



## **How Do Firm's CSR Performance and ESG Ratings Affect Performance and Risk**

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### **ABSTRACT**

Based on data from 1,590 non-financial industry listed firms on the Taiwan Stock Exchange and the Taipei Exchange between 2007 and 2020, this study examines whether a firm's corporate social responsibility (CSR) performance and ESG ratings affect its performance and risk. The firm's CSR performance was constructed based on whether it was included in the list of annual CSR awards by Taiwan's leading business magazines, the *Global Views Monthly* and the *Common Wealth*. Furthermore, referring to the inclusion criteria of the constituents of the Shanghai Stock Exchange Social Responsibility Index, the firm's social contribution value, social return on assets and social contribution value per share were calculated to quantify CSR performance. Firm's TESG ratings variables, including TESG ratings, TESG score, TESG score on environment performance, TESG score on social performance and TESG score on corporate governance performance. Through correlation analysis and regression estimations, the empirical result shows that better CSR performance and ESG ratings are associated with better accounting and market performance and lower risk indicators, indicating that better CSR performance and ESG ratings enable firm to obtain better operating consequences and financial market performance, and also have risk mitigation effect in reducing the volatility of firm's operation and stock market performance.

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*Keywords:* Corporate Social Responsibility, ESG Ratings

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## 1. Introduction

Since the 1990s, Corporate Social Responsibility (CSR) has been widely recognized and pursued by many firms as a means to achieve sustainable development and profitability, while also considering the need to give back to society and build corporate reputation. This important business philosophy goes beyond pursuing maximum benefits for stockholders, and involves supporting the welfare of employees, consumers, disadvantaged groups, and the general public. This concept of social responsibility is not contradictory to the pursuit of financial performance by firms. According to the World Business Council for Sustainability and Development (WBCSD), CSR is defined as "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large". As international organizations, governments, and various types of organization continue to advocate for CSR, more and more stakeholders are paying attention to how public-traded firms perform in this area. There is also an increasing number of firms that are proactively investing huge resource in CSR initiatives, such as improving employee working conditions and quality of life, promoting employment opportunities, and promoting sustainable development, in order to gain the trust of stakeholders, enhance corporate reputation and promote competitive advantage.<sup>†</sup>

Currently, there are various evaluations and related regulations on CSR both domestically and internationally, to analyze the effectiveness and performance of firms' efforts on CSR. In foreign countries, for example, the FTSE4Good Index Series measures global versus regional firms' performance in environmental, social, and governance (ESG) issues, while the Dow Jones Sustainability Global Index measures the performance of global sustainable development business leaders, excluding firms in the alcohol, gambling, tobacco, weapons, and firearms industries. In Taiwan, there are also similar standards and regulations that prioritize CSR rating, such as the Sustainable Development Association, the Ministry of Economic Affairs, the Financial Supervisory Commission (FSC) of the Executive Yuan, the Taiwan Stock Exchange, and the Taipei Exchange. The FSC of the Executive Yuan not only strengthens the internal control responsibility of listed firms, but also requires listed firms in food, financial, chemical industry, and firms with a paid-in capital of over NT\$10 billion to disclose CSR reports, in order to enhance the social responsibility of firms that directly face

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<sup>†</sup> Several scholars have put forward their opinions or definitions of CSR successively. Bowen (1953) defined CSR as the moral obligation of businesses to act in ways that promote the well-being of society beyond their economic interests. Businesses have a responsibility to take into account the impact of their actions on society and to act in ways that are consistent with social values and expectations. Bowen argued that businesses have a social contract with society, which goes beyond the legal and economic obligations of the firm. This contract requires businesses to act in a socially responsible way, even if it means sacrificing short-term profits. Bowen believed that businesses that fulfill their social responsibilities are more likely to be successful in the long run, as they build trust and legitimacy with their stakeholders. The Triple Bottom Line proposed by Elkington (1997) is a concept of CSR that emphasizes businesses should focus on achieving results in three aspects: economic, social, and environmental. Specifically, the Triple Bottom Line model measures a firm's economic benefits, social responsibilities, and environmental impact, and evaluates the firm's performance in these areas. Carroll (1979,1991)'s pyramid of CSR is a framework that identifies four distinct responsibilities of businesses, arranged in a pyramid structure. These responsibilities are economic responsibility, legal responsibility, ethical responsibility and philanthropic responsibility. The pyramid is designed to illustrate how the responsibilities of businesses go beyond just economic success, and that companies have a broader obligation to society as a whole. The pyramid also highlights that businesses should not neglect their economic responsibilities while addressing their social responsibilities. The Stakeholder Theory by Freeman (1984), is a framework for understanding and managing organizational relationships with its stakeholders. According to Freeman, stakeholders are individuals or groups that have a legitimate interest in the actions and decisions of an organization. In contrast to traditional shareholder-focused models of corporate governance, stakeholder theory argues that organizations should consider the interests of all stakeholders, not just shareholders. This includes employees, customers, suppliers, local communities, government, and the natural environment.

consumers (B2C), and to restore the confidence of consumers and the public.

In addition, in Taiwan financial markets, leading business magazines such as the *Common Wealth* and the *Global Views Monthly* also conducted annual evaluations of CSR and established relevant awards. Among them, in 1994, the *Common Wealth* pioneered the concept of "Best Corporate Citizenship" and introduced corporate citizenship scoring items in the annual benchmarking enterprise evaluation, including corporate governance, corporate commitment, social participation, environmental protection and other indicators. In 2005, the *Global Views Monthly* launched a survey on CSR, evaluating the performance in various aspects such as corporate governance, social performance, environmental performance, CSR strategy planning, organizational operations, stakeholder consultation and other aspects and confers "CSR Award". From the above, it can be seen that the success or failure of a firm is closely related to its moral values, responsibilities, and sustainability, all of which are key factors in the evaluation and survival of the enterprise.

Taking the example of a food oil company owned by Taiwan's Ting-Hsin International Group, was found to have used cheap non-edible oil to blend edible oil and falsely labeled the product ingredients and dates, resulting in multiple batches of the products being sold to both the domestic and overseas markets, causing widespread attention and condemnation from Taiwan's society. Ting-Hsin International Group subsequently recalled the affected products across Taiwan, triggering investigations and actions by the Taiwanese government to review and improve food safety regulations. However, the incident caused significant negative impact on Ting-Hsin International Group, including damage to its brand image and a sharp drop in its stock price. Another notorious case is that in 2015, Volkswagen Group was found by the United States Environmental Protection Agency (EPA) to have tampered with emission data from its diesel engine vehicles during testing, making them appear more environmentally friendly than they actually were. In fact, these vehicles emitted far more pollutants than the regulatory standards allowed. This event caused a sharp drop in Volkswagen Group's stock price and prompted global attention and scrutiny towards automotive emissions and environmental standards. Volkswagen Group had to undertake large-scale recalls and reforms to comply with the regulations and standards of various countries. In this event, Volkswagen Group not only faced huge fines and compensation costs, but also suffered severe damage to its brand image and market trust crisis.

On the contrary, Taiwan Semiconductor Manufacturing Company (TSMC) is a company that prioritizes CSR. TSMC is dedicated to reducing its carbon footprint and has set ambitious goals to achieve net-zero emissions by 2050. TSMC has also implemented several environmental initiatives, such as using renewable energy and reducing waste generation. TSMC strives to maintain a diverse and inclusive workplace, which includes providing equal opportunities and promoting work-life balance for its employees. TSMC also prioritizes social responsibility by giving back to the community through various charitable programs and initiatives. TSMC has established partnerships with local organizations to support education, disaster relief, and community development. In addition, TSMC encourages its employees to participate in volunteering activities, contributing to a better society. Overall, TSMC's commitment to corporate social responsibility aligns with its vision to be the world's most trusted and respected semiconductor technology company, creating sustainable value for all stakeholders.<sup>‡</sup>

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<sup>‡</sup> Another famous case is the one of the largest convenience store chains in Taiwan, 7-Eleven (Uni-President Enterprises Corporation) has always placed great emphasis on corporate social responsibility and actively implements related initiatives,

Regarding the reasons for promoting CSR performance of the above-mentioned firms, Cornell and Shapiro (1987) argued that higher CSR performance enhances performance, reduce individual risks by improving corporate reputation, increase profitability, and meet the interests of stakeholders. Waddock and Graves (1997) also suggested that firms with better financial performance have more resources to engage in CSR activities, which can have a positive impact on shareholder equity and asset returns in the following year. Chen, Tang and Hung (2013) found that investing in CSR activities can increase firm value and operational efficiency, while also improving resource utilization and reducing waste, resulting in a significant decrease in operating costs. Ioannou and Serafeim (2015) also suggested that better CSR performance lead securities analysts to provide more buy and hold recommendations. Nowadays, most research findings support the positive impact of CSR on organizational effectiveness (Javed, Rashid, Hussain and Ali, 2020; Miller, Eden and Li, 2020), and several meta-analysis studies also confirm positive correlation between the two (Margolis, Elfenbein and Walsh, 2009; Orlitzky, Schmidt and Rynes, 2003).

However, Friedman (1970) argued that engaging in CSR has a negative impact on financial performance, which is detrimental to the firm's financial performance by misallocating scarce resource. Preston and O' Bannon (1997) explored the relationship between CSR and financial performance with two opposing arguments: the trade-off hypothesis and the social impact hypothesis. The trade-off hypothesis argues that fulfilling CSR transfers a firm's funds and resources, which increases the firm's costs and decreases its financial performance compared to firms that do not fulfill social responsibilities. Schuler and Cording (2006) also believed that only firms with better financial performance have the ability to afford the costs required for CSR, while firms with poor financial performance lack the resources to implement social responsibility. Shiu and Yang (2017) found that firms that have sustained, long-term engagement in CSR experience relatively lower declines in their stock and bond prices when facing negative events. However, this protective effect only works once, and if a firm experiences negative events again, the protective effect of CSR will become invalid. Therefore, it can be concluded that not all studies have found a positive correlation between CSR and a firm's financial performance.

Hong, Chang and Lin (2022) found through correlation analysis and regression estimation that when firms face negative macroeconomic impacts and firm-specific negative events, both financial performance and firm value tend to decrease and volatility increases. However, the study also found that firms with better CSR performance had relatively smaller decreases in performance and lower increases in volatility, confirming the function of CSR as performance insurance. In addition, Gelb and Strawser (2001) found that firms with better social responsibility performance provide more financial information disclosure. Kim, Park and Wier (2012) also found that better CSR performance of firms can help reduce earnings management (proxied by abnormal accruals), thereby improving the quality of the firm's

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including: Environmental protection and energy conservation: 7-Eleven promotes environmental protection and energy conservation initiatives, such as recycling and reducing the use of plastic bags, and using LED lights and highly efficient air conditioning equipment in their stores. Community care: 7-Eleven frequently participates in community and charity events, such as donating supplies to disadvantaged groups and disaster areas, as well as sponsoring community sports and cultural events. Product safety and quality: 7-Eleven insists on the safety and quality of its products, regularly conducting quality and safety inspections, and actively soliciting feedback and suggestions from consumers. Employee welfare and training: 7-Eleven is committed to employee welfare and training, providing competitive salaries and benefits, as well as various professional training and development opportunities to help employees grow and develop in the workplace. Anti-corruption and transparency: 7-Eleven adheres to ethical and business standards, opposes corrupt and fraudulent behaviors, and establishes transparent corporate management and reporting mechanisms to enhance the transparency and credibility of the company.

accounting reporting.

Promoting social responsibility not only has a positive impact on firm performance but also has an insurance effect for firm performance. According to Minor and Morgan (2011), a firm's social responsibility performance helps establish reputation capital and avoid harm, making it more likely that negative events are attributed to bad luck rather than poor management, resulting in lower levels of punishment toward the firm. Godfrey (2005) found that failure to actively improve society (e.g., charitable activities) or curb negative social activities (e.g., environmental protection) may lead to punishment from stakeholders or lawsuits and penalties, increasing the risk faced by the firm and adversely affecting its credit risk and ratings. Pelozo (2006) suggested that CSR has an insurance effect, and Chen, Hsiu and Chang (2015) and Hsu, Chen and Tseng (2013) found that firms with higher social responsibility ratings have better credit ratings, with the degree of participation in social responsibility activities affecting the credit rating level, and that social responsibility contributes to a firm's financial performance, which in turn affects its ability to repay debts, influencing its credit risk rating. Kim, Li, and Li (2014) further suggested that better social responsibility performance reduces the risk of stock price crash risk.

Some studies have yielded different findings. McWilliams and Siegel (2000) suggest that a firm's implementation of social responsibility often depends on factors such as the firm's size, research and development capabilities, etc. Generally, larger firms are better able to attract public attention to their social responsibility efforts. However, if a large firm has a high debt ratio, or if a smaller firm lacks funding, it may be less able and willing to fulfill its social responsibilities. Nieh, Lin and Chi (2017) also found that mid-sized firms with total assets between certain thresholds may not see an improvement in business performance even if they invest more capital in social responsibility, due to insufficient social awareness. Overinvestment in social responsibility could erode the firm's profits and hinder its ability to increase performance. Furthermore, Cardebat and Sirven (2010) found that there is no correlation between a firm's engagement in social responsibility and its financial performance. As the cost of social responsibility activities increases, most firms are hesitant to increase spending on social responsibility due to cost considerations. Chen, Hung and Wang (2018) also found that mandatory disclosure of social responsibility reports can lead to various negative effects, such as decreased sales, increased operating costs, increased asset impairment losses, decreased capital expenditures, and decreased market growth opportunities.

The above literature explores CSR in terms of both enhancing firm performance, avoiding risks and reducing harms. However, various studies have shown conflicting results regarding whether investing too much in CSR erodes a firm's profits, leading to various risks or deteriorating firm performance. Clearly, there are different arguments on this matter. Based on data from 1,590 non-financial industry firms listed on the Taiwan Stock Exchange and the Taipei Exchange between 2007 and 2020, this study examines whether CSR performance affects a firm's performance and risk. The study constructs the CSR performance of firms based on whether they have been included in the annual CSR awards lists of leading business magazines such as the *Common Wealth* and the *Global Views Monthly*, as well as by incorporating the Shanghai Stock Exchange's Social Responsibility Index. The study quantifies CSR performance through social contribution value, social return on assets, and social contribution value per share, and uses correlation analysis and regression estimation to show that CSR performance is positively correlated with firm performance and negatively

correlated with firm risk.

The contributions of the study mainly include the following four aspects. Firstly, in addition to using accounting-based performance indicators, this study also adopts market-based performance indicators to comprehensively evaluate whether a firm's CSR engagement is reflected in its operational results and how the financial market evaluates whether a firm's CSR engagement can truly create additional value. Secondly, in quantifying the firm's risk, in addition to the volatility of operational results and stocks returns, referring to Kim, Li, and Li (2014), this study specifically measures the skewness of the stock returns, focusing on the downside risk of stock returns, that is, the severity of the financial market's reaction when a firm experiences negative events or impacts. These two risk indicators measure the severity of the firm's poor or extremely deteriorating conditions and are different from the volatility of returns, while also addressing both upside risk and downside risk.

Thirdly, this study decomposes the concept of social contribution value in the measurement of CSR performance into the contributions of firm's four major types of stakeholders (stockholders, employees, creditors and governments) and evaluates whether the contributions to different stakeholders differ in improving performance and reducing risk, thereby assisting in assessing where the firm should invest more CSR for which types of stakeholders. Fourthly, while in recent years there has been a shift towards more concrete assessment and quantification of the ESG dimensions in measuring a firm's performance in CSR, this study uses the recently announced TESG rating framework, including TESG ratings, TESG scores, and the scores of the environmental, social, and corporate governance areas, as well as the ranking of these scores among different industries. On the one hand, this helps reduce the industry differences in measuring CSR performance, and also helps evaluate the differences in the impact of the firm's ratings on performance and risk at different levels, making this paper's measurement of CSR performance more comprehensive.

The next section describes literature review and hypothesis development, followed by the third section on variables, econometric models, samples, and data. The fourth section presents empirical results, and the final section concludes with recommendations.

## **2. Literature Review and Hypothesis Development**

### **2.1 The Development and Regulations on CSR**

**CSR** is a highly regarded issue in international practices and management, with significant attention from regulatory authorities and financial markets in various countries. Both firms and nations should consider the implementation of CSR based on long-term planning for future operations. The Clean Water Act (CWA) in the United States originated in 1948 and was initially named the Federal Water Pollution Control Act. This law regulated the discharge of water pollution and surface water quality standards to ensure water quality. In 1972, the law underwent extensive modification and expansion to become the current Clean Water Act (CWA). The U.S. Environmental Protection Agency has established standards for industrial wastewater discharge and national water quality standards for pollutants in surface water based on this law. In addition, the United States has implemented legislation such as the Clean Air Act (CAA), the Toxic Substances Control Act (TSCA), the Resource Conservation and Recovery Act (RCRA), and policies and regulations related to circular economy since 2019. These laws demonstrate that firms and nations must address their impact on the environment while pursuing rapid economic growth and find a balance between the two. In 2022, the U.S. president signed a \$437 billion "Inflation Reduction Act," with \$369 billion allocated to energy security and climate investments. The budget will mainly be used to invest

in cultivating a domestic supply chain for green energy technology, supporting green energy banks and agricultural emission reductions, promoting the use of electric vehicles, and rewarding agriculture for capturing new emerging climate technologies such as carbon and hydrogen. This bill demonstrates the United States' emphasis on global energy and climate change issues and hopes to lead global innovation as a guiding indicator.

Over the past decade, there have been significant changes in the Asian financial markets, with the ESG trend sweeping across Asia from Europe and the US, prompting Asian economies to actively promote sustainable development reforms. Japan's ESG-related regulations have been a leader in the Asia-Pacific market. In 2014, the Japanese Financial Services Agency issued the "Japan Stewardship Code," which mainly targets institutional investors and investment agents who entrust investments in Japanese listed firm stocks, proposing seven principles. The code has significantly improved the quality of management and information disclosure for institutional investors, and was revised in 2020 to expand the asset categories that meet the definition of stewardship. Although the code is not legally binding, the number of institutions that have signed it has increased from 214 in 2016 to 280 in 2020, indicating that the ESG management trend has had a significant impact on Japanese firms and markets.

Given the flourishing development of CSR activities by foreign firms, our country has gradually promoted relevant policies and measures in the past decade. In 2014, the Financial Supervisory Commission (FSC) issued the "Operating Guidelines for Listed (OTC) Firms to Compile and Declare CSR Reports," which requires firms in the food industry, financial and insurance industry, chemical industry, and those with a paid-in capital of over NTD 10 billion to refer to the latest version of the sustainability reporting guidelines and prepare a CSR report for the previous year. Since 2015, this requirement has been extended to firms with a paid-in capital of over NTD 5 billion. To align with the domestic authorities' sustainable development policies, the Taiwan Stock Exchange has also compiled various social responsibility investment-related indices since 2010, such as the "Taiwan Employment 99 Index", "Taiwan High Salary 100 Index", and "Taiwan Corporate Governance 100 Index". These indices allow investors to incorporate relevant factors that affect the environment, society, and corporate governance into investment decisions, encouraging firms to allocate more resources towards fulfilling their social responsibilities.

In recent years, a new and more specific way of measuring CSR performance has emerged and developed in management practice and academia. This is called ESG performance, which stands for environmental, social, and governance. The concept of ESG was first introduced in the 2004 United Nations report "Who Cares Wins", which emphasized the importance of considering the impact of ESG factors on long-term financial performance in CSR and risk management. In terms of environmental protection, ESG measures greenhouse gas emissions, water and wastewater management, biodiversity, and other aspects of environmental pollution prevention and control. In terms of social responsibility, ESG measures customer welfare, labor relations, diversity and inclusiveness, and other aspects of stakeholder impact in various industries. In terms of corporate governance, ESG measures business ethics, competitive behavior, supply chain management, and other aspects related to corporate stability and reputation. CSR and ESG are related but not entirely identical concepts. ESG assessment covers multiple dimensions such as climate change, environmental impact, employee welfare, corporate governance, anti-corruption, and anti-bribery, while CSR is more focused on a firm's social responsibility and ethical behavior.

In 2015, the United Nations proposed 17 Sustainable Development Goals (SDGs) as a guiding framework for countries around the world to work towards sustainable development by 2030, in response to the common challenges faced by humanity. These SDGs include goals such as poverty eradication, zero hunger, gender equality, clean water and sanitation, climate action, sustainable consumption and production, and more. They are further broken down into 169 tracking indicators, covering three major dimensions: economic growth, social progress, and environmental protection. Many European and American firms have already made SDGs their direction for promoting business and CSR, because these goals address the problems that humanity is facing. Providing solutions to these problems presents potential market demand while also responding to the needs of stakeholders. Although Taiwan is not a member of the United Nations, and not all SDGs may be applicable to Taiwan, many Taiwanese firms have started to pay attention to SDGs and align their CSR activities with corresponding SDG goals. SDGs apply to all stakeholders including countries, governments, businesses, organizations, and even citizens. CSR and ESG mainly apply to businesses, and while these three concepts appear independent, they actually complement each other. CSR is the concept of sustainable business operation, while SDGs are international sustainable development goals. Thus, businesses can link their own sustainable development goals with SDGs to enhance their international competitiveness. In addition to being a measurement indicator for practicing CSR, ESG can also be combined with SDGs to help businesses formulate long-term development goals and sustainable behavior. Through this integration, SDGs can be embedded into organizational culture and normal operations, which strengthens sustainable values and creates more social welfare.

## **2.2 CSR, ESG, Firm Performance and Risk**

**Referring** to Shen and Chang (2008), a firm's CSR performance helps to enhance its performance. For example, earlier Bowen (1953) and Arrow (1973) recognized that corporate activities are closely related to all members of society, so they should consider the rights and interests of all stakeholders, taking from society and using it for society. Freeman's (1984) stakeholder theory suggests that a firm can maximize its value by meeting the interests of all its stakeholders. Cornell and Shapiro (1987) and Preston and O' Bannon (1997) believe that if a firm can meet the expectations of stakeholders from all levels of society, it will have a positive impact on the firm's financial performance. A higher social performance will lead to better financial performance, and there is a positive relationship between the two.

Cochran and Wood (1984) found a positive relationship between a firm's social responsibility performance and its financial performance. Waddock and Graves (1997) found a positive relationship between a firm's social responsibility performance and its return on assets, return on equity, and sales growth. Better financial performance also tends to lead to greater investment in social responsibility, creating a positive cycle. Firms with good social responsibility performance typically provide employees with a safe and healthy work environment, which can increase productivity (Turban and Greening, 1997). Donations or charitable activities can enhance a firm's reputation and trustworthiness (Bowman and Haire, 1975; Alexander and Bucholtz, 1978) and increase its brand image and competitiveness in the market (Porter and van der Linde, 1995; Fombrun, Gardberg and Barnett, 2000). Similar findings have been reported by Brammer and Millington (2005), Luce, Baber and Hillman (2001), and Hull and Rothenberg (2008). Wu and Shen (2013) confirmed that banks with better social responsibility performance tend to have better financial performance using a sample of banks. Other studies worth mentioning include Kim, Li and Li (2014) and Lins,



Servaes and Tamayo (2017).

In recent years, more and more empirical studies on the impact of a firm's ESG performance on its financial performance or firm value have emerged. Aydoğmuş, Gülay and Ergun (2022) employ the data of largest 5,000 publicly listed firms around the global from Bloomberg database from 2013~2021 and found that overall ESG combined score is positively and significantly associated with firm value. Individual Social and Governance scores have a positive and significant relationship while Environment score does not have a significant relationship with firm value. On the other hand, ESG combined score, Environment, Social, and Governance scores have positive and significant relationships with firm profitability. Fatemi, Glaum and Kaiser (2018) employ the data of 11,000 firms in 63 countries to examine the effect of environmental, social, and governance (ESG) activities and their disclosure on firm value and find that ESG strengths increase firm value and that weaknesses decrease it. Wu, Li, Du and Li (2022) investigate the relationship between Environmental, Social and Governance performance and firm value of Chinese manufacturing listed firms, and find that ESG performance is important in improving firm value and executive and institutional ownership both positively moderate the linkage between ESG performance and firm value. Quintiliani (2022) employ a data of 115 listed firms in Europe from 2016 to 2020 to investigate the correlations between ESG score and firm value, and found that there is a positive correlation between ESG score and firm performance and firm value. Similar studies can be referred to Tahmid, Hoque, Said, Saona and Abul Kalam Azad (2022), Yahya and Vaihekoski (2021), Li, Gong, Zhang and Koh (2018), Ionescu, Firoiu, Pirvu and Vilag (2019), Pulino, Ciaburri, Magnanelli and Nasta (2019), Nguyen, Hoang and Tran (2022), Ahmad, Mobarek and Roni (2021), Touati and Hult (2022), Ying (2022), Barth, Hübel and Scholz (2022), Lian, Ye, Zhang and Zhang (2023), Chen and Xie (2022), Xu, Hou, Main and Ding (2022), Gillan, Koch and Starks (2021) and Feng, Goodell and Shen (2021).

With the regulations on corporate disclosure of social responsibility information and the numerous policies encouraging firms to fulfill their social responsibility in the Taiwan financial market, coupled with the gradually forming consensus and shared values among stakeholders regarding CSR, firms with better social responsibility performance should receive positive evaluations from the public. This study proposes a hypothesis to be tested that there is a positive relationship between a firm's social responsibility performance and its financial performance.

**Hypothesis 1:** *There is a positive correlation between CSR performance and firm performance.*

With the development of globalization and cross-border operations, businesses face an increasing number of risks. Proper risk management is beneficial for maintaining stable growth and reducing unforeseen losses. Actively fulfilling social responsibility helps prevent damage to the interests of stakeholders at all levels, which can lead to direct claims and indirect non-cooperative movements against the firm, and thus helps maintain stable operations. To achieve sustainable business, firms must balance the interests of stakeholders. If a firm deliberately focuses only on a specific group, such as major shareholders, the loss of other stakeholders' interests may be highlighted when the situation crosses a critical threshold (such as a food safety scandal, low wages, inability to recover, and consecutive employee suicide cases). This can lead to negative effects on the firm, such as loss of reputation, deteriorating financial performance, and plummeting stock prices. Conversely, the more a

firm takes care of the interests of all stakeholders, the lower the likelihood of the above situations occurring. This reduces the instability of the firm's operations or profits.

Existing research such as Waddock and Graves (1997) suggests that socially irresponsible firms may face uncertain claims in the future. For example, if a firm fails to control the safety of its products and sells them, it increases the likelihood of future legal action, thus raising the firm's operating costs. Godfrey (2005) pointed out that corporate charity can generate positive reputation and moral capital for the firm's stakeholders. Engaging in corporate charity is like an intangible asset that provides insurance-like protection to the firm. The author believes that after stakeholders identify with a firm's charitable activities, it creates the firm's moral capital, which can reduce the impact of negative news on the firm. Godfrey, Merrill, and Hansen (2009) divide CSR into TCSR (technical CSR) and ICSR (institutional CSR). TCSR refers to social responsibility activities aimed at a firm's primary stakeholders, while ICSR refers to social responsibility activities aimed at a firm's secondary stakeholders. Using data on 178 negative events of 160 listed firms in the United States from 1992 to 2003, the authors found that ICSR can help reduce the extent of shareholder value loss when negative events occur, creating an insurance effect. TCSR did not have an insurance effect, but it still confirms that CSR can serve as a risk management tool to protect shareholder value.

Shiu and Yang (2011) used event study methodology and found that CSR engagement has a similar insurance effect on stock and bond prices when firms face negative events. However, this effect only exists when the firm engages in CSR activities on a long-term and continuous basis. Long-term CSR engagement is beneficial in protecting the wealth of shareholders and bondholders when negative events occur, and can be an effective risk management tool. Jo and Na (2012) explored whether controversial firms engaging in CSR activities can help reduce firm risk. They examined controversial firms in the United States from 1991 to 2010, such as liquor, tobacco, and gambling firms, and found that CSR helps to reduce firm risk. Further analysis of the risk reduction effect of CSR on controversial and non-controversial firms showed that the risk reduction effect of CSR is more statistically and economically significant in controversial firms. This indicates that the management of controversial firms can use CSR engagement as one of the firm's risk management policies. Kao, Shiu and Lin (2016) examined whether CSR-related activities can reduce firm risk using data from Chinese listed firms from 2008 to 2012. The empirical results showed a significant negative relationship between CSR and total firm risk, supporting the hypothesis that CSR can reduce risk.

Gupta and Krishnamurti (2018) found that a firm's social responsibility performance contributes to the establishment of moral and exchange capital, which can help the firm overcome bankruptcy challenges. Lins, Servaes and Tamayo (2017) pointed out that a firm's social responsibility can build trust in the financial market and found that firms with good social responsibility performance enjoyed higher levels of trust among investors and in the market during the financial crisis, resulting in better profitability, higher sales per employee, and more loans. Jia, Gao and Julian (2020) used the SEC's policy change on the removal of certain firm short-selling restrictions as an exogenous negative impact on stock price risk, and found that firms with better social responsibility performance had a lower tendency for their stocks to be shorted among those affected by the negative impacts, demonstrating the function of social responsibility performance in reducing negative effects. Based on these views, this study proposes that a firm's social responsibility performance can help reduce the firm's risk,

ranging from the risk of performance volatility and the downside risk.

Lian, Ye, Zhang and Zhang (2023) employ the data of 988 bonds issued by Chinese 443 A-share listed firms from the first quarter of 2009 to the fourth quarter of 2020, and found that Good ESG performance decreases bond credit spreads by decreasing corporate financial risk, enhancing corporate transparency, and decreasing debt agency costs. The effect of ESG performance on bond credit spreads is more pronounced for non-state enterprises, enterprises in poor macroeconomic environments, and enterprises in regions with a higher degree of marketization. Feng, Goodell and Shen (2022) investigate the relationships between environmental, social, and corporate governance ratings and stock price crash risk, finding a statistically and economically significant negative relationship for Chinese firms. Sassen, Hinze and Hardeck (2016) employ a large European panel dataset of 8,752 firm-year observations covering the period 2002~2014, and found that a higher CSP decreases total and idiosyncratic risk but systematic risk. Social performance has a significantly negative effect on all three risk measures, environmental performance generally decreases idiosyncratic risk, whereas total risk and systematic risk are only affected in environmentally sensitive industries. The evidence lacks of significant effect of corporate governance performance on firm risk.

**Hypothesis 2:** *There is a negative correlation between CSR performance and firm risk. The better the CSR performance, the lower the firm risk.*

### 3. Variable, Econometric Model, Samples and Data

#### 3.1 Variable

##### 3.1.1 Explained Variable - Performance and Risk

This study uses both accounting-based and market-based performance indicators. The former includes return on assets (*roa*: after-tax net income divided by total assets), return on equity (*roe*: after-tax net income divided by total equity), and earnings per share (*eps*: after-tax net income divided by the number of shares outstanding). The latter includes gross stock return (*gret*: annual return of common equity), excess stock return (*nret*: annual return of common equity minus annual return of the Taiwan Stock Exchange weighted stock price index), and Tobin's q (*tobinq*: market value of common equity plus book value of liability divided by book value of assets). The larger the values of these six variables, the better the firm's performance.

This study uses four indicators to measure firm risks. First, the variance of returns on assets (*roavar*), which is defined as the variance of return on assets for the current year and the previous four years. A larger value indicates a greater volatility in the firm's profitability, and a greater operating risk. Second, the variance of the excess weekly stock return rate (*ertvar*) is defined as the variance of the excess weekly stock return for a specific year of the firm. A higher value indicates higher volatility in the weekly excess stock return, and greater wealth uncertainty and risk for investors holding the firm's stock. Third, the absolute value of the negative weekly excess stock return divided by the positive weekly excess stock return for a specific year of the firm (*rtdu*), measures the degree to which a specific firm has negative returns (i.e., a decline in stock price) during a specific year. A higher value indicates a greater risk of a crash in the stock price or a downside risk in the stock return, leading to greater wealth loss for investors due to potential negative events affecting the firm. Fourth, the 95% Value-at-Risk of the weekly excess stock return (*estvar95*), is defined as the 5th percentile of the weekly excess stock return for a specific firm in a year (multiplied by negative one). A higher value indicates a smaller stock return for the firm during periods of poor performance,

leading to a greater degree of stock price crash and wealth loss for investors due to negative events, similar to the previous variable. A higher value for these four variables indicates higher firm risk, ranging from stock market performance volatility and downside risk.

### 3.1.2 Main Explanatory Variable - CSR and ESG Performance

**According** to Chang (2011), Taiwan's leading business magazine, the *Common Wealth* conducted a corporate citizenship survey in 2007 for publicly traded firms in Taiwan. The survey referred to international indicators and evaluation methods such as the United Nations Global Compact, the OECD Guidelines for Multinational Enterprises, and the Dow Jones Sustainability Index, and selected the Best Corporate Citizens in Taiwan based on four dimensions: corporate governance, corporate commitment, social engagement, and environmental protection. The selection process for the Best Corporate Citizens list first screened firms that had been profitable for three consecutive years. Then, more than 500 analysts, accountants, and business professionals compared and evaluated the performance of the firms in the four dimensions, and experts in the academic, government, and business sectors who had long been concerned with CSR also participated in the evaluation. The scores were weighted and added up to obtain the total scores of each firm, and the top 50 firms with the highest scores were named the "Best Corporate Citizens TOP50".

In addition, starting in 2005, another leading business magazine, the *Global Views Monthly* conducted a major survey on CSR performance for listed firms in Taiwan. The survey referenced the evaluation weight criteria of Germany's social responsibility research institution, OEKOM, and gave weighted scores to the evaluated firms in three aspects: social performance, environmental performance, and financial information. The survey also examined other information of the evaluated firms, including: (1) auditing questionnaire contents and negative news reports; (2) external organizations' (such as the Environmental Protection Agency, Labor Commission, Consumers' Foundation, and public interest groups) audits; (3) elimination of firms with significant labor disputes, environmental pollution cases, major consumer disputes, or limitations on operators due to lawsuits in the past two years; (4) elimination of firms with three consecutive years of operating losses. Firms that score high in the evaluation will be awarded the annual "CSR Award".

This study constructs three variables to measure a firm's CSR performance based on the list of winning firms of the *Common Wealth's* "Corporate Citizen Awards" and the *Global Views Monthly's* "CSR Awards" from 2007 to 2020. The first variable is current social responsibility performance (*csrdummy*), which is a dummy variable that equals 1 if the firm has won either of the two awards in a specific year, and 0 otherwise. The second variable is continuous social responsibility performance (*csrcont*), which is a dummy variable that equals 1 for a firm in every year of the data period (14 years) if it has won either of the two awards every year, but equals 0 if it fails to win either of the two awards in any year. The third variable is repeat social responsibility performance (*csrovlp*), which is a dummy variable that equals 1 if a firm has won both of the two awards in a specific year, and 0 otherwise.

In addition, this study refers to Huang and Chang (2020) to calculate the social contribution value of each firm-year sample as a measure of CSR performance. Social contribution value refers to the amount that a firm pays to its primary stakeholders, including shareholders, employees, government, and creditors each year. This includes the cash dividends paid to shareholders, salary expenses and benefits paid to employees, taxes paid to the government, and interest expenses paid to creditors. Adding up these four amounts gives the total value created by the firm for its primary stakeholders, and this social contribution

value is used as a quantitative indicator of how much benefit the firm creates for society. This study takes the natural logarithm of the social contribution value (*scv*) as the second variable to measure CSR performance. At the same time, considering the firm's size, the social contribution value that is not taken the natural logarithm is divided by the total assets of the firm to obtain the social returns of assets (*sroa*), which quantifies the benefits that each unit of assets brings to its primary stakeholders. In addition, the social contribution value that is not taken the natural logarithm is divided by the number of outstanding shares in that year to obtain the social contribution value per share (*scvps*), which quantifies the benefits that each unit of common stock brings to its primary stakeholders. The larger the values of these three variables, the better the firm's CSR performance.

### 3.1.3 Control Variable

**This** study refers to existing studies and includes thirteen variables that control for firm performance. First, previous literature indicates that firm size affects performance (Bamber et al., 2011; Barron et al., 2018; Collins and Kothari, 1989). Therefore, this study includes firm size (*asset*) as a variable, calculated as the natural logarithm of total assets to control for the impact of firm size on performance. Second, Billings (1999) found a negative correlation between the debt ratio and performance. Therefore, this study includes the debt ratio (*debt*), calculated as total debt divided by total assets, to control for the leverage effect on firm performance.

Third, revenue growth rate is often used as a control variable for firm performance. Higher revenue growth rates indicate stronger growth momentum and better performance (Chang and Lu, 2016). Therefore, this study also includes sales growth rate (*growth*), calculated as the current year's net sales minus the previous year's net sales and divided by the previous year's net sales. Fourth, Morck, Shleifer and Vishny (1988) and McConnell and Servaes (1990) mentioned that the higher a firm's research and development expenditure (R&D), the more the firm invests in intangible assets that help improve future performance, and the more potential it has to increase its value in the future. This study defines R&D expenditure (*rd*) as the percentage of R&D expenses to net sales to control for the impact of R&D on firm performance. Fifth, many studies believe that the longer a firm has been established, the more stable its profits will be, and the more efficiently it will respond to market information, improving its performance (Calantone et al., 2002; Lee et al., 2011). Therefore, this study considers the age of the firm (*age*) as a control variable, calculated as the sample year minus the year of firm establishment.

In corporate governance literature, the size of the board of directors (i.e., the total number of seats or members of directors) has been found to have a positive (and sometimes negative) impact on firm performance (Pfeffer, 1972; Yermack, 1996). Therefore, this study includes board size (*board*) as a control variable and measures it by the total number of board members. A higher proportion of external directors on the board can help improve the monitoring efficiency of the board and thus improve firm performance (Fama, 1980). This study uses the independent director ratio (*indr*) as a proxy variable for board independence, calculated as the number of independent directors divided by the total number of board members. Liao, Lee and Wu (2006) confirmed a positive correlation between director shareholdings and firm performance, suggesting that a higher director shareholdings help improve board efficiency (in monitoring and advising) and thus enhance management decision-making quality, leading to improved firm performance. This study includes the director shareholdings (*dirhold*) as a control variable to control for the effect of director

shareholdings on firm performance, where the director shareholding ratio is defined as the number of shares held by directors divided by the total number of shares outstanding.

The literature has indicated that a higher directors' share pledging ratio can have a negative impact on firm performance (Chiou et al., 2002; Kao et al., 2004; Chen et al., 2013), as an increase in the director share pledging ratio can lead to a greater discrepancy between the private interests of directors and the interests of the firm, resulting in a negative impact on firm performance. This study includes the director share pledging ratio (*pledge*) as a control variable to control for its impact on firm performance, calculated as the number of shares pledged by directors divided by the total number of shares held by directors. According to the agency theory of interests alignment (Jensen and Meckling, 1976), the higher the proportion of shareholding by managers, the more aligned their interests will be with those of the firm, and the more motivated they will be to make management decisions that align with the firm's interests, driving overall firm performance. Therefore, this study includes the managerial shareholdings (*manhold*) as a control variable, calculated as the number of shares held by managers divided by the total number of shares outstanding.

Institutional investors possess better professional knowledge and analytical ability, which enable them to more effectively monitor management and contribute to the improvement of firm performance (Shleifer and Vishny, 1986; Agrawal and Mandelker, 1990; Pound, 1988). This study incorporates the institutional investor shareholdings (*insthold*) into the empirical model, which is calculated as the number of shares held by institutional investors divided by the number of shares outstanding, in order to control for the impact of institutional investor shareholding on firm performance. In addition, foreign institutional investors' shareholding has also been mentioned in previous studies as having an impact on firm performance, and the two are positively correlated (Huang, 2014). Therefore, this study also includes the foreign institutional investors' shareholdings (*forhold*) to control for its impact on firm performance, which is calculated as the number of shares held by foreign institutional investors (foreign corporations) divided by the number of shares outstanding. A dummy variable for family businesses (*family*) is included. As many listed firms in Taiwan are family businesses, this study defines firms with single-family control as family businesses in order to control for the potential impact of family businesses on firm performance. When the firm's control is under a single family, it is defined as a family firm, with a dummy variable value of 1, and 0 otherwise. The abbreviation and definitions of the above variables are summarized in Table 1.

**Table 1 The Abbreviation and Definition of Variables**

| Variable                                     | Abbreviation  | Definition  |
|--|---------------|---|
| <b>Explained Variable - firm performance</b> |               |   |
| Returns on assets (%)                        | <i>roa</i>    | Earnings before interest and tax / total asset  |
| Returns on equity (%)                        | <i>roe</i>    | After-tax net income / total equity   |
| Earnings per share (N.T.D)                   | <i>eps</i>    | After-tax net income / shares outstanding   |
| Stock gross returns (%)                      | <i>gret</i>   | Annualized stock gross returns  |
| Stock excess returns (%)                     | <i>nret</i>   | Annualized stock gross returns-market returns   |
| Tobin's q                                    | <i>tobinq</i> | Divide the sum of the book value of liabilities and the market value of common equity by the book value of assets |
| <b>Explained Variable - firm risk</b>        |               |   |
| Variance of returns on assets                | <i>roavar</i> | The variance of last-five year returns on assets  |
| Variance of weekly stock excess returns      | <i>ertvar</i> | The variance of weekly stock excess returns   |
| The ratio of negative to positive returns    | <i>ertdu</i>  | The absolute value of the sum of negative returns divided by the sum of positive returns                          |

|  |                 |  |
|--|-----------------|--|
| 95% value at risk (%)                              | <i>ertvar95</i> | The 5% percentile of weekly stock excess return within a year *(-1)  |
| <b>Main explanatory variable - CSR performance</b> |                 |  |
| Current performance of CSR                         | <i>csrdummy</i> | A dummy variable of the current performance of CSR ( <i>csrdummy</i> ), which measures the performance of a firm based on the list of firms that have won the <i>Common Wealth's</i> "Corporate Citizenship" and the <i>Global Views Monthly's</i> "CSR Award". If a firm wins either or both of the awards in a specific year, the value of <i>csrdummy</i> is equal to 1 in that year, otherwise, if the firm does not win either award, the value <i>csrdummy</i> is 0. |
| Continuous performance of CSR                      | <i>csrcont</i>  | Set to 1 if a firm wins either or both of the awards every year during the data period (14 years). If the firm fails to win either award in any given year during the data period, <i>csrcont</i> is set to 0.   |
| Overlap performance of CSR                         | <i>csrovlp</i>  | Set to 1 if a firm wins both awards in a specific year. If the firm wins only one award or none at all in a specific year, <i>csrovlp</i> is set to 0.   |
| Social contribution value (take <i>ln</i> )        | <i>scv</i>      | The sum of interest expense, tax, employee salary and after tax net income, and then take the natural logarithm  |
| Social return on assets (%)                        | <i>sroa</i>     | (Social contribution value / total assets)*100%  |
| Social contribution value per share (NTD)          | <i>scvps</i>    | (Social contribution value / number of shares outstanding)   |
| <b>Control variable</b>                            |                 |  |
| Firm size  | <i>asset</i>    | The total amount of assets and then takes the natural logarithm  |
| Debt ratio (%)                                     | <i>debt</i>     | (Total liabilities divided by total assets)×100%   |
| Growth rate of net sales (%)                       | <i>salesgr</i>  | (Current year's net sales - net sales in the previous year / net sales in the previous year) x 100%  |
| Firm age (year)                                    | <i>age</i>      | The number of years since the firm was established   |
| Board scale (# of person)                          | <i>board</i>    | The number of directors  |
| Independent director ratio (%)                     | <i>indr</i>     | (The number of independent directors / the number of directors)×100%   |
| Directors' shareholdings (%)                       | <i>dirhold</i>  | (number of shares hold by directors / number of shares outstanding) * 100%   |
| Directors' shareholdings pledge ratio (%)          | <i>pledge</i>   | (number of shares pledged by directors / number of shares hold by directors)×100%  |
| Managerial shareholdings (%)                       | <i>manhold</i>  | (number of shares hold by the management / number of shares outstanding) * 100%  |
| Institutional investors' shareholdings (%)         | <i>insthod</i>  | (number of shares hold by institutional investors / number of shares outstanding) * 100%   |
| Foreign Institutional investors' shareholdings (%) | <i>forhold</i>  | ( number of shares hold by foreign institutional investors / number of shares outstanding) * 100%  |
| Family control                                     | <i>family</i>   | If the type of control is single-family controlled, then it is 1, and 0 otherwise.   |

Note: this table reports the abbreviations and definitions of the variables. The variable definitions are based on the Taiwan Economic Journal (TEJ) database and the author's own definitions.

### 3.2 Econometric Model

This study employs multiple regression to estimate how CSR and ESG performance affects firm's performance and risk. The regression equation is:

$$\begin{aligned}
 \text{PERFORMANCE / RISK}_{i,t} = & \beta_0 + \beta_1 \cdot \text{CSR}_{i,t} \\
 & + \beta_2 \cdot \text{asset}_{i,t} + \beta_3 \cdot \text{debt}_{i,t} + \beta_4 \cdot \text{grow}_{i,t} + \beta_5 \cdot \text{rd}_{i,t} \\
 & + \beta_6 \cdot \text{age}_{i,t} + \beta_7 \cdot \text{board}_{i,t} + \beta_8 \cdot \text{indr}_{i,t} + \beta_9 \cdot \text{dirhold}_{i,t} \\
 & + \beta_{10} \cdot \text{pledge}_{i,t} + \beta_{11} \cdot \text{manhold}_{i,t} + \beta_{12} \cdot \text{insthold}_{i,t} \\
 & + \beta_{13} \cdot \text{forhold}_{i,t} + \beta_{14} \cdot \text{family}_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

where the subscripts *i* and *t* represent the *i*th firm in the *t*th year. PERFORMANCE / RISK is a vector of performance and risk variables, including return on assets (*roa*), return on equity

(*roe*), earnings per share (*eps*), annual stock gross return rate (*gret*), annual stock excess return rate (*nret*), and Tobin's Q (*tobinq*). CSR is a vector of variables for CSR performance, including current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on assets (*sroa*), and social contribution value per share (*scvps*). The remaining variables in the regression equation are control variables, including firm size (*asset*), debt ratio (*debt*), growth rate of net sales (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director shareholdings (*dirhold*), directors' shareholding pledge ratio (*pledge*), managerial shareholdings (*manhold*), institutional investors' shareholding (*insthold*), foreign institutional investors' shareholdings (*forhold*), and a dummy variable indicating whether the firm is family controlled (*family*). The regression equation is pooled estimated by least square principle. When the dependent variable is PERFORMANCE and the estimated coefficient  $\beta_1$  is positive and significant, it indicates that the empirical results support hypothesis 1. When the dependent variable is RISK and the estimated coefficient  $\beta_1$  is negative and significant, it indicates that the empirical results support hypothesis 2.

### 3.3 Firm Samples and Data

The sample consists of 1,590 non-financial industry listed firms on the Taiwan Stock Exchange and the Taipei Exchange. Financial industry firms such as banks, securities, billings, insurance, and financial holding firms were excluded because their accounting regulations and reporting, government regulations, and performance evaluation differ substantially from those of non-financial industry firms and require a separated analysis. The data was collected from the Taiwan Economic Journal (TEJ) database, the annual name lists of the *Common Wealth's* "Corporate Citizen" is collected on magazine's website (<https://topic.cw.com.tw/csr/report.aspx>), so does the name lists of the *Global Views Monthly's* "CSR Awards" (<https://csr.gvm.com.tw/2021/award.html>). The data period of the large part of variables is ranged from 2007~2020, and the variables of TESG ratings is ranged from 2015~2020. In subsequent statistical analyses, data of all quantitative variables are 5% winsorized.

## 4. Empirical Evidence

### 4.1 Summarize Statistics and Correlation Analysis

Table 2 reports the descriptive statistics of each variable, including the number of non-missing observations, mean, standard deviation, minimum, and maximum, for the full sample (Panel A), as well as for the sample with better current CSR performance (*csrdummy*=1) and worse current CSR performance (*csrdummy*=0) (Panel B). The rightmost column in Table 2 shows the difference between the means of each variable for the sample with better current CSR performance and the sample with worse current CSR performance (the former minus the latter) and the *t*-statistics for the difference in means. Based on the values in the rightmost column, it can be observed that firms with better current CSR performance have, on average, a higher return on assets (*roa*) (about 2.0328% higher than firms with worse current CSR performance), a higher return on equity (*roe*), higher earnings per share (*eps*), and a higher Tobin's q. Overall, the difference in means for the performance variables between the two samples indicates that firms selected for the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* have, on average, better accounting-based versus market-based performance. Better CSR performance leads to better financial performance and firm value, supporting the hypothesis 1.



Similarly, by observing the data in the rightmost column of Table 2, it can be seen that, on average, firms with better CSR performance in the sample have lower variability in return on asset (*roavar*), lower variability in weekly stock excess return (*ertvar*), and lower weekly stock excess return 95% value-at-risk (*ertvar95*). By comparing the average differences in risk variables between the two groups of samples, it can be concluded that, on average, firms that are selected for the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* have lower volatility in their stock returns, lower risk of stock price crash or downward risk. Better CSR performance leads to lower risk for the firm, confirming the hypothesis 2.

Table 3 reports the pairwise Pearson correlation coefficients between each variable. Observing the correlation coefficients between the CSR performance variable and the firm performance variables (the intersection of columns 7-12 and rows 1-6), it can be seen that most of the evidence indicates that the correlation between the CSR performance and the firm performance are positive and statistically significant at the 5% level. This suggests that firms with better CSR performance tend to have higher returns on asset, returns on equity, earnings per share, annual gross stock return, annual excess stock return, and Tobin's q. The evidence of correlation analysis supports the hypothesis 1.

Observing the correlation coefficients between the CSR performance variable and the firm risk variables (the intersection of columns 13-16 and rows 1-6), most of the evidence shows that the correlation between the CSR performance and the firm risk are negative and statistically significant at the 5% level. This indicates that firms with better CSR performance tend to have lower variance of returns assets, lower variance of stock excess returns, lower value of negative excess return to positive excess return, and smaller 95% value-at-risk of weekly excess returns. Firms with better CSR performance tend to have lower volatility in operating consequences, lower volatility and downside risk of stock market performance. The pairwise correlation analysis supports the hypothesis 2.

**Table 2 Descriptive Statistics**

| Variable        | Panel A. Full samples |        |           |         |        | Panel B. Samples of firms with <i>csrdummy</i> =1 |        |           |          |        | Samples of firms with <i>csrdummy</i> =0 |        |           |          |        | Difference in mean |
|-----------------|-----------------------|--------|-----------|---------|--------|---|--------|-----------|----------|--------|--|--------|-----------|----------|--------|--------------------|
|                 | Num. of obs.          | Mean   | Std. Dev. | Min     | Max    | Num. of obs.                                      | Mean   | Std. Dev. | Min      | Max    | Num. of obs.                             | Mean   | Std. Dev. | Min      | Max    |                    |
| <i>csrdummy</i> | 22,260                | 0.0295 | 0.1692    | 0.0000  | 1.0000 | 657   | 1.0000 | 0.0000    | 1.0000   | 1.0000 | 21,603                                   | 0.0000 | 0.0000    | 0.0000   | 0.0000 | 1.0000             |
| <i>csrcont</i>  | 22,260                | 0.0031 | 0.0560    | 0.0000  | 1.0000 | 657   | 0.1065 | 0.3088    | 0.0000   | 1.0000 | 21,603                                   | 0.0000 | 0.0000    | 0.0000   | 0.0000 | 0.1065***          |
| <i>csrovlp</i>  | 22,260                | 0.0049 | 0.0698    | 0.0000  | 1.0000 | 657   | 0.1659 | 0.3723    | 0.0000   | 1.0000 | 21,603                                   | 0.0000 | 0.0000    | 0.0000   | 0.0000 | 0.1659***          |
| <i>scv</i>      | 17,450                | 11.332 | 5.5871    | -11.488 | 15.365 | 272   | 13.900 | 1.0222    | 9.1822   | 15.357 | 17,178                                   | 11.292 | 5.6203    | -11.488  | 15.365 | 2.6085***          |
| <i>sroa</i>     | 17,450                | 12.439 | 8.5257    | -6.0482 | 33.210 | 565   | 15.186 | 8.1060    | -4.9671  | 33.124 | 16,885                                   | 12.347 | 8.5244    | -6.0482  | 33.210 | 2.8387***          |
| <i>scvps</i>    | 15,417                | 3.8927 | 3.3249    | -0.9263 | 14.503 | 489   | 5.8611 | 3.2905    | -0.7954  | 14.379 | 14,928                                   | 3.8282 | 3.3063    | -0.9263  | 14.503 | 2.0328***          |
| <i>roa</i>      | 18,749                | 7.7712 | 7.0767    | -9.4300 | 24.630 | 607   | 11.441 | 6.3757    | -7.2300  | 24.420 | 18,142                                   | 7.6484 | 7.0662    | -9.4300  | 24.630 | 3.7930***          |
| <i>roe</i>      | 18,808                | 7.0869 | 9.9690    | -23.100 | 28.760 | 617   | 12.176 | 7.6201    | -17.9200 | 28.490 | 18,191                                   | 6.9143 | 9.9939    | -23.1000 | 28.760 | 5.2614***          |
| <i>eps</i>      | 19,011                | 1.6669 | 2.0948    | -2.2500 | 8.1200 | 554   | 3.0622 | 2.0587    | -2.0000  | 8.0800 | 18,457                                   | 1.6250 | 2.0815    | -2.2500  | 8.1200 | 1.4372***          |
| <i>nret</i>     | 16,680                | 3.2064 | 27.755    | -43.420 | 95.365 | 623   | 3.9957 | 25.049    | -41.609  | 95.241 | 16,057                                   | 3.1757 | 27.855    | -43.420  | 95.365 | 0.8200             |
| <i>gret</i>     | 16,658                | 9.4026 | 35.563    | -50.637 | 133.07 | 621   | 11.257 | 30.762    | -50.046  | 129.82 | 16,037                                   | 9.3308 | 35.735    | -50.637  | 133.07 | 1.9259             |
| <i>tobinq</i>   | 18,961                | 1.1584 | 0.5289    | 0.5200  | 3.0800 | 569   | 1.3604 | 0.6740    | 0.5200   | 3.0600 | 18,392                                   | 1.1522 | 0.5225    | 0.5200   | 3.0800 | 0.2083***          |
| <i>roavar</i>   | 18,480                | 31.470 | 39.538    | 0.9175  | 211.35 | 550   | 16.633 | 24.440    | 0.9352   | 199.61 | 17,930                                   | 31.925 | 39.824    | 0.9175   | 211.35 | -15.292***         |
| <i>ertvar</i>   | 16,677                | 23.991 | 18.124    | 3.9444  | 90.252 | 570   | 14.617 | 11.062    | 3.9455   | 73.337 | 16,107                                   | 24.323 | 18.237    | 3.9444   | 90.252 | -9.7062***         |
| <i>ertdu</i>    | 16,686                | 1.0125 | 0.3195    | 0.4834  | 1.8383 | 587   | 0.9993 | 0.3154    | 0.4841   | 1.8317 | 16,099                                   | 1.0130 | 0.3197    | 0.4834   | 1.8383 | -0.0137            |
| <i>ertvar95</i> | 16,691                | 5.9137 | 2.0212    | 2.7818  | 11.470 | 569   | 4.8964 | 1.6540    | 2.7984   | 11.258 | 16,122                                   | 5.9496 | 2.0237    | 2.7818   | 11.470 | -1.0532***         |
| <i>asset</i>    | 19,039                | 14.956 | 1.0663    | 12.989  | 17.576 | 333   | 15.960 | 1.0765    | 13.077   | 17.571 | 18,706                                   | 14.938 | 1.0575    | 12.989   | 17.576 | 1.0222***          |
| <i>debt</i>     | 19,040                | 35.438 | 14.545    | 9.3900  | 68.130 | 608   | 35.735 | 15.122    | 9.5300   | 68.130 | 18,432                                   | 35.428 | 14.526    | 9.3900   | 68.130 | 0.3070             |
| <i>salesgr</i>  | 18,684                | 2.7078 | 20.016    | -41.820 | 69.150 | 643   | 2.5345 | 15.474    | -39.710  | 60.560 | 18,041                                   | 2.7140 | 20.159    | -41.820  | 69.150 | -0.1795            |
| <i>rd</i>       | 19,118                | 3.1589 | 4.1417    | 0.0000  | 21.380 | 616   | 3.2333 | 3.7266    | 0.0000   | 21.350 | 18,502                                   | 3.1565 | 4.1548    | 0.0000   | 21.380 | 0.0768             |
| <i>age</i>      | 20,005                | 27.068 | 11.468    | 7.0000  | 53.000 | 570   | 28.818 | 10.567    | 7.0000   | 53.000 | 19,435                                   | 27.017 | 11.489    | 7.0000   | 53.000 | 1.8004***          |
| <i>board</i>    | 19,064                | 6.9929 | 1.5351    | 5.0000  | 11.000 | 525   | 8.0495 | 1.7379    | 5.0000   | 11.000 | 18,539                                   | 6.9630 | 1.5183    | 5.0000   | 11.000 | 1.0865***          |
| <i>idr</i>      | 19,313                | 24.068 | 16.015    | 0.0000  | 42.857 | 573   | 24.967 | 13.899    | 0.0000   | 42.857 | 18,740                                   | 24.040 | 16.075    | 0.0000   | 42.857 | 0.9266             |
| <i>dirhold</i>  | 18,009                | 20.485 | 11.208    | 5.8400  | 52.830 | 549   | 20.475 | 13.662    | 5.8700   | 52.560 | 17,460                                   | 20.485 | 11.122    | 5.8400   | 52.830 | -0.0102            |
| <i>manahold</i> | 19,013                | 1.0873 | 1.4275    | 0.0000  | 6.3300 | 631   | 0.8354 | 1.1381    | 0.0000   | 5.7900 | 18,382                                   | 1.0959 | 1.4356    | 0.0000   | 6.3300 | -0.2605***         |
| <i>insthold</i> | 17,991                | 38.372 | 19.462    | 5.9700  | 79.220 | 477   | 52.946 | 18.640    | 6.7100   | 78.940 | 17,514                                   | 37.975 | 19.331    | 5.9700   | 79.220 | 14.9712***         |
| <i>foreign</i>  | 18,990                | 6.1274 | 8.3164    | 0.0000  | 37.810 | 450   | 15.961 | 11.658    | 0.0000   | 37.660 | 18,540                                   | 5.8887 | 8.0712    | 0.0000   | 37.810 | 10.0724***         |
| <i>family</i>   | 20,008                | 0.6192 | 0.4856    | 0.0000  | 1.0000 | 651   | 0.4378 | 0.4965    | 0.0000   | 1.0000 | 19,357                                   | 0.6253 | 0.4841    | 0.0000   | 1.0000 | -0.1875***         |

Note: this table reports the basic summarize statistics of each variable, including the number of non-missing observations, mean, standard deviation, minimum and maximum of full samples (Panel A), samples of firm with *csrdummy*=1 and samples of firm with *csrdummy*=0. The rightmost column reports the differences in means (and *t*-statistics) of each variable. The data period is from 2007 to 2020. \*, \*\* and \*\*\* show that the differences in means reach 10%, 5% and 1% significant level, respectively.

**Table 3 Correlation Coefficients Matrix**

| variable             | (1)      | (2)      | (3)      | (4)      | (5)      | (6)      | (7)      | (8)      | (9)      | (10)     | (11)     | (12)     | (13)     | (14)     | (15)     | (16)     | (17)     | (18)     | (19)     | (20)     | (21)     | (22)     | (23)     | (24)     | (25)     | (26)     | (27)     | (28)   |  |  |
|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|--|--|
| (1) <i>csrdummy</i>  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (2) <i>csrcont</i>   | 0.3221*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (3) <i>csrovlp</i>   | 0.4022*  | 0.3984*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (4) <i>scv</i>       | 0.0578*  | 0.0152*  | 0.0152*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (5) <i>sroa</i>      | 0.0589*  | 0.0463*  | 0.0247*  | 0.4699*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (6) <i>scvps</i>     | 0.1072*  | 0.0436*  | 0.0549*  | 0.4180*  | 0.7589*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (7) <i>roa</i>       | 0.0949*  | 0.0545*  | 0.0601*  | 0.4764*  | 0.8258*  | 0.7150*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (8) <i>roe</i>       | 0.0940*  | 0.0561*  | 0.0549*  | 0.5355*  | 0.7550*  | 0.7231*  | 0.8534*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (9) <i>eps</i>       | 0.1154*  | 0.0653*  | 0.0670*  | 0.4317*  | 0.6587*  | 0.8675*  | 0.7614*  | 0.8522*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (10) <i>nret</i>     | 0.0056   | 0.0067   | 0.0082   | 0.0998*  | 0.2231*  | 0.1805*  | 0.2411*  | 0.2733*  | 0.2206*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (11) <i>gret</i>     | 0.0103   | 0.0084   | 0.0111   | 0.0920*  | 0.1682*  | 0.1499*  | 0.1947*  | 0.2218*  | 0.1877*  | 0.7300*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (12) <i>tobinq</i>   | 0.0672*  | 0.0680*  | 0.0649*  | 0.0247*  | 0.3608*  | 0.3361*  | 0.3858*  | 0.3118*  | 0.3234*  | 0.1869*  | 0.2130*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (13) <i>roavar</i>   | -0.0657* | -0.0141  | -0.0292* | -0.1687* | -0.0121  | -0.0823* | -0.0560* | -0.1150* | -0.0791* | -0.0333* | -0.0334* | 0.1019*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (14) <i>ertvar</i>   | -0.0973* | -0.0312* | -0.0466* | -0.1809* | -0.0496* | -0.1139* | -0.0984* | -0.1343* | -0.1396* | 0.2073*  | 0.1549*  | 0.1261*  | 0.2562*  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (15) <i>ertdu</i>    | -0.0079  | -0.0120  | -0.0157* | -0.0878* | -0.2017* | -0.1528* | -0.2159* | -0.2425* | -0.1938* | -0.8483* | -0.5776* | -0.1672* | 0.0294*  | -0.2107* | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (16) <i>ertvar95</i> | -0.0946* | -0.0317* | -0.0447* | -0.1879* | -0.0877* | -0.1387* | -0.1366* | -0.1870* | -0.1776* | -0.0155  | -0.0712* | 0.0684*  | 0.2734*  | 0.7424*  | -0.0068  | 1.0000   |          |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (17) <i>asset</i>    | 0.1257*  | 0.0353*  | 0.0461*  | 0.3235*  | -0.0909* | 0.1573*  | 0.0814*  | 0.1348*  | 0.1787*  | 0.0026   | 0.0373*  | -0.0765* | -0.1731* | -0.2336* | -0.0092  | -0.2090* | 1.0000   |          |          |          |          |          |          |          |          |          |          |        |  |  |
| (18) <i>debt</i>     | 0.0037   | 0.0264*  | 0.0135   | -0.0073  | -0.1855* | -0.0293* | -0.1435* | -0.0243* | -0.0532* | -0.0158  | -0.0101  | -0.1862* | -0.0463* | 0.0127   | 0.0180*  | 0.0097   | 0.1549*  | 1.0000   |          |          |          |          |          |          |          |          |          |        |  |  |
| (19) <i>salesgr</i>  | -0.0016  | 0.0005   | -0.0002  | 0.1454*  | 0.2527*  | 0.2296*  | 0.2886*  | 0.3028*  | 0.2608*  | 0.2477*  | 0.1669*  | 0.1388*  | -0.0015  | 0.0483*  | -0.2306* | -0.0078  | 0.0060   | 0.0767*  | 1.0000   |          |          |          |          |          |          |          |          |        |  |  |
| (20) <i>rd</i>       | 0.0033   | -0.0069  | -0.0090  | -0.0211* | 0.2018*  | 0.1006*  | 0.0640*  | -0.0130  | 0.0073   | -0.0224* | -0.0066  | 0.1732*  | 0.0975*  | 0.0951*  | 0.0140   | 0.1170*  | -0.1690* | -0.1974* | 0.0006   | 1.0000   |          |          |          |          |          |          |          |        |  |  |
| (21) <i>age</i>      | 0.0261*  | -0.0184* | -0.0005  | 0.0623*  | -0.1789* | -0.1182* | -0.1332* | -0.0615* | -0.0740* | -0.0052  | 0.0207*  | -0.1725* | -0.2075* | -0.1763* | 0.0042   | -0.2105* | 0.2593*  | 0.0749*  | -0.0866* | -0.2785* | 1.0000   |          |          |          |          |          |          |        |  |  |
| (22) <i>board</i>    | 0.1158*  | 0.0376*  | 0.0595*  | 0.1070*  | 0.0281*  | 0.0931*  | 0.0511*  | 0.0448*  | 0.0713*  | -0.0203* | 0.0220*  | 0.0527*  | -0.0718* | -0.0969* | 0.0229*  | -0.0929* | 0.2087*  | 0.0105   | 0.0080   | -0.0226* | 0.0490*  | 1.0000   |          |          |          |          |          |        |  |  |
| (23) <i>idr</i>      | 0.0098   | 0.0326*  | -0.0009  | -0.0196* | 0.0921*  | 0.1552*  | 0.0548*  | 0.0431*  | 0.1000*  | -0.0448* | 0.0078   | 0.1443*  | 0.0296*  | -0.0082  | 0.0431*  | -0.0242* | -0.1399* | -0.0223* | -0.0131  | 0.1608*  | -0.2179* | 0.1203*  | 1.0000   |          |          |          |          |        |  |  |
| (24) <i>dirhold</i>  | -0.0002  | -0.0030  | -0.0105  | -0.0258* | 0.0584*  | 0.0295*  | 0.0366*  | 0.0279*  | 0.0171*  | 0.0092   | 0.0033   | 0.0469*  | 0.0213*  | 0.0173*  | -0.0028  | 0.0029   | -0.1203* | -0.0053  | 0.0260*  | -0.0493* | -0.0755* | 0.0672*  | 0.0492*  | 1.0000   |          |          |          |        |  |  |
| (25) <i>manahold</i> | -0.0327* | 0.0031   | -0.0353* | 0.0394*  | 0.1795*  | 0.1332*  | 0.1145*  | 0.1129*  | 0.1085*  | 0.0446*  | 0.0186*  | 0.0815*  | 0.0398*  | 0.0378*  | -0.0417* | 0.0516*  | -0.1672* | -0.0340* | 0.0558*  | 0.1807*  | -0.2327* | -0.0043  | 0.0756*  | -0.0333* | 1.0000   |          |          |        |  |  |
| (26) <i>insthold</i> | 0.1236*  | 0.0432*  | 0.0640*  | 0.0950*  | 0.0620*  | 0.1788*  | 0.1578*  | 0.1702*  | 0.2045*  | 0.0144   | 0.0239*  | 0.1046*  | -0.0303* | -0.0858* | -0.0048  | -0.0797* | 0.2501*  | 0.0241*  | 0.0608*  | -0.0793* | -0.0015  | 0.1417*  | 0.0312*  | 0.3278*  | -0.0947* | 1.0000   |          |        |  |  |
| (27) <i>foreign</i>  | 0.1842*  | 0.0461*  | 0.0994*  | 0.1552*  | 0.0785*  | 0.2132*  | 0.1583*  | 0.1447*  | 0.2221*  | -0.0028  | 0.0165*  | 0.0885*  | -0.0357* | -0.0978* | 0.0040   | -0.0652* | 0.3654*  | -0.0132  | 0.0279*  | 0.0081   | 0.0287*  | 0.1368*  | 0.0243*  | -0.0814* | -0.0634* | 0.3216*  | 1.0000   |        |  |  |
| (28) <i>family</i>   | -0.0685* | 0.0221*  | -0.0147* | -0.0348* | -0.0938* | -0.0945* | -0.0629* | -0.0373* | -0.0479* | -0.0044  | -0.0079  | -0.0499* | -0.0438* | -0.0159* | 0.0083   | -0.0220* | 0.0166*  | 0.0181*  | -0.0284* | -0.1520* | 0.2240*  | -0.1029* | -0.0839* | 0.0116   | -0.1730* | -0.0148* | -0.0440* | 1.0000 |  |  |

Note: this table reports the pairwise Pearson correlation coefficients among variables. The data period is from 2007 to 2020. The asterisk mark means that a correlation coefficient reaches a significance level of 5%. Please refer to table 1 for the definitions of variables.

#### 4.2 Baseline Regression Result

**Table 4** reports the regression estimates of the impact of CSR performance on firm performance, measured by return on assets (*roa*). The main explanatory variables of models (1) to (6) are different CSR performance variables, including current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on assets (*sroa*), and social contribution value per share (*scvps*). Observing the estimation coefficient of current CSR performance in model (1), it is found to be positive (2.681) and statistically significant at the 1% level. This suggests that firms are selected for the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* have, on average, higher *roa* (2.681% higher) than firms that did not receive the awards. Model (2) shows that the estimation coefficient of continuous CSR performance is also positive and significant (6.69). This means that firms that received the aforementioned awards continuously for 14 years during the data period, on average, have a 6.69% higher *roa* than firms that did not receive the awards or received them sporadically. Although the estimation coefficient of overlap CSR performance in model (3) is positive, it is not statistically significant, indicating that being selected for either of the two award events leads to a higher *roa*, and being selected by both awards does not have a significant boost effect. In models (4) to (6), the estimation coefficients of social contribution value, social return on assets, and social contribution value per share are all positive and statistically significant at the 1% level, indicating that firms with higher social contribution value, social return on assets, and social contribution value per share tend to have higher *roa*. The estimation results of the main explanatory variables in Table 4 mostly support hypothesis 1, which suggests that firms with better CSR performance have better firm performance.

Secondly, looking at the estimation results of controlling variables, this study found that in models (1) to (6), most of the estimated coefficients for asset size are significantly positive, indicating that firms with larger asset sizes have higher firm performance, in terms of larger returns on asset (*roa*). The estimated coefficients for debt ratio are mostly significantly negative, indicating that firms with higher debt ratios have poorer firm performance. Most of the estimated coefficients for sales growth rate are significantly positive, indicating that firms with higher sales growth rates have better firm performance. Most of the estimated coefficients for years of establishment are significantly negative, indicating that aged firms tend to have poorer performance. Most of the estimated coefficients for board size are significantly negative, indicating that firms with more board members have lower performance. The estimated coefficients for independent director ratio, managerial shareholdings, institutional investors' shareholdings, and foreign institutional investor's shareholdings are mostly significantly positive, indicating that firms with greater degree of board independence, higher managerial shareholdings, higher institutional investors' shareholdings, and higher foreign institutional investor's shareholdings tend to have better firm performance. The estimation results of controlling variables are consistent with existing studies and financial intuition. Finally, the adjusted coefficient of determination for each estimation model are between 19.4% and 78.7%, and the F-values of joint test for each model is extremely high, indicating that the current regression model specifications are appropriate.

Table 5 reports the regression estimates of the impact of CSR performance on firm performance measured by return on equity (*roe*). By observing the estimated coefficients

of the main explanatory variables in each model, it can be found that the estimated coefficients of current CSR performance, continuous CSR performance, social contribution value, social return on assets, and social contribution per share are all positive and statistically significant, indicating that firms that have won the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* in the current year, or have won either of two awards continuously for the 14-year data period, have larger social contribution value, larger social return on assets, and larger social contribution per share are more likely to have higher *roe*. The empirical results support hypothesis 1. Table 6 reports the regression estimates of the impact of CSR performance on firm performance measured by earnings per share (*eps*), and the empirical results similarly support the hypothesis 1, better CSR performance leads to better financial performance.

Table 7 and Table 8 report the regression estimates of the impact of CSR performance on annual gross stock return (*gret*) and annual excess stock return (*nret*), respectively. Observing the estimated results of the main explanatory variables in models (1)-(3), we find that the estimated coefficients of current CSR performance, continuous CSR performance, and overlap CSR performance do not reach statistical significance, indicating that firms that are selected as the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* do not have a significantly better stock market performance. However, observing models (4)-(6) in both table, we find that the estimated coefficients of social contribution value, social return on assets, and social contribution value per share are all positive and significant, indicating that higher social contribution value, social return on assets, and social contribution value per share are associated with higher stock gross returns and excess returns. The results of Tables 6 and 7 partially support hypothesis 1, better CSR performance leads to better market-based performance. Table 9 reports the regression estimates of the impact of CSR performance on Tobin's q. The estimated results of all models show that the six variables of CSR performance have a positive and significant impact on Tobin's q, indicating that better CSR performance is associated with higher firm value, confirming the hypothesis 1.

The estimation results in Tables 4 to 9 show that a firm's CSR performance not only improves its accounting-based performance indicators, but also enhances its market-based performance indicators. These empirical results are consistent with previous studies such as Waddock and Graves (1997), Griffin and Mahon (1997), Margolis and Walsh (2003), Orlitzky, Schmidt and Rynes (2003), Wu and Shen (2013), and Chi, Miao and Chuang (2014). They all indicated that better CSR performance corresponds to an increase in stakeholder management and then promotes operational consequences, leading to better stock market performance for the firm.

The regression results in Table 10 report the impact of CSR performance on a firm's risk, which is measured by the variance of the return on assets (*roavar*) that reflects the variability or volatility of firm's operational consequences. Similar to before, the main explanatory variables in models (1) to (6) are different CSR performance variables, including current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on assets (*sroa*), and social contribution value per share (*scvps*). The estimated coefficients of most CSR performance variables in models (1) to (6) are negative and statistically significant. The coefficients of current CSR performance, social contribution value, social return on assets, and social contribution value per share are negative and significant, indicating that

firms selected as the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly*, as well as those with higher social contribution value, social return on assets, and social contribution value per share, have lower variance of returns on assets and thus lower operational risk. The empirical findings support hypothesis 2.

Table 11 reports the regression estimates of the impact of CSR performance on firm risk, measured by the variance of excess weekly stock returns (*estvar*). The estimated coefficients of the CSR performance variables in models (1) to (6) are mostly negative and statistically significant. The coefficients of current CSR performance, continuous CSR performance, social contribution value, social return on assets, and social contribution value per share are all negative and statistically significant. This indicates that firms selected as the "Corporate Citizen" of the *Common Wealth* or the "CSR Award" of the *Global Views Monthly* in the current year, firms with continuously selected as either of two awards in whole data period, firms with larger social contribution value, social return on assets, and social contribution value per share, have lower variance of excess stock returns, indicating lower volatility in their stock market performance and lower wealth fluctuations for their investors. The empirical results support hypothesis 2.

Tables 12-13 report the regression estimates of the impact of CSR performance on firm risk, the ratio of negative excess returns to positive excess returns (*rtdu*), and the 95% VaR of the weekly excess stock return, both as measures of the weekly stock excess return downside risk. Observing the estimated coefficients of each CSR performance variable in models (1)-(6) of both table, it is found that most of them are negative and statistically significant. This indicates that better CSR performance is associated with lower level of negative excess return to positive excess return, and lower level of 95% VaR of weekly excess return, which both implies lower stock price crash risk and downside risk. Investors would suffer less wealth losses due to firm's potential negative events with better CSR performance. The empirical results support hypothesis 2.

Overall, the estimation results of Tables 10-13 show that the CSR performance of a firm not only reduces the volatility of its operational consequences but also contributes to the stability of its stock market performance, in terms of both stock return volatility and downside risk. This finding is consistent with previous studies such as Orlitzky and Benjamin (2001), Godfrey (2005), Godfrey, Merrill and Hansen (2009), Koh, Qian and Wang (2014), Kim, Li and Li (2014), and Kao, Shiu and Lin (2016), all of which suggest that good CSR performance helps to reduce a firm's earnings volatility and market risk, making CSR performance a risk management tool for firms.

**Table 4 Regression Result of the Effects of CSR Performance on Firm Performance (*roa*)**

| Explanatory Variable     | Explained Variables ( <i>roa</i> ) |                       |                       |                        |                        |                        |
|--------------------------|------------------------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|
|                          | (1)                                | (2)                   | (3)                   | (4)                    | (5)                    | (6)                    |
| <i>csrdummy</i>          | 2.681***<br>(5.54)                 |                       |                       |                        |                        |                        |
| <i>csrcont</i>           |                                    | 6.690***<br>(5.24)    |                       |                        |                        |                        |
| <i>csrovlp</i>           |                                    |                       | 4.059<br>(1.52)       |                        |                        |                        |
| <i>scv</i>               |                                    |                       |                       | 0.699***<br>(46.05)    |                        |                        |
| <i>sroa</i>              |                                    |                       |                       |                        | 0.711***<br>(154.94)   |                        |
| <i>scvps</i>             |                                    |                       |                       |                        |                        | 1.460***<br>(92.14)    |
| <i>asset</i>             | 0.621***<br>(7.87)                 | 0.634***<br>(8.05)    | 0.650***<br>(8.24)    | -0.188**<br>(-2.49)    | 1.330***<br>(31.96)    | 0.116*<br>(1.95)       |
| <i>debt</i>              | -0.106***<br>(-22.75)              | -0.106***<br>(-22.72) | -0.106***<br>(-22.73) | -0.0927***<br>(-21.52) | -0.0412***<br>(-16.46) | -0.104***<br>(-29.59)  |
| <i>salesgr</i>           | 0.103***<br>(32.09)                | 0.103***<br>(32.08)   | 0.103***<br>(32.02)   | 0.0800***<br>(26.94)   | 0.0275***<br>(15.78)   | 0.0433***<br>(17.69)   |
| <i>rd</i>                | -0.00429<br>(-0.25)                | -0.00127<br>(-0.08)   | -0.000239<br>(-0.01)  | -0.0418***<br>(-2.73)  | -0.238***<br>(-26.41)  | -0.125***<br>(-9.92)   |
| <i>age</i>               | -0.0578***<br>(-9.22)              | -0.0563***<br>(-8.97) | -0.0571***<br>(-9.08) | -0.0669***<br>(-11.61) | -0.0554***<br>(-16.81) | -0.0476***<br>(-10.28) |
| <i>board</i>             | -0.188***<br>(-4.32)               | -0.180***<br>(-4.14)  | -0.187***<br>(-4.28)  | -0.179***<br>(-4.49)   | -0.0966***<br>(-4.21)  | -0.173***<br>(-5.42)   |
| <i>idr</i>               | 0.0247***<br>(6.13)                | 0.0248***<br>(6.13)   | 0.0254***<br>(6.27)   | 0.0197***<br>(5.30)    | 0.00754***<br>(3.55)   | -0.0324***<br>(-10.79) |
| <i>dirhold</i>           | 0.0105<br>(1.61)                   | 0.0104<br>(1.59)      | 0.0119*<br>(1.83)     | 0.000554<br>(0.09)     | -0.0186***<br>(-5.44)  | -0.0142***<br>(-2.95)  |
| <i>manahold</i>          | 0.440***<br>(9.92)                 | 0.441***<br>(9.93)    | 0.447***<br>(10.06)   | 0.304***<br>(7.46)     | -0.0696***<br>(-2.95)  | -0.0350<br>(-1.04)     |
| <i>insthold</i>          | 0.0393***<br>(9.32)                | 0.0394***<br>(9.35)   | 0.0388***<br>(9.21)   | 0.0357***<br>(9.29)    | 0.0214***<br>(9.68)    | 0.00683**<br>(2.16)    |
| <i>foreign</i>           | 0.0746***<br>(7.89)                | 0.0766***<br>(8.12)   | 0.0775***<br>(8.20)   | 0.0645***<br>(7.40)    | -0.0153***<br>(-3.04)  | -0.0100<br>(-1.41)     |
| <i>family</i>            | 0.0681<br>(0.50)                   | 0.0268<br>(0.20)      | 0.0592<br>(0.43)      | 0.182<br>(1.46)        | 0.314***<br>(4.37)     | 0.347***<br>(3.43)     |
| constant                 | 2.275**<br>(1.98)                  | 2.006*<br>(1.75)      | 1.797<br>(1.57)       | 6.630***<br>(6.22)     | -16.98***<br>(-27.70)  | 7.611***<br>(8.87)     |
| Num. of obs.             | 9,495                              | 9,495                 | 9,495                 | 8,615                  | 8,615                  | 7,924                  |
| Adj. <i>R</i> -square    | 0.196                              | 0.196                 | 0.194                 | 0.352                  | 0.787                  | 0.605                  |
| Prob. of <i>F</i> -stat. | 0.000                              | 0.000                 | 0.000                 | 0.000                  | 0.000                  | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (returns on asset: *roa*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 5 Regression Result of the Effects of CSR Performance on Firm Performance (*roe*)**

| Explanatory Variable | Explained Variables ( <i>roa</i> ) |                        |                        |                        |                       |                        |
|----------------------|------------------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|
|                      | (1)                                | (2)                    | (3)                    | (4)                    | (5)                   | (6)                    |
| <i>csrdummy</i>      | 3.012***<br>(4.44)                 |                        |                        |                        |                       |                        |
| <i>csrcont</i>       |                                    | 8.399***<br>(4.81)     |                        |                        |                       |                        |
| <i>csrovlp</i>       |                                    |                        | 6.119<br>(1.64)        |                        |                       |                        |
| <i>scv</i>           |                                    |                        |                        | 1.033***<br>(51.77)    |                       |                        |
| <i>sroa</i>          |                                    |                        |                        |                        | 0.919***<br>(128.53)  |                        |
| <i>scvps</i>         |                                    |                        |                        |                        |                       | 1.972***<br>(89.73)    |
| <i>asset</i>         | 1.255***<br>(11.40)                | 1.267***<br>(11.53)    | 1.285***<br>(11.69)    | 0.0780<br>(0.77)       | 2.111***<br>(32.29)   | 0.561***<br>(6.77)     |
| <i>debt</i>          | -0.0775***<br>(-11.86)             | -0.0772***<br>(-11.81) | -0.0776***<br>(-11.86) | -0.0674***<br>(-11.67) | 0.0128***<br>(3.24)   | -0.0736***<br>(-15.07) |
| <i>salesgr</i>       | 0.146***<br>(32.55)                | 0.146***<br>(32.56)    | 0.146***<br>(32.49)    | 0.109***<br>(27.38)    | 0.0451***<br>(16.43)  | 0.0652***<br>(19.16)   |
| <i>rd</i>            | -0.0899***<br>(-3.85)              | -0.0868***<br>(-3.72)  | -0.0857***<br>(-3.67)  | -0.141***<br>(-6.91)   | -0.381***<br>(-27.08) | -0.243***<br>(-13.90)  |
| <i>age</i>           | -0.0335***<br>(-3.83)              | -0.0319***<br>(-3.64)  | -0.0327***<br>(-3.74)  | -0.0460***<br>(-5.97)  | -0.0189***<br>(-3.64) | -0.00980<br>(-1.53)    |
| <i>board</i>         | -0.312***<br>(-5.13)               | -0.302***<br>(-4.97)   | -0.310***<br>(-5.11)   | -0.306***<br>(-5.73)   | -0.225***<br>(-6.24)  | -0.340***<br>(-7.68)   |
| <i>idr</i>           | 0.0466***<br>(8.27)                | 0.0464***<br>(8.24)    | 0.0472***<br>(8.38)    | 0.0423***<br>(8.50)    | 0.0286***<br>(8.54)   | -0.0269***<br>(-6.43)  |
| <i>dirhold</i>       | 0.0155*<br>(1.72)                  | 0.0149*<br>(1.65)      | 0.0171*<br>(1.89)      | -0.00278<br>(-0.35)    | -0.0246***<br>(-4.57) | -0.0198***<br>(-2.96)  |
| <i>manahold</i>      | 0.832***<br>(13.49)                | 0.832***<br>(13.50)    | 0.840***<br>(13.60)    | 0.611***<br>(11.20)    | 0.166***<br>(4.48)    | 0.182***<br>(3.89)     |
| <i>insthold</i>      | 0.0474***<br>(8.06)                | 0.0477***<br>(8.12)    | 0.0470***<br>(7.99)    | 0.0416***<br>(8.07)    | 0.0210***<br>(6.04)   | 0.00378<br>(0.86)      |
| <i>foreign</i>       | 0.0819***<br>(6.24)                | 0.0838***<br>(6.39)    | 0.0850***<br>(6.48)    | 0.0596***<br>(5.12)    | -0.0381***<br>(-4.82) | -0.0372***<br>(-3.77)  |
| <i>family</i>        | 0.272<br>(1.44)                    | 0.221<br>(1.16)        | 0.262<br>(1.38)        | 0.394**<br>(2.35)      | 0.462***<br>(4.09)    | 0.375***<br>(2.67)     |
| constant             | -10.16***<br>(-6.37)               | -10.43***<br>(-6.56)   | -10.67***<br>(-6.70)   | -3.496**<br>(-2.45)    | -34.35***<br>(-35.73) | -2.574**<br>(-2.16)    |
| Num. of obs.         | 9,563                              | 9,563                  | 9,563                  | 8,677                  | 8,635                 | 7,971                  |
| Adj. R-square        | 0.170                              | 0.171                  | 0.169                  | 0.365                  | 0.714                 | 0.584                  |
| Prob. of F-stat.     | 0.000                              | 0.000                  | 0.000                  | 0.000                  | 0.000                 | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (returns on equity: *roe*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.



**Table 6 Regression Result of the Effects of CSR Performance on Firm Performance (*eps*)**

| Explanatory Variable | Explained Variables ( <i>eps</i> ) |                        |                        |                        |                        |                        |
|----------------------|------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                      | (1)                                | (2)                    | (3)                    | (4)                    | (5)                    | (6)                    |
| <i>csrdummy</i>      | 0.930***<br>(6.33)                 |                        |                        |                        |                        |                        |
| <i>csrcont</i>       |                                    | 1.954***<br>(5.15)     |                        |                        |                        |                        |
| <i>csrovlp</i>       |                                    |                        | 0.821<br>(1.04)        |                        |                        |                        |
| <i>scv</i>           |                                    |                        |                        | 0.160***<br>(33.30)    |                        |                        |
| <i>sroa</i>          |                                    |                        |                        |                        | 0.176***<br>(95.64)    |                        |
| <i>scvps</i>         |                                    |                        |                        |                        |                        | 0.523***<br>(158.81)   |
| <i>asset</i>         | 0.439***<br>(18.65)                | 0.444***<br>(18.90)    | 0.449***<br>(19.08)    | 0.241***<br>(10.07)    | 0.616***<br>(36.85)    | 0.242***<br>(19.66)    |
| <i>debt</i>          | -0.0221***<br>(-15.85)             | -0.0220***<br>(-15.78) | -0.0221***<br>(-15.85) | -0.0202***<br>(-14.89) | -0.00487***<br>(-4.84) | -0.0211***<br>(-29.18) |
| <i>salesgr</i>       | 0.0281***<br>(29.52)               | 0.0281***<br>(29.51)   | 0.0280***<br>(29.42)   | 0.0228***<br>(24.57)   | 0.00810***<br>(11.63)  | 0.00765***<br>(15.20)  |
| <i>rd</i>            | -0.0130***<br>(-2.59)              | -0.0119**<br>(-2.37)   | -0.0116**<br>(-2.32)   | -0.0216***<br>(-4.47)  | -0.0670***<br>(-18.57) | -0.0568***<br>(-21.91) |
| <i>age</i>           | -0.00882***<br>(-4.71)             | -0.00838***<br>(-4.47) | -0.00861***<br>(-4.59) | -0.00961***<br>(-5.30) | -0.00483***<br>(-3.65) | -0.00293***<br>(-3.07) |
| <i>board</i>         | -0.0557***<br>(-4.29)              | -0.0529***<br>(-4.07)  | -0.0551***<br>(-4.24)  | -0.0413***<br>(-3.29)  | -0.0238***<br>(-2.59)  | -0.0476***<br>(-7.25)  |
| <i>idr</i>           | 0.0191***<br>(15.90)               | 0.0191***<br>(15.91)   | 0.0193***<br>(16.06)   | 0.0190***<br>(16.30)   | 0.0161***<br>(18.95)   | 0.000773<br>(1.25)     |
| <i>dirhold</i>       | 0.00213<br>(1.10)                  | 0.00210<br>(1.08)      | 0.00264<br>(1.36)      | -0.000712<br>(-0.38)   | -0.00563***<br>(-4.10) | -0.00684***<br>(-6.88) |
| <i>manahold</i>      | 0.194***<br>(14.71)                | 0.194***<br>(14.71)    | 0.196***<br>(14.81)    | 0.158***<br>(12.36)    | 0.0634***<br>(6.68)    | 0.0227***<br>(3.26)    |
| <i>insthold</i>      | 0.0127***<br>(10.10)               | 0.0127***<br>(10.12)   | 0.0125***<br>(9.97)    | 0.0123***<br>(10.16)   | 0.00780***<br>(8.77)   | 0.00261***<br>(4.00)   |
| <i>foreign</i>       | 0.0240***<br>(8.44)                | 0.0249***<br>(8.77)    | 0.0250***<br>(8.80)    | 0.0194***<br>(7.02)    | 0.00195<br>(0.96)      | -0.00470***<br>(-3.19) |
| <i>family</i>        | 0.0208<br>(0.51)                   | 0.0103<br>(0.25)       | 0.0193<br>(0.47)       | 0.0512<br>(1.30)       | 0.0577**<br>(2.00)     | 0.0546***<br>(2.62)    |
| constant             | -4.759***<br>(-13.96)              | -4.870***<br>(-14.31)  | -4.926***<br>(-14.46)  | -3.683***<br>(-10.97)  | -9.786***<br>(-39.75)  | -2.769***<br>(-15.67)  |
| Num. of obs.         | 9,432                              | 9,432                  | 9,432                  | 8,575                  | 8,468                  | 8,013                  |
| Adj. R-square        | 0.215                              | 0.214                  | 0.212                  | 0.300                  | 0.618                  | 0.812                  |
| Prob. of F-stat.     | 0.000                              | 0.000                  | 0.000                  | 0.000                  | 0.000                  | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (earnings per share: *eps*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 7 Regression Result of the Effects of CSR Performance on Firm Performance (*gret*)**

| Explanatory Variable | Explained Variables ( <i>gret</i> ) |                      |                      |                      |                      |                      |
|----------------------|-------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                      | (1)                                 | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
| <i>csrdummy</i>      | -0.890<br>(-0.31)                   |                      |                      |                      |                      |                      |
| <i>csrcont</i>       |                                     | 11.01<br>(1.47)      |                      |                      |                      |                      |
| <i>csrovlp</i>       |                                     |                      | 19.31<br>(1.24)      |                      |                      |                      |
| <i>scv</i>           |                                     |                      |                      | 0.565***<br>(5.47)   |                      |                      |
| <i>sroa</i>          |                                     |                      |                      |                      | 0.755***<br>(13.57)  |                      |
| <i>scvps</i>         |                                     |                      |                      |                      |                      | 1.507***<br>(10.86)  |
| <i>asset</i>         | 1.002**<br>(2.01)                   | 0.966*<br>(1.94)     | 0.982**<br>(1.98)    | -0.102<br>(-0.18)    | 1.480***<br>(2.79)   | 0.189<br>(0.35)      |
| <i>debt</i>          | -0.108***<br>(-3.73)                | -0.107***<br>(-3.70) | -0.108***<br>(-3.71) | -0.0712**<br>(-2.29) | 0.000449<br>(0.01)   | -0.0619**<br>(-1.97) |
| <i>salesgr</i>       | 0.332***<br>(16.40)                 | 0.333***<br>(16.42)  | 0.332***<br>(16.41)  | 0.292***<br>(13.41)  | 0.220***<br>(9.87)   | 0.242***<br>(10.78)  |
| <i>rd</i>            | -0.0260<br>(-0.25)                  | -0.0296<br>(-0.28)   | -0.0287<br>(-0.28)   | -0.0829<br>(-0.76)   | -0.274**<br>(-2.45)  | -0.214*<br>(-1.88)   |
| <i>age</i>           | 0.163***<br>(4.15)                  | 0.164***<br>(4.18)   | 0.163***<br>(4.16)   | 0.173***<br>(4.13)   | 0.197***<br>(4.73)   | 0.187***<br>(4.42)   |
| <i>board</i>         | 0.0210<br>(0.08)                    | 0.0342<br>(0.13)     | 0.0231<br>(0.09)     | 0.139<br>(0.49)      | 0.240<br>(0.85)      | 0.129<br>(0.45)      |
| <i>idr</i>           | 0.0661***<br>(2.61)                 | 0.0645**<br>(2.55)   | 0.0654***<br>(2.58)  | 0.0851***<br>(3.15)  | 0.0696***<br>(2.60)  | 0.0288<br>(1.05)     |
| <i>dirhold</i>       | 0.0366<br>(0.91)                    | 0.0324<br>(0.80)     | 0.0350<br>(0.87)     | 0.00864<br>(0.20)    | -0.00938<br>(-0.22)  | 0.00393<br>(0.09)    |
| <i>manahold</i>      | 0.814***<br>(2.87)                  | 0.802***<br>(2.83)   | 0.813***<br>(2.87)   | 0.768**<br>(2.54)    | 0.354<br>(1.16)      | 0.321<br>(1.04)      |
| <i>insthold</i>      | 0.00698<br>(0.26)                   | 0.00823<br>(0.31)    | 0.00730<br>(0.27)    | 0.0126<br>(0.45)     | -0.00598<br>(-0.21)  | -0.0224<br>(-0.78)   |
| <i>foreign</i>       | -0.0558<br>(-0.96)                  | -0.0592<br>(-1.03)   | -0.0578<br>(-1.00)   | -0.0646<br>(-1.04)   | -0.189***<br>(-3.02) | -0.152**<br>(-2.37)  |
| <i>family</i>        | -0.0880<br>(-0.10)                  | -0.145<br>(-0.17)    | -0.0872<br>(-0.10)   | -0.147<br>(-0.16)    | -0.177<br>(-0.20)    | -0.0506<br>(-0.06)   |
| constant             | -10.53<br>(-1.46)                   | -10.04<br>(-1.40)    | -10.24<br>(-1.43)    | -3.185<br>(-0.41)    | -30.67***<br>(-3.95) | -3.836<br>(-0.49)    |
| Num. of obs.         | 8,446                               | 8,446                | 8,446                | 7,564                | 7,450                | 7,319                |
| Adj. R-square        | 0.033                               | 0.033                | 0.033                | 0.032                | 0.050                | 0.041                |
| Prob. of F-stat.     | 0.000                               | 0.000                | 0.000                | 0.000                | 0.000                | 0.000                |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (annualized stock gross returns: *gret*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*idr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 8 Regression Result of the Effects of CSR Performance on Firm Performance (*nret*)**

| Explanatory Variable | Explained Variables ( <i>nret</i> ) |                       |                       |                       |                       |                       |
|----------------------|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                      | (1)                                 | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   |
| <i>csrdummy</i>      | -1.272<br>(-0.58)                   |                       |                       |                       |                       |                       |
| <i>csrcont</i>       |                                     | 1.897<br>(0.33)       |                       |                       |                       |                       |
| <i>csrovlp</i>       |                                     |                       | -6.290<br>(-0.53)     |                       |                       |                       |
| <i>scv</i>           |                                     |                       |                       | 0.590***<br>(7.69)    |                       |                       |
| <i>sroa</i>          |                                     |                       |                       |                       | 0.760***<br>(18.46)   |                       |
| <i>scvps</i>         |                                     |                       |                       |                       |                       | 1.416***<br>(13.62)   |
| <i>asset</i>         | 0.0274<br>(0.07)                    | 0.00995<br>(0.03)     | 0.0173<br>(0.05)      | -0.906**<br>(-2.16)   | 0.636<br>(1.62)       | -0.494<br>(-1.23)     |
| <i>debt</i>          | -0.0972***<br>(-4.45)               | -0.0970***<br>(-4.44) | -0.0973***<br>(-4.45) | -0.0737***<br>(-3.16) | -0.00621<br>(-0.27)   | -0.0728***<br>(-3.11) |
| <i>salesgr</i>       | 0.377***<br>(24.85)                 | 0.377***<br>(24.86)   | 0.377***<br>(24.86)   | 0.349***<br>(21.47)   | 0.279***<br>(16.99)   | 0.304***<br>(18.26)   |
| <i>rd</i>            | -0.152*<br>(-1.92)                  | -0.155**<br>(-1.96)   | -0.154*<br>(-1.95)    | -0.248***<br>(-3.00)  | -0.438***<br>(-5.27)  | -0.341***<br>(-4.01)  |
| <i>age</i>           | 0.0464<br>(1.58)                    | 0.0463<br>(1.58)      | 0.0459<br>(1.56)      | 0.0289<br>(0.93)      | 0.0614**<br>(2.02)    | 0.0547*<br>(1.76)     |
| <i>board</i>         | -0.563***<br>(-2.81)                | -0.561***<br>(-2.80)  | -0.564***<br>(-2.82)  | -0.586***<br>(-2.77)  | -0.468**<br>(-2.24)   | -0.577***<br>(-2.71)  |
| <i>idr</i>           | -0.0416**<br>(-2.20)                | -0.0422**<br>(-2.24)  | -0.0418**<br>(-2.22)  | -0.0420**<br>(-2.10)  | -0.0532***<br>(-2.71) | -0.0898***<br>(-4.44) |
| <i>dirhold</i>       | 0.0680**<br>(2.25)                  | 0.0666**<br>(2.20)    | 0.0675**<br>(2.23)    | 0.0524*<br>(1.65)     | 0.0384<br>(1.22)      | 0.0576*<br>(1.79)     |
| <i>manahold</i>      | 0.793***<br>(3.77)                  | 0.789***<br>(3.75)    | 0.789***<br>(3.75)    | 0.748***<br>(3.36)    | 0.334<br>(1.51)       | 0.391*<br>(1.72)      |
| <i>insthold</i>      | -0.0101<br>(-0.51)                  | -0.00973<br>(-0.49)   | -0.00996<br>(-0.50)   | -0.0191<br>(-0.91)    | -0.0426**<br>(-2.06)  | -0.0521**<br>(-2.46)  |
| <i>foreign</i>       | -0.00985<br>(-0.23)                 | -0.0117<br>(-0.27)    | -0.0111<br>(-0.26)    | -0.00732<br>(-0.16)   | -0.126***<br>(-2.72)  | -0.0897*<br>(-1.87)   |
| <i>family</i>        | 0.793<br>(1.25)                     | 0.788<br>(1.24)       | 0.798<br>(1.26)       | 0.836<br>(1.25)       | 0.919<br>(1.39)       | 1.087<br>(1.61)       |
| constant             | 7.136<br>(1.32)                     | 7.412<br>(1.37)       | 7.321<br>(1.36)       | 14.94**<br>(2.55)     | -12.03**<br>(-2.09)   | 12.22**<br>(2.11)     |
| Num. of obs.         | 8,606                               | 8,606                 | 8,606                 | 7,716                 | 7,619                 | 7,474                 |
| Adj. R-square        | 0.072                               | 0.072                 | 0.072                 | 0.074                 | 0.106                 | 0.088                 |
| Prob. of F-stat.     | 0.000                               | 0.000                 | 0.000                 | 0.000                 | 0.000                 | 0.000                 |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (annualized stock excess returns: *nret*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*idr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 9 Regression Result of the Effects of CSR Performance on Firm Performance (*tobinq*)**

| Explanatory Variable | Explained Variables ( <i>tobinq</i> ) |                         |                         |                         |                        |                         |
|----------------------|---------------------------------------|-------------------------|-------------------------|-------------------------|------------------------|-------------------------|
|                      | (1)                                   | (2)                     | (3)                     | (4)                     | (5)                    | (6)                     |
| <i>csrdummy</i>      | 0.182***<br>(4.83)                    |                         |                         |                         |                        |                         |
| <i>csrcont</i>       |                                       | 0.747***<br>(7.89)      |                         |                         |                        |                         |
| <i>csrovlp</i>       |                                       |                         | 0.518**<br>(2.50)       |                         |                        |                         |
| <i>scv</i>           |                                       |                         |                         | 0.00957***<br>(7.27)    |                        |                         |
| <i>sroa</i>          |                                       |                         |                         |                         | 0.0218***<br>(33.20)   |                         |
| <i>scvps</i>         |                                       |                         |                         |                         |                        | 0.0537***<br>(32.45)    |
| <i>asset</i>         | -0.0528***<br>(-8.53)                 | -0.0527***<br>(-8.55)   | -0.0509***<br>(-8.24)   | -0.0608***<br>(-8.86)   | -0.0240***<br>(-3.97)  | -0.0868***<br>(-13.71)  |
| <i>debt</i>          | -0.00608***<br>(-16.57)               | -0.00605***<br>(-16.53) | -0.00609***<br>(-16.58) | -0.00611***<br>(-15.65) | -0.00312***<br>(-8.51) | -0.00465***<br>(-12.51) |
| <i>salesgr</i>       | 0.00505***<br>(20.13)                 | 0.00506***<br>(20.19)   | 0.00504***<br>(20.08)   | 0.00474***<br>(17.72)   | 0.00242***<br>(9.51)   | 0.00264***<br>(10.18)   |
| <i>rd</i>            | 0.0178***<br>(13.48)                  | 0.0180***<br>(13.65)    | 0.0181***<br>(13.70)    | 0.0181***<br>(13.16)    | 0.0139***<br>(10.70)   | 0.0171***<br>(12.86)    |
| <i>age</i>           | -0.00415***<br>(-8.42)                | -0.00400***<br>(-8.13)  | -0.00409***<br>(-8.29)  | -0.00445***<br>(-8.57)  | -0.00331***<br>(-6.89) | -0.00297***<br>(-6.06)  |
| <i>board</i>         | 0.00846**<br>(2.46)                   | 0.00937***<br>(2.73)    | 0.00856**<br>(2.49)     | 0.00712**<br>(1.97)     | 0.0112***<br>(3.36)    | 0.0123***<br>(3.62)     |
| <i>idr</i>           | 0.00256***<br>(8.05)                  | 0.00252***<br>(7.95)    | 0.00260***<br>(8.18)    | 0.00273***<br>(8.13)    | 0.00215***<br>(6.96)   | -0.000309<br>(-0.97)    |
| <i>dirhold</i>       | -0.00119**<br>(-2.33)                 | -0.00131**<br>(-2.57)   | -0.00111**<br>(-2.17)   | -0.00118**<br>(-2.22)   | -0.00185***<br>(-3.72) | -0.00194***<br>(-3.81)  |
| <i>manahold</i>      | 0.00940***<br>(2.68)                  | 0.00915***<br>(2.62)    | 0.00989***<br>(2.82)    | 0.00947**<br>(2.57)     | -0.00671*<br>(-1.94)   | -0.00773**<br>(-2.15)   |
| <i>insthold</i>      | 0.00372***<br>(11.23)                 | 0.00376***<br>(11.37)   | 0.00369***<br>(11.14)   | 0.00352***<br>(10.17)   | 0.00288***<br>(8.99)   | 0.00295***<br>(8.81)    |
| <i>foreign</i>       | 0.00654***<br>(8.81)                  | 0.00665***<br>(8.99)    | 0.00674***<br>(9.09)    | 0.00645***<br>(8.19)    | 0.00408***<br>(5.57)   | 0.00319***<br>(4.21)    |
| <i>family</i>        | 0.0246**<br>(2.29)                    | 0.0202*<br>(1.89)       | 0.0242**<br>(2.26)      | 0.0296***<br>(2.62)     | 0.0341***<br>(3.26)    | 0.0308***<br>(2.87)     |
| constant             | 1.911***<br>(21.29)                   | 1.904***<br>(21.31)     | 1.879***<br>(20.98)     | 1.937***<br>(20.11)     | 1.133***<br>(12.73)    | 2.228***<br>(24.49)     |
| Num. of obs.         | 9,273                                 | 9,273                   | 9,273                   | 8,329                   | 8,215                  | 7,615                   |
| Adj. R-square        | 0.173                                 | 0.176                   | 0.172                   | 0.180                   | 0.263                  | 0.267                   |
| Prob. of F-stat.     | 0.000                                 | 0.000                   | 0.000                   | 0.000                   | 0.000                  | 0.000                   |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance (Tobins' *q*: *tobinq*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 10 Regression Result of the Effects of CSR Performance on Firm Risk (*roavar*)**

| Explanatory Variable | Explained Variables ( <i>roavar</i> ) |                       |                       |                       |                       |                       |
|----------------------|---------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                      | (1)                                   | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   |
| <i>csrdummy</i>      | -8.110***<br>(-2.85)                  |                       |                       |                       |                       |                       |
| <i>csrcont</i>       |                                       | -4.935<br>(-0.68)     |                       |                       |                       |                       |
| <i>csrovlp</i>       |                                       |                       | -4.672<br>(-0.27)     |                       |                       |                       |
| <i>scv</i>           |                                       |                       |                       | -0.930***<br>(-10.23) |                       |                       |
| <i>sroa</i>          |                                       |                       |                       |                       | -0.427***<br>(-8.69)  |                       |
| <i>scvps</i>         |                                       |                       |                       |                       |                       | -1.101***<br>(-8.72)  |
| <i>asset</i>         | -3.649***<br>(-8.07)                  | -3.742***<br>(-8.29)  | -3.753***<br>(-8.32)  | -2.172***<br>(-4.46)  | -3.058***<br>(-6.66)  | -2.876***<br>(-5.90)  |
| <i>debt</i>          | 0.00111<br>(0.04)                     | 0.00152<br>(0.06)     | 0.00161<br>(0.06)     | -0.0678**<br>(-2.46)  | -0.0752***<br>(-2.72) | -0.0441<br>(-1.55)    |
| <i>salesgr</i>       | -0.00907<br>(-0.50)                   | -0.00869<br>(-0.48)   | -0.00863<br>(-0.48)   | 0.0628***<br>(3.36)   | 0.0596***<br>(3.12)   | 0.0788***<br>(3.98)   |
| <i>rd</i>            | 0.391***<br>(4.08)                    | 0.378***<br>(3.95)    | 0.377***<br>(3.94)    | 0.329***<br>(3.38)    | 0.417***<br>(4.24)    | 0.367***<br>(3.59)    |
| <i>age</i>           | -0.638***<br>(-17.58)                 | -0.640***<br>(-17.65) | -0.640***<br>(-17.64) | -0.625***<br>(-16.85) | -0.633***<br>(-17.29) | -0.621***<br>(-16.29) |
| <i>board</i>         | -0.398<br>(-1.58)                     | -0.405<br>(-1.61)     | -0.400<br>(-1.59)     | -0.519**<br>(-2.01)   | -0.604**<br>(-2.38)   | -0.327<br>(-1.25)     |
| <i>idr</i>           | -0.0855***<br>(-3.67)                 | -0.0873***<br>(-3.74) | -0.0877***<br>(-3.76) | -0.0500**<br>(-2.09)  | -0.0601**<br>(-2.55)  | -0.0485**<br>(-1.96)  |
| <i>dirhold</i>       | -0.0382<br>(-1.02)                    | -0.0414<br>(-1.11)    | -0.0424<br>(-1.13)    | -0.0419<br>(-1.10)    | -0.0481<br>(-1.27)    | -0.0628<br>(-1.59)    |
| <i>manahold</i>      | -0.657***<br>(-2.59)                  | -0.672***<br>(-2.65)  | -0.676***<br>(-2.66)  | -0.232<br>(-0.89)     | -0.119<br>(-0.46)     | -0.00828<br>(-0.03)   |
| <i>insthold</i>      | 0.00383<br>(0.16)                     | 0.00502<br>(0.21)     | 0.00544<br>(0.22)     | 0.0161<br>(0.65)      | 0.0305<br>(1.24)      | 0.0746***<br>(2.87)   |
| <i>foreign</i>       | 0.0227<br>(0.42)                      | 0.0155<br>(0.29)      | 0.0147<br>(0.27)      | -0.00418<br>(-0.07)   | 0.0481<br>(0.86)      | -0.000737<br>(-0.01)  |
| <i>family</i>        | -0.184<br>(-0.24)                     | -0.151<br>(-0.19)     | -0.173<br>(-0.22)     | -0.749<br>(-0.93)     | -0.461<br>(-0.58)     | 0.172<br>(0.21)       |
| constant             | 105.7***<br>(16.05)                   | 107.2***<br>(16.33)   | 107.3***<br>(16.37)   | 95.20***<br>(13.84)   | 102.6***<br>(15.15)   | 94.05***<br>(13.36)   |
| Num. of obs.         | 9,431                                 | 9,431                 | 9,431                 | 8,451                 | 8,305                 | 7,663                 |
| Adj. R-square        | 0.063                                 | 0.062                 | 0.062                 | 0.077                 | 0.068                 | 0.067                 |
| Prob. of F-stat.     | 0.000                                 | 0.000                 | 0.000                 | 0.000                 | 0.000                 | 0.000                 |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk (variance of the last five-year returns on assets: *roavar*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*idr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 11 Regression Result of the Effects of CSR Performance on Firm Risk (*estvar*)**

| Explanatory Variable | Explained Variables ( <i>estvar</i> ) |                       |                       |                       |                       |                       |
|----------------------|---------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                      | (1)                                   | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   |
| <i>csrdummy</i>      | -2.838**<br>(-2.07)                   |                       |                       |                       |                       |                       |
| <i>csrcont</i>       |                                       | -6.728*<br>(-1.85)    |                       |                       |                       |                       |
| <i>csrovlp</i>       |                                       |                       | -6.698<br>(-0.93)     |                       |                       |                       |
| <i>scv</i>           |                                       |                       |                       | -0.299***<br>(-6.59)  |                       |                       |
| <i>sroa</i>          |                                       |                       |                       |                       | -0.237***<br>(-9.41)  |                       |
| <i>scvps</i>         |                                       |                       |                       |                       |                       | -0.622***<br>(-9.84)  |
| <i>asset</i>         | -3.605***<br>(-15.82)                 | -3.620***<br>(-15.91) | -3.632***<br>(-15.96) | -3.021***<br>(-11.94) | -3.502***<br>(-14.51) | -3.205***<br>(-13.15) |
| <i>debt</i>          | 0.106***<br>(7.88)                    | 0.106***<br>(7.86)    | 0.106***<br>(7.88)    | 0.0928***<br>(6.53)   | 0.0649***<br>(4.49)   | 0.103***<br>(7.16)    |
| <i>salesgr</i>       | 0.0683***<br>(7.56)                   | 0.0682***<br>(7.55)   | 0.0684***<br>(7.57)   | 0.0887***<br>(9.20)   | 0.105***<br>(10.57)   | 0.0958***<br>(9.68)   |
| <i>rd</i>            | 0.253***<br>(5.34)                    | 0.250***<br>(5.27)    | 0.249***<br>(5.26)    | 0.278***<br>(5.63)    | 0.321***<br>(6.35)    | 0.302***<br>(5.93)    |
| <i>age</i>           | -0.253***<br>(-14.08)                 | -0.254***<br>(-14.18) | -0.254***<br>(-14.14) | -0.245***<br>(-12.98) | -0.267***<br>(-14.19) | -0.269***<br>(-14.15) |
| <i>board</i>         | -0.0302<br>(-0.24)                    | -0.0386<br>(-0.31)    | -0.0317<br>(-0.26)    | -0.0639<br>(-0.49)    | -0.0907<br>(-0.70)    | -0.0310<br>(-0.24)    |
| <i>idr</i>           | -0.0843***<br>(-7.36)                 | -0.0844***<br>(-7.36) | -0.0850***<br>(-7.41) | -0.0921***<br>(-7.62) | -0.0874***<br>(-7.26) | -0.0721***<br>(-5.90) |
| <i>dirhold</i>       | -0.0365*<br>(-1.95)                   | -0.0365*<br>(-1.95)   | -0.0380**<br>(-2.04)  | -0.0289<br>(-1.49)    | -0.0158<br>(-0.81)    | -0.0123<br>(-0.62)    |
| <i>manahold</i>      | -0.260**<br>(-2.04)                   | -0.263**<br>(-2.07)   | -0.269**<br>(-2.12)   | -0.0564<br>(-0.42)    | 0.0452<br>(0.33)      | 0.0717<br>(0.52)      |
| <i>insthold</i>      | 0.0159<br>(1.29)                      | 0.0157<br>(1.28)      | 0.0162<br>(1.32)      | 0.0139<br>(1.08)      | 0.0214*<br>(1.66)     | 0.0292**<br>(2.24)    |
| <i>foreign</i>       | 0.0256<br>(0.96)                      | 0.0234<br>(0.88)      | 0.0223<br>(0.84)      | 0.0386<br>(1.37)      | 0.0691**<br>(2.43)    | 0.0708**<br>(2.44)    |
| <i>family</i>        | 1.172***<br>(3.02)                    | 1.216***<br>(3.12)    | 1.185***<br>(3.05)    | 1.394***<br>(3.41)    | 1.552***<br>(3.79)    | 1.413***<br>(3.42)    |
| constant             | 81.59***<br>(24.70)                   | 81.91***<br>(24.85)   | 82.05***<br>(24.90)   | 76.34***<br>(21.44)   | 83.73***<br>(23.63)   | 76.48***<br>(21.73)   |
| Num. of obs.         | 8,704                                 | 8,704                 | 8,704                 | 7,771                 | 7,673                 | 7,542                 |
| Adj. R-square        | 0.080                                 | 0.080                 | 0.080                 | 0.084                 | 0.091                 | 0.093                 |
| Prob. of F-stat.     | 0.000                                 | 0.000                 | 0.000                 | 0.000                 | 0.000                 | 0.000                 |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk (variance of weekly excess stock returns: *estvar*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*idr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 12 Regression Result of the Effects of CSR Performance on Firm Risk (*rtdu*)**

| Explanatory Variable | Explained Variables ( <i>rtdu</i> ) |                         |                         |                         |                         |                         |
|----------------------|-------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                      | (1)                                 | (2)                     | (3)                     | (4)                     | (5)                     | (6)                     |
| <i>csrdummy</i>      | 0.00195<br>(0.08)                   |                         |                         |                         |                         |                         |
| <i>csrcont</i>       |                                     | -0.120*<br>(-1.71)      |                         |                         |                         |                         |
| <i>csrovlp</i>       |                                     |                         | 0.0103<br>(0.08)        |                         |                         |                         |
| <i>scv</i>           |                                     |                         |                         | -0.00507***<br>(-5.76)  |                         |                         |
| <i>sroa</i>          |                                     |                         |                         |                         | -0.00734***<br>(-15.22) |                         |
| <i>scvps</i>         |                                     |                         |                         |                         |                         | -0.0125***<br>(-10.27)  |
| <i>asset</i>         | -0.00406<br>(-0.94)                 | -0.00381<br>(-0.88)     | -0.00404<br>(-0.94)     | 0.00443<br>(0.92)       | -0.00789*<br>(-1.73)    | 0.00285<br>(0.61)       |
| <i>debt</i>          | 0.00128***<br>(5.03)                | 0.00127***<br>(4.99)    | 0.00128***<br>(5.03)    | 0.00103***<br>(3.83)    | 0.000354<br>(1.30)      | 0.000958***<br>(3.50)   |
| <i>salesgr</i>       | -0.00399***<br>(-22.71)             | -0.00400***<br>(-22.74) | -0.00399***<br>(-22.71) | -0.00371***<br>(-19.82) | -0.00305***<br>(-15.99) | -0.00333***<br>(-17.27) |
| <i>rd</i>            | 0.00122<br>(1.33)                   | 0.00124<br>(1.35)       | 0.00122<br>(1.33)       | 0.00201**<br>(2.10)     | 0.00407***<br>(4.18)    | 0.00255**<br>(2.57)     |
| <i>age</i>           | -0.000334<br>(-0.98)                | -0.000347<br>(-1.01)    | -0.000333<br>(-0.97)    | -0.000236<br>(-0.66)    | -0.000498<br>(-1.40)    | -0.000470<br>(-1.29)    |
| <i>board</i>         | 0.00832***<br>(3.55)                | 0.00818***<br>(3.50)    | 0.00832***<br>(3.56)    | 0.00880***<br>(3.58)    | 0.00808***<br>(3.30)    | 0.00967***<br>(3.89)    |
| <i>idr</i>           | 0.000557**<br>(2.54)                | 0.000571***<br>(2.61)   | 0.000558**<br>(2.55)    | 0.000533**<br>(2.31)    | 0.000665***<br>(2.91)   | 0.000992***<br>(4.22)   |
| <i>dirhold</i>       | -0.000739**<br>(-2.08)              | -0.000701**<br>(-1.98)  | -0.000738**<br>(-2.08)  | -0.000634*<br>(-1.72)   | -0.000507<br>(-1.37)    | -0.000671*<br>(-1.77)   |
| <i>manahold</i>      | -0.00819***<br>(-3.37)              | -0.00810***<br>(-3.33)  | -0.00819***<br>(-3.36)  | -0.00822***<br>(-3.21)  | -0.00467*<br>(-1.82)    | -0.00477*<br>(-1.82)    |
| <i>insthold</i>      | 0.000267<br>(1.14)                  | 0.000257<br>(1.10)      | 0.000267<br>(1.14)      | 0.000362<br>(1.48)      | 0.000487**<br>(2.01)    | 0.000590**<br>(2.38)    |
| <i>foreign</i>       | 0.0000645<br>(0.13)                 | 0.0000843<br>(0.17)     | 0.0000663<br>(0.13)     | 0.000131<br>(0.24)      | 0.00115**<br>(2.10)     | 0.000803<br>(1.43)      |
| <i>family</i>        | -0.00517<br>(-0.70)                 | -0.00464<br>(-0.63)     | -0.00518<br>(-0.70)     | -0.00501<br>(-0.64)     | -0.00448<br>(-0.58)     | -0.00420<br>(-0.53)     |
| constant             | 0.982***<br>(15.70)                 | 0.979***<br>(15.69)     | 0.982***<br>(15.74)     | 0.907***<br>(13.47)     | 1.136***<br>(17.04)     | 0.899***<br>(13.42)     |
| Num. of obs.         | 8,523                               | 8,523                   | 8,523                   | 7,628                   | 7,533                   | 7,402                   |
| Adj. R-square        | 0.062                               | 0.062                   | 0.062                   | 0.063                   | 0.085                   | 0.070                   |
| Prob. of F-stat.     | 0.000                               | 0.000                   | 0.000                   | 0.000                   | 0.000                   | 0.000                   |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk (the ratio of sum of negative excess stock returns to sum of positive excess stock returns: *rtdu*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 13 Regression Result of the Effects of CSR Performance on Firm Risk (*estvar95*)**

| Explanatory Variable | Explained Variables ( <i>estvar95</i> ) |                        |                        |                        |                        |                        |
|----------------------|---|------------------------|------------------------|------------------------|------------------------|------------------------|
|                      | (1)                                     | (2)                    | (3)                    | (4)                    | (5)                    | (6)                    |
| <i>csrdummy</i>      | -0.390**<br>(-2.50)                     |                        |                        |                        |                        |                        |
| <i>csrcont</i>       |   | -0.941**<br>(-2.25)    |                        |                        |                        |                        |
| <i>csrovlp</i>       |   |                        | -0.961<br>(-1.15)      |                        |                        |                        |
| <i>scv</i>           |   |                        |                        | -0.0491***<br>(-9.43)  |                        |                        |
| <i>sroa</i>          |   |                        |                        |                        | -0.0434***<br>(-15.10) |                        |
| <i>scvps</i>         |   |                        |                        |                        |                        | -0.102***<br>(-14.15)  |
| <i>asset</i>         | -0.328***<br>(-12.54)                   | -0.330***<br>(-12.64)  | -0.332***<br>(-12.71)  | -0.242***<br>(-8.40)   | -0.345***<br>(-12.57)  | -0.285***<br>(-10.30)  |
| <i>debt</i>          | 0.0133***<br>(8.62)                     | 0.0133***<br>(8.61)    | 0.0133***<br>(8.63)    | 0.0113***<br>(6.94)    | 0.00748***<br>(4.54)   | 0.0132***<br>(8.10)    |
| <i>salesgr</i>       | -0.000922<br>(-0.89)                    | -0.000932<br>(-0.90)   | -0.000906<br>(-0.88)   | 0.00149<br>(1.35)      | 0.00441***<br>(3.91)   | 0.00322***<br>(2.86)   |
| <i>rd</i>            | 0.0433***<br>(7.95)                     | 0.0428***<br>(7.87)    | 0.0427***<br>(7.85)    | 0.0447***<br>(7.89)    | 0.0522***<br>(9.03)    | 0.0467***<br>(8.04)    |
| <i>age</i>           | -0.0362***<br>(-17.65)                  | -0.0364***<br>(-17.75) | -0.0364***<br>(-17.71) | -0.0368***<br>(-17.12) | -0.0397***<br>(-18.53) | -0.0399***<br>(-18.44) |
| <i>board</i>         | -0.00868<br>(-0.61)                     | -0.00974<br>(-0.69)    | -0.00886<br>(-0.63)    | -0.0183<br>(-1.24)     | -0.0189<br>(-1.28)     | -0.00943<br>(-0.64)    |
| <i>idr</i>           | -0.0131***<br>(-9.96)                   | -0.0131***<br>(-9.96)  | -0.0132***<br>(-10.02) | -0.0142***<br>(-10.24) | -0.0137***<br>(-9.97)  | -0.0109***<br>(-7.85)  |
| <i>dirhold</i>       | -0.00608***<br>(-2.85)                  | -0.00606***<br>(-2.84) | -0.00627***<br>(-2.94) | -0.00564**<br>(-2.55)  | -0.00400*<br>(-1.79)   | -0.00411*<br>(-1.83)   |
| <i>manahold</i>      | -0.0367**<br>(-2.51)                    | -0.0371**<br>(-2.54)   | -0.0379***<br>(-2.59)  | -0.0180<br>(-1.17)     | 0.00680<br>(0.44)      | 0.00359<br>(0.23)      |
| <i>insthold</i>      | 0.00307**<br>(2.17)                     | 0.00305**<br>(2.16)    | 0.00312**<br>(2.21)    | 0.00274*<br>(1.86)     | 0.00402***<br>(2.74)   | 0.00505***<br>(3.40)   |
| <i>foreign</i>       | 0.00653**<br>(2.15)                     | 0.00627**<br>(2.07)    | 0.00612**<br>(2.02)    | 0.00842***<br>(2.63)   | 0.0154***<br>(4.77)    | 0.0138***<br>(4.18)    |
| <i>family</i>        | 0.187***<br>(4.20)                      | 0.192***<br>(4.32)     | 0.188***<br>(4.22)     | 0.209***<br>(4.47)     | 0.232***<br>(4.97)     | 0.213***<br>(4.53)     |
| constant             | 11.48***<br>(30.32)                     | 11.53***<br>(30.51)    | 11.55***<br>(30.57)    | 10.92***<br>(26.96)    | 12.46***<br>(30.98)    | 11.11***<br>(27.83)    |
| Num. of obs.         | 8,747                                   | 8,747                  | 8,747                  | 7,828                  | 7,717                  | 7,589                  |
| Adj. R-square        | 0.080                                   | 0.080                  | 0.080                  | 0.092                  | 0.110                  | 0.108                  |
| Prob. of F-stat.     | 0.000                                   | 0.000                  | 0.000                  | 0.000                  | 0.000                  | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk (5% percentile of excess weekly stock returns within a year: *estvar95*). The main explanatory variables in models (1) to (6) adopt different CSR performance variables, namely current CSR performance (*csrdummy*), continuous CSR performance (*csrcont*), overlap CSR performance (*csrovlp*), social contribution value (*scv*), social return on asset (*sroa*), and social contribution value per share (*scvps*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.



### 4.3 Additional Tests

#### 4.3.1 Various Dimensions in CSR Performance

**Stakeholders** of a firm are wide-ranging, including not only shareholders and creditors but also employees, consumers, government and non-governmental organizations, upstream suppliers, and other external third parties who are potentially related to the firm's operations. This study decomposes social contribution value into four components, including the total amount of cash dividends paid to shareholders, the total amount of salaries and benefits paid to employees, the total amount of interest paid to creditors, and the total amount of taxes paid to the government. Taking into account the firm's size effect, the above four items are divided by the number of shares outstanding to derive four variables, including the total amount of cash dividends divided by the number of shares outstanding (*dividq*), the total amount of employee salaries and benefits divided by the number of shares outstanding (*salaryq*), the total amount of interest divided by the number of shares outstanding (*interestq*), and the total amount of taxes divided by the number of shares outstanding (*taxq*). This study estimates how these four dimensions in CSR performance affect firm performance and risk.

Table 14 presents the regression estimates of the impact of four dimensions in CSR performance on firm performance, measured by return on assets (*roa*) and Tobin's q (*tobinq*). Models (1) to (4) use different CSR performance dimensions as the main explanatory variables. Looking at the estimated results when the dependent variable is *roa*, the estimated coefficients of the four CSR performance variables are all positive and statistically significant, indicating that the more a firm contributes to dividend payments, employee salaries and benefits, taxes, and interest payments, the higher its *roa*. Interestingly, because the data units for the four CSR performance variables are the same, we can see that the marginal impact of taxes on *roa* is the largest, followed by dividend payments, while employee salaries and benefits and interest payments have smaller effects. A firm's contribution to government taxes has the greatest impact on enhancing its *roa*.

Next, looking at the estimated results when the dependent variable is Tobin's Q, the estimated coefficients of the four CSR performance variables are all positive and statistically significant, indicating that the more a firm contributes to dividend payments, employee wages and benefits, taxes, and interest payments, the higher its value. Similarly interesting, we can see that the marginal impact of taxes and interest payments on a firm's evaluation by investors is relatively larger than that of dividend payments and employee wages and benefits. Overall, based on the impact of the four CSR performance dimensions on firm performance, the empirical results still support hypothesis 1, CSR performance helps to enhance firm's accounting-based versus market-based performance.

Table 15 reports the regression estimation results of the impact of different CSR performance dimensions on risk (variance of returns on assets: *roavar* and weekly excess stock return 95% VaR: *estvar95*). Regardless of the dependent variable, firms' contributions in dividend payments, employee salaries and benefits, and tax have significant negative effects on firm risk. However, a positive and significant impact on the weekly stock excess return 95% VaR is observed for interest payments. Overall, most of the estimation results of the CSR classification variables still support hypothesis 2, better CSR performance helps to reduce firm risk.

#### 4.3.2 TESG Ratings as an Alternative Measures on CSR Performance

In 2022, the Taiwan Economic Journal database constructed and published the TESG

sustainability development index (<https://tesg.tej.com.tw/>) for publicly listed firms in Taiwan. The E (Environment) component evaluates a firm's environmental protection efforts, including carbon emissions, wastewater management, and energy management, to measure whether the firm considers environmental protection in its development. The S (Social) component assesses a firm's social responsibility, including labor rights, social participation, and customer protection, to promote a good workplace environment and implement CSR. The G (Governance) component evaluates a firm's governance, including compliance with regulations, supply chain management, and risk management, to assess the firm's managers and operations.

TESG evaluation derives fruitful variables in measuring firm's CSR performance, and this study adopts several comprehensive evaluation indicators. First, TESG ratings (*tesgrate*) is divided into 7 levels, including A+, A, B+, B, B-, C, and C-, and this study assigns an integer value of 7, 6,...1 to the seven TESG levels, and a higher score indicates a better TESG rating. Second, the firm's TESG score (*tesgscore*) ranges from 0 to 100 points, with 0 being the worst and 100 being the best. Third to fifth variables are the scores of the three individual TESG category items: environmental dimension score (*envscore*), social dimension score (*socscore*), and corporate governance dimension score (*govscore*). A higher score (0~100 points) for each of these variables indicates better performance by the firm in each category of ESG performance.

Table 16 reports the regression estimates of the impact of a firm's five TESG rating variables on its performance (return on assets: *roa* and Tobin's Q: *tobinq*). Models (1) to (5) use different main explanatory variables, including TESG rating, TESG score, environmental score, social score, and governance score. The control variables in the regression equations are the same as in the previous models. First, when the performance variable is *roa*, the estimation results of the main explanatory variables in Models (1) to (2) show that the coefficients of TESG rating and TESG score are both positive and statistically significant. This suggests that firms with higher TESG ratings and scores have higher *roa*. Additionally, the estimation results of the main explanatory variables in Models (3) to (5) show that the coefficients of environmental score, social score, and governance score are all positive and statistically significant, indicating that firms with higher scores in these areas have higher *roa*. Comparing the marginal effects of the different scores on *roa*, we find that social score and governance score have a larger marginal impact on *roa*, while environmental score has a smaller marginal impact. Second, when the performance variable is Tobin's Q, the estimation results of the main explanatory variables in Models (1) to (5) show that higher TESG ratings, TESG scores, environmental scores, social scores, and governance scores all have a significant positive impact on a firm's value indicator Tobin's Q. This suggests that firms with higher TESG ratings, overall scores, and individual scores have higher firm value. The estimation results in Table 16 support hypothesis 1.

The regression estimates of the impact of the firm's TESG scores on the risk of the firm (measured by the variance of returns on asset, *roavar*, and the 95% value at risk of weekly excess stock returns, *estvar95*) are reported in Table 17. Regardless of the dependent variable, whether it is TESG rating, TESG score, or scores in the environmental, social, or governance dimensions, the estimated coefficients are mostly negative and significant, indicating that the firm's higher TESG rating, TESG score, or scores in the environmental, social, or governance dimensions significantly reduce the risk of

operational consequences and stock market crash risk. In comparing the marginal impact of different dimension scores on reducing firm risk, the estimated coefficients suggest that social and governance scores have a larger marginal impact (with larger absolute values), while environmental scores have a smaller marginal impact. Overall, the estimation results in Table 17 still support hypothesis 2 of the study.

**Table 14 The Effects of Four Dimensions in CSR Performance on Firm Performance**

| Explanatory Variable | Explained Variables ( <i>roa</i> ) |                        |                        |                        | Explained Variables ( <i>tobinq</i> ) |                        |                         |                         |
|----------------------|------------------------------------|------------------------|------------------------|------------------------|---------------------------------------|------------------------|-------------------------|-------------------------|
|                      | (1)                                | (2)                    | (3)                    | (4)                    | (1)                                   | (2)                    | (3)                     | (4)                     |
| <i>salaryq</i>       | 1.993***<br>(36.40)                |                        |                        |                        | 0.0480***<br>(10.56)                  |                        |                         |                         |
| <i>dividq</i>        |                                    | 3.592***<br>(76.97)    |                        |                        |                                       | 0.161***<br>(38.22)    |                         |                         |
| <i>taxq</i>          |                                    |                        | 11.05***<br>(67.19)    |                        |                                       |                        | 0.427***<br>(26.86)     |                         |
| <i>interestq</i>     |                                    |                        |                        | 1.718*<br>(1.79)       |                                       |                        |                         | 0.312***<br>(3.60)      |
| <i>asset</i>         | 0.925***<br>(10.97)                | -0.0805<br>(-1.22)     | -0.0215<br>(-0.30)     | 0.117<br>(1.35)        | -0.0494***<br>(-7.04)                 | -0.0984***<br>(-16.22) | -0.0882***<br>(-12.67)  | -0.0704***<br>(-8.98)   |
| <i>debt</i>          | -0.146***<br>(-28.96)              | -0.0580***<br>(-14.80) | -0.0848***<br>(-20.30) | -0.0998***<br>(-17.08) | -0.00614***<br>(-14.70)               | -0.00237***<br>(-6.57) | -0.00434***<br>(-10.56) | -0.00696***<br>(-13.08) |
| <i>salesgr</i>       | 0.0906***<br>(26.71)               | 0.0601***<br>(22.38)   | 0.0601***<br>(20.82)   | 0.0833***<br>(24.41)   | 0.00465***<br>(16.45)                 | 0.00269***<br>(10.97)  | 0.00341***<br>(12.06)   | 0.00520***<br>(16.92)   |
| <i>rd</i>            | -0.204***<br>(-10.96)              | -0.00401<br>(-0.29)    | 0.0654***<br>(4.42)    | 0.0324*<br>(1.86)      | 0.0163***<br>(10.53)                  | 0.0200***<br>(15.64)   | 0.0217***<br>(15.00)    | 0.0193***<br>(12.22)    |
| <i>age</i>           | -0.0523***<br>(-7.99)              | -0.0474***<br>(-9.23)  | -0.0465***<br>(-8.53)  | -0.0610***<br>(-9.37)  | -0.00397***<br>(-7.26)                | -0.00344***<br>(-7.28) | -0.00308***<br>(-5.75)  | -0.00461***<br>(-7.86)  |
| <i>board</i>         | -0.289***<br>(-6.33)               | -0.151***<br>(-4.29)   | -0.0989***<br>(-2.64)  | -0.142***<br>(-3.17)   | 0.00812**<br>(2.12)                   | 0.0131***<br>(4.01)    | 0.0130***<br>(3.51)     | 0.00889**<br>(2.20)     |
| <i>idr</i>           | -0.00433<br>(-1.01)                | -0.0276***<br>(-8.23)  | -0.0264***<br>(-7.42)  | 0.0182***<br>(4.37)    | 0.00176***<br>(4.90)                  | -0.000324<br>(-1.05)   | 0.000213<br>(0.61)      | 0.00255***<br>(6.78)    |
| <i>dirhold</i>       | -0.0170**<br>(-2.50)               | 0.00206<br>(0.38)      | -0.00909<br>(-1.60)    | 0.00112<br>(0.17)      | -0.00163***<br>(-2.84)                | -0.00142***<br>(-2.88) | -0.00182***<br>(-3.26)  | -0.000536<br>(-0.88)    |
| <i>manahold</i>      | 0.215***<br>(4.56)                 | 0.00898<br>(0.24)      | 0.0778**<br>(1.97)     | 0.316***<br>(6.82)     | 0.00740*<br>(1.87)                    | -0.00729**<br>(-2.13)  | -0.00106<br>(-0.27)     | 0.0129***<br>(3.07)     |
| <i>insthold</i>      | 0.0321***<br>(7.19)                | 0.0139***<br>(3.94)    | 0.0214***<br>(5.77)    | 0.0313***<br>(7.06)    | 0.00366***<br>(9.78)                  | 0.00284***<br>(8.77)   | 0.00372***<br>(10.18)   | 0.00359***<br>(8.97)    |
| <i>foreign</i>       | 0.0332***<br>(3.29)                | 0.000580<br>(0.07)     | 0.0177**<br>(2.14)     | 0.0951***<br>(9.91)    | 0.00612***<br>(7.24)                  | 0.00275***<br>(3.80)   | 0.00309***<br>(3.80)    | 0.00834***<br>(9.60)    |
| <i>family</i>        | 0.449***<br>(3.15)                 | 0.374***<br>(3.34)     | 0.262**<br>(2.21)      | 0.0187<br>(0.13)       | 0.0369***<br>(3.08)                   | 0.0421***<br>(4.08)    | 0.0256**<br>(2.19)      | 0.0221*<br>(1.74)       |
| constant             | -1.993<br>(-1.64)                  | 9.455***<br>(9.95)     | 9.553***<br>(9.36)     | 11.00***<br>(8.77)     | 1.795***<br>(17.70)                   | 2.346***<br>(27.01)    | 2.259***<br>(22.65)     | 2.187***<br>(19.30)     |
| Num. of obs.         | 7,185                              | 8,013                  | 6,911                  | 6,912                  | 7,012                                 | 7,801                  | 6,729                   | 6,716                   |
| Adj. R-square        | 0.325                              | 0.529                  | 0.504                  | 0.183                  | 0.186                                 | 0.293                  | 0.247                   | 0.182                   |
| Prob. of F-stat.     | 0.000                              | 0.000                  | 0.000                  | 0.000                  | 0.000                                 | 0.000                  | 0.000                   | 0.000                   |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance, proxied by returns on assets (*roa*) and Tobins'q (*tobinq*). The main explanatory variables in models (1) to (4) adopt four dimensions in CSR performance variables, including total amount of cash dividends divided by the number of shares outstanding (*dividq*), the total amount of employee salaries and benefits divided by the number of shares outstanding (*salaryq*), the total amount of interest divided by the number of shares outstanding (*interestq*), and the total amount of taxes divided by the number of shares outstanding (*taxq*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-share-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 15 The Effects of Four Dimensions in CSR Performance on Firm Risk**

| Explanatory Variable     | Explained Variables ( <i>roavar</i> ) |                       |                       |                       | Explained Variables ( <i>estvar95</i> ) |                        |                        |                        |
|--------------------------|---------------------------------------|-----------------------|-----------------------|-----------------------|---|------------------------|------------------------|------------------------|
|                          | (1)                                   | (2)                   | (3)                   | (4)                   | (1)                                     | (2)                    | (3)                    | (4)                    |
| <i>salaryq</i>           | -2.836***<br>(-8.43)                  |                       |                       |                       | -0.195***<br>(-10.38)                   |                        |                        |                        |
| <i>dividq</i>            |                                       | -2.875***<br>(-8.39)  |                       |                       |   | -0.364***<br>(-19.22)  |                        |                        |
| <i>taxq</i>              |                                       |                       | -5.507***<br>(-4.69)  |                       |   |                        | -0.707***<br>(-10.40)  |                        |
| <i>interestq</i>         |                                       |                       |                       | 8.607<br>(1.45)       |   |                        |                        | 2.377***<br>(6.97)     |
| <i>asset</i>             | -3.138***<br>(-6.05)                  | -3.216***<br>(-6.44)  | -3.149***<br>(-6.05)  | -2.489***<br>(-4.65)  | -0.317***<br>(-10.91)                   | -0.249***<br>(-9.10)   | -0.275***<br>(-9.16)   | -0.303***<br>(-9.88)   |
| <i>debt</i>              | 0.0144<br>(0.47)                      | -0.0484<br>(-1.64)    | -0.0500<br>(-1.63)    | -0.138***<br>(-3.81)  | 0.0174***<br>(10.02)                    | 0.00774***<br>(4.74)   | 0.0102***<br>(5.76)    | 0.00203<br>(0.98)      |
| <i>salesgr</i>           | 0.0181<br>(0.88)                      | 0.00858<br>(0.43)     | 0.0214<br>(1.03)      | 0.0768***<br>(3.73)   | -0.000431<br>(-0.38)                    | 0.00292***<br>(2.66)   | 0.00246**<br>(2.05)    | 0.00376***<br>(3.17)   |
| <i>rd</i>                | 0.585***<br>(5.16)                    | 0.269**<br>(2.56)     | 0.174<br>(1.62)       | 0.236**<br>(2.22)     | 0.0555***<br>(8.76)                     | 0.0377***<br>(6.56)    | 0.0327***<br>(5.26)    | 0.0478***<br>(7.79)    |
| <i>age</i>               | -0.678***<br>(-16.70)                 | -0.646***<br>(-16.56) | -0.596***<br>(-14.84) | -0.557***<br>(-13.89) | -0.0414***<br>(-18.28)                  | -0.0403***<br>(-18.89) | -0.0383***<br>(-18.53) | -0.0327***<br>(-14.17) |
| <i>board</i>             | -0.520*<br>(-1.85)                    | -0.264<br>(-0.98)     | -0.352<br>(-1.27)     | -0.497*<br>(-1.80)    | -0.0183<br>(-1.17)                      | -0.0185<br>(-1.26)     | -0.0179<br>(-1.12)     | -0.00500<br>(-0.32)    |
| <i>indr</i>              | -0.0563**<br>(-2.13)                  | -0.0828***<br>(-3.26) | -0.0906***<br>(-3.46) | -0.0823***<br>(-3.19) | -0.0142***<br>(-9.64)                   | -0.0105***<br>(-7.58)  | -0.0110***<br>(-7.32)  | -0.0136***<br>(-9.25)  |
| <i>dirhold</i>           | -0.0157<br>(-0.37)                    | -0.0284<br>(-0.70)    | -0.0614<br>(-1.47)    | -0.0663<br>(-1.60)    | -0.00364<br>(-1.54)                     | -0.00451**<br>(-2.02)  | -0.00415*<br>(-1.72)   | -0.00492**<br>(-2.07)  |
| <i>manahold</i>          | -0.145<br>(-0.50)                     | -0.368<br>(-1.32)     | -0.515*<br>(-1.79)    | -0.194<br>(-0.68)     | -0.00814<br>(-0.50)                     | 0.00248<br>(0.16)      | -0.0146<br>(-0.88)     | -0.0151<br>(-0.93)     |
| <i>insthold</i>          | 0.0345<br>(1.24)                      | 0.0277<br>(1.03)      | 0.0498*<br>(1.82)     | 0.0321<br>(1.17)      | 0.00271*<br>(1.74)                      | 0.00532***<br>(3.60)   | 0.00318**<br>(2.01)    | 0.00357**<br>(2.26)    |
| <i>foreign</i>           | -0.0369<br>(-0.59)                    | 0.0361<br>(0.60)      | -0.0384<br>(-0.63)    | -0.0392<br>(-0.67)    | 0.0123***<br>(3.56)                     | 0.0134***<br>(4.12)    | 0.0100***<br>(2.89)    | 0.00793**<br>(2.38)    |
| <i>family</i>            | -0.772<br>(-0.88)                     | 0.350<br>(0.41)       | 0.108<br>(0.12)       | -0.714<br>(-0.83)     | 0.207***<br>(4.21)                      | 0.166***<br>(3.56)     | 0.201***<br>(4.01)     | 0.174***<br>(3.49)     |
| constant                 | 102.3***<br>(13.62)                   | 101.9***<br>(14.19)   | 98.05***<br>(13.09)   | 88.02***<br>(11.36)   | 11.73***<br>(27.93)                     | 10.89***<br>(27.64)    | 10.98***<br>(25.41)    | 10.99***<br>(24.75)    |
| Num. of obs.             | 7,101                                 | 7,838                 | 6,737                 | 6,749                 | 7,050                                   | 7,763                  | 6,677                  | 6,701                  |
| Adj. <i>R</i> -square    | 0.074                                 | 0.067                 | 0.058                 | 0.057                 | 0.103                                   | 0.125                  | 0.091                  | 0.079                  |
| Prob. of <i>F</i> -stat. | 0.000                                 | 0.000                 | 0.000                 | 0.000                 | 0.000                                   | 0.000                  | 0.000                  | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk, proxied by the variance of the last five-year returns on assets (*roavar*) and the 5% percentile of excess weekly stock returns within a year (*estvar95*). The main explanatory variables in models (1) to (4) adopt four dimensions in CSR performance variables, including total amount of cash dividends divided by the number of shares outstanding (*dividq*), the total amount of employee salaries and benefits divided by the number of shares outstanding (*salaryq*), the total amount of interest divided by the number of shares outstanding (*interestq*), and the total amount of taxes divided by the number of shares outstanding (*taxq*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), directors' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 16 The Effects of TESG Ratings on Firm Performance**

| Explanatory Variable | Explained Variables ( <i>roa</i> ) |                        |                       |                       |                        | Explained Variables ( <i>tobinq</i> ) |                        |                        |                        |                        |
|----------------------|------------------------------------|------------------------|-----------------------|-----------------------|------------------------|---------------------------------------|------------------------|------------------------|------------------------|------------------------|
|                      | (1)                                | (2)                    | (3)                   | (4)                   | (5)                    | (1)                                   | (2)                    | (3)                    | (4)                    | (5)                    |
| <i>tesgrate</i>      | 0.891***<br>(14.03)                |                        |                       |                       |                        | 0.0383***<br>(7.46)                   |                        |                        |                        |                        |
| <i>tesgscore</i>     |                                    | 0.186***<br>(14.30)    |                       |                       |                        |                                       | 0.00854***<br>(8.13)   |                        |                        |                        |
| <i>envscore</i>      |                                    |                        | 0.0518***<br>(5.70)   |                       |                        |                                       |                        | 0.00393***<br>(5.43)   |                        |                        |
| <i>socscore</i>      |                                    |                        |                       | 0.105***<br>(10.38)   |                        |                                       |                        |                        | 0.00458***<br>(5.66)   |                        |
| <i>govscore</i>      |                                    |                        |                       |                       | 0.102***<br>(11.78)    |                                       |                        |                        |                        | 0.00357***<br>(5.14)   |
| <i>asset</i>         | 0.181<br>(1.50)                    | 0.163<br>(1.35)        | 0.373***<br>(3.01)    | 0.240*<br>(1.95)      | 0.483***<br>(4.06)     | -0.0957***<br>(-9.89)                 | -0.0976***<br>(-10.08) | -0.0922***<br>(-9.47)  | -0.0932***<br>(-9.55)  | -0.0822***<br>(-8.67)  |
| <i>debt</i>          | -0.0980***<br>(-14.76)             | -0.0976***<br>(-14.71) | -0.101***<br>(-14.99) | -0.102***<br>(-15.18) | -0.0961***<br>(-14.36) | -0.00398***<br>(-7.46)                | -0.00395***<br>(-7.41) | -0.00416***<br>(-7.78) | -0.00416***<br>(-7.79) | -0.00397***<br>(-7.39) |
| <i>salesgr</i>       | 0.0951***<br>(19.15)               | 0.0950***<br>(19.15)   | 0.0981***<br>(19.40)  | 0.0961***<br>(19.16)  | 0.0975***<br>(19.53)   | 0.00483***<br>(12.07)                 | 0.00481***<br>(12.04)  | 0.00494***<br>(12.31)  | 0.00489***<br>(12.19)  | 0.00495***<br>(12.34)  |
| <i>rd</i>            | -0.0381<br>(-1.61)                 | -0.0385<br>(-1.63)     | -0.0152<br>(-0.63)    | -0.0412*<br>(-1.71)   | -0.00544<br>(-0.23)    | 0.0149***<br>(7.89)                   | 0.0148***<br>(7.83)    | 0.0155***<br>(8.20)    | 0.0147***<br>(7.73)    | 0.0163***<br>(8.65)    |
| <i>age</i>           | -0.0613***<br>(-6.59)              | -0.0623***<br>(-6.70)  | -0.0570***<br>(-6.02) | -0.0632***<br>(-6.71) | -0.0570***<br>(-6.09)  | -0.00677***<br>(-9.06)                | -0.00683***<br>(-9.15) | -0.00665***<br>(-8.87) | -0.00687***<br>(-9.14) | -0.00656***<br>(-8.76) |
| <i>board</i>         | -0.114*<br>(-1.77)                 | -0.122*<br>(-1.89)     | -0.0889<br>(-1.35)    | -0.111*<br>(-1.70)    | -0.0672<br>(-1.04)     | 0.0126**<br>(2.43)                    | 0.0120**<br>(2.32)     | 0.0131**<br>(2.53)     | 0.0129**<br>(2.48)     | 0.0148***<br>(2.85)    |
| <i>idr</i>           | 0.0104<br>(1.19)                   | 0.00937<br>(1.07)      | 0.0165*<br>(1.85)     | 0.0198**<br>(2.23)    | -0.000200<br>(-0.02)   | 0.00179**<br>(2.54)                   | 0.00174**<br>(2.47)    | 0.00214***<br>(3.03)   | 0.00219***<br>(3.10)   | 0.00152**<br>(2.14)    |
| <i>dirhold</i>       | 0.0103<br>(1.11)                   | 0.00984<br>(1.06)      | 0.0159*<br>(1.68)     | 0.0138<br>(1.47)      | 0.0107<br>(1.15)       | -0.000395<br>(-0.53)                  | -0.000443<br>(-0.59)   | -0.000200<br>(-0.27)   | -0.000221<br>(-0.30)   | -0.000297<br>(-0.40)   |
| <i>manahold</i>      | 0.454***<br>(6.79)                 | 0.448***<br>(6.71)     | 0.474***<br>(6.97)    | 0.469***<br>(6.95)    | 0.455***<br>(6.76)     | 0.0111**<br>(2.07)                    | 0.0107**<br>(2.00)     | 0.0117**<br>(2.17)     | 0.0118**<br>(2.18)     | 0.0115**<br>(2.13)     |
| <i>insthold</i>      | 0.0354***<br>(5.71)                | 0.0351***<br>(5.67)    | 0.0340***<br>(5.39)   | 0.0326***<br>(5.21)   | 0.0347***<br>(5.57)    | 0.00398***<br>(8.02)                  | 0.00398***<br>(8.02)   | 0.00397***<br>(7.97)   | 0.00386***<br>(7.75)   | 0.00393***<br>(7.88)   |
| <i>foreign</i>       | 0.0784***<br>(5.89)                | 0.0776***<br>(5.83)    | 0.0808***<br>(5.95)   | 0.0820***<br>(6.11)   | 0.0816***<br>(6.10)    | 0.00789***<br>(7.38)                  | 0.00784***<br>(7.34)   | 0.00780***<br>(7.26)   | 0.00800***<br>(7.46)   | 0.00805***<br>(7.51)   |
| <i>family</i>        | 0.392**<br>(2.01)                  | 0.407**<br>(2.09)      | 0.167<br>(0.85)       | 0.192<br>(0.98)       | 0.459**<br>(2.33)      | 0.0528***<br>(3.37)                   | 0.0541***<br>(3.46)    | 0.0434***<br>(2.77)    | 0.0443***<br>(2.83)    | 0.0524***<br>(3.32)    |
| constant             | 5.010***<br>(2.94)                 | -1.241<br>(-0.72)      | 2.350<br>(1.36)       | 1.891<br>(1.10)       | -1.899<br>(-1.09)      | 2.370***<br>(17.43)                   | 2.092***<br>(15.35)    | 2.240***<br>(16.54)    | 2.232***<br>(16.48)    | 2.104***<br>(15.19)    |
| Num. of obs.         | 4,280                              | 4,280                  | 4,280                 | 4,280                 | 4,280                  | 4,203                                 | 4,203                  | 4,203                  | 4,203                  | 4,203                  |
| Adj. R-square        | 0.210                              | 0.211                  | 0.179                 | 0.193                 | 0.199                  | 0.180                                 | 0.182                  | 0.175                  | 0.175                  | 0.174                  |
| Prob. of F-stat.     | 0.000                              | 0.000                  | 0.000                 | 0.000                 | 0.000                  | 0.000                                 | 0.000                  | 0.000                  | 0.000                  | 0.000                  |

Note: This table reports the regression estimates of the effects of CSR performance on firm performance, proxied by returns on assets (*roa*) and Tobins'q (*tobinq*). The main explanatory variables in models (1) to (5) adopt TESG ratings variables, including TESG ratings (*tesgrate*), TESG score (*tesgscore*), TESG score on environment performance (*envscore*), TESG score on social performance (*socscore*), and TESG score on corporate governance performance (*govscore*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 17 The Effects of TESG Ratings on Firm Risk

| Explanatory Variable | Explained Variables ( <i>roavar</i> ) |                      |                      |                      |                      | Explained Variables ( <i>estvar95</i> ) |                       |                       |                       |                       |
|----------------------|---------------------------------------|----------------------|----------------------|----------------------|----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|
|                      | (1)                                   | (2)                  | (3)                  | (4)                  | (5)                  | (1)                                     | (2)                   | (3)                   | (4)                   | (5)                   |
| <i>tesgrate</i>      | -1.368***<br>(-4.07)                  |                      |                      |                      |                      | -0.124***<br>(-6.09)                    |                       |                       |                       |                       |
| <i>tesgscore</i>     |                                       | -0.297***<br>(-4.30) |                      |                      |                      |   | -0.0272***<br>(-6.53) |                       |                       |                       |
| <i>envscore</i>      |                                       |                      | -0.128***<br>(-2.70) |                      |                      |   |                       | -0.00459<br>(-1.60)   |                       |                       |
| <i>socscore</i>      |                                       |                      |                      | -0.162***<br>(-3.04) |                      |   |                       |                       | -0.0140***<br>(-4.35) |                       |
| <i>govscore</i>      |                                       |                      |                      |                      | -0.144***<br>(-3.17) |   |                       |                       |                       | -0.0175***<br>(-6.43) |
| <i>asset</i>         | -3.500***<br>(-5.55)                  | -3.454***<br>(-5.47) | -3.630***<br>(-5.71) | -3.591***<br>(-5.66) | -3.958***<br>(-6.40) | -0.251***<br>(-6.55)                    | -0.246***<br>(-6.40)  | -0.284***<br>(-7.30)  | -0.259***<br>(-6.67)  | -0.293***<br>(-7.79)  |
| <i>debt</i>          | 0.00492<br>(0.14)                     | 0.00426<br>(0.12)    | 0.00973<br>(0.28)    | 0.0106<br>(0.30)     | 0.00341<br>(0.10)    | 0.0125***<br>(5.88)                     | 0.0125***<br>(5.86)   | 0.0129***<br>(6.06)   | 0.0130***<br>(6.07)   | 0.0122***<br>(5.71)   |
| <i>salesgr</i>       | -0.0220<br>(-0.87)                    | -0.0216<br>(-0.85)   | -0.0262<br>(-1.04)   | -0.0238<br>(-0.94)   | -0.0253<br>(-1.00)   | 0.00339**<br>(2.18)                     | 0.00342**<br>(2.20)   | 0.00282*<br>(1.81)    | 0.00319**<br>(2.04)   | 0.00311**<br>(2.01)   |
| <i>rd</i>            | 0.126<br>(1.02)                       | 0.128<br>(1.04)      | 0.0990<br>(0.80)     | 0.127<br>(1.02)      | 0.0771<br>(0.63)     | 0.0539***<br>(7.25)                     | 0.0542***<br>(7.30)   | 0.0504***<br>(6.77)   | 0.0540***<br>(7.22)   | 0.0497***<br>(6.72)   |
| <i>age</i>           | -0.458***<br>(-9.36)                  | -0.456***<br>(-9.32) | -0.461***<br>(-9.42) | -0.455***<br>(-9.29) | -0.462***<br>(-9.45) | -0.0240***<br>(-8.10)                   | -0.0239***<br>(-8.05) | -0.0244***<br>(-8.18) | -0.0237***<br>(-7.96) | -0.0246***<br>(-8.31) |
| <i>board</i>         | -0.300<br>(-0.88)                     | -0.284<br>(-0.84)    | -0.313<br>(-0.92)    | -0.311<br>(-0.91)    | -0.385<br>(-1.13)    | 0.0355*<br>(1.72)                       | 0.0372*<br>(1.80)     | 0.0291<br>(1.40)      | 0.0325<br>(1.57)      | 0.0292<br>(1.42)      |
| <i>idr</i>           | 0.108**<br>(2.34)                     | 0.110**<br>(2.38)    | 0.0986**<br>(2.13)   | 0.0948**<br>(2.05)   | 0.122***<br>(2.62)   | 0.00320<br>(1.14)                       | 0.00337<br>(1.20)     | 0.00247<br>(0.87)     | 0.00195<br>(0.69)     | 0.00515*<br>(1.81)    |
| <i>dirhold</i>       | -0.0204<br>(-0.42)                    | -0.0190<br>(-0.39)   | -0.0271<br>(-0.56)   | -0.0262<br>(-0.54)   | -0.0205<br>(-0.42)   | -0.00525*<br>(-1.76)                    | -0.00514*<br>(-1.73)  | -0.00604**<br>(-2.02) | -0.00577*<br>(-1.94)  | -0.00495*<br>(-1.66)  |
| <i>manahold</i>      | -0.366<br>(-1.04)                     | -0.354<br>(-1.01)    | -0.390<br>(-1.11)    | -0.389<br>(-1.11)    | -0.373<br>(-1.06)    | -0.0577***<br>(-2.67)                   | -0.0565***<br>(-2.62) | -0.0617***<br>(-2.85) | -0.0596***<br>(-2.76) | -0.0572***<br>(-2.66) |
| <i>insthold</i>      | 0.0234<br>(0.71)                      | 0.0236<br>(0.72)     | 0.0235<br>(0.71)     | 0.0272<br>(0.83)     | 0.0236<br>(0.72)     | 0.00240<br>(1.19)                       | 0.00242<br>(1.20)     | 0.00244<br>(1.20)     | 0.00266<br>(1.32)     | 0.00236<br>(1.17)     |
| <i>foreign</i>       | 0.0612<br>(0.88)                      | 0.0630<br>(0.90)     | 0.0583<br>(0.83)     | 0.0550<br>(0.79)     | 0.0570<br>(0.82)     | 0.00943**<br>(2.25)                     | 0.00957**<br>(2.28)   | 0.00882**<br>(2.09)   | 0.00886**<br>(2.11)   | 0.00934**<br>(2.23)   |
| <i>family</i>        | -1.591<br>(-1.55)                     | -1.631<br>(-1.59)    | -1.283<br>(-1.25)    | -1.325<br>(-1.29)    | -1.649<br>(-1.60)    | 0.132**<br>(2.13)                       | 0.128**<br>(2.05)     | 0.166***<br>(2.66)    | 0.160***<br>(2.58)    | 0.116*<br>(1.85)      |
| constant             | 92.14***<br>(10.36)                   | 102.0***<br>(11.38)  | 96.16***<br>(10.85)  | 97.09***<br>(10.95)  | 102.1***<br>(11.24)  | 9.404***<br>(17.33)                     | 10.30***<br>(18.83)   | 9.735***<br>(17.94)   | 9.816***<br>(18.12)   | 10.53***<br>(19.00)   |
| Num. of obs.         | 4,164                                 | 4,164                | 4,164                | 4,164                | 4,164                | 3,969                                   | 3,969                 | 3,969                 | 3,969                 | 3,969                 |
| Adj. R-square        | 0.057                                 | 0.057                | 0.055                | 0.055                | 0.055                | 0.073                                   | 0.074                 | 0.065                 | 0.068                 | 0.074                 |
| Prob. of F-stat.     | 0.000                                 | 0.000                | 0.000                | 0.000                | 0.000                | 0.000                                   | 0.000                 | 0.000                 | 0.000                 | 0.000                 |

Note: This table reports the regression estimates of the effects of CSR performance on firm risk, proxied by the variance of the last five-year returns on assets (*roavar*) and the 5% percentile of excess weekly stock returns within a year (*estvar95*). The main explanatory variables in models (1) to (5) adopt TESG ratings variables, including TESG ratings (*tesgrate*), TESG score (*tesgscore*), TESG score on environment performance (*envscore*), TESG score on social performance (*socscore*), and TESG score on corporate governance performance (*govscore*). Control variables include firm size (*asset*), debt ratio (*debt*), sales growth rate (*salesgr*), research and development ratio (*rd*), firm age (*age*), board size (*board*), independent director ratio (*indr*), director s' shareholdings (*dirhold*), managerial shareholdings (*manahold*), institutional investors shareholdings (*insthold*), foreign institutional investors shareholdings (*forhold*), and a dummy variable indicating whether the firm is a family-controlled firm (*family*). The data period is from 2007 to 2020. The *t*-values of the estimated coefficients are shown in parentheses, and \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## 5. Conclusion and Suggestion

**Pursuing** sustainable business practices that prioritize the interests of stakeholders, rather than solely the interests of shareholders, is now an undeniable management concept in current business practices. Prioritizing the interests of stakeholders and achieving good performance in various aspects of sustainable business or ESG in the financial market is also an important strategy for firms to increase their exposure, gain public recognition, and enhance their competitive advantage. This study examines whether a firm's CSR performance corresponds to better accounting versus market performance and lower volatility and downside risks based on data from non-financial industry firms listed on the Taiwan Stock Exchange and the Taipei Exchange from 2007 to 2020.

The study first constructs three CSR performance variables based on whether the firm has been awarded the annual CSR award by the *Common Wealth* and the *Global Views Monthly*. Then, the study constructs and calculates the firm's social contribution value, social return on assets, and social contribution per share to quantify the firm's CSR performance based on the inclusion criteria of the Shanghai Stock Exchange Social Responsibility Index. In addition, various ESG performance variables of sample firms with shorter period are also employed. Through correlation analysis and regression estimation, empirical results show that the better a firm's CSR performance and ESG performance, the better its accounting and market performance, and the lower its various risk indicators. Therefore, the view that good performance in CSR and ESG will lead to better operating results and financial market performance for the firm, while also having a risk-mitigating and harm reducing effect on firm's operations and stock market performance is supported by the data of publicly traded firms in the Taiwan financial market over the past 14 years.

Regarding the policy implications of the empirical results, for investors, firms with better CSR and ESG performance have relatively better performance in both operating consequences and financial markets performance, as well as lower volatility and downside risk, therefore choosing to invest in firms with better CSR and ESG performance can enhance wealth and enjoy lower wealth volatility and loss risk. For government regulatory authorities, sustainable or even expanded CSR standards, regulation and incentives for publicly traded firms can help firms prioritize the overall interests of stakeholders, which can enhance the development and stability of capital markets. For corporate executives, investing resources in improving CSR performance and ESG ratings can help increase firm's operating and financial market performance, enhance the firm's competitive advantage and sustainability.

For future research suggestions, first, the firm's consumers' awareness and industry characteristics may affect the public's demand for CSR and ESG performance, with firms with greater consumers' awareness or in sensitive industries being more likely to be seen or demanded for their CSR performance, therefore engaging in positive CSR activities may lead to even greater benefits. Therefore, the firm's consumers' awareness or industry characteristics may interfere with the effect size of CSR performance on the firm's performance and risk. Secondly, in terms of econometric estimation, it is recommended to consider using methods that address self-selection issues in non-random assignment of samples to firms with good CSR and ESG performance, such as two-stage estimation and propensity score matching, to enhance the causal inference of the study. Regarding the endogeneity issue of CSR performance, two-stage least square instrumental variable



estimation can be used as a correction estimation, and the firm's previous period CSR and ESG performance or the industry average CSR and ESG performance can be used as instrumental variables. Finally, based on the tradeoff between the benefits of stakeholder's management and the cost of agency conflicts of CSR investment, nonlinear effects of CSR and ESG performance on firm's performance and risk can be investigated.

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