Journal of Open Innovation: Technology, Market, and Complexity

Article

The Impact of Technological Innovation and Strategic CSR on Firm Value: Implication for Social Open Innovation

Soohwan Choi and Jaewook Yoo *

College of Business Administration, Konkuk University, Seoul 05029, Korea
* Correspondence: jwyoo@konkuk.ac.kr; Tel.: +82-2-450-4098

Abstract: This study was designed to explore the effects of strategic CSR conformity and technological innovation activities on the market value of Korean manufacturing firms. We proposed a research model based on resource-based, stakeholder, and institutional theories to examine the main effects of technological innovation activities and strategic CSR conformity, as well as their interaction effect on firm value. The findings showed that technological innovation activities have a significant positive impact on the firm value, whereas strategic CSR conformity does not. They also presented that the interaction between technological innovation activities and strategic CSR conformity had a negative effect on firm value, contrary to what was expected in hypothesis 3. Thus, further analysis was performed by dividing the sample into two subgroups: the upper group (above the mean) and the lower group (below the mean). The results showed that the interaction effect between strategic CSR and technological innovation activities had a significant positive impact on the market value of Korean manufacturing firms. This finding implies that a firm should invest in strategic CSR at a level higher than the industry average to intensify the positive effect of technological innovation activities on firm value.

Keywords: strategic CSR; technology innovation; conformity; firm value

Citation: Choi, S.; Yoo, J. The Impact of Technological Innovation and Strategic CSR on Firm Value: Implication for Social Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 188. https://doi.org/10.3390/joitmc8040188

Received: 12 September 2022
Accepted: 9 October 2022
Published: 16 October 2022

1. Introduction

Recently, there has been an increase in interest in sustainable management. Expectations of corporate social responsibility (CSR), such as job creation and employment maintenance, have rapidly increased. The government has passed legislation requiring CSR disclosure. Along with corporate social responsibility, technological innovation is an important factor in enhancing firm value [1]. Technological innovation allows firms to overcome environmental uncertainty and achieve a competitive advantage in the market [2]. Firms can create distinctive competitive advantages and increase their value through technological innovation [3]. For this reason, many firms have increased their investment in technological innovation and CSR [4]. However, there are still many concerns that investment in CSR could be a factor that worsens corporate profitability [5]. Thus, firms tend to perceive CSR as a cost rather than an investment, especially in the short term.

CSR reveals characteristics similar to technological innovation activities in that it can help firms improve their value over time while increasing costs in the short term [6]. Despite this common characteristic, studies on the relational effect of technological innovation activities and CSR on firm value have not been sufficiently conducted. How much should a firm invest in technological innovation activities and CSR to increase their market value? What level of CSR investment should be accepted for intensifying the positive effects of technological innovation activities on firm value? These are critical questions for all firms that need to efficiently allocate and invest their limited resources in technology innovation and CSR. However, not only theoretical discussions on this topic but also empirical research is very insufficient. Thus, this study focuses on analyzing the independent and interaction effects of technological innovation activities and strategic CSR on the market

value of Korean manufacturing firms. The results of empirical analysis provide practical implications for firms performing technological innovation activity and strategic CSR with limited resources, as well as academic implications for theoretical development and future research.

2. Theoretical Background

2.1. Technological Innovation

Technological innovation affects a firm's performance by allowing the firm to develop new products or services that are not yet available in the market or to improve existing products or services [7]. Schumpeter suggested that technological innovation is a key factor that constantly develops the economy. With the advent of a knowledge-based economy, technological innovation is emphasized as an important competitive strategy to achieve strategic competitiveness and long-term goals despite the large amount of investment required. Technological innovation is important, especially when a firm plans to enter a new market or to create barriers to entry into the market to which the firm belongs. It enables firms to achieve stable profit generation in the long run [2].

Technological innovation is of great interest and a research topic in the manufacturing industry [8]. According to the third revision of the *Oslo Manual of the Organization for Economic Co-operation and Development*, technological innovation can be classified into two different types: product innovation and process innovation. Product innovation provides firms with opportunities to increase sales by improving their product competitiveness. Examples of product innovations include MP3 players and ABS-braking systems. On the other hand, process innovation as another type of technological innovation increases production efficiency by introducing differentiated or improved methods in production processes or logistics. Examples of process innovation include automobile production equipment (e.g., radio frequency identification [RFID]) and computer-based tools (e.g., computer-aided design [CAD]) [9]. The representative cases for each type of innovation are summarized in Table 1.

Table 1. Types and representative examples of technological innovation.

Type of Innovation		Concept	Representative Case
Technological Innovation	Product innovation	When releasing a completely differentiated product with superior performance over existing products	MP3 players, ABS-braking systems
	Process innovation	When introducing differentiated techniques and improvements in the manufacturing process and logistics method that are not currently in use	RFID, CAD

Reprinted/adapted with permission from Ref. [10]. 2022, Kwon. S.J.

2.2. Stakeholder Theory

2.2.1. Definition of Stakeholders

Stakeholder theory, first proposed by Ansoff [11], focuses on explaining the relationship between an organization and its stakeholders [12]. It deals with people and/or organizations who have an interest in the decision-making and performance of a firm. It is a theory of relationships with individuals or groups that are affected by firm activities and have an impact on firm performance [12–14].

However, the definition of stakeholders differs according to the perspective of scholars [15]. When defined broadly, stakeholders comprise all individuals or groups that affect or are affected by the achievement of an organization's goals. For example, the definition of Freeman [14] refers to stakeholders in such a broad sense. However, when defined in a

narrow sense, stakeholders are defined as limited to individuals and groups that rely on the financial performance of a firm [16]. This viewpoint is concerned with practical issues arising from the manager's selective behavior in dealing with the firm's limited resources and time. Based on this difference in perspective, existing studies define stakeholders differently, as summarized in Table 2.

Table 2. Definition of stakeholders.

Reference	Definition of Stakeholders
Stanford memo, 1963	Define a group as a stakeholder in the case where a firm's survival may be interrupted when there is no support from the group.
Rhenmen, 1964	Define a stakeholder relationship when a firm relies on someone to achieve its personal goals or when the firm relies on someone to survive.
Ahlstedt & Jahnukainen, 1971	Definition of participants in a firm that moves according to their interests and goals.
Freeman & Reed, 1983	Broad meaning: defined as a group that can be influenced or affected by achieving an organization's goals. Narrow meaning: defined as an organization that relies on sustainable survival.
Freeman & Gilbert, 1987	Defined as a group that can be influenced or affected by a business.
Cornell & Shapiro, 1987	Defined as claimants under contract.
Evan & Freeman, 1988	Defined as a group that holds a stake in a firm or has the right to claim.
Alkhajaji, 1989	Defined as responsible group.
Carroll, 1989	Defined as a group with interests (legal or moral), rights, or shares in legal ownership of a firm's property.
Thompson et al., 1991	Defined as an individual or a group having a relationship with a firm.
Savage et al., 1991	Defined as a group that is interested in and can influence a firm's activities.
Hill & Jones, 1992	Defined as a group of interchanges that can exercise legitimate claims against a firm, supply important resources to the firm, and benefit from meeting expectations.
Brenner, 1993	Defined as an individual or a group having a legitimate and insignificant relationship with a firm, such as a transaction relationship, a relationship that influences and receives behavior, and a relationship linked to moral responsibility.
Langtry, 1994	The case where a group may demand moral or legal claims and the firm is responsible for the happiness of the individual or group.
Wicks et al., 1994	Defined as an individual or a group that interacts with a firm and gives meaning and justice to the firm.
Clarkson, 1994	Defined as an individual or a group who may be put at risk or affected as a result of investing in a firm in capital, labor, finance, or something valuable.

Reprinted/adapted with permission from Ref. [16]. 2022, Mitchell, R.K., Agle, B.R., Wood, D.J.

2.2.2. Types of Stakeholders

According to Freeman's definition [14], many scholars classified stakeholders into external and internal groups [17]. External stakeholders include consumers, shareholders, governments, local communities, labor unions, and environmental organizations while in-

ternal stakeholders include managers and employees [18–20]. Different stakeholders expect and demand different values. Shareholders are interested in the improvement of financial performance and market value. However, environmental organizations are more concerned with increasing emission reduction than with financial performance or the market value of the firm. Unlike the shareholder-centered perspective, which prioritizes shareholder interests, stakeholder theory emphasizes balancing the expectations and interests of all stakeholders. Firm performance should be shared with many stakeholders involved in a firm's activities [21].

According to stakeholder theory, stakeholder expectations for firms include corporate accountability as well as economic or financial performance [22]. For this reason, firms strive to show social and environmental responsibility through activities such as strategic CSR. Managers play an important role in coordinating the interests of various internal and external stakeholders. It is critical to disclose non-financial performance information as well as financial performance information [12].

According to stakeholder theory, managers must be faithful to all stakeholders [23]. Unlike the shareholder-centered perspective, which views a firm as a private organization for investors, stakeholder theory recognizes the firm as a social group that is responsible for various internal- and external-stakeholders. Stakeholders should actively participate in a firm's decision-making process and activities to achieve their goals [23]. Sustainable management, which has recently received considerable attention, relates to all stakeholders who directly or indirectly interact with firms. For sustainable management and growth, a firm should reflect the expectations and needs of various stakeholders in its management activities [20].

2.3. Corporate Social Responsibility (CSR)

2.3.1. Definition

Many scholars have defined CSR by reflecting on environmental situations they faced [24]. The most cited definition might be that of Carroll [25,26], which describes CSR as a pyramid of economic, legal, ethical, and philanthropic responsibilities. The economic responsibility that constitutes the bottom of the pyramid is the most basic responsibility of a firm. It is the responsibility to provide a fundamental basis for the existence of a firm. Legal responsibility, which is a higher level of responsibility than economic responsibility, refers to a firm's obligation to follow laws. Ethical responsibility refers to a firm's obligation to meet the expectations of stakeholders through actions that meet social norms and standards for environmental or social issues. Finally, philanthropic responsibility, located at the top of the pyramid, is defined as the voluntary responsibility of a firm to meet social expectations [27].

Aside from Carroll, Bowen [28] defined CSR as a corporate obligation to pursue desirable policies in terms of societal goals and values [29]. Heald [30] recognized CSR in terms of maximum economic performance as well as the mandatory management of human and constructive social policies. Similar to these scholars, international institutions have suggested different definitions of CSR. The United Nations Council for Trade and Development (UNCTAD) defined CSR as "how firms respond to and influence society's needs and goals," while the World Council for Sustainable Development (WBCSD) defined CSR as "a firm's willingness to contribute to sustainable development in cooperation with employees, families, communities and society as a whole." Similarly, the European Communities defined CSR as "a concept in which a firm incorporates a voluntary interest in society and the environment into its activities and interactions with stakeholders" [31].

2.3.2. Strategic CSR

CSR is not philanthropy. It was never supposed to be. However, CSR activities were left to the discretion of the firm in the past. Unlike European countries, which have emphasized managers' obligations to fulfill the interests of various stakeholders based on stakeholder capitalism, in the United States, which has developed based on

shareholder capitalism, the fiduciary duty of manager to shareholders is emphasized. Thus, CSR considering the interests of various stakeholders other than shareholders has been considered as a cost that is not beneficial to improve firm value.

Accordingly, many firms often implemented their CSR activities through voluntary donations and contributions to the arts, education, and community [27]. They did not recognize the relevance of CSR activities; instead, negative perceptions of CSR activities have grown as research has revealed that CSR does not improve firm value [32]. However, sustainability issues emerged due to Enron bankruptcy and Lehman collapse, which served as opportunities to spread awareness of the importance of CSR [4]. Firms that did not faithfully perform CSR faced social criticism, investors' avoidance, and difficulties due to employees who prioritized their interests over the firm's interest.

In addition, the concept of strategic CSR began to be emphasized, as CSR was recognized as an effective means of strengthening corporate competitiveness and value [33]. Strategic CSR refers to planning and investing activities to achieve a sustainable competitive advantage, while simultaneously achieving better social performance [34]. Accordingly, Porter and Kramer [35] defined strategic CSR as a corporate activity to improve both economic and social performance. They define strategic CSR as having a positive effect on society as well as investors [32].

Firms have traditionally prioritized profit maximization because investors make their investment decisions based on financial performance. However, with the recent emergence of a number of social and environmental issues, the importance of social responsibility is increasing [36]. Due to globalization and development of IT technology, much information related to socially responsible activities of firms has rapidly spread. As the issue of sustainable development has gained prominence, firms have interest in sustainable management. In response, they are establishing dedicated departments and cooperative systems with non-profit organizations to strengthen their strategic CSR [37].

Although CSR tended to be regarded only as philanthropic, it has recently been recognized as a competitive strategy to improve the reputation and market value of firms [38]. As stakeholders' awareness of CSR matures, firms can no longer avoid strategic CSR. According to previous research, firms that actively engage in strategic CSR can improve their financial performance and market value, as well as their reputation and image [38]. Therefore, strategic CSR should not be recognized as a cost. It is a strategic means to achieve a firm's competitive advantage and sustainable management.

3. Research Model and Method

3.1. Research Model

3.1.1. Technological Innovation and Firm Value

Technological innovation requires a lot of time and money. It can, however, bring enormous wealth to firms, allowing them to exercise monopolistic power in the market [39,40]. In general, a firm's ability to improve performance through innovation can be confirmed by the incremental development of the business and the increase in total sales of the firm. Cases in which potential business losses occur if innovation is not carried out also confirm the importance of innovation to improve a firm's performance. Innovation could increase the value of a firm's intangible assets and provide opportunities for profit generation. However, not all technological innovation activities are beneficial for profit [41]. For example, a firm may find it difficult to make a profit if a product or service developed by technological innovation is not sold to consumers [39]. Also, technological innovation often does not help improve profits in the short term. Instead, it is seen as an investment activity for long-term benefits [42,43]. Thus, firms that invest in technological innovation activities may raise external stakeholders' expectations of long-term profit generation. These expectations have a positive impact on the market value of a firm [39].

Previous studies analyzing the relationship between technological innovation activities and firm value have presented following results. A study by Kim and Kim [44], which analyzed the effect of technological innovation activities on bankruptcy risk, suggested a U-

shaped relationship between them. Thus, the risk of bankruptcy decreases as expenditures for technological innovation activities increase whereas the risk of bankruptcy increases if expenditures for technological innovation activities exceed a certain level [8,45]. The findings show that technological innovation activities can have either positive or negative effects on corporate value depending on their degree.

However, most previous studies other than this study suggest a positive relationship between technological innovation activities and firm value. For example, Ehie and Olibe [46] showed that investment in technological innovation has a positive effect on firm value. They argued that this relationship is stronger in the manufacturing sector than in the service industry. In a study of Korean listed firms, Min and Smyth [41] also showed that R&D intensity positively affects firm value. In addition, Rong and Xiao [47] showed that firms are more likely to diversify into industries with more applicable technological innovations, and this diversification increases the value of firms. Hirschey and Weigandt [48] suggested that corporate innovation activities have a positive long-term effect on firm value. Seo and Kim [49] also suggested that firm value increases with technological innovation investment. Flammer and Bansal [50] indicated that long-term strategies, such as technological innovation, help improve firm value. In this study, which focuses on Korean manufacturing firms, the relationship between technology innovation activities and firm value was expected to be similar to the analysis results of previous studies. Therefore, we presented the following hypothesis:

- **Hypothesis 1.** *A firm's technological innovation activities have a positive effect on firm value.*

3.1.2. Strategic CSR Conformity and Firm Value

Agency theory, which assumes managerial opportunism, limited rationality, and information asymmetry between managers and shareholders, argues that managers' interests may be different from those of owners [51]. In addition, based on these assumptions and arguments, agency theorists raise the adverse selection and moral hazard problems of managers [52]. A moral hazard problem arises when a manager as agent takes private interests through opportunistic behavior, contrary to the owner's interests [52,53]. Based on this perspective, the advocates of agency theory argue that managers can excessively invest in CSR to improve their personal reputation, which can eventually become an agent problem that lowers the interests of investors [54,55].

In contrast, advocates of stakeholder theory argue that managers can perform CSR to resolve conflicts between stakeholders. Managers' efforts in CSR can help firms acquire a positive reputation and procure resources from stakeholders [21,51,56]. Stakeholder theory defines all individuals or organizations that directly or indirectly affect or receive the influence of firms' activities and performance as stakeholders. Thus, the scope of stakeholders considered in stakeholder theory is much more diverse and wider than that defined in agency theory [14]. Stakeholder theorists also argue that the positive reputation perceived by stakeholders strengthens the legitimacy of a firm [57,58]. Thus, CSR should be considered a strategic element of sustainable management [59,60].

A prior study argued that CSR increases the systemic risk of macroeconomic factors affecting the stock market whereas reducing the idiosyncratic risk due to internal problems such as strikes and product defects [61]. Hu et al. [62] present the results of an empirical analysis in which CSR increases firm value. However, if advertising costs are high, CSR may be perceived as a promotional tool, harming reputation and lowering firm value. Barnea and Rubin [63] presented that, from the perspective of agency theory, managers may have an incentive to engage in CSR more for personal purposes, and excessive CSR eventually reduces firm value. On the other hand, Harjoto and Laksmana [64] suggested that CSR could positively affect firm value by reducing excessive risk-taking and risk-averse tendencies of managers. Chung et al. [65] and Jeon et al. [66] also suggested a positive relationship between CSR and firm value. Deloitte and Euronext (2003) confirmed that social management could positively affect firm value in a joint survey of 388 fund managers

and financial experts [67]. Thus, the results of previous studies that have analyzed the effect of CSR on firm value are inconsistent.

Then, why have these conflicting findings been presented in previous studies? To answer this question, we should consider each potential problem that may arise in two different cases: a very high level of strategic CSR investment and a very low level of strategic CSR investment. In a rapidly changed business environment where social expectations for the roles and responsibilities of firms have increased, firms that are passive in CSR activities will be criticized by various stakeholders. The criticism of stakeholders eventually undermines the image of the firm, preventing stakeholders from supporting and providing resources to the firm. Thus, firms should more actively carry out activities for social responsibility [68]. On the other hand, if a firm performs an excessively high level of CSR, it can be evaluated that the firm is using limited resources in an inefficient manner that does not help improve economic performance, which in turn can negatively affect firm value [54,55]. Therefore, a firm needs to determine the optimal level of strategic CSR activities to help improve its firm value.

In some cases, firms should be differentiated by doing activities at a higher or lower level than their competitors. In other cases, however, it is necessary to focus on gaining legitimacy from stakeholders by implementing activities at a similar level to competitors [69–71]. Such decision-making may vary depending on the type of activities and also the social environment to which the firm belongs. Considering Korea's social environment during the research period, it can be seen that CSR began to be considered as a strategic factor for sustainable management. However, rather than seeing CSR as an element that firms can capture to utilize new business opportunities, there was a strong tendency to regard it as an element that should be implemented for the purpose of obtaining social legitimacy through execution at moderate level. Thus, it is inferred that stakeholders, including investors, tend to highly evaluate the growth potential and the value of firms that invest more resources in improving economic performance while maintaining legitimacy through CSR at a similar level to their competitors. Therefore, we presented the following hypothesis:

- **Hypothesis 2.** *A firm's strategic CSR conformity has a positive effect on firm value.*

3.1.3. Interaction between Technological Innovation and Conformity of Strategic CSR Activities

Stakeholder theory and resource-based theory are two theories that explain the motivation of CSR. According to the stakeholder theory, CSR can be seen as a way to achieve legitimacy by satisfying the expectations and needs of various stakeholders. In resource-based theory, CSR is regarded as an activity to acquire resources and capabilities based on the legitimacy acquired from stakeholders. In this way, the motivation for a firm to perform CSR can be explained from an integrated perspective of stakeholder and resource-based theory. Specifically, firms can acquire legitimacy through strategic CSR and acquire necessary resources from stakeholders based on the acquired legitimacy [72].

Strategic CSR is a factor that can contribute to creating a sustainable competitive advantage through technological innovation activities [73]. Porter and Karmer [35,74,75] explained the relationship between strategic CSR and technological innovation in several real-world cases. First, software company AMD (Advanced Micro Devices) raised the skill level of local citizens by investing in education for low-income students, thereby solving problems related to the lack of skilled manpower in the region. This is a good example of how a firm's strategic CSR activities can further strengthen the positive impact of technological innovation activities on firm value. For another example, Toyota, an automobile manufacturer, developed eco-friendly hybrid cars in response to social responsibility demands, effectively reducing air pollution and becoming a leader in hybrid technology ahead of its competitors [32].

Strategic CSRs also provide complementary value to technological innovation, enabling firms to fulfill social responsibilities and improve economic performance at the same time [76]. For example, firms can innovate by increasing social responsibility through

activities to recycle resources and at the same time using recycled resources to develop new products [77]. In a study on the relationship between CSR and technological innovation, Guo et al. [61] argued that CSR could weaken the negative impact of innovation on corporate value. Mishra [78] also argued that innovative companies that perform high levels of CSR activities can further improve their value through innovation.

However, most Korean firms have shown a tendency to perform CSR activities under institutional pressure rather than voluntarily [60]. According to institutional theory, firms can obtain legitimacy through CSR. On the basis of legitimacy, firms can meet the needs of stakeholders while facilitating access to the resources they want [79]. However, it is necessary to invest more resources in economic activities such as technological innovation, while maintaining the moderate level of investment on CSR because firms have limited resources [80]. This is because, in order for a firm to maintain its legitimacy through specific actions or strategies, it must maintain the level of investment to achieve suitability (the degree of compliance with industry norms and standards) through similar activities with competitors. Finkelstein and Hambrick [81] argued that firms conforming to dominant practices should, on average, realize positive returns. The observations that can support this argument empirically have been found in previous research, such as studies in the US pharmaceutical industry, airline industries, and color television industry. Thus, rather than investing too many resources in CSR, firms should maintain a similar level of CSR investment to their competitors. On the other hand, they should invest more actively in the activities of technological innovation to maximize the interaction effect with strategic CSR on firm value [19,69]. Therefore, we presented the following hypothesis:

- **Hypothesis 3.** *The interaction between technological innovation activities and strategic CSR conformity has a positive effect on firm value.*

Figure 1 is the research model that presents the relationships among independent, moderating, and dependent variables of this study.

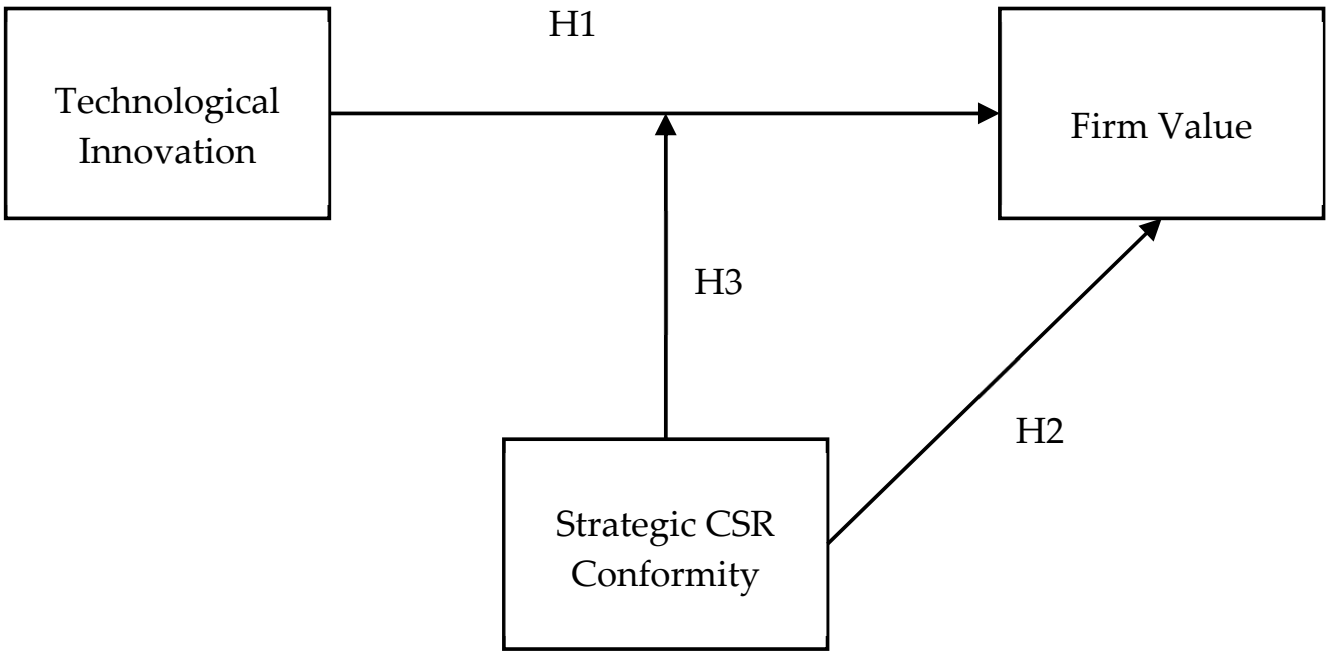

Figure 1. Research model.

3.2. Research Method

3.2.1. Data Collection and Sample

To reflect recent environmental changes, in which the importance of technological innovation and strategic CSR is emphasized, we collected data from 2018, the most recent

data available at the time the study was conducted. The sample included listed Korean manufacturing firms that were candidates for the Good Business Award presented by KEJI under the Citizens' Coalition for Economic Justice.

The score on CSR (Economic Definition Index: KEJI Index), evaluated by the Institute for Economic Justice, was adopted as a proxy for the level of social responsibility of sample firms. Much of the Korean literature has used the KEJI Index as a proxy measurement for CSR [36]. The KEJI CSR evaluation model consists of six items: soundness (25 points), fairness (20 points), social contribution (15 points), consumer protection (15 points), environmental management (10 points), and employee satisfaction (15 points). Since 2012, there has been a significant change in the method of calculating the KEJI index by excluding the item "contributing to economic development." Accordingly, in studying the relationship between strategic CSR and firm performance, the suitability of the KEJI index as a proxy for measuring strategic CSR has improved.

In addition, KIS-Value and corporate business reports of the Financial Supervisory Service's electronic disclosure system were used to collect data of debt ratio, number of employees, and year of establishment. KIS-value is a database that provides financial data of Korean firms and industries for investment analysis, consulting, and academic research. This study was conducted in the manufacturing industry. Thus, a total of 128 manufacturing firms were selected for the final sample after excluding 42 firms in the financial and service sectors and 30 firms with missing values.

3.2.2. Measurement of Variables

Technological Innovation

Prior studies have adopted different proxies, including the number of patent applications, technology introduction cost, or purchase cost of machinery and tools related to the new product, and process to measure technological innovation. In this study, we adopted the ratio of R&D expenses, which is the most representative input index for technological innovation [82]. Specifically, we measured the standardized value of R&D expenses compared with sales as a proxy for technological innovation activities.

Firm Value

Many studies use Tobin q to measure firm value, which was the dependent variable in this study [61,64,83]. Accordingly, we measured firm value using Tobin q in this study. In particular, we calculated ([final market capitalization < common stocks + preferred stocks > + total debt]/total assets) to measure firm value [31]. It was argued that the explanatory power of Tobin q in evaluating firm value might not be good enough because the stock market plays a limited role as a means of financing, and short-term volatility is very high due to speculative factors. However, Tobin q has been known as the best proxy for evaluating the impact of various firm activities on the market value of firm in the reality. An analysis was conducted with a one-year time lag between the independent and dependent variables to examine the effect of technological innovation activities and strategic CSR on firm value.

Strategic CSR Conformity

To measure strategic CSR conformity, the total KEJI score of each firm, which is the sum of the six evaluation items, was first calculated. The KEJI scores of individual firms were then deducted from the average of the total KEJI scores of all sample firms. Finally, an absolute value was used to convert all negative values into positive ones [70].

(Average of KEJI's total score of all sample firms) − (KEJI's total score of individual firms) = |Strategic CSR conformity|

According to this calculation method, a value far from the industrial average indicates that the firm's strategic CSR conformity is low. By contrast, a value close to the industrial average indicates that the firm's strategic CSR conformity is high. As this can cause confusion when explaining the results, the calculated value was standardized (Z) after

subtracting the strategic CSR conformity value of individual firms from the maximum strategic CSR conformity of sample firms.

$$Z\{(\text{The maximum strategic CSR conformity of sample firm}) - (\text{Strategic CSR conformity of individual firms})\}$$

Therefore, a small strategic CSR conformity was interpreted as low conformity (differentiation), and a large strategic CSR conformity was interpreted as high conformity (homogenization).

For the robustness of the research findings, we measured the strategic CSR conformity by calculating the median instead of the average of sample firms, then subtracting the KEJI score of each firm, and calculating the absolute value. According to the measurements, there was little difference between the mean and median values. The distribution was not skewed. In addition, the results when the median value was used to calculate the strategic CSR conformity showed no statistically significant difference from the results when the average was used.

Control Variable

The effects of market share, sales operating profit ratio, debt ratio, firm size, firm age, and industry type were controlled for in the empirical analysis. Firms with a high market share can reduce production costs through market dominance and economies of scale effects [84]. Thus, the effect of market share, measured by dividing total sales for each firm by the total sales of industries, was controlled for in the analysis.

A high operating profit ratio on sales indicates that the profitability of the firm is good, which can lead to an increase in investment. Firms with a high operating profit ratio for sales can increase their investments in technological innovation activities and strategic CSR [49]. Thus, the effect of the operating profit ratio of sales that is calculated as the value of the operating profit divided by sales was controlled.

The debt ratio, which can be measured by dividing the total debt by the total assets, helps assess the debt repayment capacity of firm. A high debt ratio can reduce agent costs by reducing opportunistic managerial behavior through creditor monitoring [85]. Thus, the debt ratio that may influence the investment in CSR was controlled.

Both firm size and firm age are the factors are related to the capacity and tendency of the firm for investment in technological innovation and CSR. Thus, their effects were controlled in the empirical analysis. Firm size can be measured through substitutes, such as sales, assets, and the number of employees [66,86]. In this study, firm size was measured using the natural logarithm of the number of employees [61]. On the other hand, the firm age was obtained by subtracting the firm's establishment year from the base year [61,87].

The impact of technological innovation on performance may differ between high-tech and low-tech industries [88,89]. Therefore, the firms in the sample were categorized as belonging to high-tech or low-tech industries. The effect was controlled for by including dummy variables coded as 1 for the high-tech industry and 0 for the low-tech industry.

4. Analysis Results

We conducted a hierarchical multiple regression analysis to examine the effect of technological innovation and strategic CSR conformity and their interaction effect on firm value. Table 3 presents the means, standard deviations, and Pearson's correlations of the variables. A variance inflation factor (VIF) analysis was performed to check the multicollinearity of the variables. As can be seen in the table, firm value, a dependent variable, showed a significant correlation with sales operating profit ratio, debt ratio, firm age, industry type, technological innovation, and strategic CSR conformity. However, multicollinearity was not a problem in the regression analysis because the e VIF of all variables was less than 2.

Table 3. Pearson correlation coefficient and variance expansion coefficient (N = 128).

Variables	AVG	SD	VIF	1	2	3	4	5	6	7
1. Firm value	0.72	0.47								
2. Market share	0.06	0.14	1.46	0.07						
3. Sales operating profit ratio	8.43	9.06	1.20	0.34 ***	0.24 ***					
4. Debt ratio	73.4	53.1	1.13	0.15 *	0.02	−0.27 ***				
5. Firm size	6.69	1.27	1.35	0.09	0.41 ***	0.14	0.03			
6. Firm age	3.35	1.02	1.10	−0.15 *	0.04	−0.08	−0.16 *	−0.02		
7. Industry type	0.66	0.47	1.42	0.25 ***	−0.23 **	0.07	−0.09	0.07	0.04	
8 Technological innovation	0.00	1.00	1.74	0.42 ***	−0.06	0.10	−0.03	0.28 ***	−0.16 *	0.46 ***
9. Strategic CSR conformity	0.00	1.00	1.26	−0.09 *	−0.18 *	−0.14 *	0.01	−0.19 **	0.01	0.06

* $p < 0.05$; ** $p < 0.01$ *** $p < 0.001$.

Table 4 presents the results of hierarchical multiple regression analysis. According to the results of Model 1, which analyzed the effects of control variables on dependent variable, the sales operating profit ratio (β = 0.019, $p < 0.001$), debt ratio (β = 0.002, $p < 0.01$), and industry type (β = 0.268, $p < 0.01$) had a significant positive (+) effect on firm value. However, market share, firm size, and firm age were not revealed to have a significant effect on firm value.

Table 4. Multiple regression analysis results.

Step	Variables	Model 1	Model 2	Model 3	Model 4
		β(t)	β(t)	β(t)	β(t)
1	Control Variables				
	Market share	0.156	0.239	0.248	0.406
		(0.50)	(0.82)	(0.85)	(1.40)
	Sales operating profit ratio	0.019 ***	0.019 ***	0.019 ***	0.019 ***
		(4.28)	(4.44)	(4.43)	(4.46)
	Debt ratio	0.002 **	0.002 ***	0.002 ***	0.002 **
		(3.00)	(3.27)	(3.26)	(3.23)
	Firm size	−0.004	−0.042	−0.042	−0.039
		(−0.13)	(−1.31)	(−1.28)	(−1.24)
	Firm age	−0.043	−0.013	−0.012	−0.009
		(1.13)	(−0.34)	(−0.33)	(−0.24)
	Industry type (high-tech/low-tech)	0.268 **	0.107	0.102	0.122
		(3.19)	(1.22)	(1.14)	(1.40)
2	Main effect variables				
	Technological innovation		0.178 ***	0.182 ***	0.138 **
			(4.20)	(4.15)	(3.02)
	Strategic CSR conformity			0.013	0.048
				(0.34)	(1.23)
3	Interaction				
	Technological innovation * Strategic CSR conformity				−0.071 **
					(−2.71)
	Model				
	R^2	0.24	0.34	0.34	0.38
	Adjusted R^2	0.20	0.30	0.29	0.33
	F value	6.54***	8.90***	7.75***	8.07***

* $p < 0.05$; ** $p < 0.01$ *** $p < 0.001$.

In Model 2, the technology innovation variable as an independent variable, was added to Model 1 and analyzed to verify Hypothesis 1. The results showed that technological innovation had a significantly positive effect on firm value (β = 0.178, $p < 0.001$). Therefore, Hypothesis 1 was supported. The results suggested that firms that technologically innovate could improve their value in the market.

The results of Model 3, which was analyzed by adding the CSR conformity variable to Model 2, showed that strategic CSR conformity did not significantly affect firm value

($\beta = 0.013$, $p > 0.05$). Thus, Hypothesis 2 was rejected. This result suggested that a firm's strategic CSR does not have a direct effect on firm value.

Finally, the interaction variable of technological innovation and strategic CSR conformity was added to Model 4 to analyze the moderating effect of strategic CSR conformity on the relationship between technological innovation and firm value. The results showed that strategic CSR conformity significantly moderated the effect of technological innovation on firm value ($\beta = -0.071$, $p < 0.01$). However, contrary to expectation, the value of β was negative. Therefore, Hypothesis 3, which expected strategic CSR conformity to have a positive effect on firm value through interaction with technological innovation, was rejected. This finding showed that the firms engaged in technological innovation activities can increase their value in the market when strategic CSR activities are executed differently from other firms.

A graph of the interaction effect between the two variables was analyzed to further verify the interaction effect of technological innovation and strategic CSR conformity, which appeared opposite to the hypothesis 3. As shown in Figure 2, when technological innovation is low or medium, firm value is higher when interacting with high strategic CSR conformity. Meanwhile, when technological innovation is high, firm value is higher when interacting with low strategic CSR conformity. However, because the strategic CSR conformity variable was measured as an absolute value, it was impossible to determine whether a firm with a low strategic CSR conformity performed a higher-than-average level of strategic CSR or a lower level of strategic CSR. Therefore, based on the total score average of the KEJI index, the sample was divided into two subgroups: the upper group (above the mean) and the lower group (below the mean), and a hierarchical regression analysis was performed for each subsample.

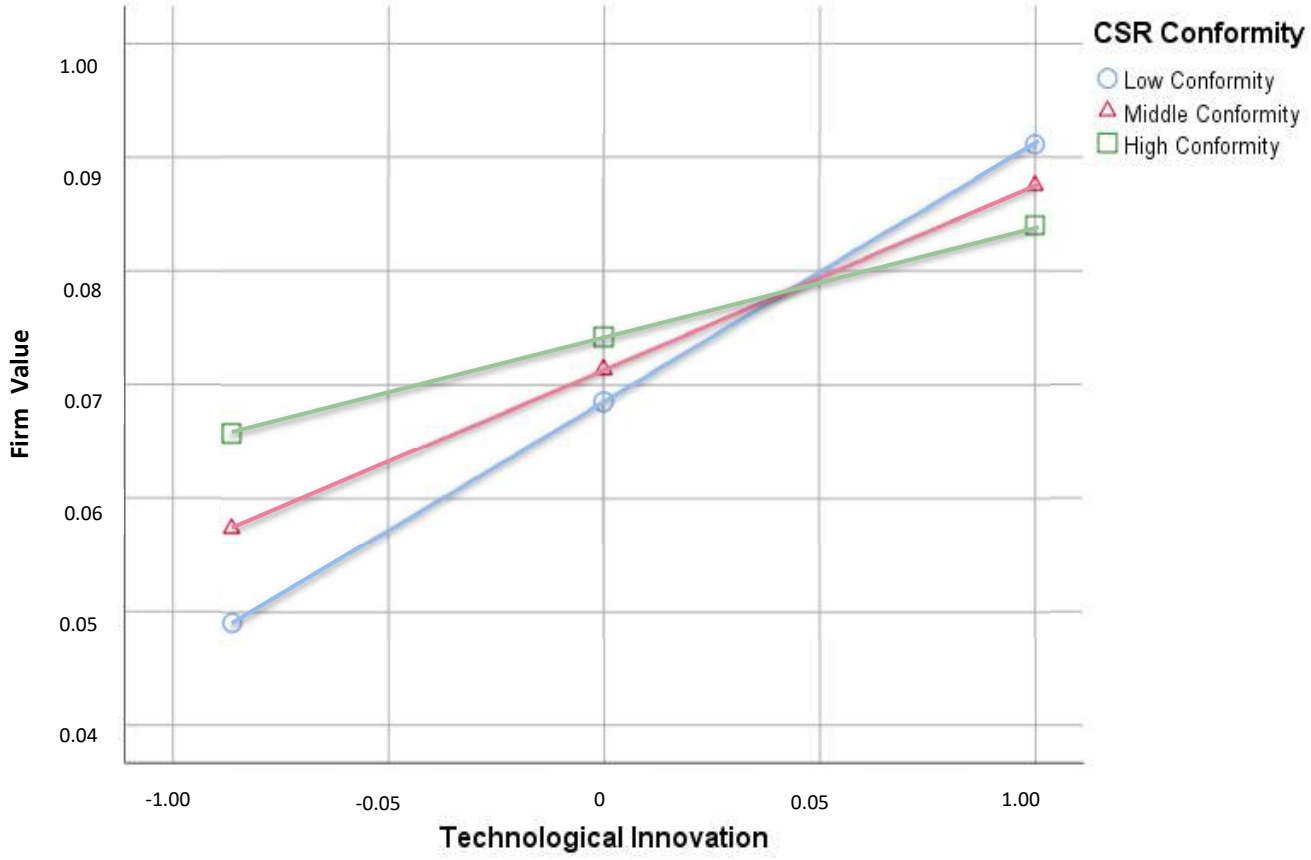

Figure 2. Interaction graph.

The KEJI score of each firm was deducted from the average of the total KEJI scores of all firms included in the sample. Then, absolute values were used to convert all negative

values into positive. Next, as in the overall sample analysis, the value was standardized (Z) by subtracting the strategic CSR conformity value of individual firms from the maximum strategic CSR conformity value of all firms in the sample. Therefore, if the interaction variable between technological innovation and strategic CSR presents a significantly negative effect in the analysis findings of the subsample, it can be interpreted that the higher the level of strategic CSR, the greater the impact of technological innovation on firm value.

Table 5 shows the regression analysis results for the "lower" group that makes strategic CSR less than average. As can be seen from Model 3, the interaction effect of strategic CSR conformity in the lower group was not statistically significant ($\beta = -0.029$, $p > 0.05$). However, the results for "upper" group in Table 6 showed a significant negative interaction effect of strategic CSR conformity with technological innovation activities on firm value ($\beta = -0.085$, $p < 0.05$). This result indicates that technological innovation activities can positively influence the market value more strongly for firms that engage in CSR activities above average. Thus, strategic CSR should be considered as a good management practice for improving the performance of firms that promote market value especially through technological innovation.

Table 5. Multiple regression analysis results (sample of lower average).

Step	Variables	Model 1	Model 2	Model 3
		β(t)	β(t)	β(t)
1	Control Variables			
	Market share	0.205 (0.31)	−0.040 (−0.06)	−0.006 (−0.00)
	Sales operating profit ratio	0.019 *** (3.41)	0.019 *** (3.38)	0.018 *** (3.31)
	Debt ratio	0.003 ** (2.96)	0.002 *** (2.97)	0.003 ** (2.96)
	Firm size	−0.085 (−1.76)	−0.102 (−2.14)	−0.103* (−2.13)
	Firm age	−0.49 (−0.94)	−0.033 (−0.63)	−0.036 (−0.67)
	Industry type	0.252 (2.56)	0.165 (1.55)	0.165 (1.53)
2	Main effect Variables			
	Technological innovation		0.101 (1.43)	0.114 (1.31)
	Strategic CSR conformity		0.110 (1.70)	0.101 (1.39)
3	Interaction			
	Technological innovation * strategic CSR conformity			−0.029 (−0.26)
	Model			
	R^2	0.29	0.34	0.34
	Adjusted R^2	0.23	0.26	0.25
	F value	4.84 ***	4.50 ***	3.95 ***

*$p < 0.05$; **$p < 0.01$ ***$p < 0.001$.

Table 6. Multiple regression analysis results (sample of upper average).

Step	Variables	Model 1	Model 2	Model 3
		β(t)	β(t)	β(t)
1	Control Variables			
	Market share	0.053 (0.13)	0.183 (0.50)	0.330 (0.93)
	Sales operating profit ratio	0.016 (1.88)	0.016 * (2.07)	0.016 * (2.18)

Table 6. *Cont.*

Step	Variables	Model 1	Model 2	Model 3
		β(t)	β(t)	β(t)
	Debt ratio	0.002 (1.16)	0.002 (1.20)	0.001 (0.98)
	Firm size	0.036 (0.67)	−0.008 (−0.17)	0.005 (0.10)
	Firm age	−0.039 (−0.65)	−0.009 (−0.17)	0.020 (0.37)
	Industry type	0.293 (0.08)	−0.006 (−0.03)	0.018 (0.10)
2	Main effect Variables			
	Technological innovation		0.214 ** (3.30)	0.123 (1.66)
	Strategic CSR conformity		0.005 (0.08)	0.063 (1.08)
3	Interaction			
	Technological innovation * strategic CSR conformity			−0.085 * (−2.27)
	Model			
	R^2	0.20	0.39	0.45
	Adjusted R^2	0.09	0.27	0.34
	F value	1.85	3.36**	3.85 ***

* $p < 0.05$; ** $p < 0.01$ *** $p < 0.001$.

5. Discussion: Strategic CSR and Social Open Innovation

This study focuses on examining the main effect of technological innovation activities and strategic CSR, as well as their interaction effect on firm value. However, it should be noted that the effect of technological innovation on firm value through interaction with strategic CSR may differ depending on types of technological innovation. There are two different types of technological innovation: open innovation that actively utilizes various external resources and closed innovation that is a traditional method of utilizing internal resources [29].

Open innovation refers to a way in which firms create new products and services through combining internal knowledge with external knowledge and technologies [57,90]. On the other hand, closed innovation is a method of supplying products and services by containing the necessary knowledge and technology itself within the company [91–96]. Among these, open innovation, especially social open innovation, may have a more significant effect on firm value through interaction with strategic CSR because of the nature of its activities. Social open innovation is an approach to tackling social problems which orchestrates the participation of multiple stakeholders in the process, from generating ideas to scaling solutions. To successfully implement social open innovation activities, the firm has to establish cooperative relationships with various external organizations and individuals. Strategic CSR that is beneficial to build cooperative relationships with stakeholders including suppliers and partners to practice win–win management is very beneficial for this purpose. Thus, strategic CSR is expected to significantly increase the positive effect of social open innovation activities on firm value rather than closed innovation.

According to Gould [14], good relationships with stakeholders built through strategic CSR activities also reduce the likelihood of accidental outflow of intellectual assets developed through social open innovation activities. Strategic CSR enables firms to build broad and deep trust relationships with stakeholders. As a result, stakeholders want to build partnerships that share knowledge and resources with firms, which can stimulate combined open innovation processes to help form a virtuous cycle between strategic CSR and social open innovation [97].

From another point of view, firms may use social open innovation to strengthen the effect of strategic CSR on firm value. To successfully carry out strategic CSR activities,

firms should have the ability to solve various types of social and environmental problems. Thus, it is important to gain support and legitimacy from external organizations and individuals [98–100]. For this purpose, social open innovation helps firms gain legitimacy from stakeholders based on friendly relationships with external parties [101–106]. According to the prior studies based on stakeholder theory [107], sharing knowledge and information can promote the formation of trust relationships with external parties. This relates to stakeholder trust and cooperation, which are key elements for the successful implementation of strategic CSR and the improvement of firm value [59,108].

The virtuous cycle relationship between social open innovation and strategic CSR can also be explained in the perspective of absorptive capability theory. In fact, employees are key players in determining the success of strategic CSR activities because how deeply they are involved in activities can determine the success of the strategic CSR of the firm [109]. The process by which employees achieve strategic CSR objectives helps to change organizational culture more openly and to make the flow of internal and external knowledge and information more flexible. This changed organizational culture and effective flow of knowledge and information improve firm value by strengthening social open innovation activities based on understanding and cooperative relationships between various stakeholders and the firm [45,110–114].

6. Conclusions

6.1. Summary and Interpretation of Key Findings

In this study, we examined the effect of technological innovation activities and strategic CSR conformity and their interaction effect on firm value, for the listed Korean firms chosen as candidates for the KEJI Good Company Award in 2018. The key findings are as follows. First, as in previous studies [41,46,48,115], technological innovation activities were found to have a statistically significant positive effect on firm value. This finding shows that technological innovation activities are recognized by stakeholders, including investors, as an important strategy for increasing firm performance. Second, in the analysis of hypothesis 2, it was found that strategic CSR conformity did not significantly affect firm value. This result shows that, contrary to the hypothesis, performing a similar level of CSR with competitors does not help improve firm value. Third, we found a negative interaction effect between technological innovation activities and strategic CSR conformity on firm value. Because this finding is contrary to hypothesis 3, we implemented further analyses by dividing the sample into two subgroups. According to the findings, the interaction effect of strategic CSR with technological innovation activities was significantly positive on the value of Korean manufacturing firms only when the firm's strategic CSR was above the industrial average. This is a result presenting that strategic CSR can strengthen the positive effect of technological innovation activities on firm value. In addition, the result suggests that the strategic CSR of Korean manufacturing firms has been implemented as a strategic activity to improve firm value, not just to obtain and secure legitimacy.

This study focused on identifying the optimal level of strategic CSR, while prior studies [70,81,116] have investigated the optimal level of advertising and financial strategies. Unlike an investment in advertising and financial strategies, investing in CSR has been regarded as a strategy that increases long-term profits by improving corporate reputation rather than helping to improve short-term profits [117]. Therefore, shareholders may expect that the average level of CSR performed by a firm is at the most appropriate level. However, unexpected results were found. These findings may be attributed to the influence of stakeholders who judged that average-level strategic CSR was insufficient. In fact, according to the KEJI data analyzed in this study, the average CSR score (total KEJI) of the target firms was only 66 out of 100, which may not fully meet the expectations of stakeholders.

6.2. Academic and Practical Implications

As a study in areas where firms are highly interested in reflecting recent environmental changes and creating a sustainable competitive advantage, the findings of this study provide the following academic and practical implications. First, this study broadens academic knowledge on technological innovation and strategic CSR, which are key strategies for creating a sustainable competitive advantage in the long run, thereby providing a theoretical background for future research in the fields. Conflicting research findings and arguments have been presented regarding the effects of strategic CSR and its interaction effect with technological innovation on financial performance. These findings showed that strategic CSR as a non-market strategy may not directly improve financial value, but strengthened the impact of technological innovation activities that improve financial performance. Thus, future research should concentrate on the interactions between strategic CSR and other market competitive strategies that can improve financial performance, rather than the direct effect of strategic CSR on financial performance. In addition, the research findings show that the impact of technological innovation activities on financial performance may vary depending on the level of strategic CSR compared with other firms. This finding suggests that when analyzing the interaction effect between non-market and market competitive strategies to improve financial performance, the relative level of non-market strategy compared to competitors should be taken into account.

As a practical implication, this study emphasizes the importance of stakeholder-centered perspectives rather than shareholder-centered perspectives. Traditionally, the most important stakeholder in corporate management has been investors, including shareholders. However, with the recent advent of the era of stakeholder capitalism, management that considers the interests of various stakeholders is considered a very important factor not only for social performance but also for improving financial performance. With these changes, many academic discussions on ESG continue, along with considerations of CSR. In addition, there is an active movement to legislate the disclosure of non-financial indicators. To respond effectively to these changes, firms have to decide how to allocate resources between market strategies and non-market strategies. They must effectively utilize limited resources to create synergy between market and non-market strategies. This study provides meaningful implications for these firms. Specifically, it shows that manufacturers need to perform a higher-than-average level of CSR in order to strengthen the effect of improving firm value through technological innovation activities.

6.3. Limitations and Future Research

Despite its academic and practical implications, this study has some limitations as follow. First, the sample size was not sufficiently large because only listed firms subject to evaluation by the KEJI were analyzed. Future research that analyzes the effect of the relative level in comparison with the industry average of non-market strategies on the relationship between market strategies and corporate performance will provide more valuable practical implications. Second, the impact of strategic CSR on firm value can last for more than one year. Therefore, in future research it is necessary to analyze the impact of strategic CSR on firm value by expanding the time difference between independent and dependent variables to more than one year. Third, in the analysis of two subgroups, the results of firms performing high-level strategic CSR revealed a relatively high level of explanatory power of the model compared to the results of firms performing low-level strategic CSR. However, the effect of control variables on dependent variables was not significant in the analysis results of the firms performing a high level of strategic CSR. These findings are inferred to be due to a significant difference in the influence of technical innovation and strategic CSR on firm values in the two subgroups. However, to identify the cause of these unexpected findings more clearly, additional research including more diverse control variables should be implemented in the analysis of firms performing high-level strategic CSR. Finally, firms in developed countries are more actively engaged in socially responsible activities than the firms in developing countries. Therefore, future research might study the optimal level

of strategic CSR for firms in developed countries in comparison with that in developing countries. Furthermore, research on the motivating factors that lead firms to use CSR as a strategic opportunity is expected to provide valuable insights to scholars and practitioners.

Author Contributions: Conceptualization: S.C. and J.Y.; methodology: S.C.; data collection: S.C.; analysis: S.C.; validation: J.Y.; writing: S.C.; reviewing and editing: J.Y.; revision and resubmission process: S.C. and J.Y.; supervision: J.Y. All authors have read and agreed to the published version of the manuscript.

Funding: This study received no external funding.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Demirel, P.; Mazzucato, M. Innovation and Firm Growth: Is R&D Worth It? *Ind. Innov.* **2012**, *19*, 45–62.
2. Hagedoorn, J. *Innovation and Entrepreneurship: Schumpeter Revisited, Industrial and Corporate Change*; Oxford University Press: Oxford, UK, 1996; Volume 5, pp. 883–896.
3. Belenzon, S.; Patacconi, A. Innovation and firm value: An investigation of the changing role of patents 1985–2007. *Res. Policy* **2013**, *42*, 1496–1510. [CrossRef]
4. Kim, C.H. A Domestic Settlement Plan for Corporate Social Responsibility Management. *Soc. Enterp. Stud.* **2012**, *5*, 3–51.
5. Chon, M.L.; Kim, C.S. The Effect of Sustaining Corporate Social Responsibility on Relationship between CSR and Financial Performance. *Korean Account. Inf. Assoc.* **2011**, *29*, 351–374.
6. Knox, S.; Maklan, S. Corporate Social Responsibility: Moving Beyond Investment Towards Measuring Outcomes. *Eur. Manag. J.* **2004**, *22*, 508–516. [CrossRef]
7. Rogers, M. The definition and measurement of innovation. *Melb. Inst. Appl. Econ. Soc. Res.* **1998**, *10*, 27.
8. Marques, J.P. Closed versus open innovation: Evolution or combination? *Int. J. Bus. Manag.* **2014**, *9*, 196. [CrossRef]
9. Battisti, G.; Stoneman, P. How Innovative are UK Firms? Evidence from the Fourth UK Community Innovation Survey on Synergies between Technological and Organizational Innovations. *Br. J. Manag.* **2010**, *21*, 187–206. [CrossRef]
10. Kwon, S.J. The Effect of Product Innovation, Process Innovation, and Marketing Innovation on Innovation Capability and Knowledge Sharing of Ventures: Focusing on the Moderating Effect of Business Area. *J. Korean Entrep. Soc.* **2017**, *12*, 97–122. [CrossRef]
11. Ansoff, I. *Corporate Strategy*; McGraw-Hill: New York, NY, USA, 1965.
12. Fernando, S.; Lawrence, S. A Theoretical Framework for CSR Practices: Integrating Legitimacy Theory, Stakeholder Theory and Institutional Theory. *J. Theor. Account. Res.* **2014**, *10*, 149–178.
13. Fadun, S.O. Corporate Social Responsibility (CSR) Practices and Stakeholders Expectations: The Nigerian Perspectives. *Res. Bus. Manag.* **2014**, *1*. [CrossRef]
14. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Pitman: Boston, MA, USA, 1984.
15. Windsor, D. Stakeholder Management in Multinational Enterprises. *Proc. Int. Assoc. Bus. Soc.* **1992**, *3*, 241–255. [CrossRef]
16. Mitchell, R.K.; Agle, B.R.; Wood, D.J. Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts. *Acad. Manag. Rev.* **1997**, *22*, 853–886. [CrossRef]
17. Carroll, A.B. The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Bus. Horiz.* **1991**, *34*, 39–48. [CrossRef]
18. Rauf, F.; Voinea, C.L.; Naveed, K.; Fratostiteanu, C. CSR Disclosure: Effects of Political Ties, Executive Turnover and Shareholder Equity. Evidence from China. *Sustainability* **2021**, *13*, 3623. [CrossRef]
19. Kim, M.C.; Kim, Y.H. Corporate social responsibility and shareholder value of restaurant firms. *Int. J. Hosp. Manag.* **2014**, *40*, 120–129. [CrossRef]
20. Kolk, A.; Pinkse, J. Towards strategic stakeholder management? Integrating perspectives on sustainability challenges such as corporate responses to climate change. Corporate Governance. *Int. J. Bus. Soc.* **2007**, *7*, 370–378.
21. Donaldson, T.; Preston, L.E. The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *Acad. Manag. Rev.* **1995**, *20*, 65–91. [CrossRef]
22. Guthrie, J.; Petty, R.; Ricceri, F. The voluntary reporting of intellectual capital: Comparing evidence from Hong Kong and Australia. *J. Intellect. Cap.* **2006**, *7*, 54–271. [CrossRef]
23. Kim, D.J. Effects Of External Activities Of Corporate Social Responsibility On Benefits Of Employees And Shareholders-Mainly From Stakeholders' Perspective. *J. Hum. Resour. Manag. Res.* **2009**, *16*, 29–47.
24. Votaw, D. Genius Became Rare: A Comment on the Doctrine of Social Responsibility Pt1. *Calif. Manag. Rev.* **1972**, *28*, 142–152.
25. Carroll, A.B. A Three-Dimensional Conceptual Model of Corporate Performance. *Acad. Manag. Rev.* **1979**, *4*, 497–505. [CrossRef]
26. Carroll, A.B.; Buchholtz, A.K. Business and Society. In *Ethics and Stakeholder Management*; South-Western: Cincinnati, OH, USA, 1996.

27. Tian, Z.; Wang, R.; Yang, W. Consumer Responses to Corporate Social Responsibility (CSR) in China. *J. Bus. Ethics* **2011**, *101*, 197–212. [CrossRef]
28. Bowen, H.R. *Social Responsibilities of the Businessman*; Harper and Row: NewYork, NY, USA, 1953.
29. Rahman, H.; Ramos, I. Open Innovation in SMEs: From closed boundaries to networked paradigm. *Issues Inf. Sci. Inf. Technol.* **2010**, *7*, 471–487. [CrossRef]
30. Heald, M. Management's responsibility to society: The growth of an idea. *Bus. Hist. Rev.* **1957**, *31*, 375–384. [CrossRef]
31. Kim, A.H.; Yoo, J.W. The Moderating Effect of Corporate Governance on the Relations between Corporate Social Responsibility and Corporate Value. *Korean J. Bus. Adm.* **2012**, *26*, 219–240.
32. Byun, S.Y.; Kim, J.W. Strategic CSR and Corporate Performance in Korean and Japanese Corporations. *Int. Bus. J.* **2011**, *22*, 83–110.
33. Lee, J.D.; Chung, Y.H. The Effect of Innovation Activities on Asymmetric cost Behavior. *Korean Bus. Educ. Rev.* **2018**, *33*, 259–273. [CrossRef]
34. Mendes, A.M.; Santos, M.J. Strategic CSR: An integrative model for analysis. *Soc. Responsib. J.* **2016**, *12*, 363–381. [CrossRef]
35. Porter, M.E.; Kramer, M.R. Strategic & Society: The Link Between Competitive Advantage and Corporate Social Responsibility. *Harv. Bus. Rev.* **2006**, *84*, 56–68.
36. Jang, J.K. The Relation between Corporate Social Responsibility and Firm Value. *Korea Contents Soc.* **2015**, *15*, 455–462. [CrossRef]
37. Blowfield, M. Reasons to be cheerful? What we know about csr's impact. *Third World Q.* **2007**, *28*, 683–695. [CrossRef]
38. David, P.; Kline, S.; Dai, Y. Corporate social responsibility practices, corporate identity, and purchase intention: A dual-process model. *J. Public Relat. Res.* **2005**, *17*, 291–313. [CrossRef]
39. Johnson, L.D.; Pazderka, B. Firm value and investment in R&D. *Manag. Decis. Econ.* **1993**, *14*, 15–24.
40. Reinganum, J.F. Innovation and Industry Evolution. *Q. J. Econ.* **1985**, *100*, 81–99. [CrossRef]
41. Min, B.S.; Smyth, R. How does leverage affect R&D intensity and how does R&D intensity impact on firm value in South Korea? *Appl. Econ.* **2016**, *48*, 5667–5675.
42. Eng, L.L.; Shackell, M. The Implications of Long-Term Performance Plans and Institutional Ownership for Firms' Research and Development (R&D) Investments. *J. Account. Audit. Financ.* **2001**, *16*, 117–139.
43. Mitchell, G.R.; Hamilton, W.F. Managing R&D as A Strategic Option. *Res. Technol. Manag.* **1988**, *31*, 15–22.
44. Kim, J.S.; Kim, S.C. Innovation and the Default Risk of Firms. *Korean Manag. Rev.* **2009**, *38*, 773–797.
45. Bhatt, P.; Ahmad, A.J.; Roomi, M.A. Social innovation with open source software: User engagement and development challenges in India. *Technovation* **2016**, *52*, 28–39. [CrossRef]
46. Ehie, I.C.; Olibe, K. The effect of R&D investment on firm value: An examination of US manufacturing and service industries. *Int. J. Prod. Econ.* **2010**, *128*, 127–135.
47. Rong, Z.; Xiao, S. Innovation-Related Diversification and Firm Value. *Eur. Financ. Manag.* **2017**, *23*, 475–518. [CrossRef]
48. Hirschey, M.; Weygandt, J.J. Amortization policy for advertising and research and development expenditures. *J. Account. Res.* **1985**, *23*, 326–335. [CrossRef]
49. Seo, R.J.; Kim, J.S. Technology Innovation, Market Share and Firm Value in the Panel of Korean Manufacturing Firms. *J. Ind. Econ. Bus.* **2011**, *24*, 3211–3226.
50. Flammer, C.; Bansal, P. Does A Long-Term Orientation Create Value? Evidence From A Regression Discontinuity. *Strateg. Manag. J.* **1990**, *38*, 1827–1847. [CrossRef]
51. Guping, C.; Safdar, S.M.; Wan, P.; Badulescu, A.; Badulescu, D.; Vianna Brugni, T. Do Board Gender Diversity and Non-Executive Directors Affect CSR Reporting? Insight from Agency Theory Perspective. *Sustainability* **2020**, *12*, 8597. [CrossRef]
52. Eisenhardt, K.M. Agency Theory: An Assessment and Review. *Acad. Manag. Rev.* **1989**, *14*, 57–74. [CrossRef]
53. Wiese, A.; Toporowski, W. CSR failures in food supply chains—An agency perspective. *Br. Food J.* **2013**, *115*, 92–107. [CrossRef]
54. Li, F.; Li, T.; Minor, D.A. Test of Agency Theory: CEO Power, Firm Value, and Corporate Social Responsibility. *Int. J. Manag. Financ.* **2016**, *12*, 611–628. [CrossRef]
55. Milton, S. Some observations on CSR and Strategic Management. *Bp. Manag. Rev.* **2010**, *41*, 59–67. [CrossRef]
56. Hillman, A.J.; Keim, G.D. Shareholder value, stakeholder management, and social issues: What's the bottom line. *Strateg. Manag. J.* **2001**, *22*, 125–139. [CrossRef]
57. Gassmann, O.; Enkel, E.; Chesbrough, H. The future of open innovation. *R&D Manag.* **2010**, *40*, 213–221.
58. Hoskisson, R.E.; Hitt, M.A.; Wan, W.P.; Yiu, D. Theory and research in strategic management: Swings of a pendulum. *J. Manag.* **1999**, *25*, 417–456. [CrossRef]
59. Dahlsrud, A. How corporate social responsibility is defined: An analysis of 37 definitions. *Corp. Soc. Responsib. Environ. Manag.* **2008**, *15*, 1–13. [CrossRef]
60. Ozdora-Aksak, E.; Atakan-Duman, S. Gaining legitimacy through CSR: An analysis of Turkey's 30 largest corporations. *Bus. Ethics Eur. Rev.* **2016**, *25*, 238–257. [CrossRef]
61. Guo, Z.; Hou, S.; Li, Q. Corporate Social Responsibility and Firm Value: The Moderating Effects of Financial Flexibility and R&D Investment. *Sustainability* **2020**, *12*, 8452.
62. Hu, Y.; Chen, S.; Shao, Y.; Gao, S. CSR and Firm Value: Evidence from China. *Sustainability* **2018**, *10*, 4597. [CrossRef]
63. Barnea, A.; Rubin, A. Corporate Social Responsibility as a Conflict Between Shareholders. *J. Bus. Ethics* **2010**, *97*, 71–86. [CrossRef]
64. Harjoto, M.; Laksmana, I. The Impact of Corporate Social Responsibility on Risk Taking and Firm Value. *J. Bus. Ethics* **2018**, *151*, 353–373. [CrossRef]

65. Chung, C.Y.; Jung, S.; Young, J. Do CSR Activities Increase Firm Value? Evidence from the Korean Market. *Sustainability* **2018**, *10*, 3164. [CrossRef]
66. Jeon, I.S.; Seol, Y.Y.; Kim, C.K. The Relevance of Corporate Social Responsibility and Corporate Value. *Korean Bus. Educ. Rev.* **2012**, *27*, 361–387.
67. Magelssen, C. Allocation of property rights and technological innovation within firms. *Strateg. Manag. J.* **2020**, *41*, 758–787. [CrossRef]
68. Deegan, C.; Rankin, M.; Voght, P. Firms' Disclosure Reactions to Major Social Incidents: Australian Evidence. *Account. Forum* **2000**, *24*, 101–130. [CrossRef]
69. Deephouse, D.L. To be different, or to be the same? It's a question (and theory) of strategic balance. *Strateg. Manag. J.* **1999**, *20*, 147–166. [CrossRef]
70. Lim, M.S.; Kim, C.Y.; Yoo, J.W. How Strategic Conformity Interacts with Innovation: An Empirical Study on Korean Manufacturing Firms from the Perspective of Optimal Distinctiveness. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 121. [CrossRef]
71. Zhao, E.Y.; Fisher, G.; Lounsbury, M. Optimal distinctiveness: Broadening the interface between institutional theory and strategic management. *Strateg. Manag. J.* **2017**, *38*, 93–113. [CrossRef]
72. Branco, M.C.; Rodrigues, L.L. Corporate Social Responsibility and Resource-Based Perspectives. *J. Bus. Ethics* **2006**, *69*, 111–132. [CrossRef]
73. Hart, S.L. A Natural-Resource-Based View of The Firm. *Acad. Manag. Rev.* **1995**, *20*, 986–1014. [CrossRef]
74. Porter, M.E.; Kramer, M.R. The competitive advantage of corporate philanthropy. *Harv. Bus. Rev.* **2002**, *80*, 56–68. [PubMed]
75. Porter, M.E.; Kramer, M.R. Corporate philanthropy: Taking the high ground. Foundation strategy group. 2003. Available online: https://www.hbs.edu/faculty/Pages/item.aspx?num=20671 (accessed on 11 September 2022).
76. Gallego-Álvarez, I.; Prado-Lorenzo, J.M.; García-Sánchez, I.M. Corporate social responsibility and innovation: A resource-based theory. *Manag. Decis.* **2011**, *49*, 1709–1727. [CrossRef]
77. McWilliams, A.; Siegel, D. Corporate social responsibility: A theory of the firm perspective. Academy of Management. *Acad. Manag. Rev.* **2001**, *26*, 117–127. [CrossRef]
78. Mishra, D.R. Post-innovation CSR Performance and Firm Value. *J. Bus. Ethics* **2017**, *140*, 285–306. [CrossRef]
79. Panwar, R.; Paul, K.; Nybakk, E.; Hansen, E.; Thompson, D. The legitimacy of CSR actions of publicly traded companies versus family-owned companies: JBE. *J. Bus. Ethics* **2014**, *125*, 481–496. [CrossRef]
80. Withisuphakorn, P.; Jiraporn, P. The effect of firm maturity on corporate social responsibility (CSR): Do older firms invest more in CSR? *Appl. Econ. Lett.* **2016**, *23*, 298–301. [CrossRef]
81. Finkelstein, S.; Hambrick, D.C. Top-Management-Team Tenure and Organizational Outcomes: The Moderating Role of Managerial Discretion. *Adm. Sci. Q.* **1990**, *35*, 484–503. [CrossRef]
82. Fagerberg, J.; Mowery, D.C.; Nelson, R.R. *Innovation*, 4th ed.; Oxford University Press: Oxford, UK, 2005.
83. Servaes, H.; Tamayo, A. The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. *Manag. Sci.* **2013**, *59*, 1045–1061. [CrossRef]
84. Gilbert, R.; Newbery, D. Preemptive patenting and the persistence of monopoly. *Am. Econ. Rev.* **1982**, *72*, 514–526.
85. D'Amato, A.; Falivena, C. Corporate social responsibility and firm value: Do firm size and age matter? Empirical evidence from European listed companies. *Corp. Soc. Responsib. Environ. Manag.* **2020**, *27*, 909–924. [CrossRef]
86. Na, Y.; Hong, S.H. An Empirical Analysis on Value Relevance of Corporate Social Responsibility Activities by Firm Size. *Korean Account. J.* **2011**, *20*, 125–160.
87. Ryu, D.W.; Ryu, D.J.; Hwang, J.H. Corporate Social Responsibility: Investment or Expense? *Korean Manag. Rev.* **2017**, *46*, 1127–1155. [CrossRef]
88. Branch, B. Research and development Activity and Profitability-A Distributed Lag Analysis. *J. Political Econ.* **1974**, *82*, 999–1011. [CrossRef]
89. Sougiannis, T. The Accounting Based Valuation of Corporate R&D. *Account. Rev.* **1994**, *69*, 44–68.
90. Chesbrough, H.; Vanhaverbeke, W.; West, J. *Open Innovation: The New Imperative for Creating and Profiting from Technology*; Harvard Business Press: Boston, MA, USA, 2006; Volume 1.
91. Bae, Y.; Chang, H. Efficiency and effectiveness between open and closed innovation: Empirical evidence in South Korean manufacturers. *Technol. Anal. Strateg. Manag.* **2012**, *24*, 967–980. [CrossRef]
92. Dionisio, M.; de Vargas, E.R. Corporate social innovation: A systematic literature review. *Int. Bus. Rev.* **2020**, *29*, 101641. [CrossRef]
93. Eichler, G.M.; Schwarz, E.J. What sustainable development goals do social innovations address? A systematic review and content analysis of social innovation literature. *Sustainability* **2019**, *11*, 522. [CrossRef]
94. Meyer, J.W.; Rowan, B. Institutionalized organizations: Formal structure as myth and ceremony. *Am. J. Sociol.* **1977**, *83*, 340–363. [CrossRef]
95. Osburg, T. *Social Innovation to Drive Corporate Sustainability. Social Innovation*; Springer: Berlin/Heidelberg, Germany, 2013; Volume 3, pp. 13–22.
96. Schmidthuber, L.; Piller, F.; Bogers, M.; Hilgers, D. Citizen participation in public administration: Investigating open government for social innovation. *R&D Manag.* **2019**, *49*, 343–355.

97. Roszkowska-Sliz, M. Exploring the Link Between Strategic CSR and Open Innovation. In Proceedings of the ISPIM Innovation Symposium, The International Society for Professional Innovation Management (ISPIM), Dublin, Ireland, 8–11 June 2014; Volume 1, pp. 1–21.
98. Enkel, E.; Gassmann, O.; Chesbrough, H. Open R&D and open innovation: Exploring the phenomenon. *R&D Manag.* **2009**, *39*, 311–316.
99. Felin, T.; Zenger, T.R. Closed or open innovation? Problem solving and the governance choice. *Res. Policy* **2014**, *43*, 914–925. [CrossRef]
100. Ghodbane, W. Corporate social responsibility and performance outcomes of high technology firms: Impacts on open innovation. *J. Syst. Manag. Sci.* **2009**, *9*, 29–38.
101. Ayuso, S.; Rodríguez, M.Á.; García-Castro, R.; Ariño, M.Á. Does Stakeholder Engagement Promote Sustainable Innovation Orientation? *Ind. Manag. Data Syst.* **2011**, *111*, 1399–1417. [CrossRef]
102. Luo, X.; Wang, H.; Raithel, S.; Zheng, Q. Corporate social performance, analyst stock recommendations, and firm future returns. *Strateg. Manag. J.* **2013**, *36*, 123–136. [CrossRef]
103. Bresciani, S.; Camilleri, M.A.; Troise, C.; O'Regan, N. Creating value through open innovation approaches: Implications for corporate sustainability and responsibility. 2022. Available online: https://www.um.edu.mt/library/oar/handle/123456789/86697 (accessed on 11 September 2022).
104. Holmes, S.; Smart, P. Exploring Open Innovation Practice in Firm-nonprofit Engagements: A Corporate Social Responsibility Perspective. *R&D Manag.* **2009**, *39*, 394–409.
105. Unceta, A.; Castro-Spila, J.; Garcia Fronti, J. The three governances in social innovation. *Innov. Eur. J. Soc. Sci. Res.* **2017**, *30*, 406–420. [CrossRef]
106. Yun, J.J.; Park, K.; Im, C.; Shin, C.; Zhao, X. Dynamics of social enterprises—Shift from social innovation to open innovation. *Sci. Technol. Soc.* **2017**, *22*, 425–439. [CrossRef]
107. Alexy, O.; George, G.; Salter, A. From Sensing Shape to Shaping Sense: A Dynamic Model of Absorptive Capacity and Selective Revealing. *Acad. Manag. Rev.* **2013**, *38*, 270–291. [CrossRef]
108. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Cambridge University Press: Cambridge, UK, 2010.
109. ter Hoeven, C.L.; Verhoeven, J.W.M. "Sharing is caring": Corporate social responsibility awareness explaining the relationship of information flow with affective commitment". *Corp. Commun. Int. J.* **2013**, *18*, 264–279. [CrossRef]
110. Baker, S.; Mehmood, A. Social innovation and the governance of sustainable places. *Local Environ.* **2015**, *20*, 321–334. [CrossRef]
111. Chalmers, D. Social innovation: An exploration of the barriers faced by innovating organizations in the social economy. *Local Econ.* **2013**, *28*, 17–34. [CrossRef]
112. Chesbrough, H.; Di Minin, A. Open social innovation. *New Front. Open Innov.* **2014**, *16*, 301–315.
113. Lau, A.K.; Lo, W. Regional innovation system, absorptive capacity and innovation performance: An empirical study. *Technol. Forecast. Soc. Change* **2015**, *92*, 99–114. [CrossRef]
114. Roszkowska-Menkes, M.T. Integrating strategic CSR and open innovation. Towards a conceptual framework. *Soc. Responsib. J.* **2018**, *14*. [CrossRef]
115. Bosworth, D.; Rogers, M. Market Value, R&D and Intellectual Property: An Empirical Analysis of Large Australian Firms. *Econ. Rec.* **2001**, *77*, 323–337.
116. Oliver, C. Sustainable competitive advantage: Combining institutional and resource-based views. *Strategy Manag. J.* **1997**, *18*, 697–713. [CrossRef]
117. Gotsi, M.; Wilson, A.M. Corporate reputation management: Living the brand. *Manag. Decis.* **2001**, *39*, 99–104. [CrossRef]