literature review on the UNGC initiative, identifying five main streams of studies: motivations, weaknesses, impacts, contextual factors affecting adoption, and contextual factors affecting performance.

The papers on the impacts of UNGC adoption can be classified into two broad categories according to the impacts considered: a) firm performance such as efficiency, effectiveness, productivity, and profitability; b) "intermediate" effects such as the improvement of the organizational culture, improvement of the corporate image, access to a CSR network, and increased customer satisfaction. In this section, we focus on the first category; while in the next section we will assume a broader perspective and consider both categories of papers to develop our research framework.

Starting from the 96 papers included in Orzes et al. (2018) review and 27 further papers published from December 2016 to July 2019, we identified 8 empirical papers dealing with the performance of UNGC adoption and its affecting factors. These papers can be further classified according to the type of performance analyzed: environmental, social, and governance (ESG) performance, stock market performance, and operating performance.

2.1. ESG performance

Berliner and Prakash (2015) analyze MSCI ESG Statistics on 3000 US

firms and show that UNGC companies perform worse than non-UNGC companies in what they call "fundamental ESG performance dimensions" (e.g., hazardous waste, ozone depleting chemicals, and substantial emissions), while they achieve better performance only in "superficial" dimensions (e.g., pollution prevention, recycling, and clean energy). They conclude that firms are "shirking on their obligations, taking advantage of the reputational benefits of membership while not undertaking serious efforts toward compliance" (Berliner and Prakash, 2015: 131). Conversely, Ortas et al. (2015a) find in their secondary data analysis on 198 French, Spanish and Japanese adopters that (a) UNGC companies have significantly better ESG performance, and (b) companies with higher ESG performance have also higher operating performance (return on assets). In addition, they show that the aforementioned relationships are affected by the country of the firm (Ortas et al., 2015a, 2015b). Jastram and Klingenberg (2018) develop a survey on 49 German companies to understand in which management areas the impact of the UNGC has been stronger, demonstrating that the standard is less frequently used for risk management, financial management, or controlling, while more frequently used to develop a code of conduct, to define basic values, and to develop strategic objectives.

2.2. Stock market performance

Berthelot et al. (2012) and Coulmont and Berthelot (2015) – analyzing a sample of 146 Canadian firms and 244 French firms, respectively – show that investors attribute a positive value to UNGC adoption. Janney et al. (2009) find instead in their secondary data analysis on 175 global firms that the stock market reaction to UNGC adoption depends on the country of the firm: positive market reaction for European companies and negative market reaction for US companies (Janney et al., 2009).

2.3. Operating performance

Focusing on a sample of 121 Spanish firms, Rodriguez-Fernandez (2016) finds no effect of UNGC on return on assets and on return on equity. The above-mentioned paper by Ortas et al. (2015a) finds instead a positive relationship but as a consequence of better ESG performance. The only factor affecting the impact of UNGC adoption on firm performance so far considered in the literature is the country (Ortas et al., 2015a, 2015b; Janney et al., 2009).

In conclusion, the main weaknesses of the literature con be summarized as follows. Only a few articles analyze the impact of UNGC on firm performance, in particular on the operating performance (profitability/efficiency), as well as the contingent factors that may affect this relationship, except for the country. Results are conflicting, also because the empirical research has involved relatively small (in particular in Jastram and Klingenberg, 2018 and in Rodriguez-Fernandez, 2016) and non-homogeneous samples in terms of countries and industries. Considering the fact that UNGC has no auditing system and the consequent risk of decoupling/blue-washing (Knudsen, 2011), the effects of UNGC adoption on operating performance represent a relevant, important and open question.

3. Research framework and hypotheses development

We present a research framework, drawing on both the studies focused on the direct impact on firm performance and the studies considering the "intermediate" effects. Signalling Theory and the Resource Based View are used here to provide a theoretical framework for the study. These theories were selected because of their direct relevance to the research questions being investigated. They are among the most commonly adopted theoretical lenses to ground studies about UNGC (e.g., Janney et al., 2009 for ST; Ayuso et al., 2016 for RBV).

Developed by Spence (1973), who showed how high-quality prospective employees distinguish themselves from low-quality ones via the (costly) signal of rigorous higher education, Signalling Theory (ST) has been used widely in entrepreneurship, management and economics (for a review see Connelly et al. (2011) among others). According to the ST, some products exhibit attributes for which consumers cannot assess the quality neither before nor after purchase. In order to reduce this information asymmetry, companies whose products possess desirable attributes send signals to the consumers, i.e. actions that succinctly convey relevant information (Akerlof, 1970). A certification is an example of such signalling: it may be defined as a process whereby an unobservable product feature is made known to the consumer through a labelling or certification system. The UNGC label "signals" to the market a set of attributes that cannot be verified independently by the customer, for example the respect of human rights or the use of environmentally safe manufacturing processes. A signal will be credible if firms with inferior capabilities and products find the costs of the signal higher than the benefits, whereas firms with superior capabilities and products find the benefits higher than the costs (Scott, 2014). The idea that UNGC can be considered as a signal is reported by Coulmont and Berthelot (2015) and Janney et al. (2009) who argued that for a "high-type" firm (a company with a high level of commitment towards the UNGC principles) the costs of joining UNGC are less than for a "low-type". Therefore, a company's willingness to incur such costs can be a signal that distinguishes it from less-committed organizations.

The RBV theory argues that the competitive advantage of companies is determined by valuable, rare, inimitable, and non-substitutable resources and competences (Barney, 1991). The adoption of CSR frameworks (such as the UNGC) may generate or foster the adoption of effective organizational competencies and routines (e.g., employee involvement, organization-wide coordination, and a forward-looking managerial style) which, in the light of the RBV, contribute to the creation of a sustainable competitive advantage. The literature has discussed the potential contribution of RBV to explain the adoption of the UNGC certification as well as the achievement of benefits. Ayuso et al. (2016) explained the positive link existing between the level of firm-specific resources and the real extent of implementation of Global Compact principles. Other authors discuss the connection with achieved benefits: Arevalo and Aravind (2017) showed that organizational resources are positively related to the extent of reputational benefits achieved through UNGC participation; Arevalo et al. (2013) reported that benefits in terms of image are actually the main motivations pushing companies with more firm-specific resources to adopt the UNGC.

3.1. Impact of UNGC on firm performance

The UNGC aims to "mobilize a global movement of sustainable companies and stakeholders", supporting companies to "do business responsibly" and "take strategic actions to advance broader societal goals" (UNGC official website, 2017). Six out of the ten principles are related to human and labor rights: firms should operate in respect of internationally proclaimed human rights and support the freedom of associations of workers, making sure they are not complicit in any abuse, discrimination or forced labor. Under these conditions, it is expected that the UNGC adoption leads to an improvement of working conditions, thus increasing employees' satisfaction and the quality and efficiency of their work (Arevalo and Aravind, 2017; Dubee, 2007; Erro and Sanchez, 2012; Ruggie, 2001). These expectations are partially supported by some studies. Lehmann et al. (2010) underline that joining UNGC positively enhances employees' relations. Arevalo and Aravind (2011) demonstrate empirically that companies' decision to adopt the UNGC is also driven by the intention of satisfying workers, resulting in a more proactive dialogue and exchange of ideas with them. The reason to use

the certification as a way to motivate employees is typical of companies perceiving employees as one of the most rare and inimitable resources they possess. Thereby, according to RBV, UNGC fosters more motivated resources, so achieving better and more efficient organizational routines and working practices. Moreover, the participation to UNGC can be a signal not only for customers but also for employees, of the willingness of their companies to differentiate in the market. More motivated employees are generally also more productive (Mullins, 2005). Therefore, we hypothesize that:

H1. There is a significant positive relationship between UNGC adoption and labor productivity.

Several scholars shed light on the positive impacts of UNGC adoption on firm reputation (Arevalo and Aravind, 2017; Fritsch, 2008; Janney et al., 2009), customer satisfaction (Arevalo and Aravind, 2011; Erro and Sanchez, 2012), access to new markets (Erro and Sanchez, 2012), and creation of new partnerships (Bennie et al., 2007; Mele and Schepers, 2013; Shoji, 2015). These reputational advantages might then lead to sales improvement.

Grounding on the ST, UNGC can be viewed as a credible signal for the customers interested in CSR issues (sometime labelled as "ethical customers"), also thanks to the reputation of the promoting institution, i.e., the UN. Grounding on the RBV, the UNGC could generate the adoption of effective organizational resources, which are valuable and specific. In that way, these resources, such as forward-looking managerial style, employees with a high level of involvement and a deeper coordination within the organization, allow to achieve an image gain, generally able to increase the appreciation of the companies by customers and so allowing sales growth (e.g., Miles and Munilla, 2004; Stigzelius and Mark-Herbert, 2009; Orzes et al., 2018). Starting from these considerations, we postulate that:

H2. There is a significant positive relationship between UNGC adoption and sales growth.

Profits are an essential element in assessing the impact of a management initiative. As we highlighted above, scholars have pointed out the potential effects of UNGC adoption both on sales improvement and on cost savings (e.g., Arevalo and Aravind, 2017; Lehmann et al., 2010). In addition, UNGC does not require high costs of implementation (Bernhagen et al., 2013; Voegtlin and Pless, 2014), unlike other ethical standards (e.g. SA8000).

Both revenue growth and cost reduction can be justified using the conceptual arguments of ST and RBV (e.g., Arevalo and Aravind, 2017; Coulmont and Berthelot, 2015; Janney et al., 2009). UNCG adoption can in fact contribute to develop a better image and reputation that foster the growth of sales, as well as develop relations (i.e. with suppliers and workers) and organizational routines which can increase the efficiency of processes. Therefore, we hypothesize that:

H3. There is a significant positive relationship between UNGC adoption and profitability.

3.2. Contextual factors

As already pointed out, the only contingent factor affecting the impact of UNGC on performance considered in previous studies is the geographical context (Janney et al., 2009; Ortas et al., 2015a, 2015b). However, if we consider the adoption of UNGC rather than the performance impact, the literature identifies several potential affecting factors. In addition, there is a stream of studies devoted to the contingent factors influencing the performance impact of other CSR standards (e.g., SA8000).

As far as contextual factors affecting UNGC adoption are concerned (see Orzes et al., 2018 for a detailed review), they can be classified into three categories: country-, firm-, and industry-related factors. Among country-related factors, previous studies consider the level of country inclination to CSR (Ortas et al., 2015a, 2015b), the influence of religion on society (Williams and Zinkin, 2010), the liberalism of the economic system (Lim and Tsutsui, 2012), and the level of development of the country (Bremer, 2008). The main firm-related factors analyzed are the firm size (Arevalo et al., 2013; Bernhagen and Mitchell, 2010), the pre-adoption operating performance (Arevalo and Aravind, 2011, 2015), the length of UNGC participation (Ayuso et al., 2016), and the belonging to the UN vendors list (Bernhagen and Mitchell, 2010). Finally, the only industry-related factor considered by previous studies is the environmental sensitivity of the sector (Knudsen, 2011).

As far as the contextual factors affecting the performance impact of other CSR practices or standards are concerned, previous studies mention the economic environment or economic development of the country (Lee et al., 2013; Sánchez et al., 2015), the firm technology and labor intensity (Lo et al., 2014; Orzes et al., 2017), and the industry (Lo et al., 2014). Drawing from the above-mentioned literature streams, we develop below a set of hypotheses about the factors that might affect the relationship between UNGC adoption and operating performance. Six out of ten Principles of the UNGC promote the respect for human and workers' rights. Given that working conditions are not uniform across developed and developing countries (Sartor et al., 2016), it is reasonable to suppose that the effects of UNGC adoption and implementation vary according to the level of development of the country of origin. For instance, Bremer (2008) in her secondary-data analysis finds out that the impacts of UNGC implementation are "much worse among developing country companies". This result is however not confirmed by the meta-analysis conducted by Hou et al. (2016) which shows that CSR practices have higher performance impact in developing economies. Therefore, we postulate that:

H4. The relationship between UNGC adoption and operating performance is affected by the level of development of firm's country of origin.

As highlighted above the UNGC is focused on human and workers' rights. We therefore expect a positive effect on employees' satisfaction and consequently on the quality and efficiency of their work (see H1). In companies characterized by high labor intensity the performance impact of UNGC is likely to be higher. We therefore hypothesize that:

H5. *The* relationship *between UNGC adoption and operating performance is affected by the firm's labor intensity.*

Any CSR standard is grounded on the concept of "social good". However, the real meaning of this concept depends on the cultural values which can be dramatically different from one country to another (Miles and Munilla, 2004; Ortas et al., 2015a). As discussed by Hofstede (1980) in his seminal contributions, culture, social systems, ways of life, and people's mindsets are country specific factors that affect the management of organizations. Therefore, we hypothesize that:

H6. *The relationship between UNGC adoption and operating performance is affected by the cultural features of the firm's country of origin.*

Previous studies highlight that the UN encourage firms belonging to their vendors list to adopt the UNGC (Bennie et al., 2007) and to effectively meet its formal requirements (Bernhagen and Mitchell, 2010). In other words, the UN use their market power to further spread the UNGC standard. We can expect that the performance impact of UNGC adoption by UN suppliers/vendors is higher. The UNGC adoption allows in fact these firms to acquire/retain a significant customer (i.e., the UN), that might in turn also contribute to enhance the firm's visibility/brand value and to acquire further customers. We therefore hypothesize that:

H7. *The relationship between UNGC adoption and operating performance*

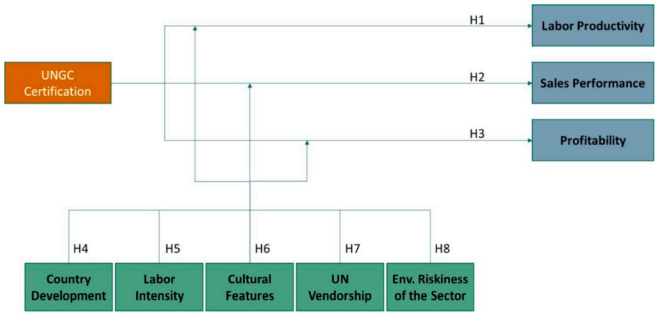


Fig. 1. Conceptual framework.

is affected by the firm's inclusion in the United Nations vendor list.

Industries vary considerably in their environmental impacts and governmental regulatory standards (Semenova and Hassel, 2016). Particularly in the latest years, corporate image has become more and more important for companies belonging to environmentally sensitive industries because they are more exposed to public opinion due to recent environmental scandals (Post, 2012). Thus, we hypothesize that:

H8. *The relationship between UNGC adoption and operating performance is affected by the firm's belonging to environmentally sensitive sectors.*

Fig. 1 shows the conceptual framework of this empirical study, portraying all the relationships hypothesized and analyzed. While extant literature on the impact of UNGC standard on firm performance is rather fragmented (e.g., Orzes et al., 2018), the framework provides the first comprehensive view of the potential effects of UNGC on operating performances (labour productivity, sales growth and profitability) and the factors affecting such effects.

4. Methodology

In order to empirically test the research hypotheses, we employed a longitudinal event-study methodology (Barber and Lyon, 1996), built on secondary data gathered from the "Standard and Poor Capital IQ's Compustat Global" and "Compustat North America" datasets. The event-study methodology has been extensively adopted in the management field (see among others De Jong et al. (2014), Lo et al. (2014) and Orzes et al. (2018) which used this method to shed light on the effects of ISO 14001, OHSAS, 18001 and SA8000 on firm performance). The "Compustat Global" dataset contains information on companies from more than 80 countries and 40,000 firms, covering about 90% of the world capitalization. This dataset does not include north-American companies, so we have integrated it with the "Compustat North America" dataset that includes more than 24,000 publicly listed companies in Canada and United States of America. We matched the list of UNGC firms available on the official UNGC Website with the Compustat Global and Compustat North America datasets. In this way we identified 810 companies. We included in our sample firms that adopted the UNGC until 2013, the last year for which we have complete data about the analyzed sample. Table 1 presents the breakdown of the sample by sector. Sampled firms belong to a wide variety of sectors, with a prevalence of manufacturing (45,5%), followed by transportation and public utilities (15%), finance, insurance and real estate (14,5%), and services (9,5%).

Table 2 presents the breakdown of the sample by country. Our sample basically captures the entire population of public listed UNGC companies thus providing reliable results for this specific population. There are instead some differences between our sample and the wider

Table 1
Breakdown of the sample by sector.

Sector	SIC Code	Number of companies
Mining	1000–1499	31
Construction	1500–1799	29
Manufacturing	2000–3999	368
Transportation and Public Utilities	4000–4999	120
Wholesale Trade	5000–5199	23
Retail trade	5200–5999	34
Finance, Insurance and Real Estate	6000–6799	117
Services	7000–8999	78
Non-classifiable	9900–9999	10
TOTAL		810

population of all UNGC companies (e.g., in the distribution by country). These differences can be explained considering our focus on public listed companies. To assess whether our findings are generalizable to the wider population of UNGC firms, we carried out additional analyses using post-stratification weighting with inverse probability (Kalton and Flores-Cervantes, 2003). This method allowed us to correct our sample making its distribution by country equal to the one of the population of UNCG companies.

In order to test our hypotheses (H1, H2, and H3) we employed an event-study methodology to detect abnormal performance between the 810 sampled UNGC companies and a wide set of control firms (non-UNGC adopters). The event period was defined as the year in which a company joined the UNGC (year t), since the implementation process is relatively short. Indeed, companies are simply required to demonstrate their intention to take part to the UNGC through a Letter of Commitment signed by CEO. The year preceding the event period (t-1) was considered the base year and used for determining the control firm sample. Year t-2 was considered to tackle the endogeneity issue. We adopted the three performance indicators most frequently used by previous event-studies on similar topics (Corbettet al., 2005; Lo et al., 2014; Orzes et al., 2018):

- the ratio between operating income and number of employees to measure labor productivity;
- the relative sales growth – defined as $(SALES_t - SALES_{t-1})/SALES_{t-1}$ – for sales performance;
- the Return on Assets (ROA) – expressed as operating income on total assets – to measure profitability (Appendix 1 summarizes the operationalization of the variables).

The event study compares each company (in our case each UNGC adopter) with a control sample created ad hoc (in our case non-UNGC adopters). In this regard, we used Barber and Lyon's (1996) steps to identify the control sample for each sampled UNGC company. The matching criteria we adopted were the following: the same two-digits SIC code; 50–200% of firms' total assets; and 90–110% of the considered performance (i.e., labor productivity, relative sales growth, ROA) in year t-1 (Corbett et al., 2005). If no firm was matched, the first criterion was modified to at least one-digit SIC code and then removed (Barber and Lyon, 1996). On average, for each sampled UNGC company we identified a control sample consisting of 6.25 firms.

The descriptive statistics of the sample (data are referred to year *t-1*) are shown in Table 3.

The abnormal change in performance was then calculated as follows:

$$AP_{(t+b)} = PS_{(t+b)} - EP_{(t+b)}$$

$$EP_{(t+b)} = PS_{(t+a)} + (PC_{(t+b)} - PC_{(t+a)})$$

where AP is the abnormal performance, EP is the expected performance,

Table 2
Breakdown of the sample by country.

Country	All UNGC participants		UNGC companies (active status)		Our sample	
	Number	Percent.	Number	Percent.	Number	Percent.
Spain	2249	13,35%	299	7,41%	37	4,57%
France	1832	10,88%	427	10,58%	87	10,74%
Mexico	854	5,07%	142	3,52%	16	1,98%
Brazil	764	4,54%	195	4,83%	30	3,70%
United States	689	4,09%	179	4,44%	43	5,31%
Colombia	526	3,12%	137	3,40%	11	1,36%
China	524	3,11%	89	2,21%	9	1,11%
Germany	464	2,75%	196	4,86%	47	5,80%
United Kingdom	443	2,63%	117	2,90%	38	4,69%
Japan	439	2,61%	226	5,60%	110	13,58%
Denmark	408	2,42%	150	3,72%	24	2,96%
Argentina	403	2,39%	101	2,50%	9	1,11%
Myanmar	347	2,06%				
Turkey	326	1,94%	71	1,76%	11	1,36%
India	318	1,89%	58	1,44%	19	2,35%
Italy	286	1,70%	72	1,78%	20	2,47%
Sweden	274	1,63%	164	4,06%	40	4,94%
Republic of Korea	256	1,52%	106	2,63%	27	3,33%
Peru	157	0,93%	34	0,84%	5	0,62%
Poland	147	0,87%	20	0,50%	5	0,62%
Kenya	145	0,86%	27	0,67%	3	0,37%
Australia	144	0,85%	54	1,34%	11	1,36%
Indonesia	141	0,84%	20	0,50%	4	0,49%
Switzerland	140	0,83%	74	1,83%	18	2,22%
Other countries	4301	27,12%	1077	26,69%	186	22,96%
TOTAL	**16843**	**100,00%**	**4035**	**100,00%**	**810**	**100,00%**

Table 3
Descriptive statistics of the sample.

Certified firms	Median	Mean	SD
Number of Employees	13171	33899	62410
Total Assets [M$]	5521	35802	122701
Net Sales [M$]	3498	10685	20612
Labor Productivity [k$/employee]	31,59	48,24	58,31
Sales Performance [%]	10,17%	15,32%	51,93%
Profitability [ROA, %]	6,69%	8,07%	7,90%

PSis the actual performance of the sampled firms, PC is the median performance of control firms, t is the year of joining UNGC, *a* is the starting year of comparison (−2, −1, 0, 1), and *b* is the ending year of comparison (−1, 0, 1, 2).

We verified through the Shapiro-Wilk Tests that data were not normal, and the skewness was low (between −1 and 1 in almost all cases, see Table 4). We therefore used the Wilcoxon signed rank (WRS) test to verify whether the abnormal performance differed significantly from zero. We then applied an Ordinary Least Square (OLS) regression methodology to study how contextual factors "affect" the relationship between UNGC adoption and both profitability and sales growth, testing H4, H5, H6, H7, H8. Considering the nature of the statistical analyses conducted in our paper, we prefer to use the term "affect" rather than moderate. The standard approach for moderation analyses requires in fact to calculate the main effects and the interaction terms. In our study – as in previous event studies (e.g., Lo et al., 2013) – this is not possible since each firm has its own control sample (consisting of firms with similar characteristics) and there is no dummy variable for UNGC adoption (for which direct effects and interaction terms should be calculated). A different statistical approach should therefore be used for the analysis of moderating/affecting factors (see below for further details). The dependent variable of the Ordinary Least Square (OLS) regression was the abnormal performance of the sales growth or the ROA, calculated in the time-period from *t* to *t+2*. The independent variables were instead the sales growth (Model 1) or ROA (Model 2) at year t, the level of development of the country, the labor intensity of the firm, the country's cultural features, the UN vendorship, and the environmental sensitivity of the sector. Besides the aforementioned variables, we also considered firm size and early vs. late adoption as control variables, consistently with previous studies (e.g., Lo et al., 2014; Orzes et al., 2017).

Consistent with previous studies (e.g., Lo et al., 2014; Orzes et al., 2017), we did not consider the labor productivity in this analysis.

As far as the level of development of the country is concerned, we adopted the Human Development Index (HDI), which measures each country on the following dimensions: long and healthy life (life expectancy index), knowledge (education index), and a decent standard of living (GNI index). Data were gathered from the official United Nations Development Programme website (UNDP official website, 2016). Consistently with previous studies (Lo et al., 2014; Orzes et al., 2017), labor intensity was measured as the ratio of the number of employees to total assets of the firm.

We used Hofstede's indicators as a proxy for the country's cultural features. Hofstede (1980) proposed a measurement system for national culture, based on four dimensions: (a) power distance, (b) individualism, (c) masculinity, (d) uncertainty avoidance. He subsequently added two further dimensions: (e) long-term orientation and (f) indulgence (Hofstede et al., 2010). UN vendorship measures whether the company is an official supplier of the United Nations. It was calculated by matching our sample with the vendors list available on the official UN website (United Nations, 2016). Finally, we used the list provided by the United States Environmental Protection Agency (EPA, 2016) to classify the environmentally sensitive sectors. Three regression equations were used: Model 0 (with only control variables), Model 1 (with control variables and independent variables) and Model 2 (with control variables and other independent variables). Since the level of development of the country and the Hofstede's cultural variables were correlated, being both country-related factors (see the correlation matrix reported

Table 4
Results of the event-study analysis.

Labor Productivity (M$/employee) Period	AP mean	AP median	Normality (Ryan-Joiner)	Skewness	p-value (WRS)
t-2 to t-1	−0,305	0030	No	−0,26	0,343
t-1 to t (Pre)	−1844	−0,184	No	−0,99	0,668
t to t+2 (Post)	0,356	−0,903	No	0,33	0,748
t-1 to t+2 (Full)	−1488	−1699	No	−0,34	0,779
t to t+1	−0,510	−0,369	No	0,47	0,600
t+1 to t+2	0,867	−0,019	No	0,96	0,518
t-1 to t+1	−2355	−0,389	No	−0,34	0,835
Sales variation (%) Period	**AP mean**	**AP median**	**Normality (Ryan-Joiner)**	**Skewness**	**p-value (WSR)**
t-2 to t-1	−0,013	0000	No	−0,19	0,815
t-1 to t (Pre)	0,030	0011	No	0,38	**0,014**
t to t+2 (Post)	0,001	−0,006	No	0,41	0,815
t-1 to t+2 (Full)	0,031	0020	No	0,56	**0,007**
t to t+1	−0,009	−0,008	No	−0,16	0,815
t+1 to t+2	0,010	−0,001	No	0,38	0,803
t-1 to t+1	0,021	0015	No	0,35	**0,054**
Profitability Period	**AP mean**	**AP median**	**Normality (Ryan-Joiner)**	**Skewness**	**p-value (WSR)**
t-2 to t-1	−0,0052	−0,0007	No	−1,27	0,978
t-1 to t (Pre)	0,0013	0,0016	No	−0,44	0,102
t to t+2 (Post)	0,0023	0,0005	No	−0,4	0,120
t-1 to t+2 (Full)	0,0036	0,0000	No	−1,05	**0,051**
t to t+1	0,0021	0,0021	No	−0,35	**0,028**
t+1 to t+2	0,0002	0,0000	No	−0,7	0,337
t-1 to t+1	0,0033	0,0029	No	−1,2	**0,028**

in Appendix 2), we separated such variables in two separate models (Model 1 and Model 2) to avoid multi-collinearity issues.

- $Model\ 0: \ AP_k = \beta_0 + \beta_1(PP_k) + \beta_2(FSize_k) + \beta_3(E/L_k)$
- $Model\ 1: AP_k = \beta_0 + \beta_1(PP_k) + \beta_2(FSize_k) + \beta_3(E/L_k) + \beta_4(LI_k) + \beta_5(UNVEN_k) + \beta_6(HDI_k) + \beta_7(ENVRISK_k) + e_k$
- $Model\ 2: AP_k = \beta_0 + \beta_1(PP_k) + \beta_2(FSize_k) + \beta_3(E/L_k) + \beta_4(LI_k) + \beta_5(UNVEN_k) + \beta_6(HOF1_k) + \beta_7(HOF2_k) + \beta_8(HOF3_k) + \beta_9(HOF4_k) + \beta_{10}(HOF5_k) + \beta_{11}(HOF6_k) + e_k$

Where, AP_k represents the abnormal performance of the sales growth or of the ROA, calculated in the time-period from t to $t+2$, PP_k represents the sales growth (Model 1) or ROA (Model 2) at year t, $Fsize_k$ is the number of employees in year t-1, E/L_k measures whether the firm is an early or late adopter (based on the average year of adoption), LI_k is the labor intensity of the firm, $UNVEN_k$ measures whether the firm is a UN vendor, HDI_k is the Human Development Index of the country of origin of the firm, $ENVRISK_k$ expresses whether the firm operates in an environmentally sensitive sector and $HOF1_k$ to $HOF6_k$ are the Hofstede's cultural dimensions.

5. Results

Table 4 shows the results related to the effects of UNGC adoption on operating performance. For each period, we highlighted the abnormal performance of UNGC companies against the control firms in the event study period. We used the Wicoxon signed rank (WRS) test in testing our hypotheses (H1-H3).

No significant effect of UNGC has been found on labor productivity in the event study, therefore H1 is not supported. As far as sales growth is concerned, we found significant positive abnormal performance from year t-1 to year t, t+1 and t+2. Each time interval starting from t-1 presents a significant positive abnormal return, therefore supporting H2. Analyzing the effects on profitability, we notice positive results from year t-1 to year t+1 and t+2. We also found positive statistically significant abnormal profitability performance from year t to year t+1. Thus, H3 is supported.

We also carried out some additional analyses using post-stratification weighting with inverse probability (Kalton and Flores-Cervantes, 2003) to make the distribution by country of our sample equal to the one of the population of UNGC companies and therefore to test the generalizability of our findings to such a population. We did a signed-rank regression, which is equivalent to Wicoxon signed rank (WRS). The results concerning labor productivity and sales performance are completely confirmed (we found exactly the same significant and non-significant abnormal performance). However, we found some differences for profitability. The only statistically significant abnormal performance in this

Table 5
Results of the regression analysis for ROA.

AP ROA	Model 0	Model 1 (HDI, Env. Sens)	Model 2 (Hofstede)
ROA t	**−0,1106****	**−0,1115****	**−0,0849***
Early/Late Adopter	0,0578	0,0645	0,0646
Firm Size (Employees)	0,0044	−0,0392	−0,0550
Labor Intensity		0,0567	0,0678
UN Vendorship		**0,1388****	**0,1392****
HDI Index		0,0321	
Environ. Sensitive Industry		0,0096	
Power Distance (HOF 1)			−0,0295
Individualism (HOF 2)			0,0566
Masculinity (HOF 3)			0,0119
Uncertainty Avoidance (HOF 4)			0,0792
Long-term Orientation (HOF 5)			0,0359
Indulgence (HOF 6)			−0,0126
R squared	**1,63%**	**4,01%**	**4,87%**
Adjusted R squared	**1,14%**	**2,89%**	**3,08%**
Incremental adjusted R squared (compared with Model 0)	-	**1,75%**	**1,94%**

Note: ^,*,**,*** Significant at the 10, 5, 1, and 0,1 per cent levels, respectively.

Table 6
Results of the regression analysis for sales performance.

AP SALES VARIATION	Model 0	Model 1 (HDI, Env. Sens)	Model 2 (Hofstede)
SALES VAR t	**−0,4295*****	**−0,4316*****	**−0,4677*****
Early/Late Adopter	−0,0337	−0,0346	−0,0625
Firm Size (Employees)	−0,0016	−0,0008	−0,0027
Labor Intensity		−0,0132	0,0080
UN Vendorship		0,0316	0,0184
HDI Index		**−0,0758***	
Environ. Sensitive Industry		−0,0049	
Power Distance (HOF 1)			−0,0240
Individualism (HOF 2)			**−0,0986***
Masculinity (HOF 3)			0,0232
Uncertainty Avoidance (HOF 4)			**−0,1096**^
Long-term Orientation (HOF 5)			**−0,0865**^
Indulgence (HOF 6)			−0,0344
R squared	**17,95%**	**18,63%**	**21,43%**
Adjusted R squared	**17,53%**	**17,64%**	**19,87%**
Incremental adjusted R squared (compared with Model 0)	-	**0,11%**	**2,34%**

Note: ^,*,**,*** Significant at the 10, 5, 1, and 0,1 per cent levels, respectively.

case were from year t-1 to year t and to year t+1. The results concerning this performance dimension are only partially confirmed.

Tables 5 and 6 report the results of the Ordinary Least Squares analyses we performed to study how contextual factors may affect the relationship between UNGC adoption and operating performance (i.e., sales variation and profitability). As explained in Section 4, Model 0 includes only control variables, while Model 1 and Model 2 include both control variables and independent variables. We calculated two separate models (Model 1 and Model 2) to avoid multi-collinearity issues between the level of development of the country and the cultural dimensions. While there is no universally agreed cut off value for adjusted R squared (Neter et al., 1996), the values that we found in the regression of sales variation (Table 6) can be considered acceptable/good (ranging from 17,53% to 19,87%). The adjusted R squared of the regression of ROA (Table 5) is comparatively relatively low (i.e., from 1,14% to 3, 08%). Since our goal was not to predict the performance (ROA) but rather to test whether the relationship between UNGC adoption and ROA is affected by other factors, we believe that the low adjusted R squared obtained is still consistent with the objective of the analysis.

The country's level of development (measured through HDI index) has a significant effect on the relationship between UNGC adoption and sales performance ($\beta = -0{,}0758$, $p < 0{,}05$), but has no effect on the relationship between UNGC adoption and profitability, thus partially supporting H4. Moreover, the analyses show that the labor intensity and the environmental sensitivity of the sector do not affect the relationship between UNGC adoption and firm performance, neither considering sales growth nor considering profitability. Therefore, H5 and H8 are not supported. Finally, a significant moderating effect is found for the UN vendorship (positive impact on profitability performance; $\beta = 0{,}1388$, $p < 0{,}01$ in Model 1 and $\beta = 0{,}1392$ $p < 0{,}01$ in Model 2) and for three Hofstede's cultural dimensions (negative impact on sales variation performance), i.e. individualism ($\beta = -0{,}0986$, $p < 0{,}05$), uncertainty avoidance ($\beta = -0{,}1096$, $p < 0{,}1$), and long-term orientation ($\beta = -0{,}0865$, $p < 0{,}1$). These results partially support H6 and H7.

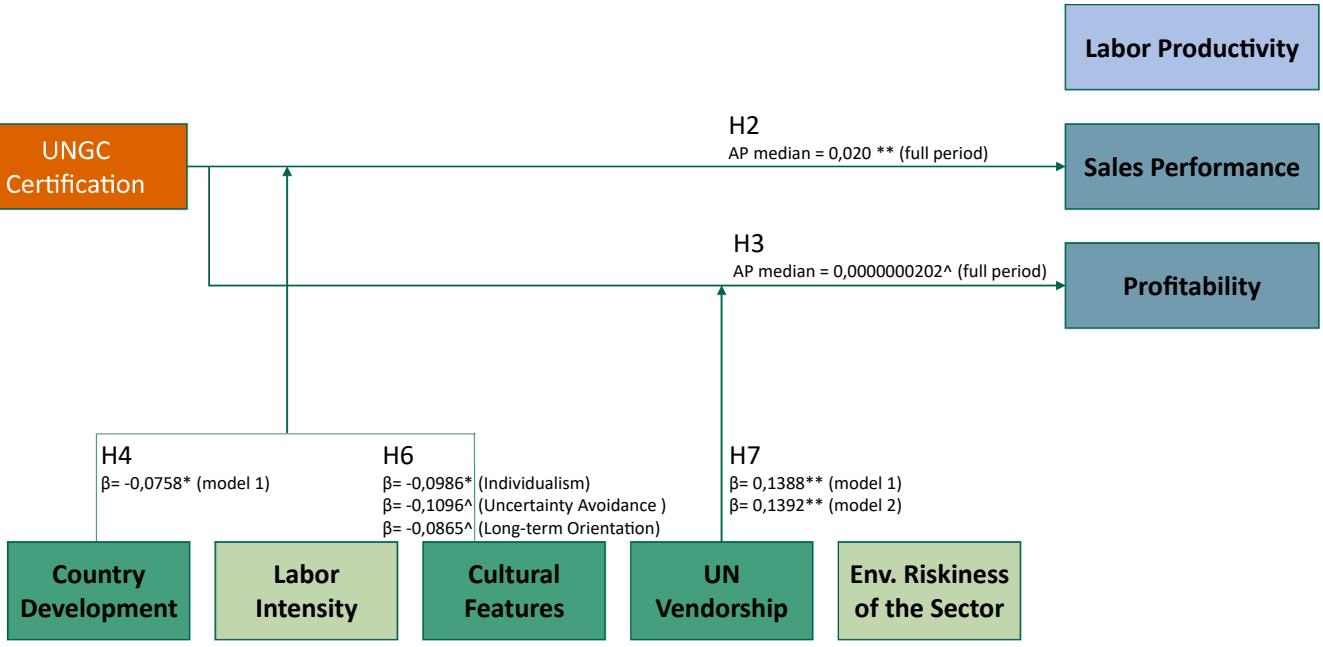
Fig. 2 highlights the research hypotheses empirically supported by our analyses.

6. Discussion

6.1. Event-study analysis (direct impact of UNGC on firm performance)

In this section we will first summarize the results associated with the hypotheses and then provide a coherent and comprehensive interpretation for each of the results.

H1 is not supported: no significant effect on labor productivity emerges from our analysis. Conceptually, the UNGC requires process re-engineering initiatives to promote the involvement of the workforce, the improvement of working conditions, the exclusion of child labor, and many other actions in the factory and in the industrial relationships. The intention of satisfying workers, considered as unique and valuable resources, and developing a proactive dialogue with them, is one of the main motivations for UNGC adoption according to previous studies



^,*,**,*** Significant at the 10, 5, 1, and 0,1 per cent levels, respectively.

Fig. 2. Synthesis of the results (supported hypotheses).

(Arevalo and Aravind, 2011; Lehmann et al., 2010). As already discussed, RBV provides strong arguments for predicting a positive impact of certification on labor productivity. However, our results do not show this effect: even if there could be an improvement in employees' conditions and involvement, it has no impact on productivity. Consistently with the Signalling Theory (ST), the certification creates a signal, recognized externally, but apparently not internally and so there is not an impact in terms of productivity.

H2 is supported: our analysis shows that UNGC companies obtain better sales performance than similar firms (control sample) in all the time periods starting from year t-1. More specifically, we found significant positive abnormal performance in the years from t-1 to t, t+1, and t+2. This result confirms the theoretical prediction of ST: the UNGC adoption helps companies to improve their corporate image since it shows a higher commitment to CSR and allows to operate under the UN name (Berliner and Prakash, 2015; Cetindamar and Husoy, 2007; Corbett et al., 2005; Eccles et al., 2014; Gilbert and Behnam, 2012). In particular, it signals to ethical customers a set of desirable attributes that cannot be verified at the time of purchase. This result is also aligned with the predictions of RBV, which postulates a positive link of UNGC adoption with both reputational benefits and image gains, which can be considered as valuable resources that result in higher sales.

H3 is supported: UNGC companies obtain higher profit levels than similar firms (control sample). More specifically, the certification shows significant positive abnormal performance from year t-1 to t+1, t+2 and from year t to t+1. This result is consistent with the sales growth highlighted above and explained by both ST and RBV, without requiring an increase in costs (Bernhagen et al., 2013; Voegtlin and Pless, 2014). As noted in the background section, there are only two other studies that analyze the impact of UNGC on profitability. The work of Rodriguez-Fernandez (2016) shows no effect, while the work of Ortas et al. (2015a) shows a positive effect but within a mediated and bidirectional relationship with ESG performance. Both works have a precise geographical characterization (the companies analyzed are Spanish, French and Japanese). This is therefore the first study to document a direct positive effect between the UNCG and profits based on an extensive and cross-country sample. This result can be considered as good news for the certifying institution: the objective of the UN is to encourage the adoption of CSR principles by the business world. Nothing better than positive performance feedback can promote this goal. However, these data are also compatible with a less bright picture.

Combining the results associated to the three hypotheses, we observe that the theoretical predictions are confirmed in H2 and H3, but not confirmed in H1. This result is particularly interesting in the light of the debate on "decoupling", i.e. the fact that the characteristics of the UNCG (lack of selectivity and the absence of monitoring mechanisms) allow companies to undertake symbolic rather than substantial adoptions (Berliner and Prakash, 2015; Knudsen, 2011). The decoupling argument provides an explanation that reconciles theoretical predictions with empirical evidence: the image and reputational gains of certification can alone explain the increase in sales and the consequent profits improvements, thanks to the signal provided to customers and markets. No substantial changes to company's processes and routines may therefore be required to obtain a return from certification. This line of results is aligned with literature insights (Berliner and Prakash, 2015; Bruno and Karliner, 2002; Hoedeman, 2002), which show that companies adopt UNGC (only) to improve corporate image and reputation.

Additionally, we cannot rule out the possibility that interventions on the work organization have actually been undertaken but that they have not yet had an impact. In other words, the commercial, organizational and operational benefits of the certification may not be simultaneous. The UNCG label can be quickly communicated and its benefits can be collected in a short amount of time. On the other hand, organizational and operational changes require longer implementation times, because the value achieved through better resources is not obtainable in the short term. For this reason, performance improvements may potentially be observed only after several years. This consideration finds support in some studies on other CSR certifications. In particular, De Jong et al. (2014) showed that there is only a long-term effect on profitability when adopting the ISO 14001 certification: the environmental capabilities take a long time to develop.

Before concluding that the UNGC certification is good for the financial statements of the adopting companies, but not (necessarily) for the true diffusion of CSR practices, further investigations are therefore required. However, we believe that these results offer adequate arguments to call into question some aspects of the UNGC certification system, in particular the inclusion and monitoring mechanisms.

6.2. *Multiple regression analysis (contextual factors)*

The first result of our regression analysis is that companies located in less developed countries have higher sales benefits from the adoption of UNGC (H4). These companies are usually characterized by worse CSR performance than firms from developed countries and are more exposed to ethical problems (Bremer, 2008; Sartor et al., 2016; Seppala, 2009). This can explain why the adoption of UNGC standard is more beneficial for them. UNGC can also help these companies to obtain access to foreign markets, where the satisfaction of some CSR requirements (e.g., avoiding child labor, safety standards) is crucial. The level of development of the country however does not affect the relationship between UNGC adoption and profitability. A possible explanation is that while firms located in less developed countries have higher sales benefits from the UNGC adoption, their adoption costs are also higher due to the higher CSR gaps to be addressed. A similar non-significant effect was found by Orzes et al. (2017) for the SA8000 certification.

We then find that UN vendors have higher profitability benefits from the adoption of UNGC (H7). Previous literature shed light on the pressures that the UN puts on its vendors to ensure they adopt the UNGC and meet its formal requirements (Bennie et al., 2007; Bernhagen and Mitchell, 2010). Our result suggests that the costs of UNGC adoption are more than covered by the premium prices that these companies can charge both to the UN and to other customers (also thanks to the visibility gains and/or the network effects obtained by being a UN supplier).

Our analyses further highlight that the relationship between UNGC adoption and firms' sales variation is affected by some country-of-origin cultural features (H6). In particular, UNGC has a stronger positive effect on the sales growth of companies headquartered in countries characterized by: (1) low individualism (i.e., collectivist societies: where individuals take care of the society as a whole, and not only of themselves and their immediate families), (2) low uncertainty avoidance (i.e., where uncertainty and ambiguity are well tolerated and individuals' actions are more oriented to risk taking rather than risk aversion), and (3) low long-term orientation (i.e., societies maintaining links with their own past, preferring to keep traditions and norms, and viewing societal changes with suspicion). The negative correlation with individualism may be related to the fact that collectivist societies can represent the most suitable context for adopting CSR standards (Ortas et al. 2015a, 2015b) for various reasons: (1) the gaps to be filled and consequently the adoption costs are generally lower (Sartor et al., 2016); (2) the employees tend to be more sensitive to the improvement in working environment (Ringov and Zollo, 2007); (3) domestic customers are more sensitive to working conditions issues (Orzes et al., 2017). The result about uncertainty avoidance, which is aligned with the study of Orzes et al. (2017) on the effects of SA8000 certification, may be explained by the fact that in countries characterized by lower uncertainty avoidance, where risk is more accepted, there is a higher propensity to invest in CSR

standards/certifications as well as in other "broader" interventions, which may not have quick and low-risk returns. From this perspective, the negative correlation of long-term orientation with sales growth could be explained considering that a culture more rooted in traditions is generally also more oriented to rights and values and so is also more oriented to CSR and to a regulation such as UNGC.

Moving to the cultural features that have not been supported through our analysis, we found that power distance was not significant. This result does not aligned with previous studies (Orzes et al., 2017; Ringov and Zollo, 2007). It can be explained by the fact that while on the one hand "flat" societies could react better to the adoption of CSR practices, on the other hand hierarchical relations could make the management of the changes required for their adoption and implementation easier. The net effect may therefore be not significant.

We found that labor intensity does not have any significant effect on the relationship between UNGC adoption and operating performance (H5). This result should be analyzed in combination with the non-significant effect of UNGC adoption on labor productivity. As we already argued in Section 6.1, interventions on the work organization – whose effects are the most likely to vary according to the firm's labor intensity – might be characterized by longer implementation times and their impact could therefore be observed only after several years (i.e. beyond the event study period considered in our study). Our results however at least do not allow us to rule out the hypothesis that some companies adopt the UNGC standard without substantially improving their processes, management systems, and/or working conditions (i.e., decoupling or symbolic implementation). This calls into question some aspects of the UNGC standard, in particular the inclusion and monitoring mechanisms. Further research is needed to examine this issue specifically.

Similarly, we did not find any significant effect related to the environmental sensitivity of the sector (EPA, 2016) in which a company operates (H8 is not supported). Apparently, this variable is not discriminating the achievement of better performance of the company; it might however perhaps play a significant role in the decision to adopt or not the UNCG standard. Further research could be useful in this sense.

In summary, our results confirm the impact of some context factors on the relationship between UNGC adoption and performance. This suggests considering the context of adoption while studying (also) the UNGC impacts on company performance.

7. Conclusions

This paper was aimed at evaluating the effects of UNGC adoption on economic and financial performance of firms and the contextual factors influencing the relationship. We formulated 8 research hypotheses, tested through a longitudinal event-study methodology. The final dataset includes 810 companies with data referring to the time span 1998–2015. Research hypotheses are formulated consistently with ST and RBV. Results of the analysis demonstrated a significant positive impact of UNGC adoption on sales growth and profitability whereas no significant impact emerged on labor productivity. In terms of affecting factors, country development and cultural features affect the impact on sales performance whereas UN vendorship affects the impact on profitability. No impact was identified by labor intensity and environmental sensitivity of the sector.

Our results provide several contributions to the scientific debate on UNGC adoption.

First, literature about UNGC is still strongly conceptual (Orzes et al., 2018) and this is a major limitation of this field of research, as also reported by Lee and Tang (2018) in discussing the main existing limitations in CSR literature. We developed a research framework grounded on theory, and tested it through a longitudinal empirical analysis on a large sample of firms, therefore providing a significant original contribution to the research field. In performing the analysis, the paper simultaneously uses different theoretical lenses to ground the research hypotheses and the research framework as well as to discuss the results. Selected theories were used by scholars in previous research about UNGC, but never jointly considering the implications and combination of ST and RBV. Secondly, among CSR standards, the UNGC is particularly interesting for two reasons: (1) also thanks to the UN support it is now the world's largest CSR initiative; (2) it does not envisage monitoring and enforcement mechanisms (e.g., third-party audits), and this calls into question the substantial adoption by companies, are they really changing internal processes? Therefore, we contribute to the debate on "decoupling" or symbolic adoption of CSR certifications, illustrating how this certification may be more oriented to symbolic adoption rather than a substantial change in the internal processes.

Finally, our paper provides a contribution to the debate over the effects of CSR practices on firm performance. This is the first study aimed at measuring empirically the effects of the UNGC initiative on firm performance, i.e. labor productivity, sales growth, and profitability. We considered both the direct effect and the affecting factors, especially the country development and the cultural features, not investigated before.

7.1. Contribution to management practice and policy

Deciding whether adopting UNGC is a strategic choice for managers and firms. It requires consideration of, on one side, the investments needed to adopt the standard, and, on the other side, the potential (positive or negative) impacts on firm performance. While the costs for adopting UNGC are usually clear (and lower compared to other CSR standards), the effect on firm performance is a controversial issue. The few empirical studies exhibit some methodological limitations (due to small and country specific samples) and conflicting results. This is the first study that uses a wide and cross-country sample and clearly shows the UNGC (positive) direct effects on sales performance and profitability. Moreover, it shows how some contextual variables affect these effects, demonstrating how the level of development of the country, the UN vendor list membership and some cultural features of the country in which the firm operates (i.e., individualism, uncertainty avoidance, long-term orientation) affect profitability and sales growth. Managers can be encouraged to consider these variables when deciding if and how to adopt the UNGC, especially performing an analysis of the features of the country of implementation before adopting this and so preheventing impacts of firm performances.

Our study has also significant implications for regulatory bodies and policy makers. After the first announcement in 1999, UNGC was partnered by 85 networks located all over the world and by Rotary International (2009). These institutions could use our findings to redefine some UNGC characteristics in order to further strengthen this standard and maximize its diffusion. The results suggest, for instance, to conduct an initial assessment of UNGC candidates, as well as a continuous monitoring of their practices. Some quantitative requirements could also be imposed to the UNGC listed companies. Some controls could be applied along the supply chain in order to avoid that socially or environmentally unacceptable behaviors are outsourced to third parties.

The UNGC less stringent requirements have the benefit to put companies on a socially responsible path without significant problems or investments. On the other hand, the lack of sanction mechanisms, third-party audits, and quantitative requirements could undermine the UNGC credibility. Policy makers could revise some of the main features of this initiative to make it more effective and able to more strongly affect the companies' business processes.

In conclusion, by empirically demonstrating the UNGC positive

effects on firm performances and by providing regulatory bodies with an incentive for its improvement, our study may contribute to the strengthening and the spread of this initiative.

7.2. Limitations and future research

The results of our study are characterized by several limitations. *First*, we focused on publicly listed companies available in the Standard and Poor's Capital IQ Compustat database. While this choice allowed us to have access to reliable balance sheet data, our sample is characterized by some differences compared to the wider population of all UNGC companies, mainly in the distribution by country. We have verified – applying post-stratification weighting with inverse probability (Kalton and Flores-Cervantes, 2003) – that these differences do not affect the results concerning labor productivity and sales performance, while the results of profitability become weaker. We can therefore imagine that companies listed on the stock exchange, which are generally larger, more structured, more visible and subject to stricter rules of transparency, are better able to exploit the advantages of UNGC in terms of profitability. Besides the country, future research could verify the generalizability of our results by using samples more similar to the wider population of UNGC companies in terms of company size and/or industrial sector. *Second*, we considered the impact of UNGC on operating performance only a small number of years after the adoption of the standard (t+1 and t+2). Future studies could extend the event study period to measure the long-term effects of UNGC adoption. *Third*, we did not consider the role of different motivations pursued by companies to adopt the UNGC certification. Further research might exploit the impact of the main antecedents of the certification on the achieved performance. *Finally*, an important direction for future research is related to the comparison between the impacts of the different CSR standards/certifications (e.g., SA8000, UNGC, GRI, ISO 26000) on firms' performance. It would be in fact interesting to study how the features of the CSR initiatives (e.g., requirements, third-party auditing, industry focus) affect the impact on companies' performance.

Author contribution statement

All authors contributed equally to this manuscript and it is very difficult to distinguish the specific contribution of each author. Anyway, Guido Orzes, Antonella Maria Moretto, Marco Sartor, Federico Caniato and Guido Nassimbeni were more involved in the Conceptualization, Methodology, Visualization, and Writing - Review & Editing; while Mattia Moro and Matteo Rossi were more involved in Formal analysis and Writing - Original Draft.

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Appendix 1. Operationalization of the variables

Variable	Measure	Reference(s)
Labor productivity	Operating income/number of employees	Lo et al. (2014), Orzes et al. (2017)
Sales performance	Relative sales growth = $(SALES_t - SALES_{t-1})/SALES_{t-1}$	Corbett et al. (2005), Lo et al. (2014); Orzes et al. (2017)
Profitability	Return on Assets (ROA)	Corbett et al. (2005), Lo et al. (2014), Orzes et al. (2017)
Level of development of the country	Human Development Index (HDI)	United Nations Development Programme (2016)
Labor intensity	Number of employees/total assets	Lo et al. (2014), Orzes et al. (2017)
Cultural features	Hofstede's cultural dimensions: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, indulgence	Hofstede (1980, 2010)
United Nations vendorship	Presence in the UN vendor list	United Nations (2016)
Environmental risky sector	Belonging to a sector that is required to report its releases to the Toxics Release Inventory.	Environmental Protection Agency. (2016)

Appendix 2. Correlation matrix

	ROA t	SVAR t	E/L	FSIZE	HDI	LAB INT	UN VEN	HOF 1	HOF 2	HOF 3	HOF 4	HOF 5	HOF 6	ENV
ROA t	1													
SALES VAR t	0,181***	1												
Early/Late Adopter	−0,058	−0,317***	1											
Firm Size (Employees)	−0,004	0,006	−0,159***	1										
HDI Index	−0,233***	−0,088*	−0,004	0,072	1									
Labor Intensity	0,103*	0,048	−0,033	0,239***	−0,144***	1								
UN Vendorship	−0,010	−0,042	−0,074*	0,200***	−0,030	0,165***	1							
Power Distance (HOF 1)	0,049	0,102**	−0,064	−0,013	−0,568***	0,128**	0,049	1						
Individualism (HOF 2)	0,030	−0,048	−0,027	0,147***	0,552***	−0,018	0,017	−0,601***	1					
Masculinity (HOF 3)	−0,061	−0,118**	0,040	0,084*	−0,042	−0,061	0,012	0,151***	−0,122**	1				
Uncertainty Avoidance (HOF 4)	−0,166***	−0,110**	−0,089*	−0,048	−0,014	−0,043	−0,016	0462***	−0,400***	0,430***	1			
Long-term Orientation (HOF 5)	−0,210***	−0,049	0,018	0,080*	0,303***	−0,079*	0,041	0,068	−0,159***	0,395***	0,346***	1		
Indulgence (HOF 6)	0,149***	−0,008	0,041	−0,035	0095**	0,042	−0,082*	−0,358***	0,324***	−0,269***	−0,436***	−0,597***	1	
Env. Risk	0,067	−0,016	−0,014	−0,036	−0,035	0,002	−0,010	−0,083*	−0,010	0,080*	−0,059	0,017	0,034	1

References

Arevalo, J.A., Aravind, D., 2011. Corporate social responsibility practices in India: approach. drivers, and barriers. Corp. Govern. 11 (4), 399–414.

Arevalo, J.A., Aravind, D., 2017. Strategic outcomes in voluntary CSR: reporting economic and reputational benefits in principles-based initiatives. J. Bus. Ethics 144 (1), 201–217.

Arevalo, J.A., Aravind, D., Ayuso, S., Roca, M., 2013. The Global Compact: an analysis of the motivations of adoption in the Spanish context. Bus. Ethics Eur. Rev. 22 (1), 1–15.

Ayuso, S., Roca, M., Arevalo, J.A., Aravind, D., 2016. What determines principle-based standards implementation? Reporting on global compact adoption in Spanish firms. J. Bus. Ethics 133, 553–565.

Barber, B.M., Lyon, J.D., 1996. Detecting abnormal operating performance: the empirical power and specification of test statistics. J. Financ. Econ. 41, 359–399.

Barney, J., 1991. Resource-based theories of competitive advantage. J. Manag. 17 (1), 99–120.

Bennie, L., Bernhagen, P., Mitchell, N.J., 2007. The logic of transnational action: the good corporation and the global compact. Polit. Stud. 55, 733–753.

Berliner, D., Prakash, A., 2015. Bluewashing the firm? Voluntary regulations, program design, and member compliance with the United Nations global compact. Pol. Stud. J. 43 (1), 115–138.

Bernhagen, P., Mitchell, N.J., 2010. The private provision of public goods: corporate commitments and the United Nations global compact. Int. Stud. Q. 54, 1175–1187.

Bernhagen, P., Mitchell, N.J., Thissen-Smiths, M., 2013. Corporate citizens and the UN Global Compact: explaining cross-national variations in turnout. Bus. Polit. 15 (1), 63–85.

Berthelot, S., Coulmont, M., Serret, V., 2012. Do investors value sustainability reports? A Canadian study. Corp. Soc. Responsib. Environ. Manag. 19, 355–363.

Brammer, S., Brooks, C., Pavelin, S., 2006. Corporate social performance and stock returns: UK evidence from disaggregate measures. Financ. Manag. 35 (3), 97–116.

Bremer, J.A., 2008. How global is the global compact? Bus. Ethics Eur. Rev. 17 (3), 227–244.

Bruno, K., Karliner, J., 2002. The UN's global compact. Cor. Acc. Johannesburg Earth Summit, Dev. 45 (3), 33–38.

Cetindamar, D., Husoy, K., 2007. Corporate social responsibility practices and environmentally responsible behaviour: the case of the United Nations global compact. J. Bus. Ethics 76, 163–176.

Ciliberti, F., Pontrandolfo, P., Scozzi, B., 2008. Logistics social responsibility: standard adoption and practices in Italian companies. Int. J. Prod. Econ. 113 (1), 88–106.

Connelly, B.L., Certo, S.T., Ireland, R.D., Reutzel, C.R., 2011. Signaling theory: a review and assessment. J. Manag. 37 (1), 39–67.

Corbett, C.J., Montes-Sancho, M.J., Kirsch, D.A., 2005. The financial impact of ISO 9000 certification in the United States: an empirical analysis. Manag. Sci. 51 (7), 1046–1059.

Coulmont, M., Berthelot, S., 2015. The financial benefits of a firm's affiliation with the UN Global compact. Bus. Ethics Eur. Rev. 24 (2), 144–157.

De Jong, P., Paulraj, A., Blome, C., 2014. The financial impact of ISO 14001 certification: top-line, bottom-line or both? J. Bus. Ethics 119, 131–149.

Dubee, F., 2007. Structural violence and productivity: the role of business and the United Nations global compact. Int. J. Prod. Perform. Manag. 56 (3), 252–258.

Eccles, R.G., Ioannou, I., Serafeim, G., 2014. The impact of corporate sustainability on organizational processes and performance. Manag. Sci. 60 (11), 2835–2857.

Environmental Protection Agency (EPA), 2016. User's manual for RSEI version 2.1.2 [1988-2002 TRI data]. https://www.epa.gov/sites/production/files/2014-03/documents/users_manualv212.pdf.

Erro, A.G., Sanchez, J.A.C., 2012. Joining the un global compact in Spain: an institutional approach. Revista de Contabilidad 15 (2), 311–355.

Fritsch, S., 2008. The UN global compact and the global governance of corporate social responsibility: complex multilateralism for a more human globalisation? Global Soc. 22 (1), 1–26.

Gilbert, D.U., Behnam, M., 2012. Trust and the United Nations global compact: a network theory perspective. Bus. Soc. 52 (1), 135–169.

Gjølberg, M., 2009. Measuring the immeasurable? Constructing an index of CSR practices and CSR performance in 20 countries. Scand. J. Manag. 25 (1), 10–22.

Goebel, P., Reuter, C., Pibernik, R., Sichtmann, C., 2012. The influence of ethical culture on supplier selection in the context of sustainable sourcing. Int. J. Prod. Econ. 140 (1), 7–17.

Hoedeman, O., 2002. Rio +10 and the greenwash of corporate globalization. Development 45 (3), 39–42.

Hofstede, G., 1980. Culture's Consequences: International Differences in Work-Related Values. Sage Publications, Beverly Hills CA.

Hofstede, G., Hofstede, G.J., Minkov, M., 2010. Cultures and Organizations: Software of the Mind: Intercultural Cooperation and its Importance for Survival. McGraw-Hill, New York, NY.

Hou, M., Liu, H., Fan, P., Wei, Z., 2016. Does CSR practice pay off in East Asian firms? A meta-analytic investigation. Asia Pacific Journal of Management 33 (1), 195–228.

Janney, J.J., Dess, G., Forlani, D., 2009. Glass houses? Market reactions to firms joining the UN global compact. J. Bus. Ethics 90, 407–423.

Jastram, S.M., Klingenberg, J., 2018. Assessing the outcome effectiveness of multi-stakeholder initiatives in the field of corporate social responsibility–the example of the United Nations global compact. J. Clean. Prod. 189, 775–784.

Kalton, G., Flores-Cervantes, I., 2003. Weighting methods. Journal of official statistics 19 (2), 81.

Knudsen, J.S., 2011. Company delistings from the UN global compact: limited business demand or domestic governance failure? J. Bus. Ethics 103, 331–349.

Lee, S., Singal, M., Kang, K.H., 2013. The corporate social responsibility–financial performance link in the US restaurant industry: do economic conditions matter? Int. J. Hospit. Manag. 32, 2–10.
Lee, H.L., Tang, C.S., 2018. Socially and environmentally responsible value chain innovations: new operations management research opportunities. Manag. Sci. 64 (3), 983–996.
Lehmann, M., Toh, I., Christensen, P., Ma, R., 2010. Responsible leadership? Development of CSR at danfoss, Denmark. Corp. Soc. Responsib. Environ. Manag. 17, 153–168.
Lim, A., Tsutsui, K., 2012. Globalization and commitment in corporate social responsibility: cross-national analysis of institutional and political-economy effects. Am. Socio. Rev. 77 (1), 69–98.
Lo, C.K.Y., Pagell, M., Fan, D., Wiengarten, F., Yeung, A.C.L., 2014. OHSAS 18001 certification and operating performance: the role of complexity and coupling. J. Oper. Manag. 32, 268–280.
Lo, C.K.Y., Wiengarten, F., Humphreys, P., Yeung, A.C.L., Cheng, T.C.E., 2013. The impact of contextual factors on the efficacy of ISO 9000 adoption. J. Oper. Manag. 31, 229–235.
Mele, V., Schepers, D.H., 2013. E pluribus Unum? Legitimacy issues and multi-stakeholder codes of conduct. J. Bus. Ethics 118, 561–576.
Miles, M.P., Munilla, L.S., 2004. The potential impact of social accountability certification on marketing: a short note. J. Bus. Ethics 50 (1), 1–11.
Mullins, L.J., 2005. Management and Organisational Behaviour, seventh ed. Prentice Hall, UK, pp. 1052–1058.
Ortas, E., Alvarez, I., Garayar, A., 2015a. The environmental, social, governance, and financial performance effects on companies that adopt the United Nations global compact. Sustainability 7, 1932–1956.
Ortas, E., Alvarez, I., Jaussaud, J., Garayar, A., 2015b. The impact of institutional and social context on corporate environmental, social and governance performance of companies committed to voluntary corporate social responsibility initiatives. J. Clean. Prod. 108, 673–684.
Orzes, G., Jia, F., Sartor, M., Nassimbeni, G., 2017. Performance implications of SA8000 certification. Int. J. Oper. Prod. Manag. 37 (11), 1625–1653.
Orzes, G., Moretto, A.M., Ebrahimpour, M., Sartor, M., Moro, M., Rossi, M., 2018. United Nations global compact: literature review and theory-based research agenda. J. Clean. Prod. 177, 633–654.
Post, J.E., 2012. The United Nations global compact: a CSR milestone. Bus. Soc. 52 (1), 53–63.
Qi, G., Zeng, S., Yin, H., Lin, H., 2013. ISO and OHSAS certifications: how stakeholders affect corporate decisions on sustainability. Manag. Decis. 51 (10), 1983–2005.
Rasche, A., 2009a. Toward a model to compare and analyze accountability standards - the case of the UN global compact. Corp. Soc. Responsib. Environ. Manag. 16, 192–205.
Renneboog, L., Ter Horst, J., Zhang, C., 2008. Socially responsible investments: institutional aspects, performance, and investor behaviour. J. Bank. Finance 32 (9), 1723–1742.
Ringov, D., Zollo, M., 2007. The impact of national culture on corporate social performance. Corp. Govern.: Int. J. Bus. Soc. 7 (4), 476–485.
Rodriguez-Fernandez, M., 2016. Social responsibility and financial performance: the role of good corporate governance. Bus. Res. Q. 19, 137–151.
Ruggie, J.G., 2001. Global_governance.net: the global compact as learning network. Glob. Governance 7 (4), 371–378.
Sánchez, J.L.F., Sotorrío, L.L., Diez, E.B., 2015. The relationship between corporate social responsibility and corporate reputation in a turbulent environment: Spanish evidence of the Ibex35 firms. Corp. Govern. 15 (4), 563–575.
Sartor, M., Orzes, G., Di Mauro, C., Ebrahimpour, M., Nassimbeni, G., 2016. The SA8000 social certification standard: literature review and theory-based research agenda. Int. J. Prod. Econ. 175, 164–181.
Scott, W.R., 2014. Financial Accounting Theory, seventh ed. Pearson Canada, Toronto.
Semenova, N., Hassel, L.G., 2016. The moderating effects of environmental risk of the industry on the relationship between corporate environmental and financial performance. Journal of Applied Accounting Research 17 (1), 97–114.
Seppala, N., 2009. Business and the international human rights regime: a comparison of UN initiative. J. Bus. Ethics 87, 401–417.
Shoji, M., 2015. Global accountability of transnational corporations: the UN Global Compact as a global norm. J. East Asia Int. Law 8 (1), 29–45.
Spence, M., 1973. Job market signaling. Q. J. Econ. 87, 355–374.
Steelman, T.A., Rivera, J., 2006. Voluntary environmental programs in the United States: whose interests are served? Organ. Environ. 19 (4), 505–526.
Stigzelius, I., Mark-Herbert, C., 2009. Tailoring corporate responsibility to suppliers: managing SA8000 in Indian garment manufacturing. Scand. J. Manag. 25 (1), 46–56.
Takahashi, T., Nakamura, M., 2010. The impact of operational characteristics on firms' EMS decisions: strategic adoption of ISO 14001 certifications. Corp. Soc. Responsib. Environ. Manag. 17 (4), 215–229.
United Nations. https://www.un.org/Depts/ptd/un-secretariat-registered-vendors, 2016.
United Nations development Programme official website. www.undp.org, 2016.
United Nations global compact official website. www.unglobalcompact.org, 2016.
Van Marrewijk, M., 2003. Concepts and definitions of CSR and corporate sustainability: between agency and communion. J. Bus. Ethics 44 (2–3), 95–105.
Voegtlin, C., Pless, N.M., 2014. Global governance: CSR and the role of the UN global compact. J. Bus. Ethics 122, 179–191.
Williams, G., Zinkin, J., 2010. Islam and CSR: a study of the compatibility between the tenets of islam and the UN global compact. J. Bus. Ethics 91, 519–533.
Xie, J., Nozawa, W., Yagi, M., Fujii, H., Managi, S., 2019. Do environmental, social, and governance activities improve corporate financial performance? Bus. Strat. Environ. 28 (2), 286–300.
Akerlof, G.A., 1970. The market for" Lemons": Quality uncertainty and mechanism design. Q. J. Econ. 84 (3), 488.
Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). Applied linear statistical models. 1996. *WCB McGraw-Hill.*