

Article

Sustaining the Family Business through Open Innovation: The Role of Technological Acquisitions in Shareholder Value Creation

He Soung Ahn 

Department of Business Administration, Sejong University, Seoul 05006, Korea; hsahn@sejong.ac.kr

Received: 28 August 2020; Accepted: 19 September 2020; Published: 22 September 2020



Abstract: Although technological acquisitions have attracted much attention as a prominent means of open innovation that allows firms to complement internal innovation, their shareholder value creation effects should be influenced by whether the acquiring family businesses can successfully realize technological synergies. Thus, the purpose of this paper is to investigate whether market participants perceive family businesses to create more value when undertaking technological acquisitions. Using a sample of 614 acquisitions by 71 family businesses between 2000 and 2014 in South Korea, an event study methodology is adopted. Empirical analysis yields strong support for the prediction that the stock market does not perceive family businesses to be able to create superior synergy through technological acquisitions compared to when they undertake nontechnological acquisitions. The competitive landscape also has implications for the shareholder value creation effects of technological acquisitions by family businesses. Overall, the findings of this paper provide insight into the shareholder wealth implications of technological acquisitions undertaken by family businesses.

Keywords: family business; technological acquisition; technological synergy; shareholder value; technological capability; competitors' acquisition behavior

1. Introduction

Because technological change is typically frequent and rapid in speed [1], firms are increasingly complementing their internal research and development (R&D) efforts with an open innovation approach to access knowledge sources that exist beyond their firm boundaries [2,3]. Among a wide variety of ways through which firms can leverage internal and external R&D strategies, technological acquisitions are a prominent means of open innovation that allows firms to tap into the technological resources of the target firm and complement acquirers' internal innovation in order to obtain sustainable competitive advantages [3–5]. In fact, the global technological acquisition activity has been impressive since as early as the 1990s [6]. Although all types of acquisitions by definition should allow firms to obtain resources and capabilities that are unavailable internally, technological acquisitions allow acquiring firms to create value by realizing technological synergies [5,7–9]. Since relying solely on internal research and development (R&D) efforts is time-consuming, technological acquisitions allows acquirers to rapidly obtain strategically valuable resources that can lead to technological synergies [5]. Technological acquisitions also help firms to overcome the inherent path dependency that internal R&D efforts encompass [10,11]. Through absorbing target firms' technological inputs (e.g., patents, technological know-how), acquiring firms are able to expand their technological knowledge base and enhance the possibility of innovative recombinations [12,13].

At the same time, technological acquisitions present significant challenges because technological synergies that arise from successful integration are far more difficult to achieve compared to synergies that arise from nontechnological acquisitions [5,14]. Because the technical capabilities

that the target firm possess are often associated with a high level of tacitness, complexity, and social embeddedness [11,15], the acquiring firm faces greater difficulties in implementing effective knowledge transfer and “maintaining the productive momentum” of both firms [5] (p. 80). This suggests that technological acquisitions have a high growth potential, but also are associated with high risk and uncertainty [16]. In fact, technological acquisitions have been found likely to be disappointing because they often fail to create value despite their strategic potential [5,6,14].

In order for acquiring firms to create more value through technological acquisitions, they should be able to successfully integrate the technological target into their organization and effectively realize technological synergy. In other words, without the realization of technological synergies, technological acquisitions do not necessarily create more value than their nontechnological counterparts. In this paper, shareholder value creation is used as a performance indicator of technological and nontechnological acquisitions. While existing studies have measured acquisition performance using various indicators (e.g., patenting activity, new product introduction) [5], market perceptions about acquisition performance have been found to be “by far the most frequently used metric to approximate acquisition performance” [17] (p. 71). Stock market changes surrounding acquisition events reflect expectations about how much value can be eventually created or destroyed.

This paper suggests that shareholder value creation effects of technological acquisitions should be influenced by firm-specific factors that can affect the acquiring firm’s potential for successfully extracting technological synergies. Specifically, family control is an important governance characteristic of the acquiring firm that influences whether the greater shareholder value is actually generated through technological acquisitions. Because the importance of technological acquisitions is no exception for family businesses, these firms are also motivated to use technological acquisitions as a means for open innovation that can help them to gain and sustain their competitive advantages [18,19]. Despite the growing attention to acquisitions by family businesses [20–24], the existing literature lacks understanding about whether family businesses are able to create superior shareholder value by engaging in technological acquisitions compared to when they undertake those that are nontechnological. Previous studies focus either on a comparison between family firms and nonfamily firms or narrowly on only technological acquisitions. For instance, Kotlar, De Massis, Frattini, Bianchi and Fang [18] found that family firms are more likely to avoid undertaking technological acquisitions compared to nonfamily firms. Similarly, Feito-Ruiz and Menéndez-Requejo [25] compared the shareholder M&A valuation of family versus nonfamily firms. André, Ben-Amar and Saadi [19] examined how the level of family ownership influences stock market reactions to technological acquisitions by family businesses without a comparison with those of their nontechnological acquisitions.

To fill the gap in the literature, this paper explores the differing implications for shareholder value of the acquiring family businesses that technological and nontechnological acquisitions have. The purpose of this study is to understand whether technological acquisitions undertaken by family businesses are perceived to in fact create more value than nontechnological acquisitions. Specifically, market participants are more likely to be skeptical about the family firms’ ability to create technological synergy despite the value of technological acquisitions as a tool to achieve open innovation [26]. For instance, not only would the acquiring family businesses find it more difficult to integrate the technological target firm into their existing organization, they are also less likely to provide autonomy to target the firm’s managers. This paper suggests that technological acquisitions conducted by family firms are likely to be more negatively perceived by shareholders than their nontechnological counterparts.

Moderating factors that lessen outsiders’ concerns about the shareholder value creation implications of technological acquisitions in family firms are further investigated. Specifically, the acquiring family businesses’ technological capabilities and the extent to which their industry peers are engaging in acquisitions are suggested to be factors that influence shareholder value created by the acquisitions announcements. When the acquiring family business has a higher level of technological

capability, the firm is better able to reconfigure and recombine the expanded resource bases to create innovation outcomes and better integrate the technological target firm in the post-acquisition stage [27–29]. On the other hand, higher levels of competitors' acquisitions implies that the acquiring family business faces a competitive threat [30]. Technological acquisitions by family businesses as a response to such competitive threats in the environment can enhance the possibility of technological synergies because it signals that these family businesses are acquiring technological targets in order to take advantage of the same valuable future growth potential as their rival firms are doing [31].

A sample of 614 acquisitions announced by 71 family businesses during 2000–2014 in South Korea is utilized for empirical testing. Adopting the event study methodology that examines the market reaction in response to M&A announcements, the cumulative abnormal return of the acquiring firm businesses' stock is used as the measure of shareholder value creation. The paper is structured as follows. An overview of previous literature on technological acquisitions and technological synergies is introduced. Hypotheses about the shareholder value creation effects of technological and nontechnological acquisitions by family businesses and the moderating effects of technological capabilities and competitors' acquisition activities are developed. After an introduction of the methodology and empirical results, the paper ends with a discussion of the main findings, theoretical and managerial implications, limitations and future research agendas, and a conclusions section.

2. Theoretical Background and Hypotheses Development

2.1. *Technological Acquisitions as a Means of Open Innovation and Technological Synergies*

Technological acquisition is defined as an acquisition in which technology is a key component of the target firm's assets [13]. Compared to nontechnological acquisitions that do not involve a technological competent [13], the primary goal of engaging in technological acquisitions is to achieve technological synergies and to acquire external resources as a means of open innovation [3,4,8]. Since acquisition is a tool by which the acquiring firm can absorb and use external knowledge that it lacks internally [7], technological acquisitions will allow the acquiring firm to add technological inputs of the target firm to its resource base. Technological inputs include not only tangible technological resources such as patents, but also intangible assets such as technological know-how [12,13]. Due to the subsequent expansion in the acquirer's technological knowledge base, the possibility of inventive recombination becomes more likely in the newly combined entity [13]. In fact, the technological inputs are anticipated to increase acquiring firms' innovation performance. The acquiring firm can also capitalize on the superior growth potential that the target firm possesses [16]. As such, technological acquisitions are recognized as an important tool for engaging in open innovation that will allow the acquiring firm to gain and sustain its competitive advantage [3,4,18,32,33].

In contrast, nontechnological acquisitions are undertaken to achieve synergies that are not necessarily technological. Firms have been recognized to have various motivations for engaging in nontechnological acquisitions: access to distribution channels, entry into new markets (e.g., foreign markets), increasing market power, obtaining economies of scale and scope, vertical integration, or diversification [7,34–37]. Acquisitions that are undertaken by such motives do not provide technological inputs for the acquiring firm and are not expected to enhance its innovation output and contribute to open innovation efforts [13].

Despite the fact that technological acquisition is a potentially valuable tool for achieving open innovation, its value depends on the assumption that the acquiring firm is able to integrate the technological target firm successfully into their existing organization and thereby realize technological synergies [7,38]. That is, an acquirer will not be able to gain the associated benefits that can arise from technological acquisitions if they are unable to successfully perform post-acquisition integration [39]. Thus, the shareholder value creation effects of technological acquisitions will not only reflect attractive growth prospects, but also take into account the uncertainty associated with its future prospects [16].

However, realizing synergies from technological acquisitions is relatively more difficult and complicated compared to when the acquisition is a nontechnological one [14]. Although the acquiring firm must be able to understand the target firm's technological knowledge base in order to implement post-acquisition integration, the information asymmetry between the acquiring and target firm often amplifies technological complexities that prevents such understanding [16]. Such information asymmetry between the two firms exists because the target's technological knowledge tends to be tacit, complex, and socially embedded in the firm [5]. The tacit nature of knowledge-based resources makes them even more difficult to transfer between organizational boundaries [40]. The lack of understanding caused by information asymmetry between the acquiring and target firms can also influence whether the acquiring firm is able to achieve actual product development in the post-acquisition phase. Technological targets possess potentially valuable technological assets whose value is heavily dependent on the acquiring firms' ability to successfully develop a product using the new technology; without such future development, commercial success will not be viable.

Technological acquisitions also entail a far greater disruption in the established organizational routines than nontechnological acquisition does [13]. Following technological acquisitions, acquirers face enhanced difficulties in resolving the disruptions and finding a consistent balance in organizational routines and eventually recovering from the reduced productivity [41]. That is, the integration of a technological target is more likely to require a significant organization restructuring and managerial attention in order to fully realize technological synergies [7,42–45].

2.2. *Shareholder Value Creation of Technological vs. Nontechnological Acquisitions by Family Businesses*

The highly uncertain nature associated with the prospects of technological acquisitions suggests that the eventual success of these types of acquisitions more heavily depends on the acquiring firms' abilities and willingness to achieve synergies compared to when the acquisition is a nontechnological one. In this paper, I focus on family businesses as acquirers because the governance structure has considerable room to influence the extent of technological synergies that they can achieve from technological acquisitions. Previous literature suggests that market participants should rely on various factors that can signal the acquirer's ability to realize technological synergies as it is more difficult to create value through technological acquisitions due to the target firm's intangible assets and risky nature of growth opportunities [18]. To the best of my knowledge, previous studies have not yet investigated whether family businesses are able to achieve superior shareholder value through technological acquisitions compared to when they make acquisitions that are nontechnological. Such an overlook is surprising given that technological acquisitions should not be equally valuable for all acquiring firms, especially in the long term. To fill the gap in the literature, I suggest that the stock market's perceptions about technological acquisitions undertaken by family businesses will be less positive compared to their nontechnological acquisitions.

Market skepticism about the potential synergies arising from technological acquisitions undertaken by family businesses are likely to exist because family business as an acquirer should face difficulties in integrating the technological target firm into their existing organization compared to when the target firm is a nontechnological one. One salient difference lies in their management styles. Given that the difference in management styles of the acquiring and target firm has been found to reduce post-acquisition performance [39], family businesses' post-acquisition integration of a technological target faces the risk of suboptimal realization of synergies. For example, family firms tend to have a more authoritarian style of management in which the controlling family—as the dominant coalition—have implicit power over decision making [46]. The resulting lower level of information exchange with actors outside the dominant coalition can cause conflict with the technological target firm in the post-acquisition phase. Organizational structure and systems of family businesses also tend to be less formalized, which can not only lead to role ambiguity but can also prevent appropriate adjustments in family members' responsibilities following the acquisition of an external technological firm [47]. If such differences in the managements styles are not effectively resolved, the newly combined

entity may face a higher possibility of turnover of target managers and employees which are the human capital that is critical to the realization of technological synergies [7,48].

Furthermore, the realization of synergies from technological acquisitions requires greater managerial attention that is more likely to be lacking in family businesses. Not only do family businesses tend to have a smaller sized close-knit group of top management teams, they are also less likely to have employed professional managerial talent that is necessary for the post-acquisition integration process [49]. The managerial talent that plays an important role during the post-acquisition integration stage is often accumulated through experience, which implies that the likelihood that a professional manager has such relevant talent is higher. However, the family business as an acquirer will be less likely to have professional managers that have the necessary human capital, relational capital, and structural capital [50]. This suggests that when a family business undertakes a technological acquisition, it is less likely to be able to devote sufficient managerial attention into the resource-consuming process of post-acquisition integration.

What can be even more potentially problematic is that family owners are more likely to resist necessary reorganization that is necessary in the post-acquisition integration stage in order to protect their family control and nonfinancial utility (e.g., socioemotional wealth) [51,52]. One example of such reorganization is the distribution of managerial autonomy to the managers from the target firm. As technological synergy requires the novel recombination of technological capabilities from both firms, the acquirer needs to provide autonomy to target firms' managers and knowledge workers [5]. Although such retained autonomy by the target firm managers has been found to positively impact on acquisition success [53], family owners will find it difficult to trust them to prioritize family-centric interests [18]. The resulting lack of trust—and autonomy—granted to the technological target firm will decrease the likelihood of a positive technological acquisition outcome, thereby reducing the likelihood of technological synergy realization.

In sum, shareholders will perceive that family businesses will be less likely to create shareholder value when they undertake technological acquisitions compared to when they acquire nontechnological target firms.

Hypothesis 1 (H1). *Technological acquisitions by family businesses will create less shareholder value compared to nontechnological acquisitions by family businesses.*

2.3. The Moderating Effect of Technological Capability

Although technological acquisitions undertaken by family businesses will not be perceived to create greater shareholder value than nontechnological acquisitions, market skepticism can be mitigated when the acquiring family business has technological capability. In the context of technological acquisitions, the level of technological capability of the acquiring family business is critical for realizing technological synergies in technological acquisitions [54]. This is because engaging in open innovation through technological acquisitions per se will not lead to superior technological synergies. Rather, acquiring firms need to take active actions to sense and seize valuable outcomes from the reconfiguration and recombination of resource bases to create new knowledge or product outputs [27,28]. Otherwise, the acquired knowledge is simply stocked within the acquirer and its full value as a technological input will not be actualized [55].

Defined as the “ability of a firm to actually create impactful innovations” [28] (p. 55), technological capability is considered to be an important source of an acquiring firm's ability to leverage the knowledge of the target firm into technological synergies [27,56]. Possessing technological capability is expected to enhance the acquiring family businesses' absorptive capacity and allow them to better judge the potential use of the acquired knowledge [28,29,57]. Acquired knowledge can either be used as an input in the family businesses' existing innovation processes or to create new innovative outcomes without the leverage of existing knowledge [55,58,59]. Therefore, family business as an

acquirer with higher technological capability means that the firm should be better able to create value using the target's capabilities.

At the same time, family business as an acquirer undertaking technological acquisitions can better integrate the technological target into their firm if it possesses higher technological capability. Family businesses with technological capabilities will have a better understanding of the post-merger integration process that is critical for creating technological synergies [29]. As such, family owners will be more willing to adopt ways to promote adequate knowledge flows and coordination with the acquired target firm and to grant them with the autonomy that is necessary for a successful integration [40,60]. Under the circumstances, shareholders will perceive that technological acquisitions by family businesses will be more likely to be value-creating when the acquiring firm has higher levels of technological capabilities. This is because the technological capability of the family business signals that the firm as an acquirer has the absorptive capacity to recognize possible novel recombinations of technological resource bases of the target firm [28,61]. Although it is unclear whether technological acquisitions by family firms will create more or less shareholder value than their nontechnological acquisitions, their technological capabilities nevertheless will increase the level of shareholder value created when engaging in technological acquisitions. In summation, the following hypothesis is suggested:

Hypothesis 2 (H2). *Technological capability of the acquiring family business will positively affect the impact technological acquisitions will have on shareholder value.*

2.4. The Moderating Effect of Competitors' Acquisition Activity

Competitors' acquisition activity constitutes an important external contingency that can influence the level of shareholder value that is created by family businesses' technological acquisitions [31]. On the one hand, the prevalence of acquisitions undertaken by competitors from the same industry implies that the focal family business faces a competitive threat [30]. Rival firms' acquisitions suggest that they are exploiting valuable growth opportunities, achieving scale economies, increasing operational efficiencies, or increasing market power [7,31,62–64]. Such benefits have considerable scope for competitors to gain competitive advantage that will allow them to outperform the focal family business. Under the circumstances, inaction implies that the firm will become less likely to survive and prosper in the given industry. Technological acquisitions that are undertaken by family businesses as a response to competitive threats in the environment has increasingly more room to create shareholder value because it signals that these family businesses are acquiring technological targets in order to take advantage of the same valuable future growth potential as their rival firms [31]. That is, market skepticism about the lack of technological synergies that can be realized by family business acquirers may be lessened when the technological acquisition is undertaken in times of higher competitive threats. Family businesses' decision to undertake technological acquisitions—despite the difficulties in the realization of technological synergies—implies that they are proactively responding to isomorphic pressures to keep up with the prevailing competition in the industry.

Furthermore, family businesses' decision to acquire a technological target firm in the face of competitive threats in the competitive environment signals that the probability of technological synergies realization can be enhanced in the post-acquisition integration stage. That is, in the face of competitive threats imposed by competitors, family businesses should be more willing to commit to the reorganizations following technological acquisitions in order to achieve as much technological synergies as possible [65]. The threat posed by such external contingency motivates the controlling family in such way that they should become more willing to abandon their normal reluctance towards change in the process of integrating the technological target firm. This is because the competitive threats from the rival firms' acquisition behavior not only decreases economic returns for the family businesses, but also decreases the nonfinancial utility of the family due to the potential reduction in firm value that can be handed over to the next generation [65]. As such, the possibility of technological

synergies increases if family businesses undertake such acquisitions in the context of heightened competitive environment. Overall, I predict the following:

Hypothesis 3 (H3). *The level of competitors' acquisition activities will positively affect the impact technological acquisitions will have on shareholder value.*

3. Methodology

3.1. Research Context and Sample

South Korea is an ideal research context because family businesses are widely prevalent in which family owners and managers strongly influence corporate decision making [66,67]. Because the focus of the paper is on the differing shareholder value creation effects of technological versus nontechnological acquisitions conducted by family businesses, only a sample consisting of family businesses is used. Following existing literature [66,68–70], family business is defined as a firm in which the founder or the members of the founding family strongly influence corporate decision making. Although a broad definition may allow us to better reflect on the reality that founding families can exert influence in the firm in many non-mutually exclusive ways [71], I adopt a relatively conservative cutoff criterion of 5 percent for family ownership to define a family business with controlling family control [32,69,72]. Thus, a family business is a firm in which members of the founding family serve either as an officer, director, or blockholder with more than 5 percent ownership.

The empirical analysis employs a sample of all acquisitions announced by publicly traded family businesses in South Korea between 2000 and 2014. Acquisition announcements are obtained through the SDC Platinum Mergers & Acquisitions database that is provided by Thomson Financial. Financial data of each individual family business are obtained from the KISVALUE database and corporate governance-related data are obtained from the TS2000 database. The final sample consists of 614 acquisition deals announced by 71 family businesses between the years 2000 and 2014.

3.2. Variable Operationalization

3.2.1. Dependent Variable

Following existing studies that adopt the event study methodology in which the market response to acquisitions announcements is used as a measure of acquisition performance [73–77], the cumulative abnormal returns (CAR) of the acquiring firm is used as the dependent variable. CAR is calculated by summing the average residuals—the difference between actual returns and the estimated expected returns—and the equation is represented as follows:

$$CAR_i = \sum R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad (1)$$

where CAR_i represents the CARs for stock i , $R_{i,t}$ represents the actual return of stock i on day t , and $\alpha_i + \beta_i R_{m,t}$ represents the expected return of stock i during the event window. An event window of 5 days is adopted and an estimation window of (−250, −50) days is used to calculate the expected returns. In the above equation, α_i and β_i are obtained by regressing the daily stock returns on the market index on the same day over the estimation window.

3.2.2. Explanatory Variables

Following previous studies [40,58,60], a technological acquisition is broadly defined as the acquisition of a technology-based company in order to gain access to the new technologies and capabilities of the target firm. The main independent variable, *technological M&A*, is a dichotomous variable that takes a value of 1 if the target firm operates in a high technology industry and 0 otherwise.

In other words, the dichotomous variable has a value of 1 if the acquisition undertaken by the family business is a technological acquisition and 0 if it is a nontechnological acquisition.

Following previous research, the moderating variable *technological capability* is measured by the level of R&D intensity of the acquiring firm where R&D intensity is calculated by dividing R&D expenditures by total sales. As R&D intensity refers to a commitment of firm resources to deploy its technology [78,79], it indicates the relative importance of R&D relative to other functions (e.g., advertising) [80].

Competitors' M&A, another moderating variable of the study, is the total volume of acquisitions undertaken by the focal firm's competitors in the same industry. A two-digit industry code is adopted to define industry peers and the Korea Standard Industry Classification (KSIC) code is used.

3.2.3. Control Variables

Control variables are included in the empirical analysis to control for various factors that can influence results. Variables related to governance characteristics of the acquiring family businesses are controlled for. *Foreign ownership* is the percentage of common stocks that are held by foreign investors. The value is logarithmically transformed. *Affiliated ownership* is the percentage of common stocks that are held by affiliated firms of the family business. The value is logarithmically transformed. *Family ownership* is the percentage of common stocks that are held by all family members of the controlling family. The value is logarithmically transformed. *Family CEO* is a dummy variable that takes a value of 1 if the current CEO is a family member and 0 otherwise. When a family member serves as a CEO, he or she may have more authority to either pursue or discourage corporate-level strategy such as M&As that entails high risk [81]. *Board independence ratio* represents the percentage of independent directors compared to the total number of directors. Family firms with higher levels of board independence are more likely to be monitored by outside board members, which can affect the shareholder value creation effects of acquisition announcements. The level of family presence in the board of directors can also influence shareholder returns of the acquiring family firm. *Family director ratio* is the percentage of family members who serve as board members among the board of directors.

Other firm characteristics of the acquiring family businesses that can affect stock market reactions to acquisitions are included. As firms with more acquisition experience will be better able to navigate through the difficulties during the post-acquisition integration of a technological target [82], acquiring family businesses' acquisition experience is controlled for. *Acquisition experience* is the number of acquisitions undertaken by the acquiring firm in the previous three years. *Tobin's Q*, which is measured by dividing the sum of acquirer market value and total debt by total assets, is controlled for because such firm-level financial characteristic can affect the shareholder returns of the acquiring family business.

Deal size represents the value of transaction included as a feature of deal-level characteristic. Industry fixed effects are controlled for. Lastly, year fixed effects are controlled for in order to take into account the unobserved heterogeneity that can exist over years. All continuous variables are used in logarithmic form.

3.3. Estimation Method and Model Specifications

An event study methodology is adopted to examine the shareholder value creation effects of technological and nontechnological M&As undertaken by family businesses. Widely used in the finance and strategic management literature [77,83–86], the event study methodology examines the market reaction in response to an event that releases new information [87,88]. The change in stock price during a short period surrounding the event is the difference between the return for a security and its predicted normal return. In this paper, the announcement of an acquisition by family businesses is the event of interest.

A regression-based approach is adopted to rule out alternative explanations and to determine whether the technological nature of acquisitions, technological capability, and competitors' acquisition activities play a role in the shareholder value of the acquiring family businesses. Accordingly,

the calculated CARs are regressed on the explanatory variables and multiple control variables. Specifically, the following regression is estimated:

$$\begin{aligned} \text{CAR}_i = & \alpha_0 + \alpha_1 \times (\text{technological M\&A}) \\ & + \alpha_2 \times (\text{technological capability}) + \alpha_3 \times (\text{competitors' M\&A}) \\ & + \gamma' X_i + \varepsilon_i \end{aligned} \quad (2)$$

where CAR_i refers to the cumulative abnormal returns (CARs) of firm i on an event day, X_i is a vector of control variables and ε_i is the error term.

4. Results

4.1. Descriptive Statistics

Table 1 reports the descriptive statistics and the correlations between the variables used in this study. All of the variance inflation factors (VIF) of the explanatory variables are well below 10. A VIF below 10 is a widely accepted standard for concluding that multicollinearity is not an issue [89]. Four variables had VIF that was higher than 2 (i.e., family ownership VIF = 2.66, foreign ownership VIF = 2.34, affiliated ownership VIF = 2.30, and board independence ratio VIF = 2.06). VIF for the remaining variables are all below 2. Thus, reported correlations do not pose any potential problems of multicollinearity.

Table 1. Descriptive statistics and correlations.

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Cumulative abnormal returns	0.00	0.05	1.00												
2. Technological M&A	0.05	0.22	−0.01	1.00											
3. Technological capability	0.62	1.31	−0.20 *	0.04	1.00										
4. Competitors' M&A	579.27	944.12	−0.04	−0.03	0.10 *	1.00									
5. Foreign ownership	2.35	1.13	−0.14 *	−0.05	0.08	0.05	1.00								
6. Affiliated ownership	1.52	1.47	0.05	−0.07	0.01	−0.21 *	−0.24 *	1.00							
7. Family ownership	3.16	0.61	−0.11 *	0.01	−0.22 *	0.16 *	−0.06	−0.50 *	1.00						
8. Family CEO	0.13	0.34	0.06	−0.03	0.02	0.06	0.08	−0.25 *	0.24 *	1.00					
9. Board independence ratio	40.27	18.41	−0.17 *	−0.05	0.21 *	0.05	0.39 *	−0.19 *	−0.10 *	0.07	1.00				
10. Acquisition experience	0.97	1.26	−0.08 *	0.08	0.10 *	0.02	0.08 *	−0.15 *	0.07	−0.06	0.17 *	1.00			
11. Family director ratio	0.17	0.11	0.15 *	−0.01	−0.11 *	0.12 *	0.02	−0.19 *	0.33 *	0.25 *	−0.08 *	−0.05	1.00		
12. Deal size	63.73	99.36	−0.14 *	−0.04	0.18 *	0.01	0.16 *	0.01	−0.11 *	−0.05	0.20 *	−0.13 *	−0.22 *	1.00	
13. Tobin's Q	597.34	450.32	0.09 *	0.00	−0.03	0.18 *	0.26 *	−0.07	0.10 *	0.04	0.10 *	0.08	0.08 *	0.01	1.00

* $p < 0.05$.

Moreover, none of the reported correlations are abnormally high. While the correlation between CARs and the technological M&A dummy is not statistically meaningful, the negative relationship is consistent with the predictions in the research model. The average CARs of all acquisitions announced by family businesses have a positive value of 0.25%.

4.2. Main Results

Table 2 presents the ordinary least squares (OLS) regression results, with the dependent variable being the stock market responses to acquisitions made by family businesses. Model 1 is the baseline model in which only the control variables are included. Among the control variables, few significant relationships are worth discussing. Family ownership has a negative impact on the shareholder returns that acquisitions generate. This suggests that the stock market in the current research setting is generally not confident that family owners are better able to create value through acquisitions, regardless of whether the target firm is technological or not. This lies in contrast with the findings by Feito-Ruiz and Menéndez-Requejo [25], who find that family ownership has a positive impact on

shareholder value of European family firms. By contrast, the presence of a family CEO and family directors seems to mitigate the stock market's concerns given that the family CEO dummy and the family director ratio is positively associated with CARs. This suggests that when family members serve as a CEO or as a board director, they may be expected to make acquisition choices that are aligned with the firms' long-term interests.

Table 2. Regression analysis of cumulative abnormal returns.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Technological M&A		−0.0148 *	−0.0141	−0.0327 ***	−0.0287 **
		(0.035)	(0.113)	(0.000)	(0.004)
Technological M&A × Technological capability			−0.0008		−0.0075
			(0.898)		(0.272)
Technological M&A × Competitors' M&A				0.0000 **	0.0000 **
				(0.004)	(0.002)
Technological capability	−0.0097 ***	−0.0098 ***	−0.0098 ***	−0.0098 ***	−0.0096 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Competitors' M&A	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000
	(0.483)	(0.405)	(0.405)	(0.263)	(0.244)
Foreign ownership	−0.0043 *	−0.0041 *	−0.0041 *	−0.0040 *	−0.0041 *
	(0.032)	(0.039)	(0.039)	(0.043)	(0.040)
Affiliated ownership	−0.0043 **	−0.0045 **	−0.0045 **	−0.0045 **	−0.0045 **
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Family ownership	−0.0324 ***	−0.0328 ***	−0.0328 ***	−0.0334 ***	−0.0333 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family CEO	0.0108 *	0.0106 *	0.0106 *	0.0106 *	0.0107 *
	(0.026)	(0.029)	(0.029)	(0.027)	(0.026)
Board independence ratio	−0.0001	−0.0001	−0.0001	−0.0001	−0.0001
	(0.363)	(0.343)	(0.345)	(0.315)	(0.325)
Acquisition experience	−0.0032 *	−0.0029 *	−0.0029 *	−0.0031 *	−0.0032 *
	(0.019)	(0.030)	(0.030)	(0.021)	(0.017)
Family director ratio	0.0982 **	0.0985 **	0.0984 **	0.0947 **	0.0939 **
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Deal size	−0.0001 ***	−0.0001 ***	−0.0001 ***	−0.0001 ***	−0.0001 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	0.0000 **	0.0000 **	0.0000 **	0.0000 **	0.0000 **
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Industry fixed effects	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
Constant	0.1298 ***	0.1338 ***	0.1337 ***	0.1399 ***	0.1396 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R-squared	0.524	0.528	0.528	0.535	0.536
Number of observations	614	614	614	614	614

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

Model 2 tests whether family businesses create lower stock market responses when they engage in technological acquisitions compared to when nontechnological acquisitions are undertaken. Results show that technological acquisitions that are undertaken by family businesses result in lower shareholder value compared to the shareholder value created by nontechnological acquisitions by family businesses. This suggests that the market does not perceive technological acquisitions to be more value-creating than nontechnological acquisitions when the family business is an acquiring firm. Thus, Hypothesis 1 is supported ($\beta = -0.0148$, $p < 0.05$). Although technological acquisitions may not necessarily generate negative CARs, this suggests that the stock market is cautious about the value-creating potential of technological acquisitions that family businesses make.

Hypothesis 2 predicts that the technological capability of the acquiring family business will positively affect the impact technological acquisitions have on shareholder value. However, Model 3 shows that the moderating effect of technological capability of the acquiring firm is insignificant. Thus, Hypothesis 2 is not supported. This suggests that the technological capabilities that the acquiring family businesses has do not reassure investors about the enhanced possibility of technological synergies in the post-acquisition stage.

Hypothesis 3 predicts that the level of competitors' acquisition activities enhances shareholder value when family businesses announces a technological acquisition. Model 4 shows that there is a positive moderating effect of the level of competitors' acquisition activities in the relationship between technological acquisitions by family businesses and the level of shareholder value that is created due to the acquisition announcement. Therefore, Hypothesis 3 is supported ($\beta = 0.0000$, $p < 0.01$). This suggests that family businesses make technological acquisitions when competitive threat is higher, and the stock market perceives that the possibility of technology synergies will increase.

Model 5 is the full model in which all the explanatory variables are included. The results remain largely the same except for Hypothesis 1, with significance level increases for Hypothesis 1.

5. Discussion

5.1. Theoretical Implications

Several meaningful contributions to existing literature are provided. First, this paper contributes to the literature on technological acquisitions by deepening our understanding of the shareholder value-creation effects of technological acquisitions undertaken by family businesses. While recognizing that technological acquisitions are a special type of M&As that deserves attention, only a few studies have examined the stock market reactions to technological acquisitions by family firms [19]. André, Ben-Amar and Saadi [19], however, looked only at technological acquisitions without a comparison of the shareholder value effects of nontechnological acquisitions undertaken by the same family firms. That is, the fact that not every acquirer can extract valuable technological synergies was overlooked. Given that achieving success from technological acquisitions requires significantly more effort in the post-acquisition integration stage, an acquirer will be able to enjoy the benefits of acquiring valuable external knowledge-based resources only if these ex post efforts turn out to be effective. The main finding of this paper suggests that outsiders' assessments about the potential for value creation by technological acquisitions takes into consideration the governance structure of the acquiring firm. For family businesses, their governance characteristic seems to invite skepticism from stakeholders regarding their ability to realize technological synergies, which is a serious hindrance to its value-creating potential. In other words, shareholders may not be confident that family businesses as acquirers of technological target firms are able to realize technological synergies.

Second, this study contributes to the literature on family firms' acquisitions by highlighting the importance of considering the external contingency in understanding the shareholder value creation effects of acquisitions undertaken by family businesses. Empirical findings suggest that the possibility of technological synergies is perceived to be higher when the acquirer faces certain competitive threats within their environment. One explanation could be that when competitors are actively engaging in external knowledge acquisition through M&A, family businesses' typical reluctance towards efforts that are necessary for realizing technological synergies is perceived to decrease. A technological acquisition, thus, undertaken in times of high competitive threats may be perceived to help overcome the difficulties that family businesses face as acquirers in the post-acquisition stage. While the importance of the external contingency in understanding the stock market reactions to M&As is not new [31], this research is the first to take it into consideration in the context of family businesses and with a distinction of the different types of acquisitions that are undertaken.

Third, this paper contributes to the literature on technological capabilities and the knowledge-based view of the firm by suggesting that technological capabilities by itself may not be sufficient to enhance shareholders' expectations for technological synergies. According to the knowledge-based view of the firm which argues that knowledge is the key productive resource of firms [11], technological capability is critical because of its tacit nature that hinders competitors' imitation attempts [80]. However, the findings of this study suggest that concerns for the realization of technological synergies by family firms—contrary to what is expected—are not necessarily mitigated even if the acquiring firm possesses superior technological capabilities. Such a finding is surprising because past studies

have had the tendency to emphasize technological capabilities as a source of acquiring firms' ability to make use of acquired knowledge-based resources in technological acquisitions [27,28,56]. This study suggests that technological capabilities cannot be expected to be valuable without consideration as to how they can actually be utilized to realize anticipated benefits.

5.2. Managerial Implications

This study provides several managerial implications that managers and decision makers can take into account. First, findings suggest that managers in family businesses should take precautions in undertaking technological acquisitions as the strategic decision does not necessarily create shareholder value at the time of announcement. Managers may find it worthwhile to undertake technological acquisitions when they are confident that firm-specific conditions facilitate the effective realization of technological synergies. When undertaking technological acquisitions, managers of family businesses should pay special attention to allocating resources effectively in the post-acquisition stage to successfully realize technological synergies. Second, the finding about the positive moderating effect of the competitive threats that the acquiring family business faces suggests that shareholders care about the competitive context in which the firm is placed. Hence, managers could benefit from making the decision to acquire a technological target firm with competitive threats in mind. Third, managers of the acquiring family businesses should be cautious when estimating the potential of technological synergies even if the firm possesses technological capabilities as technological capabilities by themselves do not lessen shareholders' skepticism about family businesses' technological acquisitions.

5.3. Limitations and Avenues for Future Research

This study is not without limitations that can be addressed by future studies. First, results may not be suitable for generalization because the sample of technological acquisitions undertaken by family businesses is limited to a single national setting (e.g., South Korea). Future research should test whether our results hold in other national settings where family businesses make technological acquisitions. Such additional testing would be valuable if the underlying perceptions about family businesses are different across nations. Another agenda for future research would be to consider cross-border technological acquisitions, which are likely to pose intensified challenges [5]. For example, cross-border cultural differences can either hinder or be an advantage in the realization of technological synergies [90].

Second, other measures for acquisition outcomes other than shareholder value can be utilized to examine whether family businesses can create more value through technological acquisitions compared to nontechnological acquisitions. The event study is inherently limited in the sense that its purpose is to capture short-term sentiments of the stock market [31]. Given that acquisition performance is essentially a multifaceted construct, not only are there different ways to proxy performance but no one factor can capture all different dimensions of performance [17]. As such, future studies should adopt other methodologies and measurements of acquisition performance to compare the value-creating implications of different types of acquisitions (e.g., technological versus nontechnological) that family businesses engage in as an acquirer. For instance, even if family businesses cannot create more short-term shareholder value by engaging in technological acquisitions compared to nontechnological ones, they can instead create better long-term value. The stock market may not be able to accurately predict the long-term consequences of technological acquisitions as it can encompass serendipitous resource configuration that is difficult to predict [5].

Third, the technological capability of the acquiring family business is measured as the level of R&D investments made by the firm. Given that this study—contrary to what is predicted—does not find strong empirical evidence of the moderating effect of technological capability, this may be due to the fact that technological capability is measured using the level of R&D intensity of the acquiring family business. Although such variable operationalization has been widely adopted in the existing literature, it relies on the assumption that R&D spending will lead to successful innovations [80]. Since R&D

spending may not guarantee the successful creation of technological acquisitions, future studies should make a more extensive effort to accurately measure technological capabilities. For instance, researchers can attempt to create an index with various dimensions measuring technological capability.

Fourth, other definitions of competitors can also be adopted to examine the broader competitive landscape affecting the shareholder value creation effects of technological acquisitions by family firms. Although competitors are defined as industry rivals in this paper, a firm can perceive other firms as rivals even if they do not operate in the same industry. For instance, a family firm can treat other family firms with similar size as competitors even if they are not direct industry peers. Future research should examine how different types of competitors can affect market perceptions about technological acquisitions by family businesses.

6. Conclusions

This paper aims to understand the differences in the shareholder wealth implications of technological and nontechnological acquisitions undertaken by family businesses. Empirical analysis finds that family businesses create lower shareholder value when they engage in technological acquisitions compared to when they undertake nontechnological acquisitions. The moderating effect of the acquiring family businesses' technological capabilities is not statistically significant. Contrary to what is expected, acquiring family businesses' technological capabilities does not seem to reassure shareholders about the prospects of technological synergies. At the same time, empirical analysis finds evidence that competitors' acquisition activity has a positive moderating effect. That is, shareholder value creation effects of technological acquisition announcements increase when the level of competitors' acquisition activities is higher. The competitive landscape in which the acquiring family business exists matters in affecting shareholders' perceptions about the prospects of their technological acquisitions.

Funding: This research received no external funding.

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

References

1. Sarkar, M.; Echambadi, R.; Agarwal, R.; Sen, B. The effect of the innovative environment on exit of entrepreneurial firms. *Strateg. Manag. J.* **2006**, *27*, 519–539. [[CrossRef](#)]
2. Cassiman, B.; Veugelers, R. In search of complementarity in innovation strategy: Internal R&D and external knowledge acquisition. *Manag. Sci.* **2006**, *52*, 68–82.
3. Chesbrough, H. The logic of open innovation: Managing intellectual property. *Calif. Manag. Rev.* **2003**, *45*, 33–58. [[CrossRef](#)]
4. Vanhaverbeke, W.; Duysters, G.; Noorderhaven, N. External technology sourcing through alliances or acquisitions: An analysis of the application-specific integrated circuits industry. *Organ. Sci.* **2002**, *13*, 714–733. [[CrossRef](#)]
5. Graebner, M.E.; Eisenhardt, K.M.; Roundy, P.T. Success and failure in technology acquisitions: Lessons for buyers and sellers. *Acad. Manag. Perspect.* **2010**, *24*, 73–92.
6. Desyllas, P.; Hughes, A. Do high technology acquirers become more innovative? *Res. Policy* **2010**, *39*, 1105–1121. [[CrossRef](#)]
7. Halebian, J.; Devers, C.E.; McNamara, G.; Carpenter, M.A.; Davison, R.B. Taking stock of what we know about mergers and acquisitions: A review and research agenda. *J. Manag.* **2009**, *35*, 469–502. [[CrossRef](#)]
8. Higgins, M.J.; Rodriguez, D. The outsourcing of R&D through acquisitions in the pharmaceutical industry. *J. Financ. Econ.* **2006**, *80*, 351–383.
9. Agarwal, R.; Helfat, C.E. Strategic renewal of organizations. *Organ. Sci.* **2009**, *20*, 281–293. [[CrossRef](#)]
10. Cyert, R.M.; March, J.G. *A Behavioral Theory of the Firm*; Prentice Hall: Englewood Cliffs, NJ, USA, 1963.
11. Kogut, B.; Zander, U. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organ. Sci.* **1992**, *3*, 383–397. [[CrossRef](#)]
12. Jo, G.S.; Park, G.; Kang, J. Unravelling the link between technological M&A and innovation performance using the concept of relative absorptive capacity. *Asian J. Technol. Innov.* **2016**, *24*, 55–76.

13. Ahuja, G.; Katila, R. Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strateg. Manag. J.* **2001**, *22*, 197–220. [\[CrossRef\]](#)
14. King, D.R.; Slotegraaf, R.J.; Kesner, I. Performance implications of firm resource interactions in the acquisition of R&D intensive firms. *Organ. Sci.* **2008**, *19*, 327–340.
15. Coff, R.W. How buyers cope with uncertainty when acquiring firms in knowledge-intensive industries: Caveat emptor. *Organ. Sci.* **1999**, *10*, 144–161. [\[CrossRef\]](#)
16. Kohers, N.; Kohers, T. The value creation potential of high-tech mergers. *Financ. Anal. J.* **2000**, *56*, 40–51. [\[CrossRef\]](#)
17. Zollo, M.; Meier, D. What is M&A performance? *Acad. Manag. Perspect.* **2008**, *22*, 55–77.
18. Kotlar, J.; De Massis, A.; Frattini, F.; Bianchi, M.; Fang, H. Technology acquisition in family and nonfamily firms: A longitudinal analysis of Spanish manufacturing firms. *J. Prod. Innov. Manag.* **2013**, *30*, 1073–1088. [\[CrossRef\]](#)
19. André, P.; Ben-Amar, W.; Saadi, S. Family firms and high technology mergers & acquisitions. *J. Manag. Gov.* **2014**, *18*, 129–158.
20. Defrancq, C.; Huyghebaert, N.; Luypaert, M. Influence of family ownership on the industry-diversifying nature of a firm's M&A strategy: Empirical evidence from Continental Europe. *J. Fam. Bus. Strategy* **2016**, *7*, 210–226.
21. Requejo, I.; Reyes-Reina, F.; Sanchez-Bueno, M.J.; Suárez-González, I. European family firms and acquisition propensity: A comprehensive analysis of the legal system's role. *J. Fam. Bus. Strategy* **2018**, *9*, 44–58. [\[CrossRef\]](#)
22. Wang, D.; Ma, G.; Song, X.; Liu, Y. Political connection and business transformation in family firms: Evidence from China. *J. Fam. Bus. Strategy* **2016**, *7*, 117–130. [\[CrossRef\]](#)
23. Hussinger, K.; Issah, A.-B. Firm acquisitions by family firms: A mixed gamble approach. *Fam. Bus. Rev.* **2019**, *32*, 354–377. [\[CrossRef\]](#)
24. Worek, M. Mergers and acquisitions in family businesses: Current literature and future insights. *J. Fam. Bus. Manag.* **2017**, *7*, 177–206. [\[CrossRef\]](#)
25. Feito-Ruiz, I.; Menéndez-Requejo, S. Family firm mergers and acquisitions in different legal environments. *Fam. Bus. Rev.* **2010**, *23*, 60–75. [\[CrossRef\]](#)
26. Miller, D.; Breton-Miller, I.L.; Lester, R.H. Family firm governance, strategic conformity, and performance: Institutional vs. strategic perspectives. *Organ. Sci.* **2013**, *24*, 189–209. [\[CrossRef\]](#)
27. López-Cabarcos, M.Á.; Srinivasan, S.; Göttling-Oliveira-Monteiro, S.; Vázquez-Rodríguez, P. Tacit knowledge and firm performance relationship: The role of product innovation and the firm level capabilities. *J. Bus. Econ. Manag.* **2019**, *20*, 330–350. [\[CrossRef\]](#)
28. Sears, J.; Hoetker, G. Technological overlap, technological capabilities, and resource recombination in technological acquisitions. *Strateg. Manag. J.* **2014**, *35*, 48–67. [\[CrossRef\]](#)
29. Han, J.; Jo, G.S.; Kang, J. Is high-quality knowledge always beneficial? Knowledge overlap and innovation performance in technological mergers and acquisitions. *J. Manag. Organ.* **2018**, *24*, 258–278. [\[CrossRef\]](#)
30. Brito, D. Preemptive mergers under spatial competition. *Int. J. Ind. Organ.* **2003**, *21*, 1601–1622. [\[CrossRef\]](#)
31. Gaur, A.S.; Malhotra, S.; Zhu, P. Acquisition announcements and stock market valuations of acquiring firms' rivals: A test of the growth probability hypothesis in China. *Strateg. Manag. J.* **2013**, *34*, 215–232. [\[CrossRef\]](#)
32. Chang, S.J.; Shim, J. When does transitioning from family to professional management improve firm performance? *Strateg. Manag. J.* **2015**, *36*, 1297–1316. [\[CrossRef\]](#)
33. Chatterji, D. Accessing external sources of technology. *Res.-Technol. Manag.* **1996**, *39*, 48–56. [\[CrossRef\]](#)
34. Anand, J.; Singh, H. Asset redeployment, acquisitions and corporate strategy in declining industries. *Strateg. Manag. J.* **1997**, *18*, 99–118. [\[CrossRef\]](#)
35. Chakrabarti, A.; Hauschildt, J.; Süverkrüp, C. Does it pay to acquire technological firms? *RD Manag.* **1994**, *24*, 047–056. [\[CrossRef\]](#)
36. De Man, A.-P.; Duysters, G. Collaboration and innovation: A review of the effects of mergers, acquisitions and alliances on innovation. *Technovation* **2005**, *25*, 1377–1387. [\[CrossRef\]](#)
37. Capron, L.; Dussauge, P.; Mitchell, W. Resource redeployment following horizontal acquisitions in Europe and North America, 1988–1992. *Strateg. Manag. J.* **1998**, *19*, 631–661. [\[CrossRef\]](#)
38. Graebner, M.E.; Heimeriks, K.H.; Huy, Q.N.; Vaara, E. The process of postmerger integration: A review and agenda for future research. *Acad. Manag. Ann.* **2017**, *11*, 1–32. [\[CrossRef\]](#)

39. Datta, D.K. Organizational fit and acquisition performance: Effects of post-acquisition integration. *Strateg. Manag. J.* **1991**, *12*, 281–297. [[CrossRef](#)]
40. Graebner, M.E. Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strateg. Manag. J.* **2004**, *25*, 751–777. [[CrossRef](#)]
41. Jemison, D.B.; Sitkin, S.B. Corporate acquisitions: A process perspective. *Acad. Manag. Rev.* **1986**, *11*, 145–163. [[CrossRef](#)]
42. Barkema, H.G.; Schijven, M. How do firms learn to make acquisitions? A review of past research and an agenda for the future. *J. Manag.* **2008**, *34*, 594–634. [[CrossRef](#)]
43. Hitt, M.A.; Hoskisson, R.E.; Ireland, R.D.; Harrison, J.S. Effects of acquisitions on R&D inputs and outputs. *Acad. Manag. J.* **1991**, *34*, 693–706.
44. Hitt, M.A.; Hoskisson, R.E.; Johnson, R.A.; Moesel, D.D. The market for corporate control and firm innovation. *Acad. Manag. J.* **1996**, *39*, 1084–1119.
45. Hoskisson, R.E.; Johnson, R.A.; Moesel, D.D. Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Acad. Manag. J.* **1994**, *37*, 1207–1251.
46. Harvey, M.; Evans, R.E. Family business and multiple levels of conflict. *Fam. Bus. Rev.* **1994**, *7*, 331–348. [[CrossRef](#)]
47. Kellermanns, F.W.; Eddleston, K.A. Feuding families: When conflict does a family firm good. *Entrep. Theory Pract.* **2004**, *28*, 209–228. [[CrossRef](#)]
48. Hambrick, D.C.; Cannella Jr, A.A. Relative standing: A framework for understanding departures of acquired executives. *Acad. Manag. J.* **1993**, *36*, 733–762.
49. Dyer, W.G. Integrating professional management into a family owned business. *Fam. Bus. Rev.* **1989**, *2*, 221–235. [[CrossRef](#)]
50. Ying, Q.; Hassan, H.; Ahmad, H. The role of a manager's intangible capabilities in resource acquisition and sustainable competitive performance. *Sustainability* **2019**, *11*, 527. [[CrossRef](#)]
51. Gómez-Mejía, L.R.; Haynes, K.T.; Núñez-Nickel, M.; Jacobson, K.J.; Moyano-Fuentes, J. Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Adm. Sci. Q.* **2007**, *52*, 106–137. [[CrossRef](#)]
52. Berrone, P.; Cruz, C.; Gomez-Mejia, L.R. Socioemotional wealth in family firms: Theoretical dimensions, assessment approaches, and agenda for future research. *Fam. Bus. Rev.* **2012**, *25*, 258–279. [[CrossRef](#)]
53. Trapczyński, P.; Zaks, O.; Polowczyk, J. The effect of trust on acquisition success: The case of Israeli start-up M&A. *Sustainability* **2018**, *10*, 2499.
54. Zhou, K.Z.; Wu, F. Technological capability, strategic flexibility, and product innovation. *Strateg. Manag. J.* **2010**, *31*, 547–561. [[CrossRef](#)]
55. Choi, S.; McNamara, G. Repeating a familiar pattern in a new way: The effect of exploitation and exploration on knowledge leverage behaviors in technology acquisitions. *Strateg. Manag. J.* **2018**, *39*, 356–378. [[CrossRef](#)]
56. Flor, M.; Oltra, M.J. The influence of firms' technological capabilities on export performance in supplier-dominated industries: The case of ceramic tiles firms. *RD Manag.* **2005**, *35*, 333–347. [[CrossRef](#)]
57. Ganzaroli, A.; De Noni, I.; Orsi, L.; Belussi, F. The combined effect of technological relatedness and knowledge utilization on explorative and exploitative invention performance post-M&A. *Eur. J. Innov. Manag.* **2016**, *19*, 167–188.
58. Puranam, P.; Srikanth, K. What they know vs. what they do: How acquirers leverage technology acquisitions. *Strateg. Manag. J.* **2007**, *28*, 805–825. [[CrossRef](#)]
59. Short, J.C.; Sharma, P.; Lumpkin, G.T.; Pearson, A.W. Oh, the places we'll go! Reviewing past, present, and future possibilities in family business Research. *Fam. Bus. Rev.* **2016**, *29*, 11–16. [[CrossRef](#)]
60. Ranft, A.L.; Lord, M.D. Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organ. Sci.* **2002**, *13*, 420–441. [[CrossRef](#)]
61. Barney, J.B. Returns to bidding firms in mergers and acquisitions: Reconsidering the relatedness hypothesis. *Strateg. Manag. J.* **1988**, *9*, 71–78. [[CrossRef](#)]
62. Banerjee, A.; Eckard, E.W. Are mega-mergers anticompetitive? Evidence from the first great merger wave. *Rand J. Econ.* **1998**, *29*, 803–827. [[CrossRef](#)]
63. Prager, R.A. The effects of horizontal mergers on competition: The case of the Northern Securities Company. *Rand J. Econ.* **1992**, *23*, 123–133. [[CrossRef](#)]

64. Kim, E.H.; Singal, V. Mergers and market power: Evidence from the airline industry. *Am. Econ. Rev.* **1993**, *83*, 549–569.
65. Souder, D.; Zaheer, A.; Sapienza, H.; Ranucci, R. How family influence, socioemotional wealth, and competitive conditions shape new technology adoption. *Strateg. Manag. J.* **2017**, *38*, 1774–1790. [[CrossRef](#)]
66. Choi, Y.R.; Zahra, S.A.; Yoshikawa, T.; Han, B.H. Family ownership and R&D investment: The role of growth opportunities and business group membership. *J. Bus. Res.* **2015**, *68*, 1053–1061.
67. Solomon, J.; Solomon, A.; Park, C.Y. A conceptual framework for corporate governance reform in South Korea. *Corp. Gov. Int. Rev.* **2002**, *10*, 29–46. [[CrossRef](#)]
68. Anderson, R.C.; Reeb, D.M. Founding-family ownership and firm performance: Evidence from the S&P 500. *J. Financ.* **2003**, *58*, 1301–1328.
69. Villalonga, B.; Amit, R. How do family ownership, control and management affect firm value? *J. Financ. Econ.* **2006**, *80*, 385–417. [[CrossRef](#)]
70. Villalonga, B.; Amit, R. How are U.S. family firms controlled? *Rev. Financ. Stud.* **2009**, *22*, 3047–3091. [[CrossRef](#)]
71. Feldman, E.R.; Amit, R.; Villalonga, B. Family firms and the stock market performance of acquisitions and divestitures. *Strateg. Manag. J.* **2019**, *40*, 757–780. [[CrossRef](#)]
72. Claessens, S.; Djankov, S.; Lang, L.H. The separation of ownership and control in East Asian corporations. *J. Financ. Econ.* **2000**, *58*, 81–112. [[CrossRef](#)]
73. Gubbi, S.R.; Aulakh, P.S.; Ray, S.; Sarkar, M.; Chittoor, R. Do international acquisitions by emerging-economy firms create shareholder value? The case of Indian firms. *J. Int. Bus. Stud.* **2010**, *41*, 397–418. [[CrossRef](#)]
74. Schoenberg, R. Measuring the performance of corporate acquisitions: An empirical comparison of alternative metrics. *Br. J. Manag.* **2006**, *17*, 361–370. [[CrossRef](#)]
75. Shimizu, K.; Hitt, M.A.; Vaidyanath, D.; Pisano, V. Theoretical foundations of cross-border mergers and acquisitions: A review of current research and recommendations for the future. *J. Int. Manag.* **2004**, *10*, 307–353. [[CrossRef](#)]
76. Halebian, J.; Kim, J.-Y.; Rajagopalan, N. The influence of acquisition experience and performance on acquisition behavior: Evidence from the U.S. commercial banking industry. *Acad. Manag. J.* **2006**, *49*, 357–370. [[CrossRef](#)]
77. Kale, P.; Dyer, J.H.; Singh, H. Alliance capability, stock market response, and long-term alliance success: The role of the alliance function. *Strateg. Manag. J.* **2002**, *23*, 747–767. [[CrossRef](#)]
78. Chandran, V.; Rasiiah, R. Firm size, technological capability, exports and economic performance: The case of electronics industry in Malaysia. *J. Bus. Econ. Manag.* **2013**, *14*, 741–757. [[CrossRef](#)]
79. Lin, B.-W.; Lee, Y.; Hung, S.-C. R&D intensity and commercialization orientation effects on financial performance. *J. Bus. Res.* **2006**, *59*, 679–685.
80. Coombs, J.E.; Bierly III, P.E. Measuring technological capability and performance. *RD Manag.* **2006**, *36*, 421–438. [[CrossRef](#)]
81. Zahra, S.A. Entrepreneurial risk taking in family firms. *Fam. Bus. Rev.* **2005**, *18*, 23–40. [[CrossRef](#)]
82. Jo, Y.; Kim, J. The impact of experience on private target acquisition in high-technology industries. *Sustainability* **2019**, *11*, 1603. [[CrossRef](#)]
83. Shen, W.; Cannella Jr, A.A. Will succession planning increase shareholder wealth? Evidence from investor reactions to relay CEO successions. *Strateg. Manag. J.* **2003**, *24*, 191–198. [[CrossRef](#)]
84. Shiu, Y.M.; Yang, S.L. Does engagement in corporate social responsibility provide strategic insurance-like effects? *Strateg. Manag. J.* **2017**, *38*, 455–470. [[CrossRef](#)]
85. Hawn, O.; Chatterji, A.K.; Mitchell, W. Do investors actually value sustainability? New evidence from investor reactions to the Dow Jones Sustainability Index (DJSI). *Strateg. Manag. J.* **2018**, *39*, 949–976. [[CrossRef](#)]
86. Flammer, C. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Acad. Manag. J.* **2013**, *56*, 758–781. [[CrossRef](#)]
87. McWilliams, A.; Siegel, D. Event studies in management research: Theoretical and empirical issues. *Acad. Manag. J.* **1997**, *40*, 626–657.
88. Fama, E.F.; Fisher, L.; Jensen, M.C.; Roll, R. The adjustment of stock prices to new information. *Int. Econ. Rev.* **1969**, *10*, 1–21. [[CrossRef](#)]

89. Kalnins, A. Multicollinearity: How common factors cause Type 1 errors in multivariate regression. *Strateg. Manag. J.* **2018**, *39*, 2362–2385. [[CrossRef](#)]
90. McCarthy, K.J.; Aalbers, H.L. Technological acquisitions: The impact of geography on post-acquisition innovative performance. *Res. Policy* **2016**, *45*, 1818–1832. [[CrossRef](#)]



© 2020 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).