




Corporate social responsibility, intellectual capital and financial performance: evidence from developed and developing Asian economies

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Abstract

Corporate social responsibility (CSR) and knowledge-based resources, i.e. intellectual capital (IC), improve financial performance. We combine these to examine how IC moderates the influence of CSR on financial performance. We analyzed 4722 firm-year observations of 787 listed firms, from 2012 to 2017, for five developed (Hong Kong, Japan, Singapore, South Korea, and Taiwan) and six developing (China, India, Indonesia, Malaysia, Philippines, and Thailand) economies. Empirically, for the whole sample, CSR has a positive effect, amplified by IC, on financial performance. The individual CSR dimensions—environmental (ENV), social (SOC) and governance (GOV)—are, however, insignificant. For the developed economies, CSR is negatively related to financial performance, with no IC moderation effect. Furthermore, SOC and GOV enhance financial performance; IC positively moderates only for GOV. For the developing economies, in contrast, CSR enhances firm performance, amplified by IC. And all three CSR dimensions have positive influence on financial performance; IC enhances only the effect of ENV. Hence, only certain CSR-IC dimensions in certain contexts improve financial performance.

Keywords Corporate social responsibility · Value-added intellectual capital · Financial performance · Developed economy · Developing economy

JEL Classification M14 · M41 · L25

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1 Introduction

Firms maximize value through efficient use of resources. Corporate social responsibility (CSR), as dimension of firm behavior, has become popular in business and academia world. The link between environmental protection and social responsibility on the one hand, and corporate governance on the other hand, is at the heart of CSR culture and corporate volunteerism (Hopkins 2007; Cheung et al. 2010; Wang 2011). Moreover, CSR contributes to well-functioning markets and financial stability in economics (Lins et al. 2017), and benefits multiple stakeholders (Kim et al. 2012). Hence, it has been intensively explored in the literature (Lin et al. 2015).

Recently, CSR has been widely measured and reported stimulating better corporate citizenship. The pros and cons of CSR, however, are not easy to test as research has demonstrated inconclusive findings. Aras et al. (2011) argue that these contradicting findings are caused by measurement and methodological issues. Investigating how corporate social programs affect firms' financial performance, scholars have found positive results (Ruf et al. 2001; Orlitzky et al. 2003; Cheung et al. 2010; Wang 2011; Flammer 2013; Brown and Forster 2013; Lin and Amin 2016; Lins et al. 2017; Mutuc and Lee 2019), negative results (Brammer et al. 2006; Berens et al. 2007; Barnett 2007; Wagner et al. 2009; Groza et al. 2011; Chen et al. 2017), and neutral results (Alexander and Buchholz 1978; McWilliams and Siegel 2000).

Following Ni et al. (2015) who explained that other factors might clarify the effects of CSR and the seminal work of Baron and Kenny (1986) to introduce moderator variables when the relation between a predictor and a criterion variable is inconsistent or holds in one setting but not in another, we consider adding a moderator and identify the cause of weak or inconsistent relationships between CSR and financial performance more clearly (Namazi and Namazi 2016). As firm performance and value creation are increasingly grounded on knowledge-based resources (e.g. Grant 1996; OECD 1996; Stewart 1997; Sveiby 1997; Bontis 1998; Inkinen 2015), intellectual capital (IC) may affect the impact of CSR activities on profit. In the fast-changing knowledge-based economy, IC generates sustainable competitiveness and becomes strategically important intangible asset (e.g. Barney 1991).

CSR and IC are increasingly important in the literature (Fuentes-Garcia et al. 2008; Passetti et al. 2009; Aras et al. 2011; Jain et al. 2017). On one side, there is a shift in factors of production and knowledge-based transformation of economies around the world. At the same time, there is a demand for sustainable development among firms. Firms have responded by balancing economic growth and the social and environmental concerns (Jain et al. 2017). Simultaneously, the productive force behind firms is what they know, i.e. their IC (Subramaniam and Youndt 2005; Sumita 2008; Inkinen et al. 2014; Campanella et al. 2014; Inkinen 2015; Cabrilo et al. 2018) that may change the nature and strength of CSR effects on financial performance.

So far, however, these two drivers of financial performance have been separately examined in the literature. While many studies explore the implications of CSR on financial performance (McWilliams and Siegel 2000; Ruf et al. 2001; Wagner et al. 2009; Cheung et al. 2010; Groza et al. 2011; Wang 2011; Flammer 2013; Brown

and Forster 2013; Lin and Amin 2016; Chen et al. 2017) and IC on financial performance (Kujansivu and Lonnqvist 2004; Chen et al. 2005; Goh 2005; Yalama and Coskun 2007; Zéghal and Maaloul 2010; Bontis et al. 2013; Janošević et al. 2013), there is little evidence on how they jointly affect financial performance (Surroca et al. 2010; Razafindrambinina and Kariodimedjo 2011; Lin et al. 2015; Jain et al. 2017).

IC has been found to positively mediate between CSR and financial performance (Surroca et al. 2010; Jain et al. 2017; Khurshid et al. 2017). By using IC as a mediator in CSR-financial performance relations in previous studies, it was assumed implicitly that the model was universal and the role of IC as a mediator was thought to apply equally to all companies (Karazsia and Berlin 2018). We, however, assume that not all companies follow-through on IC equivalently, and want to test whether CSR and financial performance have the same relation across companies from different economic contexts. Only by using IC as a moderator we might assess CSR-financial performance relationship across groups of companies, and reflect groups for which IC is more or less effective than for other groups (MacKinnon 2011). The moderation role of IC in the relationship between CSR and financial performance, so far, however, received no attention in the either CSR or IC literature, which leaves important questions unanswered, such as whether IC alters the nature or strength of the relationship between CSR and financial performance, and whether CSR and financial performance have the same relations across groups of companies.

Based on growing literature confirming that IC as a phenomenon is not identical across different regional, national, and cultural contexts (Inkinen et al. 2017), it is fair to assume that financial effectiveness of CSR activities may vary based on the key intangible assets. In this paper, we argue that the literature lacks in-depth understanding of under what IC conditions CSR activities generate superior financial performance. To test whether and how the nature and the strength of the relationship between CSR and financial performance vary as a function of IC, we empirically investigate how IC moderates the effect of CSR on financial performance. We hypothesize enhancing interactions, in which CSR and IC together have a stronger effect on financial performance than a merely additive one (Andersson et al. 2014). The intuition here is when CSR activities are used, their beneficial effects on financial performance are enhanced when combined with more developed IC. For example, we believe that more competent, reputable, and motivated employees, will better understand benefits of CSR and take more active roles in formulation and implementation of CSR strategies, and will be more actively involved in building positive relationships with stakeholders and corporate image, which together with corporate collaboration and communication systems and organizational culture, may further improve the financial effectiveness of CSR activities. We believe that people, structure, culture, and systems within firms, included as intangible assets in IC, change the effectiveness of CSR strategies.

We focus on the effects of CSR, namely environmental, social, and governance considerations on firm financial performance measured by return on assets (ROA). We analyze these effects based on 4,722 firm-year observations from developed and developing economies in Asia, during 2012–17. We used the World Bank's identification of economies based on gross national product per capita (high-income,

upper middle-income, lower middle-income) to allocate 11 Asian countries to developed or developing economies. We categorized high-income economies as developed economies (Hong Kong, Japan, Singapore, South Korea, and Taiwan), while we classified upper and lower middle-income economies as developing economies (China, India, Indonesia, Malaysia, Philippines, and Thailand).

There are three reasons for selecting these Asian countries. First, building corporate citizenship is expanding in Asia. For instance, Asia had 12% of all CSR activities over the world in 2005, which increased to 21% by 2009, based on Credit Lyonnais Securities Asia CSR Reports. In addition, Asia had 514 listed companies engaged in CSR activities in 2007, which increased to 1145 listed companies by 2017, based on the ESG Data of Thomson Reuters (2019). Second, most empirical evidence on CSR impact on financial performance has been from Western countries. Asian firms are characterized as illiquid, with little separation of management and ownership, and non-transparent family ownership of firms (Cheung et al. 2010). These characteristics have stimulated more research on the influence of CSR on firm performance in Asia (Cheung et al. 2010; Wang 2011; Lin and Amin 2016; Chen et al. 2017). These studies, however, focus on individual countries such as Indonesia, South Korea, and Taiwan. Cheung et al. (2010) investigated the phenomenon among ten emerging markets in Asia using CLSA CSR scores for 2001, 2002, and 2004. However, previous studies provided inconclusive findings, due to various measures of CSR and proxies of firm performance. Third, most prior investigations evaluating the association of CSR with IC and the impact of IC on firm performance have also focused on developed economies (Sharabati et al. 2010; Aras et al. 2011). Hence, there are few studies that examine how the IC and performance link differs by emerging and developing countries (Namvar et al. 2010; Phusavat et al. 2011). Previous research considered IC as an occurrence similar throughout regional, national, and cultural contexts. Inkinen et al. (2017) noted that the majority of IC studies have concentrated on firms in a single regional context, an indication that there is a rare study comparing results from different contexts.

The analysis of the moderating effect of IC on the relationship between CSR and financial performance, however, provides us a way to test generalizability and specificity of IC effects on the CSR- financial performance relationships in different economic contexts and obtain more knowledge ‘when’ or under ‘what’ conditions of IC the relationship between CSR and financial performance is established, and gets stronger or weaker across companies from developed and developing Asian countries. Moderation analysis also enables to identify groups of companies for which IC has its effects or has no effects on this relationship, and to go beyond that to identify in which contexts IC may have iatrogenic effects (i.e. causes more negative outcomes) on CSR-financial performance relationship (MacKinnon 2011). These types of effects would not be observable, without investigation of IC as the moderating variable.

From a theoretical perspective, we merge two streams of literature and suggest a framework that explores joint effect of CSR and IC on financial performance. Specifically, we investigate how IC (human and structural capital) moderates the relationship between CSR and financial performance, which previous studies have largely ignored. Moreover, by separating firms from developed and developing

economies, we test whether the level of country development creates conditions under which effects of CSR and IC on financial performance vary and reflect on economic contexts in which IC might be more effective in facilitating beneficial impacts of CSR on financial performance. In that way, we provide information about the consistency of IC effect across developed and developing Asian economies and obtain knowledge about the generalizability and specificity of IC effects on the CSR-financial performance relationships. From a managerial perspective, the findings guide managers in creating effective CSR strategies and enhancing the implications of CSR programs on financial performance by appropriate investments in IC. For instance, managers may consider adopting socially responsible activities which can attract positive attention and create good impression from stakeholders, and tailor IC thereby maximizing the effects of CSR activities on financial performance.

2 Literature review and hypotheses development

2.1 Corporate social responsibility

The World Business Council for Sustainable Development identified CSR as “the commitment of a business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve the quality of life” (Holme and Watts 2000, p.10). This view is congruent to the conventional definition of CSR from McWilliams and Siegel (2001) as the social activity engagements, looking beyond profit, and doing business not only according to the legal and government requirements, but in the best interest of stakeholders and for the common good. However, CSR becomes a firms’ mandate to act in accordance with some government regulatory requirements (Moon 2004; Sharfman et al. 2004). Aguinis and Glavas (2012) expounded that CSR is an activity of an organization to accommodate the stakeholders’ expectations about firms’ engagements on economic, social, and environmental issues.

CSR is a construct with multiple dimensions according to different interpretation in the literature. Wang (2011) mentioned three major demands that motivate firms in doing CSR, to become more environmentally aware and to protect their environment, to contribute to the wellbeing of the community and employees through social activities and focus on corporate governance. At present, companies have greater involvement in environmental protection and community support in addition to financial and non-financial factors to obtain the essence of strategic sustainability (Asiaei and Bontis 2019). Hence, reports about Environmental, Social, and Governance (ESG) are firms’ medium to convey its commitment to its stakeholders (Weber 2014). The key indicators of ESG show the relevant factors to achieve sustainability (Kocmanová and Dočekalová 2013). There are three groups of key performance indicators (KPIs) for environment which are efficiency, environmental management systems and enforcement, global warming, and other related issues; the KPIs for social status are manpower, stakeholder control, and employment health and safety; and for governance are corporate conduct and board effectiveness.

Institutional theory is the basis of the ESG reporting (Weber 2014). This theory highlights the institutional arguments in organizational analysis and points out that organizations are not isolated, and thus respond to various external pressures (Meyer and Rowan 1977; DiMaggio and Powell 1983; Berthod 2016). Tian et al. (2009) argue that in institutional theory, the firm's behavior is determined by the culture, laws, rules, and regulations. These factors enhance the ratings from ESG reports (Dutta et al. 2012). Brammer and Pavelin (2006), Tang et al. (2012), and Belu and Manescu (2013) expounded that the different aspects of CSR might affect financial performance in different ways, and therefore should be examined individually. Therefore, this study individually considers the CSR dimensions environment, social, and governance on firm financial performance.

2.2 CSR and financial performance

According to stakeholder's perspective, McWilliams et al. (2006) and Callan and Thomas (2009) propounded that building a firm's corporate citizenship on stakeholders generates positive results for the firm. Aside from shareholders, other external and internal stakeholders such as community, suppliers, customers, and employees, would benefit when firms implement corporate citizenship strategies and policies (Freeman 1984). Firms' CSR engagement is associated with sensitivity to stakeholders' needs and risk of stakeholders' scrutiny (Brower and Mahajan 2013). Hence, the implementation of socially responsible activities harmonizes the relationship between firms and their stakeholders (Russo and Perrini 2010; Tu and Huang 2015), and it is related to the financial performance of a company. This link has been explained by the review offering insight in thirty years of studies conducted to explore and understand the effects of social performance on financial performance (Orlitzky et al. 2003).

Mazutis (2013) explained that the firm's management of competing stakeholders' demands through different CSR activities and further implications on financial performance are the critical issues in stakeholder theory. A premise here is that firms with socially responsible practices create a sustainable relationship with stakeholders and become more profitable. This approach is also supported by the resource-based view (RBV) (Barney 1991). From a resource-based view, CSR performance provides a more positive financial outcome (Arsoy et al. 2012) by addressing and satisfying stakeholders' needs, and even going beyond stakeholders' expectations (Ruf et al. 2001). CSR, as a channel of valuable resources, can improve the quality of the firm's overall image or a specific brand, which further contributes to competitiveness and financial performance, subsequently (Ruf et al. 2001; Orlitzky et al. 2003; Brown and Forster 2013).

The financial management and business ethics literature has shown an interest in the implication of CSR activities on firm performance. Prior evidence about the immediate impact of CSR on financial performance has been mixed and contradicting. Ruf et al. (2001) explored the implication of change in corporate social performance after a year on financial accounting measures. Using the CSR data from Kinder, Lydenberg, and Domini, Inc. (KLD) database, their study provided evidence

supporting stakeholder's theory that CSR was favorable to the profitability of the company. Similar findings have been found by (Arsoy et al. 2012), who concluded that CSR and financial performance have favorable relationships in the context of a developing country. In addition, Flammer (2013) revealed that firms who indicated environmentally responsible behavior significantly increased the stock price. Moreover, Lins et al. (2017) explored the effect of CSR intensity as proxy of social capital investment on stock returns during 2008–2009 financial crisis and found that firms with high investment in social capital had a four to seven percent increase in stock returns compared to firms with low social capital investment.

However, CSR may generate disadvantages and negatively influence firm financial performance due to cash outflow (Berens et al. 2007). The investment of a company in CSR programs for stakeholders generate additional costs at the expense of shareholder value (Barnett 2007). Moreover, these activities deflect organizational goals from profit maximization (Wagner et al. 2009) and may not generate benefits (Groza et al. 2011), which negatively implicate profitability. Finally, the insignificant influence of CSR on organizational performance has also been confirmed by some studies (Alexander and Buchholz 1978; McWilliams and Siegel 2000).

In the Asian context, there has also been inconclusive evidence on the influence of CSR over financial performance. Cheung et al. (2010) investigated the impact of CSR on market valuation among firms from emerging markets in Asia. Their study revealed that such firms benefited from the implementation of CSR practices. Choi et al. (2010) confirmed that CSR-oriented firms in Korea generated positive impact on financial performance. Traditionally, business in Korea has rather been concerned with economic value than fair distribution of wealth, environmental protection, community relations, and other similar activities. Different incidents happened in Korea, which influenced an increasing concern for environment and corporate governance transparency. Wang (2011) contemplated on a local CSR index (CSRI) and conjectured that a firm with good corporate citizen will induce greater stockholder's wealth after examining the short-term and long-term stock returns linked to market indices, stock valuation, and growth stock. Lin and Amin (2016) revealed that CSR activities were helpful and had a beneficial impact on firms' performance in Taiwan and Indonesia. They discussed that Indonesia had mandatory reporting on CSR, particularly for firms engaged in natural resources, which increased their engagement in CSR and associated expenditures, and these activities became an integral part of management strategies. The findings from Taiwan were the result of sustainable investment of government and Taiwanese companies in CSR, as well as developed high-tech industry in Taiwan. Chen et al. (2017) employed the CSR Index to estimate CSR performance of Taiwanese firms and concluded that CSR activities increased costs and therefore had negative impact on firms' stock returns.

Although the evidence from prior studies on the CSR-financial performance relationship has been mixed, CSR has proven to be relevant for financial performance. Our logic is that more engagement in CSR (including all three CSR dimensions) will positively influence corporate financial performance, and therefore we develop the following hypotheses:

Hypothesis 1: CSR is positively related to corporate financial performance.

Hypothesis 1a: Environment dimension of CSR is positively related to corporate financial performance.

Hypothesis 1b: Social dimension of CSR is positively related to corporate financial performance.

Hypothesis 1c: Governance dimension of CSR is positively related to corporate financial performance.

2.3 The moderation role of intellectual capita in CSR-performance relationship

The concept of intellectual capital combines diverse academic fields and has been explored from multidimensional perspectives (Inkinen 2015; Wang et al. 2016). IC is an inventory of interlinked knowledge-based resources, existing in the organization (Kianto et al. 2014). Although there are various approaches to categorizing IC, a three-dimensional categorization of IC, as comprising of human, structural and relational capital (Roos et al. 1997; Stewart 1997; Bontis 1998; Tovstiga and Tulu-gurova 2007; Hsu and Fang 2009; Cabrilo 2014) appears to be an emerging standard (Inkinen 2015). These three IC components are seen as related with knowledge embedded in firms' employees; processes and information technology; organizational structures, and relationships and networks (Subramaniam and Youndt 2005; Stewart 1997; Bontis 1998).

As intellectual capital has become more and more important for the competitiveness of companies (Nonaka and Takeuchi 1995; Grant 1996; OECD 1996; Sveiby 1997), it has appeared to be essential to find a way to measure and report on intellectual capital and allow companies to properly manage their IC (Stewart 1997; Sveiby 1997; Pulic 2004; Guthrie et al. 2006; Janošević et al. 2013; Cabrilo 2014; Vishnu and Kumar Gupta 2014). Accounting and financial perspectives on organizational performance have not been sufficient, and in addition these perspectives do not fully capture the specific nature of IC (Lev and Zarowin 1999; Dumay 2009; Janošević et al. 2013; Kianto et al. 2018). Thus, there have been intensive discussions in academic and in the professional community about a suitable model for integrating IC into performance measurement that has resulted in modeling to estimate IC and its components (Brooking 1996; Kaplan and Norton 1996; Edvinsson 1997; Stewart 1997; Pulic 1998; Lev 2001; Andriessen 2004; Sveiby 2010; Cabrilo 2014).

Recent studies focusing on the influence of IC on organizational performance have revealed that this impact is not linear (Pedro et al. 2018) and that IC often reinforces other organization potentials for superior firm performance (Menor et al. 2007; Wu et al. 2007; Hsu and Fang 2009). Studies that explore the interaction between three constructs, CSR, IC and financial performance, have mostly considered IC as a mediator (Surroca et al. 2010; Lin et al. 2015; Jain et al. 2017; Khurshid et al. 2017). These studies have been focused on how the utilization of CSR practices boosts IC and further leads to better organizational performance. However, at present, no study has investigated whether IC modifies the nature and the strength of the impact of CSR on financial performance, or whether IC has similar or specific

effects on the CSR-financial performance relationship across firms from different economic contexts, which are main research questions in this study involving IC as a moderator. We address typical questions in moderation models, such as when (under what IC conditions) the relationship between CSR and financial performance is established and gets stronger or weaker, and whether effects of CSR on financial performance may be significantly influenced by IC for some types of firms rather than for others, for example, firms from developed rather than from developing economies (MacKinnon 2011; Andersson et al. 2014; Namazi and Namazi 2016).

Hitt et al. (2001) have showed that human capital moderates the relationship between strategy and firm performance directing us to test how the whole IC affects the relationship between CSR strategies and financial performance in different economic contexts. In this study, we argue when CSR practices (including all three CSR dimensions—environmental, social, and governance) are used, their positive effect on financial performance is increased when IC assets are more efficiently used. The analysis of the interaction between IC assets and dynamic management practices in facilitating organizational performance (Kianto et al. 2014) supports this positive interaction effect. We extend the study of Kianto et al. (2014) by explaining how to better leverage the available CSR practices for financial performance with better IC at hand. For instance, looking at the moderating role of human capital, employee characteristics, such as agreeableness and conscientiousness about the relevance of CSR activities, can stimulate their proactivity in CSR activities (Grant and Parker 2009). More competent employees are expected to take on broader roles in different CSR activities. Moreover, employees with prestigious credentials contribute to a firm's positive reputation and overall trust in firms' activities (Hitt et al. 2001; Nemiño and Gempes 2018). Thus, human capital may positively impact on how stakeholders perceive the quality of the CSR activities provided by the firm, which further may be translated into higher market value and superior financial performance (Smith et al. 2010). Finally, more motivated employees may be more interested in expanding relationships with different stakeholders and feeling more responsible for overall corporate behavior. In addition, effective formulation and implementation of CSR strategies require not only significant managerial acumen, but effective coordination across the firm in order to configure the resources in ways that help meet stakeholders' needs (Hitt et al 2001). If not managed effectively, CSR activities may reduce rather than increase firm financial performance.

Our discussion above suggests that intellectual capital changes the CSR activities and may alter the nature and strength of the relationship between CSR orientation and corporate financial performance, which indicates the moderation effects of IC on this relationship (Andersson et al. 2014). By using IC as a moderator of CSR-financial performance association we offer a comprehensive and thorough investigation of the relationship and more in-depth understanding of joint effects of CSR and IC on financial performance. This article regards IC as an essential driver to promote CSR as an organizational capability, improving firm performance. We argue here that, if companies use IC more efficiently, they better leverage CSR activities to improve financial performance. Companies with greater relationship/stakeholder orientation, high quality knowledge management processes, and motivated

and competent employees can better align CSR strategies with strategic objectives, which will further augment CSR activities and improve financial performance.

Accordingly, we hypothesize that IC strengthens the effects between CSR and CSR dimensions and corporate financial performance. Hence, we test the following hypotheses:

Hypothesis 2: IC positively moderates the relationship between CSR and corporate financial performance.

Hypothesis 2a: IC positively moderates the relationship between environment CSR dimension and corporate financial performance.

Hypothesis 2b: IC positively moderates the relationship between social CSR dimension and corporate financial performance.

Hypothesis 2c: IC positively moderates the relationship between governance CSR dimension and corporate financial performance.

Figure 1 exhibits the conceptual framework based on the hypothesized relationships. This framework shows the explanatory variables such as CSR and its three dimensions namely: environment, social, and governance. The VAIC is the moderator, and ROA is the outcome variable. In addition, the model includes the control variables such as research and development intensity, capital intensity, size, and GDP per capita.

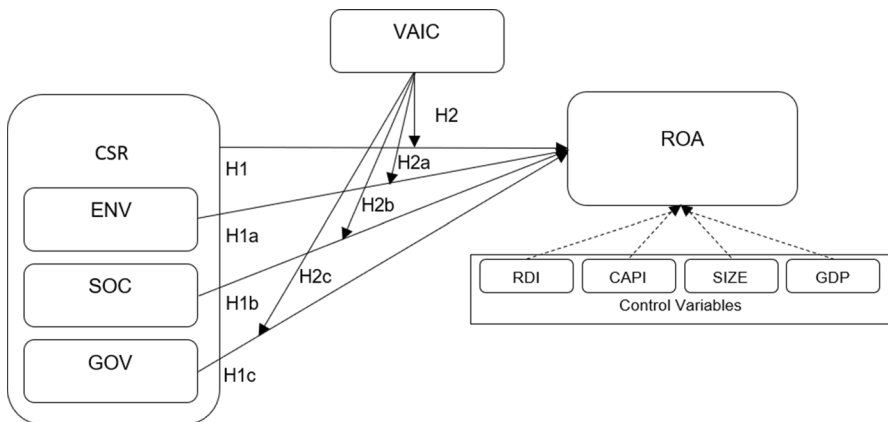


Fig. 1 Research framework. *Note:* ROA is return on assets; CSR is the corporate social responsibility ratings; ENV is the environmental dimension ratings; SOC is the social dimension ratings; GOV is the corporate governance dimension ratings; VAIC is the value-added intellectual capital; RDI is the research and development intensity; CAPI is the capital intensity; SIZE is the natural logarithm of market capitalization; GDP is the natural logarithm of the average GDP per capita.

3 Research methodology

3.1 Data and sample

We investigate how IC moderates the implication of CSR on firm's financial performance from eleven Asian countries and listed in Thomson Reuters ESG database. An initial sample contains 884 firms with complete CSR ratings. After comparing CSR data with the financial data from Thomson Reuters Eikon database, the final sample contained 787 firms with 4,722 firm-year observations from 2012 to 2017. These firms are publicly listed companies and composed of different industries. Moreover, these companies were actively listed and rated accordingly in the Thomson Reuters ESG database. We used the World Bank's classification of economies: high-income, upper middle-income, lower middle-income, and low-income economies, to group firms from developed economies (high-income): Hong Kong, Japan, Singapore, South Korea and Taiwan; and firms from developing economies (upper middle-income, lower-middle income): China, India, Indonesia, Malaysia, Philippines, and Thailand. Table 1 shows the number and percentage distribution of the firm year observations per country. We explore the phenomenon in the combined sample, and with firms from developed and developing economies, separately.

3.2 Variables employed

We consider the ESG (Environment, Social, and Governance) composite ratings as proxy of CSR. We gather these data from ESG database from Thomson Reuters. The ESG score measures firm's comparative ESG performance, commitment and effectiveness across three dimensions/pillars (Environment, Social, and Governance), and 10 main categories/themes, based on publicly available reports. The underlying measures are grouped into 10 categories. According to the Thomson Reuters (2019), the environmental dimension is composed of innovation, emission reduction, and resource use; the social dimension is composed of community, product responsibility, workforce, and human rights; and the governance dimension is composed of CSR strategy, shareholders, and management. Furthermore, categories contain various issues. For example, the category of management under corporate governance dimension consists of various issues such as diversity, composition, committees, independence, and compensation. Measures of the 10 categories form the three pillar scores (Environment, Social, and Governance), and the final ESG rating.

Chetty et al. (2015) note that the financial performance of a company can be evaluated and estimated based on accounting and market-based measures. We use the accounting measures, for three reasons. First, accounting-based measures present the historical perspective elements of a firm's financial performance. Second, these measures provide data about the process of making internal decisions as well as the performance of managers (McWilliams and Siegel 2000). Finally, accounting-based measures are more appropriate in investigating the effect of CSR on financial performance in terms of detection purpose (Moore 2001). More specifically, we use return on assets (ROA) measure, which represents the ratio between profits before tax to

Table 1 Sample characteristics

Countries	Number of observations	Percentage of observations in the total sample (%)	Number of sample firms	Average number of listed firms from 2012 to 2017*	Percentage of sample firms in average number of listed firms (%)
<i>Developed economies</i>					
Hong Kong	258	5.46	43	60	71
Japan	1968	41.68	328	404	81
Singapore	210	4.45	35	43	81
South Korea	420	8.89	70	103	68
Taiwan	648	13.72	108	126	86
Subtotal	3504	74.21	584	737	79
<i>Developing economies</i>					
China	396	8.39	66	86	77
India	384	8.13	64	85	76
Indonesia	12	0.25	2	31	7
Malaysia	222	4.70	37	47	79
Philippines	114	2.41	19	22	85
Thailand	90	1.91	15	27	56
Subtotal	1218	25.79	203	297	68
Total	4722	100.00	787	1034	76

*The average number of listed firms from 2012 to 2017 is based on the ESG data from Thomson Reuters. This study only considers firms with complete set of data from 2012 to 2017 after matching with other financial data from Thomson Reuters Eikon database

total assets. It also reflects the capability of a company to manage its assets and generate earnings.

We measure IC by using the Value-Added Intellectual Coefficient (VAIC) model, which has been the most common ROA-based approach in investigating the effect of IC on firm performance (Aras et al. 2011). Pulic (1998) defined VAIC as a “universal indicator showing abilities of a company in value creation and representing a measure for business efficiency in knowledge-based economy” (p. 9). Researchers and practitioners have often used this model to evaluate IC as a multidimensional construct (Pulic 2004; Tan et al. 2007; Zeghal and Maaloul 2010; Lin et al. 2015; Sardo and Serrasqueiro 2017; Bayraktaroglu et al. 2019). More specifically, the original VAIC model uses human capital efficiency (HCE) and structural capital efficiency (SCE) as IC components, as well as capital employed (CEE), for a broad overview of the efficiency of all resources (Pulic 1998). VAIC is easy to use as it is a standardized method based on publicly available data, and an impartial, objective, and appropriate estimate (Abdulsalam et al. 2011). In measuring VAIC we follow original model of Pulic (2004) and other previous studies (Firer and Williams 2003; Chen et al. 2005; Nazari and Herremans 2007; Zeghal and Maaloul 2010; Maditinos et al. 2011; Lin et al. 2015).

First, we computed value added (*VA*) as the aggregate value of profits retained for the year (*RE*), equity of minority shareholders in net income of subsidiaries (*MIN*), corporate taxes (*CT*), dividends (*DIV*), depreciation expenses (*DEP*), and interest expenses (*INT*) (Firer and Williams 2003; Lin et al. 2015):

$$VA = RE + MIN + CT + DIV + DEP + INT \quad (1)$$

Second, we computed value added human capital coefficient (*VAHC*) as the coefficient of the computed value added over human capital (*HC*). *HC* is embodied in employees and includes their expertise, experience, skills and motivation (Inkinen et al. 2017). Employee costs are used as proxy of *HC* (Nazari and Herremans 2007), where *HC* is measured through salaries and benefits of employees. We measure *VAHC* as follows:

$$VAHC = VA/HC \quad (2)$$

Third, we computed value added structural capital (*VASC*) as the quantitative relation of *VA* and structural capital (*SC*). *VASC* is calculated as the ratio of *SC* to *VA*.

$$VASC = SC/VA \quad (3)$$

Equation (3) shows that *VA* is the denominator and *SC* is the numerator which provides a different implication from Eq. (2). Pulic (2004), Zeghal and Maaloul (2010), and Lin et al. (2015) noted that IC is mainly human and structural capital. Lin et al. (2015) explained that *HC* and *SC* are negatively correlated in creating value for firms. We calculated *SC* as follows:

$$SC = VA/HC \quad (4)$$

Pulic (2004) mentioned that firm's value created does not derive only from firm's IC, but also from physical capital. Following Lin et al. (2015), the sum of *VAHC* and *VASC* serves as proxy for IC. Hence, *VAIC* was estimated by adding *VAHC* to *VASC*.

$$VAIC = VAHC + VASC \quad (5)$$

3.3 Regression models

We employ multivariate regression to examine the association of CSR and its dimensions on firm financial performance, and the moderating effect of IC on the impact of CSR and its dimensions on the financial performance of firms. Our main focus is on the role of combined values of IC components, namely: human and structural capital on composite and disaggregated values of CSR on ROA. We control several variables which influence the effect of CSR on corporate financial performance, and provide additional explanation of these effects. Following Lin et al. (2015), we include on R&D intensity (RDI), capital intensity (CAPI), and firm size (SIZE), as control variables. The R&D intensity is the ratio of R&D expenses to total assets which measures firm's activities in R&D from its resources and enhance productivity and generate firm value (Acquaah and Chi 2007; Lin et al. 2015; Kao et al. 2018). The capital intensity is the ratio of total assets to total sales which measures firm's efficiency in utilizing its assets to generate sales (Acquaah and Chi 2007; Lin et al. 2015; Kao et al. 2018). Moreover, we utilize the natural logarithm of market capitalization as proxy of firm size (Dang et al. 2018). Market capitalization estimates the size of a company based on the firms' current market price and outstanding shares. We also include GDP per capita as a control variable, as this study considers eleven countries in Asia.

3.3.1 Endogeneity issue

This study recognizes the possible impact of endogeneity issue of our main predictor. Firms might utilize CSR to enhance financial performance, whereas firm with greater financial performance are highly capable of doing CSR programs. The OLS estimates is biased because of the endogenous relationship (Bozzolan et al. 2015). We employ a two-stage least squares (2SLS) approach to address the endogeneity problem. We utilize the prior year values of CSR and its dimensions such as ENV, SOC, and GOV as instrumental variables (Waddock and Graves 1997; Surroca et al. 2010). Surroca et al. (2010) noted that panel data enables researchers to exploit past values of potential variable with endogeneity issue to set up an instrument. They also explained that these values are correlated to the endogenous variable because it shows persistence across time and have low-correlation with the outcome variable.

The two-stage least squares analysis involves regressing the endogenous independent variable on the instruments, and then including the predictions for the endogenous independent variable as the independent variable in the second-stage equation. In the first stage, we regress the current year value of the main independent

variable ($CSR_{i,t}$) to the prior year values ($CSR_{i,t-1}$). In the second stage, we regress the predicted value of the main independent variable using the instrumental variable to the dependent variable.

We estimated our models by utilizing fixed effect. We calculated the mean of ROA for the corresponding year, sector, and country and used these values as control in our regression models, following Surroca et al. (2010). Lastly, we control the time to address the time-invariant unobservable heterogeneity.

Hence, we estimate the following model:

$$ROA_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 VAIC_{i,t} + \beta_3 CSR * VAIC_{i,t} + \beta_4 RDI_{i,t} + \beta_5 CAPI_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 GDP_{i,t} + \beta_8 mROA_{i,t} + \beta_9 \eta_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$ROA_{i,t} = \alpha_1 + \beta_1^a ENV_{i,t} + \beta_2^a VAIC_{i,t} + \beta_3^a ENV * VAIC_{i,t} + \beta_4^a RDI_{i,t} + \beta_5^a CAPI_{i,t} + \beta_6^a SIZE_{i,t} + \beta_7^a GDP_{i,t} + \beta_8^a mROA_{i,t} + \beta_9^a \eta_{i,t} + \varepsilon_{i,t} \quad (7)$$

$$ROA_{i,t} = \alpha_1^a + \beta_1^b SOC_{i,t} + \beta_2^b VAIC_{i,t} + \beta_3^b SOC * VAIC_{i,t} + \beta_4^b RDI_{i,t} + \beta_5^b CAPI_{i,t} + \beta_6^b SIZE_{i,t} + \beta_7^b GDP_{i,t} + \beta_8^b mROA_{i,t} + \beta_9^b \eta_{i,t} + \varepsilon_{i,t} \quad (8)$$

$$ROA_{i,t} = \alpha_1^b + \beta_1^c GOV_{i,t} + \beta_2^c VAIC_{i,t} + \beta_3^c GOV * VAIC_{i,t} + \beta_4^c RDI_{i,t} + \beta_5^c CAPI_{i,t} + \beta_6^c SIZE_{i,t} + \beta_7^c GDP_{i,t} + \beta_8^c mROA_{i,t} + \beta_9^c \eta_{i,t} + \varepsilon_{i,t} \quad (9)$$

4 Results and discussions

Table 2 reports the descriptive values of the variables. For the combined sample, the mean value of ROA of 4.67 indicates that, normally, firms in this study are profitable and efficient in utilizing its assets to generate earnings. For the independent variable, the average value of CSR is 47.20. CSR dimensions such as ENV, SOC, and GOV have mean values of 55.57, 52.23, and 33.75. GOV dimension reports the lowest rating among the three CSR dimensions.

For the moderator variable, the mean value of VAIC is 48.00. In terms of control variables, the average value of RDI is 0.04. This result suggests that the expenditure of Asian firms on research and development has an average of 4% impact on the company sales. The mean value of CAPI is 5.18, which reveals the amount of capital based on sales. SIZE based on the natural logarithm of market capitalization, shows an average value of 19.14. This result shows that the firms in this study are big companies as to total values of outstanding shares. Lastly, the mean value of natural logarithm of GDP per capita is US\$9.93, equivalent to US\$28,348 which represents the economic power of the Asian economy.

Comparing developed and developing economies, the mean value of ROA of developed economies is 4.17, lower than in developing economies (at 6.10). These values show that ROA of these two types of economies are statistically different, with $p < 0.01$. These outcomes indicate that firms in developing markets are more

Table 2 Descriptive statistics

	Overall Mean (Std.Dev)	Developed economies Mean (Std.Dev)	Developing economies Mean (Std.Dev)	t-statistic	P value
ROA	4.67 (5.88)	4.17 (5.31)	6.10 (7.07)	-10.01	0.000***
CSR	47.20 (13.21)	46.74 (13.75)	48.51 (11.44)	-4.03	0.000***
ENV	55.57 (19.04)	57.87 (19.66)	48.97 (15.32)	14.35	0.000***
SOC	52.23 (16.52)	52.09 (17.05)	52.65 (14.89)	-1.02	0.309
GOV	33.75 (13.08)	30.23 (12.11)	43.87 (10.21)	-35.19	0.000***
VAIC	48.00 (460.48)	55.83 (515.57)	25.47 (238.27)	1.98	0.047**
RDI	0.04 (0.37)	0.02 (0.03)	0.07 (0.73)	-4.02	0.000***
CAPI	5.18 (10.14)	5.23 (11.21)	5.04 (6.12)	0.56	0.577
SIZE	19.14 (2.01)	19.39 (2.02)	18.44 (1.84)	14.49	0.000***
GDP	9.93 (1.01)	10.46 (0.28)	8.39 (0.76)	109.03	0.000***
N	4722	3504	1218		

Values per column are the mean values while standard deviation values are in parenthesis. *** is statistical significance at the 1% levels on a two-tailed test; ** is statistical significance at the 5% levels on a two-tailed test

profitable when compared to firms from developed markets, based on 2012 to 2017 data. For the independent variable, the mean value of CSR of firms from developed and developing economies are 46.74 and 48.51. These values show that CSR of these two economies are statistically different, at $p < 0.01$. CSR dimensions such as ENV, SOC, and GOV show a mean value of 57.87, 52.09, and 30.23, in developed economies. In developing economies, ENV, SOC, and GOV report a mean value of 48.97, 52.65, and 43.87. The ENV and GOV values from these two economies are statistically different, at $p < 0.01$. These findings reveal that firms from developed economies are engaged more in environmental aspects of CSR, whereas firms from developing economies are more engaged in social and governance CSR activities. For the moderator variable, the mean values of VAIC for firms from developed and developing economies show 55.83 and 25.47. These values show that the VAIC of these two economies is statistically different, at $p < 0.05$. This is evidence that firms from developed economies have higher investment in IC compared to firms from developing economies. For the control variables, the average values of RDI of firms from developed and developing economies are 0.02 and 0.07. In addition, the

mean values of CAPI of firms from developed and developing economies are 5.23 and 5.04. The firms from developed economies have bigger firm size based on market capitalization with 10.46 mean value, versus an 8.39 mean value for firms from developing markets. Obviously, these firms operate in markets with higher GDP per capita, as these companies belong to developed economies.

Table 3 shows the Pearson correlation coefficients for selected variables. ROA has positive and significant correlation with CSR (0.07, $p < 0.01$) and SIZE (0.08, $p < 0.01$). However, ROA has negative and significant correlation with CAPI (-0.17 , $p < 0.01$) and GDP (-0.20 , $p < 0.01$). Moreover, CSR dimensions such as SOC and GOV have positive and significant correlation on CSR at 0.08 ($p < 0.01$) and 0.14 ($p < 0.01$). Consequently, we run separate analysis to each CSR dimensions to identify individual impacts on ROA. Furthermore, we examine the collinearity statistics of each variable through variance inflation factor (VIF). The VIF values show less than < 10 , which indicates that there is no multicollinearity issue among variables.

Table 4 reports the findings of multivariate regressions of ROA on CSR and the moderating effect of VAIC in the whole sample and the sub-samples, using 2SLS. Results from combined sample show that CSR is positively and significantly associated to ROA based on the coefficient of 0.33 and a t-statistics value of 1.97 at ($p < 0.05$), indicating that firms with high-CSR ratings generate better financial performance. This finding supports the hypothesis H_1 . When we control VAIC in regression model 2, CSR has a favorable and significant effect on ROA based on the coefficient of 0.34 and a t-statistics value of 2.01 at ($p < 0.05$), whereas, VAIC has a favorable and significant effect on ROA based on the coefficient of 7.10×10^{-4} and a t-statistics value of 3.22 at ($p < 0.01$). These findings suggest that CSR-oriented firms with higher investments in IC are very likely to generate better financial performance. We analyzed the interaction term CSR*VAIC to test the moderation of VAIC and CSR on ROA. The interaction result shows a positive and significant coefficient of 0.37 and a t-statistics value of 3.65 at ($p < 0.01$), verifying our hypothesis (H_2) which stipulates that VAIC strengthens the positive relationship between CSR and ROA.

Among the firms from developed economies, Table 4 shows that CSR has a negative and significant effect on ROA based on the coefficient of -0.18 and a t-statistics value of -2.00 at ($p < 0.05$), suggesting that CSR-oriented companies are less likely to generate better financial performance in developed economies than those in developing economies. This result rejects hypothesis H_1 , which states that a positive relationship exists between CSR and ROA. When we control VAIC in regression 2, CSR has a negative effect on ROA, with a coefficient of -0.50 and a t-statistics value of -1.95 at ($p < 0.01$), whereas VAIC has no effect on ROA. These findings suggest that CSR-oriented firms less often generate better financial performance, controlling for IC investment. The interaction CSR*VAIC was insignificant, rejecting hypothesis H_2 , which states that VAIC positively moderates the relationship between CSR and ROA. However, CSR has negative and significant effect on ROA at $p < 0.05$.

Among the firms from developing economies, Table 4 reveals that CSR has a beneficial and significant effect on ROA, with a coefficient of 1.04 and a t-statistic

Table 3 Correlations among variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ROA	1.00									
(2) CSR	0.07 ^{***}	1.00								
(3) ENV	0.02	0.02	1.00							
(4) SOC	0.08 ^{***}	0.07 ^{***}	0.77 ^{***}	1.00						
(5) GOV	0.14 ^{***}	0.11 ^{***}	0.18 ^{***}	0.45 ^{***}	1.00					
(6) VAIC	0.02	-0.03 ^{**}	-0.01	0.01	0.00	1.00				
(7) RDI	-0.01	0.01	0.06 ^{***}	0.04 ^{***}	0.00	-0.01	1.00			
(8) CAPI	-0.17 ^{***}	-0.11 ^{***}	-0.03 ^{**}	-0.04 ^{**}	0.05 ^{***}	0.12 ^{***}	-0.03 ^{**}	1.00		
(9) SIZE	0.09 ^{***}	0.16 ^{***}	0.21 ^{***}	0.09 ^{***}	-0.30 ^{***}	0.02	-0.09 ^{***}	0.01	1.00	
(10) GDP	-0.13 ^{***}	0.02	0.17 ^{***}	0.03	-0.22 ^{***}	0.04 ^{***}	-0.06 ^{***}	0.03 ^{***}	0.05 ^{***}	1.00

***Correlation is significant at the 0.01 level (2-tailed). **Correlation is significant at the 0.05 level (2-tailed)

Table 4 Multiple regressions of ROA on CSR and moderating effect of VAIC

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
CSR	0.33 (1.97)**	0.34 (2.01)**	0.31 (1.86)*	-0.18 (-2.00)**	-0.50 (-1.95)**	-0.91 (-1.95)**	1.04 (2.31)**	1.05 (2.04)**	0.92 (2.49)**
VAIC		7.10×10^{-4} (3.22)***	8.03×10^{-4} (3.76)***		2.00×10^{-4} (1.15)	1.91×10^{-4} (0.70)		-4.37×10^{-4} (-0.14)	-0.10 (-1.92)
CSR*VAIC			0.37 (3.65)***			-0.01 (-0.04)			28.79 (2.00)**
RDI	-0.85 (-2.33)**	-0.87 (-2.36)**	-0.81 (-2.28)**	9.34 (3.21)***	9.39 (3.23)***	9.39 (3.23)***	-0.93 (-1.51)***	-0.94 (-1.43)	-0.86 (-1.63)
CAPI	-0.09 (-8.81)***	-0.10 (-9.00)***	-0.10 (-9.43)***	-0.07 (-8.18)***	-0.07 (-8.26)***	-0.07 (-8.25)***	-0.41 (-7.27)***	-0.41 (-7.21)***	-0.34 (-6.02)***
SIZE	0.22 (3.21)***	0.22 (3.10)***	0.23 (3.42)***	0.18 (3.93)***	0.18 (3.93)***	0.18 (3.93)***	1.96 (5.28)***	1.97 (4.84)***	1.63 (6.95)***
GDP	-5.62×10^{-5} (-5.71)***	-5.72×10^{-5} (-5.75)***	-5.50×10^{-5} (-5.66)***	2.12×10^{-5} (2.16)**	2.07×10^{-5} (2.11)**	2.07×10^{-5} (2.11)**	-4.45×10^{-5} (-0.25)	-4.51×10^{-5} (-0.25)	-7.49×10^{-5} (-0.46)
YEAR, COUNTRY, SECTOR	-0.14 (-0.34)	-0.15 (-0.36)	-0.07 (-0.17)	0.06 (0.45)	0.07 (0.53)	0.07 (0.53)	-4.27 (-1.97)**	-4.31 (-1.76)	-2.34 (-2.09)**
Constant	-11.81 (-2.43)**	-12.17 (-2.47)**	-11.40 (-2.38)**	-0.56 (-0.44)	-0.58 (-0.46)	-0.58 (-0.46)	-53.53 (-3.38)***	-53.88 (-3.01)***	-51.16 (-3.69)***
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	21.65***	20.23***	21.38***	11.57***	10.64***	9.75***	9.58***	9.60***	13.15***
R ²	0.0481	0.0490	0.0557	0.0321	0.0324	0.0324	0.0804	0.0873	0.1243
Firm-year observations	4,722			3,504			1,218		
Number of firms		787			584			203	

The table reports 2SLS estimates. We utilize the prior year values of CSR as instrument for CSR in the tabulated first stage presented in the "Appendices 4, 5, 6, 7". Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

value of 2.31 at ($p < 0.05$), suggesting that firms with high CSR ratings are more likely to generate better financial performance in developing economies than those with low ratings. This finding supports hypothesis H_1 , that there is a significant positive effect of CSR on ROA. When we control VAIC in regression 2, CSR has a favorable and significant effect on ROA, with a coefficient of 1.05 and a t-statistic of 2.04 at ($p < 0.05$), whereas VAIC has an insignificant impact on ROA. These findings suggest that CSR-oriented companies with higher IC investments are expected to be profitable. The interaction, CSR*VAIC, indicates a positive effect, with a coefficient of 28.79 and t-statistic of 2.00 at ($p < 0.05$), supporting hypothesis H_2 , that VAIC positively moderates the association of CSR on ROA.

The findings presented in Table 4 were analyzed after controlling other variables that might affect the relation between socially responsible activities and corporate financial performance. RDI coefficients have an adverse and significant implication on ROA at ($p < 0.05$) among developing-economy firms, whereas these coefficients have positive and significant implication on ROA at ($p < 0.01$) among developed-economy firms. RDI has a negative but insignificant effect on ROA of firms from developing economies. These findings suggest that expenditures of Asian firms on research and development (R&D) generate lower corporate financial performance for the combined sample. However, investments in R&D in developed economies result in better corporate financial performance. In addition, CAPI coefficients have a negative and significant influence on ROA at ($p < 0.01$) for the combined and separate samples. These findings suggest that capital-intensive Asian firms generate lower corporate financial performance, regardless of economy classification. GDP coefficients have an adverse and significant effect on ROA at ($p < 0.01$) for firms from the combined sample, whereas these coefficients have positive and significant implication on ROA at ($p < 0.05$) among firms from developed economies. Consistently, coefficients for SIZE have positive and significant relation on ROA at ($p < 0.01$) among the firms from the combined and separate samples. These results indicate that bigger firms generate better corporate financial performance. Furthermore, these results have been analyzed after controlling for fixed effects of year for time-invariant unobservable heterogeneity.

In summary, results on the combined and separate samples reveal that CSR engagements mostly improve firms' financial performance. These findings support previous studies and confirm that socially responsible engagements improve firms' financial performance (Ruf et al. 2001; Arsoy et al. 2012). These results also parallel studies in Asian countries which found that firms benefited from the improvement and implementation of CSR activities (Cheung et al. 2010; Choi et al. 2010; Wang 2011; Lin and Amin 2016). However, our findings provide evidence that the engagement of firms from developed economies in CSR negatively impacts firm performance and generates competitive disadvantages due to cash outflow (Barnett 2007; Berens et al. 2007). Moreover, these activities deflect the company from profit maximization (Wagner et al. 2009) and may not result in expected benefits (Groza et al. 2011), which negatively affect firm's financial performance. The reasons might be that these firms implement CSR, not from the true principle of ethical practices, but based on liability, compliance, and regulatory risks, similar with the findings of (Mutuc and Lee 2019). Moreover, VAIC strengthens the relationship between CSR

and financial performance for firms from the combined sample and for firms from developing economies. These findings suggest that investments in IC most likely help Asian firms to generate superior financial performance based on overall CSR, in line with (Janošević et al. 2013). VAIC has no moderating effect on CSR-ROA relationship for firms from developed economies. We conjecture that in developed economies, CSR has been treated as a strategy of firms to comply with the mandatory requirements and demands of ethical stakeholders, but IC has no significant effect on the effectiveness of CSR programs regarding financial performance.

In terms of ENV, results of multiple regressions of ROA on ENV and moderating effect of VAIC are provided in “Appendix 1”. Results from the combined sample and from the developed economies show that ENV is insignificantly associated with ROA inconsistent with hypothesis H_{1a} . The interaction, ENV*VAIC, reveals a no moderation effect, inconsistent with hypothesis H_{2a} , which claims that VAIC positively moderates the relationship between ENV and ROA. However, firms from the developing economies show that ENV has a beneficial and significant effect on ROA, with a coefficient of 0.04 and a t-statistic of 3.02 at ($p < 0.01$), suggesting that firms with high-ENV ratings are more likely to generate better financial performance in developing economies, verifying H_{1a} . The interaction term, ENV*VAIC, shows a positive and significant coefficient of 1.40 and t-statistic of 1.66 at ($p < 0.10$), supporting hypothesis H_{2a} , which states that VAIC strengthens the effect of ENV on ROA.

The firms from developing economies reveal that ENV engagements improve firm’s financial performance, in line with previous findings that firm’s that are environmentally friendly generate better financial outcomes (Flammer 2013). We conclude that Asian firms treat environmental CSR as an investment which enhance firm reputation and create value for the company. The firms from developing economies benefit from the long-term and cumulative effects of environmental activities on firm performance (Mutuc and Lee 2019). Moreover, VAIC strengthens the relationship between ENV and financial performance for firms from developing economies. These findings suggest that investments in IC and more efficient use of IC help firms from developing economies generate superior financial performance based on ENV activities.

In terms of SOC, “Appendix 2” shows that it has no effect on ROA in the combined sample, finding which rejects the hypothesis H_{1b} . The interaction, SOC*VAIC, indicates a positive effect, with a coefficient of 0.39 and t-statistic of 3.25 at ($p < 0.01$), which supports our hypothesis H_{2b} , that VAIC positively moderates the association of SOC and ROA. However, this finding does not fit the first criteria in moderation analysis since there is no effect of SOC on ROA. The firms from developed and developing economies show that SOC is positively and significantly associated to ROA based on the coefficients 0.01 at ($p < 0.05$) and 0.07 at ($p < 0.01$), and t-statistic values of 1.95 and 5.20. Moreover, findings of interaction, SOC*VAIC, indicates a negative effect from both economy classifications, with coefficients of -0.31 at ($p < 0.10$) and -2.12 at ($p < 0.01$), and t-statistic values of -1.75 and -2.91 , findings which reject hypothesis H_{2b} .

In terms of GOV, similar to SOC, “Appendix 3” shows that it has no effect on ROA in the combined sample, rejecting thus the hypothesis H_{1c} . The interaction,

GOV*VAIC, indicates a positive effect, with a coefficient of 0.63 and t-statistic of 7.28 at ($p < 0.01$), which supports our hypothesis H_{2c} , that VAIC positively moderates the association of GOV and ROA. However, this finding does not fit the first criteria in moderation analysis since there is negligible effect of GOV on ROA. The firms from developed and developing economies show that GOV is positively and significantly associated to ROA based on the coefficients 0.07 and 0.06 at ($p < 0.01$), and t-statistic values of 8.64 and 2.77. However, findings of interaction, GOV*VAIC, indicates a positive effect to firms from developed economies, whereas, negative effect to developing economies, with coefficients of 0.52 and -1.58 at ($p < 0.01$), and t-statistic values of 3.66 and -2.88 . The findings from developed economies supports hypothesis H_{2c} .

The findings on the firms from developed and developing economies reveal that social engagements and good governance improve firms' financial performance. The SOC and GOV aspects of CSR result in positive financial outcome. This outcome is parallel with the findings of (Cheung et al. 2010) that firms are favored from the improvement and execution of CSR practices. We conclude that firms from developed and developing economies treat SOC and GOV dimensions of CSR as investments which enhance firm reputation and create value for the company. In developing economies, VAIC weakens the impacts of SOC and GOV on financial performance. These findings suggest that the investments and efficient use of IC lead to trade-off over the superior generation financial performance based on SOC and GOV activities among developing economies. In developed economies, VAIC strengthen the relationship between GOV and ROA, however, it weakens the relation of SOC and ROA.

4.1 Robustness test

We conduct a robustness test for the combined and separate samples for the moderating effect of VAIC on CSR and ROA based on the above the 75% quartile of CSR scores. These scores are used to categorized firms with high-CSR performance. We find robust evidence based on the combined sample, which suggests that VAIC invigorates the favorable effect of CSR on ROA. In addition, we find robust results based on firms from developed economies, where CSR has negative impact on ROA, and the VAIC- CSR interaction has a favorable and significant effect on ROA. However, firms from developing economies reveal that VAIC strengthens the relationship between CSR and ROA.

We also investigate the moderation effects of individual IC dimensions, such as human and structural capital, on the relationship between CSR and ROA, by using the combined samples. The components of VAIC, VAHC and VASC, were used to explore their effects on financial performance. We have found that when VAHC is used as a moderator variable, the multivariate 2SLS regression results show that CSR and VAHC are significantly associated with ROA. The findings in the interaction term, however, show negligible effect on the ROA. ENV has no significant effect on ROA, whereas VAHC and the interaction terms ENV*VAHC have insignificant effect of ROA. In addition, SOC, VAHC, and the interaction term SOC*VAHC

have significant effects on ROA. Similarly, GOV, VAHC, and the interaction term GOV*VAHC have significant effects on ROA. When VASC is used as moderator variable, we find that CSR is significantly associated with ROA whereas VASC and the interaction term CSR*VASC have insignificant effects on ROA. In the case of ENV, all effects including ENV, VASC the interaction term ENV*VASC have insignificant effects of ROA. SOC and GOV have significant effects on ROA while VASC and the interaction terms SOC*VASC and GOV*VASC have insignificant effects on ROA.

5 Conclusions

We investigate the moderating role of VAIC on the influence of CSR on financial performance of firms in Asia. We also examine this broken down by developed and developing economies. While, we found that in general firms' engagements in CSR generate better financial performance in Asia, we also found that Asian firms do not realize the financial benefits of the CSR dimensions (ENV, SOC, and GOV) when analyzed individually. General outcomes are consistent with previous research about the implementation of CSR practices in Asia. The integration of IC as a moderator strengthens the relationship between CSR and financial performance.

We find contradicting evidence between firms from developed and developing economies. Firms from developed economies show that CSR generates competitive disadvantages in a market which further negatively impacts financial performance. This may be caused by increased stakeholders' pressure and demands for firms at developed markets to take responsibility for the social, environmental, and economic effects of their actions. In developed countries firms have established and promoted CSR as an integral part of corporate business for a longer time, and therefore responding to the very high demands of different stakeholders and satisfying sophisticated social needs seem to become more challenging and bring less benefits from CSR activities to the profit, compared to the developing countries. On contrary, governments of most developing countries facing major social challenges have explicitly sought to engage firms in meeting these challenges. Thus, firms in developing countries have accelerated a process of adaptation of the developed country-driven CSR agenda through greater direct engagement last 15 years. In developing countries, socially responsible behaviors have been more effective in increasing financial benefits than in developed countries, in which it has become more challenging for firms to maximize the positive societal feedback and benefits from CSR activities.

For firms from developed economies, CSR dimensions such as SOC and GOV generate positive outcomes for financial performance, but environmentally responsible activities do not bring short term benefits to these firms. We conjecture that environmentally responsible projects are farsighted programs that can integrate environmental excellence into a business strategy and bring long term financial benefits. For firms from developed Asian economies, IC is a factor that further weakens the impact of SOC on ROA and strengthens the impact of GOV on ROA. The findings from developing Asian economies suggest that firms benefit from their socially responsible programs. The favorable effects are also evident in the environmental,

social, and governance aspects of CSR, and it is reflected in their financial performance. Firms from developing economies implement comprehensive CSR programs to respond to the strong multi-stakeholder pressure and demands, which leads to positive effects on financial performance. In developing economies, IC reinforces changes in the impacts of CSR and its dimensions on financial performance. More specifically, IC strengthens the associations of CSR and ENV on ROA, whereas IC weakens the impacts of SOC and GOV on financial performance.

We made theoretical and practical contributions about the dynamics and evolution of CSR, IC and corporate financial performance. Theoretically, we developed a comprehensive model to explain how IC moderates the effect of CSR on financial performance, filling in the following knowledge gaps. First, we combined CSR and IC as two parallel streams of literature. Second, this is one of the first studies to explore the moderating role of IC in generating financial performance from CSR practices. Previous studies that have investigated CSR and IC effects on financial performance focused exclusively on IC as a mediator, and therefore ignored the potential of IC to strengthen the relationship between CSR and financial performance. Consequently, our approach complements previous findings (see Porter and Kramer 2006; Ni et al. 2015) explaining how IC may change the nature and strength of CSR effects on financial performance. Third, although our main findings show that firm's engagement in CSR activities together with investments in IC, is a powerful tool to improve financial performance, we reveal that certain CSR dimensions, rather than all, in combination with IC are beneficial for financial performance. Fourth, by making comparison between developed and developing economies that has been under-researched in previous studies (Singh et al. 2017), we demonstrate that all effects of CSR and IC on financial performance are context-specific, as the results vary from developed and developing economies. Consequently, we suggest different CSR priorities and IC adjustments for firms in specific economic contexts. For example, firms from developed economies should have to find a balance between short and long-term CSR programs and adapt IC in order to maximize their effects on financial performance. Decision makers may adopt socially responsible activities which can attract positive attention from stakeholders and create good reputation before implementing long-term environmentally friendly programs. Finally, decision makers in firms should be aware that while CSR initiatives and IC improvements are investments, they create many benefits that include better brand recognition, positive image, increased customer loyalty, and generate earnings in the long run.

This research has several drawbacks. First, the CSR information employed in this study are not free of measurement and indexing issues, similar to other sustainability databases. Second, it should also be taken into account that the VAIC method has limitations in measuring IC. Limitations mainly target the connection of VAIC method to the intangible content of IC, i.e. conceptual vagueness (Stähle et al. 2011), ability of method to present value creation potential instead of value created in the past (Janošević et al. 2013), as well as ability of the model to integrate

interactions between IC components (Chu et al. 2011). Finally, one of the most common mentioned drawbacks of Pulic's VAIC has been that it does not incorporate relational capital (Andriessen 2004; Chen et al. 2005; Janošević et al. 2013). In this study we have overcome this disadvantage of VAIC, as relational capital is a part of CSR activities. Despite the criticism (see Andriessen 2004; Chen et al. 2005; Chu et al. 2011; Ståhle et al. 2011), VAIC methodology has become increasingly popular among researchers who have been trying to explore links between IC and financial performance (Firer and Williams 2003; Chen et al. 2005; Zéghal and Maaloul 2010; Janošević et al. 2013) or IC and CSR (Aras et al. 2011). Third, this study was not aimed to explore in depth the effects of particular IC dimensions (human, structural and relational capital by using modified VAIC model) on the CSR-financial performance relationships, which may be the subject of future research. This approach might additionally enrich our knowledge about specificity of IC effects and enable managers to better tailor IC and maximize the effects of CSR programs on financial performance. Fourth, we utilized ROA, an accounting-based measure as a proxy of corporate financial performance. We are aware that market-based and combination of accounting and market-based measures may provide different findings and better assimilate the role of IC in CSR and financial performance relationship. Fifth, our findings show significant predictors but with low R-squared values and encourage future research to include additional variables to increase R-squared values and explain further the phenomenon. Finally, firms from Thomson Reuters ESG database are mostly large and publicly listed firms. Future studies may research the impact of IC on CSR and corporate financial performance relationship in the context of SMEs and non-publicly listed firms. It may trigger a better cognizance of the phenomenon due to different stakeholders' demands and expectations. Moreover, future studies may investigate CSR, IC and financial performance across different industries and make comparative analysis across industries in a country or in a cross-border analysis. CSR engagements may vary across different countries and industries, based on culture, business operations, ethical practices, and government policies.

Appendix 1: Multiple Regressions of ROA on ENV and moderating effect of VAIC

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ENV	0.01 (1.25)	0.01 (1.34)	0.01 (1.40)	4.16×10^{-3} 10 ⁻	4.42×10^{-3} (0.88)	4.15×10^{-3} (0.83)	0.04 (3.02)	0.04 (2.59)	0.04 (2.85)
VAIC		6.88×10^{-4} (3.80)	9.06×10^{-4} (3.60)	10 ⁻	2.07×10^{-4} (1.19)	-1.07×10^{-5} (-0.04)		4.88×10^{-3} (6.60)	4.58×10^{-3} (6.00)
ENV*VAIC			0.20 (1.25)			-0.18 (-1.15)			1.40 (1.66)*
RDI	-0.39 (-1.73)*	-0.39 (-1.76)*	-0.39 (-1.74)*	9.41 (3.24)	9.48 (3.26)	9.42 (3.24)	-0.14 (-0.56)	-0.12 (-0.48)	-0.10 (-0.41)
CAPI	-0.10 (-12.37)	-0.10 (-12.75)	-0.10 (-12.74)	-0.07 (-8.14)	-0.07 (-8.23)	-0.07 (-8.23)	-0.40 (-13.66)	-0.40 (-13.90)	-0.41 (-13.99)
SIZE	0.31 (7.23)	0.31 (7.18)	0.30 (7.18)	0.17 (3.71)	0.17 (3.69)	0.17 (3.71)	1.35 (10.34)	1.34 (10.41)	1.35 (10.49)
GDP	-4.29×10^{-5} (-7.79)	-4.36×10^{-5} (-7.91)	-4.35×10^{-5} (-7.90)	2.04×10^{-5} (2.08)	1.99×10^{-5} (2.02)	2.01×10^{-5} (2.04)	2.13×10^{-4} (2.68)	1.90×10^{-4} (2.44)	1.96×10^{-4} (2.51)
YEAR, COUNTRY, SECTOR	0.65 (6.46)	0.67 (6.62)	0.66 (6.60)	0.07 (0.52)	0.08 (0.61)	-0.71 (-0.56)	0.44 (2.04)	0.44 (2.08)	0.44 (2.06)
Constant	-2.59 (-2.57)	-2.63 (-2.62)	-2.65 (-2.63)	-0.66 (-0.52)	-0.69 (-0.55)	0.08 (0.62)	-20.95 (-6.93)	-20.52 (-6.91)	-20.98 (-7.03)
Year Fixed Effects	yes	yes	yes	Yes	Yes	Yes	Yes	Yes	Yes

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
F	30.79***	29.51***	27.36***	10.58**	9.81***	9.16***	33.34***	35.35***	32.87***
R ²	0.0671	0.0699	0.0703	0.0322	0.0326	0.0330	0.2332	0.2604	0.2619
Firm-year observations		4,722			3,504			1,218	
Number of firms		787			584			203	

The table reports 2SLS estimates. We utilize the prior year values of ENV as instrument for ENV in the tabulated first stage presented in the appendix. Values per column are the unstandardized coefficients while t-stat values are in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 2: Multiple regressions of ROA on SOC and moderating effect of VAIC

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
SOC	0.01 (1.25)	0.01 (1.34)	0.01 (1.40)	0.01 (1.95)**	0.01 (1.96)**	0.01 (1.84)*	0.07 (5.20)***	0.06 (4.32)***	0.05 (3.35)***
VAIC		6.79×10^{-4} (3.75)***	7.65×10^{-4} (4.19)***	–	2.04×10^{-4} (1.17)	4.04×10^{-5} (0.21)		4.63×10^{-3} (6.26)***	0.01 (4.38)***
SOC*VAIC			0.39 (3.25)***	–	–	–0.31 (–1.75)*		–2.12 (–2.91)***	
RDI	–0.38 (–1.70)*	–0.38 (–1.72)*	–0.37 (–1.68)*	–	9.66 (3.32)***	9.56 (3.28)***	–0.12 (–0.47)	–0.10 (–0.40)	–0.08 (–0.31)

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
CAPI	-0.10 (-12.36)***	-0.10 (-12.73)***	-0.10 (-12.50)***	-	-0.07 (-8.15)***	-0.07 (-8.26)***	-0.40 (-13.69)***	-0.40 (-13.92)***	-0.41 (-14.16)***
SIZE	0.31 (7.43)***	0.31 (7.38)***	0.31 (7.42)***	0.17 (3.60)***	0.17 (3.59)***	0.17 (3.62)***	1.37 (10.55)***	1.35 (10.59)***	1.37 (10.75)***
GDP	-4.22×10^{-5} (-7.77)***	-4.27×10^{-5} (-7.88)***	-4.22×10^{-5} (-7.79)***	1.90×10^{-5} (1.94)**	1.86×10^{-5} (1.89)**	1.87×10^{-5} (1.90)*	1.67×10^{-4} (2.13)**	1.53×10^{-4} (1.98)**	1.64×10^{-4} (2.13)**
YEAR, COUNTRY,	0.63	0.64	0.64	0.05	0.06	0.06	0.20	0.25	0.21
SECTOR	(6.14)***	(6.28)***	(6.31)***	(0.37)	(0.45)	(0.47)	(0.92)	(1.16)	(0.96)
Constant	-2.72 (-2.68)***	-2.77 (-2.73)***	-2.87 (-2.83)***	-0.75 (-0.59)	-0.77 (-0.61)	-0.76 (-0.60)	-21.79 (-7.28)***	-21.19 (-7.19)***	-20.74 (-7.05)***
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	30.85***	29.57***	28.16***	10.87***	10.08***	9.54***	35.43***	36.73***	34.82***
R ²	0.0672	0.0701	0.0721	0.0331	0.0335	0.0343	0.2443	0.2678	0.2733
Firm-year observations		4,722			3,504			1,218	
Number of firms		787			584			203	

The table reports 2SLS estimates. We utilize the prior year values of SOC as instrument for SOC in the tabulated first stage presented in the appendix. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 3: Multiple Regressions of ROA on GOV and moderating effect of VAIC

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
GOV	0.03 (1.26)	0.03 (1.35)	0.03 (1.40)	0.07 (8.64)***	0.07 (8.65)***	0.07 (8.81)***	0.06 (2.77)***	0.04 (2.01)**	0.03 (1.64)
VAIC		6.74×10^{-4} (3.75)***	1.11×10^{-4} (5.88)***		2.22×10^{-4} (1.29)	8.15×10^{-4} (3.46)***		4.91×10^{-3} (6.62)***	0.01 (4.41)***
GOV*VAIC			0.63 (7.28)***			0.52 (3.66)***			-1.58 (-2.88)***
RDI	-0.31 (-1.38)	-0.31 (-1.38)	-0.31 (-1.39)	11.58 (4.01)***	11.65 (4.03)***	11.34 (3.93)***	0.01 (0.04)	1.79×10^{-3} (0.01)	0.04 (0.16)
CAPI	-0.10 (-12.55)***	-0.11 (-12.95)***	-0.11 (-13.57)***	-0.07 (-8.54)***	-0.07 (-8.63)***	-0.08 (-9.21)***	-0.41 (-13.67)***	-0.40 (-13.90)***	-0.41 (-14.17)***
SIZE	0.37 (6.22)***	0.38 (6.27)***	0.38 (6.32)***	0.26 (5.62)***	0.26 (5.62)***	0.26 (5.59)***	1.35 (10.34)***	1.34 (10.38)***	1.36 (10.60)***
GDP	-3.76×10^{-5} (-6.02)***	-3.79×10^{-5} (-6.07)***	-3.76×10^{-5} (-6.05)***	-8.38×10^{-6} (-0.82)	-8.93×10^{-6} (-0.87)	-8.85×10^{-6} (-0.86)	1.31×10^{-4} (1.60)	1.28×10^{-4} (1.60)	1.41×10^{-4} (1.77)*
YEAR, COUNTRY, SECTOR	0.54 (4.02)***	0.55 (4.09)***	0.55 (4.13)***	-0.11 (-0.82)	-0.09 (-0.73)	-0.10 (-0.78)	0.44 (1.99)	0.47 (2.16)**	0.40 (1.86)*
Constant	-4.16 (-2.55)**	-4.31 (-2.65)***	-4.40 (-2.72)***	-2.42 (-1.91)*	-2.45 (-1.93)*	-2.41 (-1.91)*	-22.98 (-7.44)***	-22.10 (-7.27)***	-22.23 (-7.33)***
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	31.25***	29.97***	32.11***	17.54***	16.21***	16.12***	33.13***	35.05***	33.20***

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
R ²	0.0680	0.0709	0.0814	0.0524	0.0528	0.0566	0.2321	0.2587	0.2639
Firm-year observations	4722		3504				1218		
Number of firms	787		584				203		

The table reports 2SLS estimates. We utilize the prior year values of GOV as instrument for GOV in the tabulated first stage presented in the appendix. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 4: Multiple regressions of ROA on CSR and moderating effect of VAIC-1st Stage

	Overall Sample			Developed Economies			Developing Economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
CSR_IV	0.05 (3.15) ***	0.05 (3.15) ***	0.05 (3.11) ***	1.96E-03 (0.11)	6.76E-04 (0.04)	1.06E-03 (0.06)	0.07 (2.51) **	0.06 (2.23) **	0.05 (1.72) *
VAIC		-5.49E-05 (-0.13)	-2.48E-05 (-0.06)		-7.71E-04 (-1.74) *	-8.16E-04 (-1.78) *		0.01 (4.03) ***	0.02 (3.02) ***
CSR*VAIC			0.12 (0.62)			-0.08 (-0.37)			-3.17 (-2.16) **
RDI	1.43 (2.84) ***	1.43 (2.84) ***	1.43 (2.84) ***	-24.17 (-3.26) ***	-24.35 (-3.29) ***	-24.34 (-3.28) ***	0.78 (1.83) *	0.80 (1.88) **	0.87 (2.04) **
CAPI	-0.02 (-0.94)	-0.02 (-0.92)	-0.02 (-0.93)	-0.04 (-1.91)	-0.04 (-1.69) *	-0.04 (-1.67) *	0.02 (0.44)	0.02 (0.40)	1.55E-04 (3.06E-03)

	Overall Sample			Developed Economies			Developing Economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	SIZE	0.24 (2.49) **	0.24 (2.49) **	0.24 (2.51) **	0.63 (5.24) ****	0.63 (5.27) ***	0.63 (5.25) ***	-0.75 (-3.36) ***	-0.75 (-3.35) ***
GDP	4.21E-05 (3.43) ****	4.22E-05 (3.43) ****	4.24E-05 (3.45) ****	2.58E-04 (10.13) ****	2.60E-04 (10.21) ****	2.60E-04 (10.18) ****	1.62E-04 (1.21)	1.50E-04 (1.13)	1.81E-04 (1.35)
YEAR, COUNTRY, SECTOR	2.33	2.33	2.33	0.32	0.28	0.28	4.52	4.52	4.35
Constant	(10.19) ***	(10.17) ***	(10.18) ***	(0.96)	(0.83)	(0.84)	(12.72) ***	(12.78) ***	(12.07) ***
Year Fixed Effects	29.07 (12.72) ***	27.28 (11.91) ***	29.03 (12.70) ***	25.38 (8.01) ****	22.74 (7.07) ***	22.75 (7.07) ***	38.29 (7.61) ***	38.60 (7.72) ***	38.81 (7.77) ***
F	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	23.81	21.82	20.17	19.99	18.59	17.16	26.68	26.12	24.54
Firm-year observations	0.0527	0.0527	0.0527	0.0592	0.0601	0.0601	0.1957	0.2064	0.2095
Number of firms	4722	787	787	3504	584	584	1218	203	203

The table reports the 1st Stage Least Square estimates. We utilize the prior year values of CSR as instrument for CSR. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and **** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 5: Multiple regressions of ROA on ENV and moderating effect of VAIC -1st Stage

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ENV_IV	0.93 (177.72)***	0.93 (177.65)***	0.93 (177.46)***	0.93 (154.41)***	0.93 (154.23)***	0.93 (154.10)***	0.93 (77.50)***	0.92 (77.24)***	0.92 (71.69)***
VAIC		-4.51E-05 (-0.22)	-4.31E-04 (-1.41)		-1.40E-04 (-0.62)	-6.23E-04 (-1.83)*		1.20E-03 (1.73)*	6.50E-04 (0.78)
ENV*VAIC			-0.29 (-1.72)*			-0.35 (-1.90)*			-1.80 (-1.19)
RDI	0.17 (0.67)	0.17 (0.67)	0.17 (0.65)	1.74 (0.46)	1.70 (0.45)	1.57 (0.42)	0.11 (0.46)	0.11 (0.48)	0.08 (0.35)
CAPI	-7.38E-04 (-0.08)	-4.98E-04 (-0.05)	-4.38E-04 (-0.05)	3.62E-03 (0.34)	4.42E-03 (0.42)	4.45E-03 (0.42)	-0.01 (-0.48)	-0.01 (-0.48)	-0.01 (-0.26)
SIZE	0.02 (0.36)	0.02 (0.36)	0.02 (0.37)	-0.05 (-0.85)	-0.05 (-0.84)	-0.05 (-0.80)	-0.02 (-0.21)	-0.03 (-0.23)	-0.05 (-0.38)
GDP	9.08E-06 (1.44)	9.12E-06 (1.44)	9.09E-06 (1.44)	-4.09E-06 (-0.32)	-3.73E-06 (-0.29)	-3.16E-06 (-0.25)	-1.11E-04 (-1.53)	-1.17E-04 (-1.60)	-1.27E-04 (-1.73)*
YEAR, COUNTRY, SECTOR	0.25 (2.15)**	0.25 (2.14)**	0.25 (2.16)**	0.07 (0.44)	0.07 (0.40)	0.07 (0.40)	0.38 (1.93)*	0.38 (1.93)*	0.40 (2.01)**
Constant	4.45 (3.86)***	2.15 (1.86)*	4.47 (3.88)***	5.54 (3.42)***	4.92 (2.99)***	4.90 (2.98)***	2.85 (1.03)	2.95 (1.06)	3.58 (1.27)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	3234.12***	2964.01***	2737.37***	2348.44***	2152.39***	1988.58***	728.40***	669.06***	617.92***

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
R ²	0.8831	0.8831	0.8832	0.8809	0.8809	0.8811	0.8692	0.8695	0.8697
Firm-year observations	4722			3504			1218		
Number of firms	787			584			203		

The table reports the 1st Stage Least Square estimates. We utilize the prior year values of ENV as instrument for ENV. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 6: Multiple Regressions of ROA on SOC and moderating effect of VAIC-1st Stage

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
SOC_IV	0.92 (183.70) ***	0.92 (183.68) ***	0.92 (183.73) ***	0.93 (163.72) ***	0.93 (163.69) ***	0.93 (163.34) ***	0.90 (77.60) ***	0.90 (76.87) ***	0.90 (68.11) ***
VAIC		-1.63E-04 (-0.91)	-2.33E-04 (-1.28)		-1.10E-04 (-0.59)	-4.09E-04 (-1.75) *		-5.43E-04 (-0.80)	5.64E-04 (0.11)
SOC*VAIC			-0.19 (-1.82) *			-0.39 (-2.10) **			-0.23 (-0.21)
RDI	0.10 (0.44)	0.10 (0.44)	0.09 (0.42)	1.35 (0.43)	1.32 (0.42)	1.18 (0.38)	0.11 (0.50)	0.11 (0.49)	0.12 (0.50)
CAPI	-6.72E-04	2.05E-04	-5.14E-04	-1.55E-03	-9.14E-04	-1.75E-03	0.03	0.03	0.02

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
SIZE	(-0.08) 0.02 (0.41)	(0.03) 0.02 (0.42)	(-0.06) 0.02 (0.39)	(-0.18) -0.02 (-0.45)	(-0.10) -0.02 (-0.44)	(-0.20) -0.02 (-0.40)	(0.97) -0.01 (-0.08)	(0.97) -0.01 (-0.06)	(0.91) 0.00 (-0.04)
GDP	-1.45E-06 (-0.27)	-1.33E-06 (-0.25)	-1.61E-06 (-0.30)	-2.35E-05 (-2.23)**	-2.33E-05 (-2.20)**	-2.30E-05 (-2.17)	7.81E-07 (0.01)	2.43E-06 (0.03)	4.17E-06 (0.06)
YEAR	0.10	0.10	0.09	0.15	0.14	0.14	0.30	0.30	0.29
COUNTRY,									
SECTOR	(1.01)	(0.97)	(0.95)	(1.08)	(1.03)	(1.04)	(1.54)	(1.51)	(1.46)
Constant	3.43 (3.45)***	3.26 (3.28)***	3.47 (3.50)***	4.34 (3.25)***	4.38 (3.23)***	4.39 (3.24)***	3.52 (1.32)	5.01 (1.85)*	5.03 (1.86)*
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	3246.84***	2976.23***	2748.90***	2574.90***	2359.92***	2180.87***	674.30***	617.98***	569.99***
R ²	0.8835	0.8835	0.8836	0.8902	0.8903	0.8904	0.8601	0.8602	0.8602
Firm-year observations		4722			3504			1218	
Number of firms		787			584			203	

The table reports the 1st Stage Least Square estimates. We utilize the prior year values of SOC as instrument for SOC. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Appendix 7: Multiple Regressions of ROA on GOV and moderating effect of VAIC-1st Stage

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	GOV_IV	0.96 (198.75)***	0.96 (198.78)***	0.96 (198.78)***	0.95 (167.29)***	0.95 (167.31)***	0.95 (167.08)***	0.94 (69.05)***	0.95 (68.71)***
VAIC		-1.96E-04 (-1.58)	-2.00E-04 (-1.62)		-1.84E-04 (-1.52)	-1.41E-04 (-1.00)		-6.61E-04 (-1.23)	3.06E-03 (0.89)
GOV*VAIC			-0.06 (-1.00)			0.08 (0.57)			-0.57 (-1.10)
RDI	-0.15 (-0.99)	-0.15 (-0.99)	-0.15 (-0.99)	0.64 (0.32)	0.59 (0.29)	0.55 (0.27)	-0.18 (-1.00)	-0.18 (-1.00)	-0.16 (-0.89)
CAPI	0.01 (1.52)	0.01 (1.69)*	0.01 (1.72)*	0.01 (1.27)	0.01 (1.45)	0.01 (1.34)	0.03 (1.46)	0.03 (1.46)	0.03 (1.20)
SIZE	0.00 (-2.20)	0.00 (-2.16)**	0.00 (-2.17)**	-0.18 (-5.48)***	-0.18 (-5.47)***	-0.18 (-5.48)***	-0.11 (-1.20)	-0.11 (-1.17)	-0.09 (-1.00)
GDP	0.40 (5.62)***	0.39 (5.54)***	0.39 (5.53)***	1.69E-05 (2.36)**	1.74E-05 (2.42)**	1.75E-05 (2.43)**	-4.97E-05 (-0.85)	-4.94E-05 (-0.85)	-4.25E-05 (-0.73)
YEAR, COUNTRY, SECTOR	-0.16 (-5.37)***	-0.16 (-5.35)***	-0.16 (-5.34)***	0.22 (2.38)**	0.21 (2.27)**	0.21 (2.25)**	0.42 (2.69)***	0.41 (2.67)***	0.38 (2.41)
Constant	3.73 (5.10)***	2.83 (3.86)***	2.83 (3.86)***	4.07 (4.64)***	3.16 (3.56)***	3.17 (3.57)***	5.44 (2.49)**	5.34 (2.44)**	5.23 (2.39)**
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Overall sample			Developed economies			Developing economies		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
F	4662.75	4275.77	3946.93	3311.13	3036.54	2802.44	531.90	487.90	450.54
R ²	0.9159	0.9159	0.9160	0.9125	0.9126	0.9126	0.8291	0.8293	0.8295
Firm-year observations		4722			3504			1218	
Number of firms		787			584			203	

The table reports the 1st Stage Least Square estimates. We utilize the prior year values of GOV as instrument for GOV. Values per column are the unstandardized coefficients, with t-stat values in parenthesis. *, **, and *** indicate statistical significance at 10%, 5%, and 1% for a two-tailed test

Declarations

Conflict of interest The authors have no conflict of interest.

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