

Examining the interplay between non-market and market strategies: A study on political ties and R&D investment

非市場策略與市場策略的交互作用：以政治關係和研發投資為例

Cheng-Yu Lee¹

Department of Technology Management, National Chiayi University

Hsueh-Liang Wu

Department of International Business, National Taiwan University

Menghang Dong

School of Economics and Management, Chongqing Jiaotong University

Abstract: Building corporate ties to the government has long been viewed as an important tenet of a firm's nonmarket strategy; however, the literature thus far has not yet concluded the performance implications of doing so. The mixed findings pave the way for the contextual approach to the performance effect of corporate engagement in political ties. This study thus investigates the nuances of the complex balancing act between two types of strategy choices and environmental dynamism with a sample of 7,982 firm-year observations of publicly listed firms in Taiwan during 2002-2016. The results show that building corporate political ties per se cannot guarantee firm performance, but its synergistic effect with R&D investment leads to better performance. Furthermore, this synergistic effect becomes stronger for firms subject to more dynamic environments. The findings of this study not only enrich strategy research but also caution against polarizing either market- or nonmarket-oriented strategy.

Keywords: Nonmarket strategy, corporate political ties, R&D investment,

¹ Corresponding author: Cheng-Yu Lee, Department of Technology Management, National Chiayi University. Email: chengyulee@mail.ncyu.edu.tw.

environmental dynamism.

摘要：與政府建立政治連結長期以來被視為是企業非市場策略選項之一。然而，相關文獻對於政治連結是如何影響績效尚未達成明確共識，這意味著政治連結的效果或許可以從情境觀點來探討。本研以 2002-2016 年期間的臺灣上市公司為研究樣本，分析了 7,982 筆公司年資料，結果顯示：(1)研發投資(市場策略)對績效有正向的效果、(2)政治連結會正向調節研發投資對績效的關係、(3)在環境動盪程度較大的情況下，政治連結對研發投資與績效的調節效果會達到最高化。這些研究發現不但豐富了我們對於政治連結的理解，也提示著我們不應過度簡化市場或非市場策略對績效的影響。

關鍵詞：非市場策略、政治連結、研發投資、環境動盪

1. Introduction

A thriving private sector inherent in the capitalism hardly solves all of society's market failure problems, but it generates a surplus of resources employable to address many of them either through market activities or through government intervention (Parnell, 2019). Profit-oriented firms actively invest market-related resources in pursuit of customer satisfaction, while some choose to persuade politicians to shield them from competition. Market strategies acknowledge both industry- and firm-level influences on performance and are concerned with customers, competitors, suppliers, and other entities that lead to competitive advantage through strategic orientations, such as cost leadership and differentiation (Porter, 1980). Including those business undertakings outside of the market realm, nonmarket strategy refers to such firm activities as broad social or political initiatives, lobbying, campaign contributions, etc. (Lawton *et al.* 2013) in order to fulfill the expectation of socio-political stakeholders. As such, corporate political activities are not just a means of collaborating with government agencies/regulators, but also a proactive approach to societal development (Van Raaij and Stoelhorst, 2008).

As an important corporate nonmarket strategy, a firm's investment in political ties is viewed as a key result of corporate political activities so that political ties may help influence government policy in ways favorable to the firm (Hillman and Hitt, 1999). Among several theories shedding light on why a firm's investment in political ties can improve firm performance, the resource dependence theory (RDT) proposes that either bridging or buffering strategies can be adopted to reduce the threats of external environments (Pfeffer and Salancik, 2003); that is, firms with higher levels of political ties are better able to obtain and secure governmental resources for their survival and growth. Investment in political ties is therefore considered a strategic choice for indirectly manipulating a more favorable environment by contributing firms (Hillman, 2005). Although the bulk of studies conducted in various contexts show that political ties are beneficial to firm performance (e.g., Hillman *et al.*, 1999; Lux *et al.*, 2011), some research indicates the downside of a firm's political ties. For example, Shi *et al.* (2018) found that political ties may destroy firm value. Sun *et al.* (2012), based on a case study, found that a firm's corporate political investment is associated with corruption and organizational failure. The dependence on political ties may also erode a firm's flexibility because of the need to meet politicians' expectations.

The mixed blessings of political ties pave the way for the contingency view that political ties may interact with other corporate characteristics (Hadani and Coombes, 2015; Ozer and Markóczy, 2010). Furthermore, as Hillman *et al.* (2004) suggest, the value of a firm's nonmarket strategy is more significant in the presence of some market strategies. For example, although Toyota was committed to developing hybrid electric vehicle technology starting from the 1990s, product sales remained imperceptible until the early 2000s. By lobbying the California government to raise the fuel consumption standards of new vehicles in 2004, Toyota's hybrid cars eventually prevailed in the market. The grasp of technological opportunities and political support was a result of Toyota's investment in both R&D and corporate political activities. While the case of Toyota's hybrid cars attests that the effect of political ties is complementary with its R&D strategy, a dynamic environment presents not only uncertainty, but also a window of

opportunity for Toyota to extract benefits from the interplay of its market-and non-market investments (Lakemond and Detterfelt, 2013).

Based on the aforementioned, we identify an important but less well-investigated issue; that is, while political ties are important resources for corporate operations, they may have both advantages and disadvantages, rather than being a cure-all for firm performance. Toyota's case also suggests that the effects of political ties may be characterized by contingencies. As some literature of corporate political activities so far found the mixed and elusive effects of political ties (e.g., Guo *et al.*, 2023), it merits more empirical attention to the contextual effects of political ties.

The most direct and significant impact on corporate performance is expected to arise from market strategies, which encompass R&D, marketing, inter-firm collaboration, and other initiatives geared toward acquiring customers and expanding market reach (Donbesuur *et al.*, 2023). Among these strategies, R&D investment stands out as a potentially effective approach for assessing the contingent impact of political ties. This is because R&D investment is inherently risky, given the challenge firms face in measuring its outcomes (Shaikh *et al.*, 2018). Moreover, the efficacy of R&D investment is often contingent upon the dynamism of a firm's operating environment (Wang and Chen, 2010). Further exploration of the interplay between political ties, R&D investment, and environmental dynamism would offer deeper insights into the synergies between political ties and market strategies from the perspective of RDT. Such research endeavors would not only enhance our comprehension of political ties but also underscore the need for future studies to delve into the contingent effects of political ties (e.g., Farrukh *et al.*, 2023; Wang *et al.*, 2021).

Therefore, this study aims not only to elucidate the impact of corporate political ties but also to understand whether their interaction with R&D investment and environmental dynamism can enhance firm performance. A sample of 7,982 firm-year observations from 572 Taiwanese publicly listed firms in the period of 2002-2016 were used to test the proposed hypotheses. With the rationale of RDT, the study delves into the theoretical aspect of the complementary nature, rather

than the substitutive nature, of market and nonmarket strategies. The synergistic performance effect of R&D investment and political ties found in this study shows that the positive performance effect of R&D investment is noticeable in the presence of political ties while the direct effect of political ties is not clear. Furthermore, the impact of environmental dynamism confirms the significance of the combined effect of market and nonmarket strategies. This finding advances the body of knowledge by the contingency perspective, demonstrating the importance of aligning strategies with environmental conditions.

2. Literature review & hypotheses

2.1 The effect of corporate political ties

Per the RDT, environmental constraints induce firms to either buffer from or bridge to the external resources in pursuit of survival or growth (Pfeffer and Salancik, 1978). Among the sources of key resources, the government is one of the providers. The government controls various resources that businesses need, including land, bank credit, tax breaks, subsidies, etc., thereby affecting the market development, financial performance, and ultimately the long-term competitive advantage of businesses (e.g., Gao and Hafsi, 2015; Sheng *et al.*, 2011). In other words, a firm, through political means, may create for itself a more favorable task environment (Pfeffer and Salancik, 2003). The institutional view also suggests that connecting with the government is a legitimacy-building strategy that helps firms to manipulate government policy in ways beneficial to firms themselves (Hillman and Hitt, 1999).

Firms with political ties are more likely to obtain a wide range of government assistances. Firstly, it is about the mechanism of value appropriation which refers to a firm's access to government subsidies, grants, contracts, favorable tax rates, and below-market financing. With these resources, firms can increase sales or reduce costs (Lux *et al.*, 2011). Also, given the impact of policy changes, it is not uncommon for firms to lobby the government to keep policy unchanged or changed. Political ties can also assist firms in channeling their preferences to the

government, which is the main avenue by which enterprises can attempt to influence the political process (Kaufman and Murillo Bonvehí, 2021), by modifying or establishing regulations that could benefit the firm. Several empirical studies conducted in various contexts show that a firm's investment in political ties can prove beneficial in improving firm performance (Hillman *et al.*, 1999).

Despite the positive effect of political ties on firm performance has been documented in the prior research, some recent investigations (e.g., Qin and Zhang, 2019; Su and Yang, 2018) indicate that a firm's political ties may have detrimental effects on firms, such as (1) firms may focus on non-business purposes and neglect their original market goals; (2) the relationships with the government are mostly short-term, leading firms to prioritize short-term gains; (3) prolonged engagement with the political ties may render firms to mistakenly believe in the government protectionism, thus becoming insensitive to market shifts. The empirical study conducted by Shi *et al.* (2018) shows that political ties may destroy firm value. Likewise, the observation of Kelon, a famous home appliance company in China, from 1984 to 2001 carried out by Sun *et al.* (2011) indicates that Kelon's political investment was associated with its organizational failure.

Based on the mixed effects of corporate political ties, a firm's nonmarket strategy must fit with other firm tasks so as to respond to and influence the political-economic-social environment (Aggarwal, 2001); that is, the influence of a firm's political ties is more conditional rather than in general. Okhmatovskiy's (2010) study confirms this point by the evidence that political connections have a positive effect on firm profitability mainly for the state-owned enterprises. Sun *et al.* (2012) pointed out that the benefits of political activities are not universally held but affected by a number of factors at the environmental, interorganizational, and intra-organizational levels. In this vein, corporate political ties per se may not directly affect firm performance.

2.2 The synergistic effect of political ties and R&D investment

Among the various corporate market strategies, R&D investment stands out as a pivotal corporate activity. It entails the allocation of resources by a firm

towards activities aimed with scientific research, explore new ideas, and develop innovative solutions with the potential; these efforts consequently would result in innovation, technological advancement, and the creation of new products or processes (Adomako *et al.*, 2021; Chao and Kavadias, 2013). R&D investment is thus widely recognized as a strategic decision taken by firms to drive growth, enhance competitiveness, and adapt to changing market demands, thereby serving as a key determinant of long-term sustainability and success.

Increased R&D investment is, therefore, expected to bring positive impact on firm performance, as it fosters innovation, facilitates the creation of new intellectual property (Piergiovanni and Santarelli, 2013), and enables the development of cutting-edge products or services (Caner and Tyler, 2013). This, in turn, can lead to enhanced market positioning, expanded customer base, and higher revenue generation, ultimately contributing to improved overall business performance. Relevant findings on the association between R&D investment and firm performance from empirical studies indicate a strong positive relationship (e.g., Guo *et al.*, 2020; Tebourbi *et al.*, 2020). These findings bolster the hypothesis that greater R&D investment is positively associated with enhanced firm performance, reinforcing the critical role of R&D activities in driving value creation and competitive advantage within organizations. Thus, we have the following hypothesis:

Hypothesis 1: There is a positive relationship between R&D investment and firm performance, *ceteris paribus*.

However, although R&D investment is regarded as an important investment for enterprises to achieve excellent performance, the association between R&D investment and firm performance is not universally endorsed. The cases of corporate failure due to the heavy investment in R&D are not invisible, such as in Birkinshaw and Gibson's (2004) observation of Ericsson's failure in the mobile telephone market resulting from its devotion to the untiring pursuit of leading communication technologies; in the peak period, Ericsson employed 30,000 people in some 100 technology centers. Likewise, the empirical study conducted by Vithessonthi and Racela (2016) indicates that R&D investment can be

negatively associated with firm performance. Several reasons can be given for explaining why R&D investment cannot effectively generate superior firm performance. First, the most obvious one is that companies may not necessarily have stable and sufficient funds to complete the R&D process; second, the market opportunity may have faded out when the R&D process is completed; third, the advanced technologies or products from developed countries make the R&D investment of local enterprises worthless; fourth, the R&D results may not meet the regulatory expectations. All of the above suggests that the efficacy of R&D efforts may depend not only on productivity but also on task environments.

To soften the problems with the uncertainty of R&D investment, firms may create an environment conducive to their R&D efforts by building ties to government. Per the RDT, the external uncertainty is resolvable through inter-organizational network relationships (Pfeffer and Nowak, 1976; Pfeffer and Salancik, 1978); this implies that a firm's relationship with government may complement its R&D investment. A firm's political capital may smoothen the processes related to a firm's R&D efforts (Martin *et al.*, 2018). For example, most American semiconductor companies, such as Intel and AMD, are R&D-active (their R&D expenditure intensity in 2018 reached 19% and 9.9%, respectively). However, they still seek government assistance to increase innovation success opportunities. In the most recent case, the Semiconductor Industry Association (SIA), a trade association and lobbying group co-founded by most American semiconductor companies, lobbied the U.S. government on a \$37 billion technology development program in 2020.

The literature of corporate political activity views a firm's government connections as a way to influence public policies and industrial regulations associated with its R&D investment (Hillman *et al.*, 1999; Hillman and Hitt, 1999), which involves considerable costs of entering and penetrating markets (Zhang and Cui, 2017). Besides, governments often assist firms in maintaining market stability. For instance, before opening the Japanese auto market in the 1970s, the Japanese government adopted a protection mechanism to prevent Western automakers from importing more advanced cars into Japan. By so doing, Japanese automakers could

continue to sell their vehicles and improve car-making technologies and finally even export their products to Western countries. These achievements are partly due to the close association between Japanese automakers and the government (Oshima, 1984). In Taiwan, a similar situation occurs where local automakers (e.g., Luxgen and China Motor), even without the global reach of their Japanese counterparts, remain competitive in the domestic market due largely to the tariff barriers established by the government, which have provided these local automakers with a certain degree of breathing room so as to encourage continuous investment in the vehicle technologies.

In addition, in the context where political ties may enable firms to interact with policymakers and shape government regulations to create a favorable environment for innovation, firms are more opted to invest in innovation or other firm-specific assets which are difficult to be redeployed for other purposes. This phenomenon has also been observed in studies such as Alt *et al.* (1999) and Ozer and Markóczy (2010). Namely, political ties and R&D investment may also mutually reinforce each other. With more R&D investment, firms may need favorable market conditions for payoff, leading to the necessity of political connection with policy makers in the government; on the other hand, the favorable environment created by political ties may make firms more willing to invest in R&D. Combining the above perspectives, we argue that political ties and R&D investment are synergistic to each other, while the both ultimately helping firms gain superior performance. Similar phenomena can also be found in research on other non-market strategies. For example, CSR has been recognized as a non-market strategy (e.g., Mellahi *et al.*, 2016), and Shen *et al.* (2016) found that the joint effect of CSR and R&D investments generates a positive impact on firm performance. In accordance with the above, we propose the following hypothesis:

Hypothesis 2: There is a positive synergistic effect of political ties and R&D investment on a firm's performance.

2.3 The situational impact of environmental dynamism of the political ties-R&D synergistic effect

As the contingency theorists contend, there is no uniformly best way to formulate strategies in the current business conditions (Sui and Baum, 2014), suggesting that the relationship proposed in Hypothesis 2 may vary in different external conditions, which are relevant to the efficacy of corporate strategies (Morgan *et al.*, 2019). This study further adopts the contingency perspective to explore the environmental conditions under which the performance effect of simultaneously pursuing R&D and corporate political strategy could be enhanced or weakened.

An elaboration of the concepts of strategy and environment can be traced back to Chandler's (1962) "environment-strategy-structure" paradigm. Although the external environment can be categorized into its objective and perceived states (Mintzberg, 1983), Dess and Beard's (1984) multi-dimensional description of the external environment (i.e., complexity, dynamism, and munificence) is thus far the most commonly adopted to analyze a firm's task environment. Specifically, complexity refers to the intricacy of the external circumstances confronting an organization, while munificence implies the richness of opportunities or resources available to an organization (Reed *et al.*, 1996). Despite these two dimensions being considered as affecting a firm's strategies, the third dimension, environmental dynamism, which represents the unpredictable stability in the environment, in particular plays a significant moderating role in strategy research (Srinivasan *et al.*, 2020). In comparison, environmental munificence is more forgiving of firm mistakes and is generally beneficial to entrepreneurial behaviors (Chowdhury and Endres, 2021), while environmental complexity was found to be more related to the outcomes of competitive actions among peers (Gligor *et al.*, 2015). In this vein, this study aims to examine if the synergistic effect of corporate political and R&D investment is subject to environmental dynamism.

Environmental dynamism might appear threatening; however, it offers firms new technological opportunities, industry growth, and demand for new products (Fainshmidt *et al.*, 2019). As previous studies suggest, a dynamic setting is beneficial to firms with a differentiation orientation, which usually requires costly experimentations and the development of unique resources (Nandakumar *et al.*,

2010); this means that the benefits of investing in R&D activities would be higher in a highly dynamic environment. Some studies have confirmed the moderating effect of environmental dynamism on a firm's innovative activities and the consequent outcomes. For example, in Lin and Chang's (2015) study, the performance effect of a firm's expansion in the technological portfolio was found to be enhanced by environmental dynamism. Likewise, from the perspective of being acquired, which reflects the corporate value, Heeley *et al.* (2006) indicate environmental dynamism strengthens the opportunities for R&D-intensive firms to be acquired.

Although it seems to be beneficial to invest in R&D in a dynamic environment, a few studies found non-significant results, such as Baron and Tang's (2011) research, which shows that environmental dynamism does not moderate the relationship between entrepreneurs' creativity and the number of innovations. Studies such as Hmieleski *et al.* (2013), also found that the innovative intentions or characteristics of firms cannot guarantee a superior performance in a dynamic environment; this implies that the nonstationary effect of environmental dynamism may prevent it from exerting a consistent influence on the relationship between innovative initiatives and outcomes.

As the RDT points out, either bridging or buffering strategies can be adopted to reduce the threats of external environments. Investment in political ties is then a way for firms to influence government policymaking and access to public resources (Zheng *et al.*, 2015). That is, a firm's political ties may help to reap the benefits and avoid the detriments of external uncertainties (Zhang *et al.*, 2020). We thus hypothesize the following:

Hypothesis 3: The positive synergistic effect of political ties and R&D investment on a firm's performance becomes more substantial when a firm operates in a dynamic environment.

3. Sample and measures

3.1 Data

The empirical study was based on a sample of publicly Taiwanese firms in various industrial sectors. The first reason we chose to test the hypotheses in the Taiwanese context is because Taiwanese companies have had to make up for the loss of low-cost advantages by pursuing more actively innovation than before in response to the rise of other developing economies in recent decades. Secondly, the Taiwanese public sector provides substantial administrative assistance, financial support, and necessary legal frameworks for private companies to improve their innovation performance and competitive advantage. Under such circumstances, firms in Taiwan also need to consider the significance of establishing political ties. Finally, given the industrial landscape diversity in Taiwan, encompassing some thirty sectors categorized by the Taiwan Economic Journal (TEJ) data bank, we built a sample of firms in industries from traditional industries of stable nature (e.g., steel, cement, textiles, etc.) to technology industries of dynamic nature (e.g., semiconductor, information and communications, biotechnology, etc.). The wide range of industries provides the necessary variability to examine the potential impact of environmental dynamism to the main relationship of our interest. Also, per the past research practices, financial firms were excluded from our sample due to the nature of being highly regulated (Chen *et al.*, 2018; Egelhoff *et al.*, 2013). In sum, Taiwanese industrial firms are deemed suitable to test the hypotheses of this study.

The data required for this study were collected from two sources. The data related to firm characteristics and performance were obtained from the TEJ, and the data regarding a firm's political connections were manually collected from the annual reports of the sampled companies. The sample period is from 2002 to 2016 because the Taiwan Stock Exchange Corporation (TSEC) started to require publicly listed firms to disclose directors' educational and industrial backgrounds from the year 2002. After removing the observations with missing data, the final sample size was 7,982 firm-year observations from 572 industrial firms.

3.2 Dependent variable

Firm performance was measured by the return on assets (ROA), calculated

by the ratio of a focal firm's net income to total assets. Specifically, ROA is deemed the most suitable proxy for assessing the profits obtained from corporate decisions that involve large amounts of capital and irreversible investments. Several studies related to innovation investment or corporate political actions measure firm performance by the measure of ROA (Hadani *et al.*, 2015; Przychodzen and Przychodzen, 2015; Schweizer *et al.*, 2023). In addition, the investment in innovation or political activities may yield delayed outcomes to different extent across industries, so this study uses the average industry-adjusted ROA in t+1 and t+2 to allow a reasonable time for a focal firm to benefit from its investment (Gerken *et al.*, 2015) and avoid the reverse performance causality effect (Leszczensky and Wolbring, 2022). The industry classification was based on TEJ's industry classification codes.

3.3 Independent variables

Political ties can be carried out via several ways, such as political donations, lobbying, bribery, and others (Hillman and Hitt, 1999). However, several reasons supplied in the literature explain why appointing directors with a government background is a suitable approach for measuring a firm's political connections. First, directors with political connections have been proven effective in bridging firms and politicians/governments (Ye and Li, 2017) and acquiring more benefits and preferential treatment from governments (Wang, 2015). In other words, by hiring directors with political backgrounds, firms can establish political ties and assist in obtaining needed external resources. Second, in the studies of political ties in the Asian context, this indicator is commonly adopted to capture a firm's political ties (e.g., Sun *et al.*, 2015; Zheng *et al.*, 2015). Third, other indicators, such as political donations, are obscure to be observed. For example, the Taiwan government promulgated the Sunshine Acts in 2018, through which the donation information for the latest presidential and legislator elections are publicly disclosed; the limited and partial data make it hard to yield generalizable results. Fourth, this study, like many RDT-based studies concerning the efficacy of political ties (e.g., Wang *et al.*, 2021; Yarbrough *et al.*, 2017; You and Du, 2012),

uses the political background of directors as a proxy that also helps us to dialogue with the relevant literature. In this vein, this study, with the same approach to political ties, can connect and dialogue with relevant literature.

R&D investment was measured by the total R&D expenditures divided by total sales. This measure is commonly used in existing studies (e.g., Honoré *et al.*, 2015; Sciascia *et al.*, 2015).

Environmental dynamism was measured by following the previous studies, such as Lee *et al.* (2013) and Simerly and Li (2000), which use the information of industry-level sales to assess the volatility of an industry. Specifically, we perform two procedures to estimate the degree of environmental dynamism across different industries identified by the TEJ classifications. Firstly, the study regresses industry-level sales at year t against time over five years (i.e., year $t-4$ to t); and secondly dividing the standard error of the coefficient of the time dummy by the average value of industry-level sales. A higher value implies that the environmental dynamism of the industry is higher.

3.4 Control variables

Our study includes several firm-level control variables that have been mentioned as related to a firm's political ties, R&D investment, and performance (e.g., Hillman *et al.*, 2004; Lux *et al.*, 2011; Sun *et al.*, 2012). Based on our observation on the corporate political activity literature, several antecedents may affect a firm's propensity to engage in political activities and R&D investment, including firm age, firm size, firm slack, foreign ownership, state ownership, board ownership, and board size. Furthermore, to avoid reverse causality, prior performance is included in the analytical model (Lin, 2014).

Firm age and firm size were separately measured by the number of years since a sample firm was incorporated and by the natural logarithm of total assets. Firm slack was proxied by a firm's debt ratio (Lee, 2015). Foreign ownership, state, and board ownership were measured separately by the percentage of shares held by foreign investors, the government, and the board, respectively. Board size was measured by the number of board members. Industry-adjusted ROA in the

previous year was regarded as the prior performance.

4. Results

The descriptive statistics and correlation matrix are presented in Table 1. Several correlation coefficients are found to be relatively high, such as firm size vs. board size, firm size vs. foreign ownership, firm performance vs. prior performance, and so on. We performed an OLS regression with all variables to determine whether any multicollinearity effects existed. The VIF values in this regression model range from 1.068 to 2.302, indicating that multicollinearity is not a concern in this study.

The panel regression model is deemed appropriate since the data used in this study is a panel dataset. However, in order to obtain more robust results, the Hausman test was then performed to determine whether fixed- or random-effects are tenable; if there is a significant correlation between the individual group effects and explanatory variables, the panel regression with fixed-effects is better able to obtain robust estimations. The result rejected the null hypothesis that group effects are orthogonal to the regressors ($\chi^2=56.28$, $p<0.05$), suggesting that the fixed-effects model is appropriate for the data used in this study.

Table 2 presents the results obtained from the panel regression analysis with fixed-effects. Model 1 is the baseline model involving all the control variables. In Model 2, we test the direct effects of political ties and R&D investment. The results show that the impact of political ties on R&D investment is positive but not statistically significant (coef. = 1.625, $p>0.05$), while R&D investment is positively related to firm performance (coef. = 0.068, $p<0.01$). These results not only support our claim that the influence of political ties is inconclusive, but also confirm Hypothesis 1 regarding the positive performance effect of R&D investment. Model 3 reveals that the interaction effect of R&D investment and political ties is significantly positively associated with firm performance (coef. = 0.464, $p<0.01$), thus supporting Hypothesis 2. In addition to the above results, we observe that the direct effect of R&D investment becomes insignificant in Model 3. The possible reason is that, as mentioned in the literature, there might be a

Table 1
Descriptive statistics and correlation matrix

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1 Firm performance	-0.949	7.413											
2 Firm age	32.247	13.185	-0.021										
3 Firm size	16.236	1.654	0.194*	0.015									
4 Debt ratio	46.211	19.966	-0.124*	-0.053*	0.462*								
5 Foreign ownership	9.866	13.414	0.245*	-0.052*	0.502*	0.080*							
6 State ownership	1.338	5.319	0.056	-0.037*	0.230*	0.046*	0.084*						
7 Board ownership	21.114	13.735	0.041*	0.019	-0.140*	-0.049*	-0.092*	0.183*					
8 Board size	7.430	2.768	0.080*	0.125	0.457*	0.161*	0.186*	0.221*	0.064*				
9 Previous performance	-0.986	7.010	0.637*	-0.005	0.180*	-0.076*	0.207*	0.226*	0.056*	0.052*			
10 Political ties	0.042	0.107	-0.030*	-0.032*	0.195*	0.109*	0.089*	0.524*	0.096*	0.132*	-0.047*		
11 R&D investment	2.183	6.531	0.041*	-0.166*	-0.101*	-0.201*	0.026*	-0.042*	-0.059*	-0.064*	0.153*	-0.031*	
12 Environmental dynamism	0.038	0.021	-0.025*	0.124*	-0.077*	-0.120*	0.045*	-0.034*	-0.024*	-0.039*	0.099*	0.081*	-0.050*

Note: *p<0.05

Table 2
Results of panel data regression with fixed effects

N = 7,982 firm- year obs.	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Constant	-35.431***	(2.814)	-36.274***	(2.470)	-35.906***	(2.470)	-36.388***	(2.831)	-36.714***	(2.830)
Firm age	-0.163***	(0.016)	-0.171***	(0.016)	-0.170***	(0.016)	-0.195***	(0.020)	-0.197***	(0.020)
Firm size	2.748***	(0.189)	2.797***	(0.191)	2.774***	(0.191)	2.841***	(0.191)	2.859***	(0.190)
Debt ratio	-0.119***	(0.007)	-0.118***	(0.007)	-0.117***	(0.007)	-0.118***	(0.007)	-0.118***	(0.007)
Foreign ownership	0.066***	(0.010)	0.065***	(0.010)	0.065***	(0.010)	0.066***	(0.010)	0.066***	(0.010)
State ownership	0.026	(0.036)	0.027	(0.036)	0.027	(0.041)	0.022	(0.041)	0.019	(0.040)
Board ownership	0.032**	(0.010)	0.032**	(0.010)	0.032**	(0.009)	0.031**	(0.010)	0.030**	(0.010)
Board size	-0.063	(0.056)	-0.055	(0.056)	-0.055	(0.056)	-0.064	(0.056)	-0.062	(0.055)
Previous performance	0.288***	(0.013)	0.295***	(0.013)	0.295***	(0.013)	0.304***	(0.013)	0.314***	(0.013)
Firm effect	Included		Included		Included		Included		Included	
Year effect	Included		Included		Included		Included		Included	
Political ties			1.625	(0.945)	0.782	(0.967)	1.523	(0.945)	1.385	(1.327)
R&D			0.068**	(0.024)	0.046	(0.026)	0.066**	(0.024)	0.101**	(0.036)
Environmental dynamism							8.320*	(3.752)	10.084*	(3.913)
PT x R&D					0.464**	(0.174)			0.129	(0.326)
PT x ED									-25.401	(28.048)
R&D x ED									-0.527*	(0.254)
PT x R&D x ED									8.636**	(4.281)
F	121.71***		99.11***		94.35***		94.12***		73.96***	
R ²	0.116		0.118		0.123		0.123		0.131	

Note: *p<0.05, **p<0.01, ***p<0.001; the number in the parentheses is the standard error of coefficient.

¹PT is the abbreviation of political ties; ²ED is the abbreviation of environmental dynamism

complex substitutive and complementary relationship between R&D and political ties. The correlation matrix also reveals a weak negative relationship between the two ($r = -0.031$, $p < 0.05$). Given the interdependence between the two main variables and the presence of an interaction term, the decrease in the significance of R&D investment seems reasonable.

In Model 4, we test the direct effect of environmental dynamism and find that it has a significantly positive effect on firm performance (coef. = 8.320, $p < 0.05$). This finding echoes some researchers who found a direct positive effect of environmental dynamism on firm performance (Agyapong *et al.*, 2021; Cruz-González *et al.*, 2015). In Model 5, the three-way interaction effect of R&D investment, political ties, and environmental dynamism was positively related to firm performance (coef. = 8.636, $p < 0.01$). However, in this model, the direct effect of R&D investment and its interaction with political ties becomes insignificant. The possible reason is that, as indicated by the VIF test and correlation coefficients, our main variables and environmental variable exhibit an acceptable level of correlation. Hence, in models with variable interactions, it is expected that the significance of certain main variables or lower-order interaction terms may decrease or even become insignificant. This occurrence is commonly observed in studies focusing on multiple-way interactions, such as those by Runge *et al.* (2022) and Song *et al.* (2019). Considering the abovementioned, the support for our Hypothesis 3 is considered reasonable.

To further confirm the predictions of Hypotheses 2 and 3, we followed the approach suggested by Aiken and West (1991) to plot the combined effects of interest. Figure 1 shows that R&D investment has a positive impact on firm performance, while the slope of R&D investment regarding firm performance becomes steeper in the presence of political ties, supporting the argument made in Hypothesis 2 that a synergistic effect of R&D investment and political ties generates better firm performance. Figure 2 reveals that the combined effect of high political ties, high R&D investment, and high environmental dynamism has the highest firm performance. This result further confirms Hypothesis 3; namely, in the dynamic environment, the synergistic effect of political ties and R&D

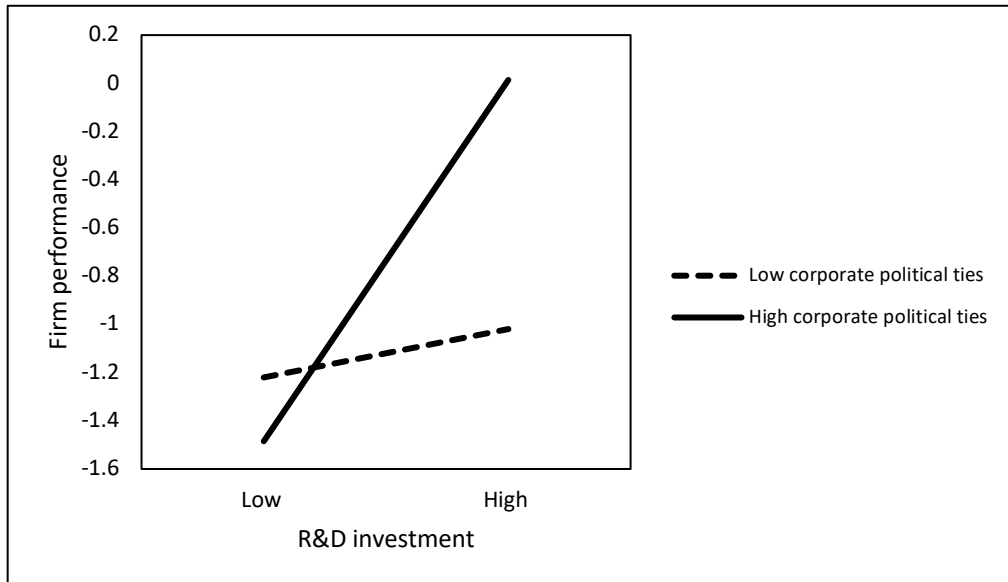


Figure 1
The moderating effect of corporate political ties

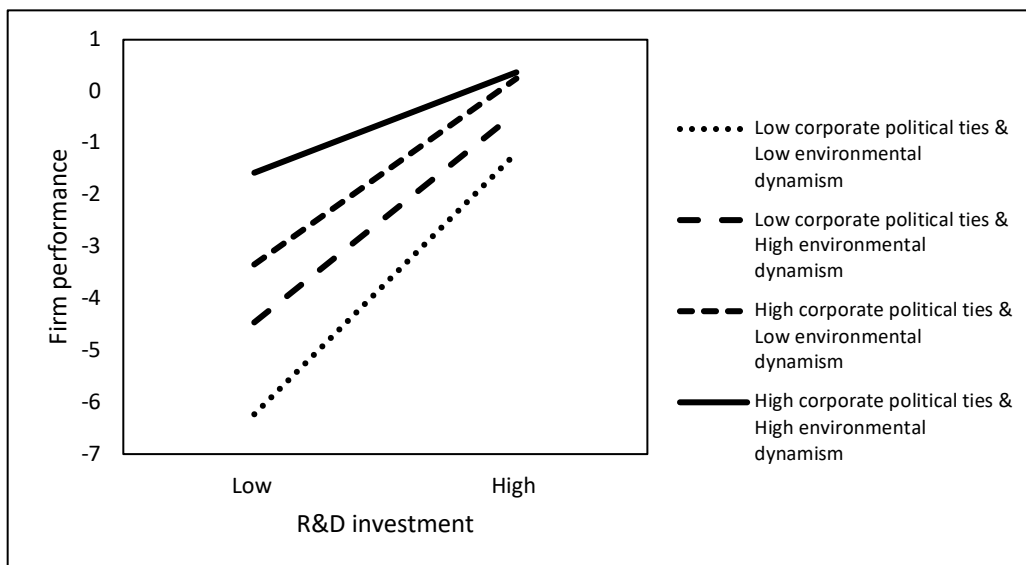


Figure 2
The configurational effect of the R&D investment, corporate political ties, and environmental dynamism

investment can help firms achieve superior performance.

Several additional tests were performed to validate the robustness of our findings. First, as building political ties can generally serve as a nonmarket strategy, it is unlikely that firms conduct this strategy randomly, implying the concern of endogeneity that some latent variables may affect whether a firm engages in corporate political activity or not. We need an instrumental variable and then use fixed effects panel regression with instrumental variable to examine whether endogeneity affects the results of this study. We thus select state ownership, an existing control variable, as the instrumental variable, because (1) in the presence of state ownership, the government gains eligibility to vie for directorial positions on the board and appoint government officials as directors; (2) upon examining the correlation coefficients, state ownership is found significantly linked positively to political ties but lacks any association with firm performance. These characteristics meet the expectation that an instrumental variable should be related to the explanatory variable but not related to the dependent variable, so that state ownership is deemed an appropriate instrumental variable. The variables and interaction terms of interest still support the proposed hypothesis expectations.

Second, by using the same instrumental variable, we took the pooled two-stage least squares regression analysis to confirm the stability of experimental results. The empirical results remain substantially unchanged. Post hoc test was conducted using a model with only control variables and two main variables. The Durbin-Wu-Hausman test shows that the Durbin score chi-square is 1.601 (p-value = 0.206) and the Wu-Hausman F value is 1.599 (p-value = 0.206), further indicating that the endogeneity issue is not a concern.

Third, following the recent studies of Bernerth *et al.* (2018) and Wu *et al.* (2018), all hypotheses remain supported with all control variables being removed. The variables of interest are still significantly correlated to firm performance in the expected directions. These results confirm the robustness of our findings. Finally, research results may be influenced by extreme values of variables. Following the practice of past studies (e.g., Fu and Ogura, 2019), we numerically rank and the top and bottom 5% of two main variables. Despite the decrease in the

significance levels of the variables and interaction terms of interest, the directions of these variables remain consistent. The above four ways of robustness checks, while not perfect, should be sufficient to demonstrate that the strategic behaviors and situational considerations of our interest have impacts on firm performance.

5. Discussion and conclusion

While political ties may be considered a relational resource that is conducive to firm performance (Dyer and Singh, 1998), the prior studies so far report inconsistent findings and suggest the synergistic effect of market strategies. This study thus sheds light on the performance implications associated with the interaction effect of corporate political activities and innovation investment. Instead of focusing merely on a polarized argument that increasing political ties or R&D investment leads to better firm performance, we adopt the resource dependency theory as the primary basis to investigate the synergistic effect of R&D and corporate political actions. At the same time, the contingency perspective is applied to examine the interplay between the alignment of market-nonmarket strategies and environmental dynamism. Using Taiwanese publicly listed firms as the research sample, this study finds that the effects of R&D and political ties can be integrated and lead to better performance. In particular, in the industrial environment with high dynamism, the synergistic effect of R&D and corporate political investments becomes more pronounced.

Firstly, in a context where the effectiveness of non-market strategies continues to be a subject of debate (e.g., Greiner and Lee, 2023; Hadani and Schuler, 2013; Ozer and Markóczy, 2010), this study explores how market and non-market strategies, separately and together, yield impact on corporate performance by providing additional evidence that market and non-market strategies complement each other rather than serve as substitutes. These findings echo Hillman *et al.*'s (2004) argument that non-market strategies, such as political ties, need to be integrated with market strategies to be effective. In addition, past research has shown that political ties have synergistic effects with various market strategies, such as exploratory innovation (Zhang *et al.*, 2015) and strategic

competitive actions (Zheng *et al.*, 2022). Our findings confirm one specific type of market strategies with which political ties can have synergistic effects.

Furthermore, the contextual effect of environmental dynamism proves that external contingency is crucial in crafting a firm's strategies (Nadkarni and Chen, 2014). Relative to the previous studies concluding that environmental dynamism moderates the effects of innovation activities (Wang and Chen, 2010) or corporate political activities (Jean *et al.*, 2018), our finding of the configurational effect of R&D investment, political ties, in the presence of environmental dynamism not only shows that the combined effectiveness of market and non-market strategies depends on the external environmental conditions, but also echoes the dynamics of strategic fit that market and nonmarket strategic changes can be logically predicted based on differences in specific environmental forces and organizational resources (Saemundsson and Candi, 2014).

Managerial implications extracted from this study are as follows. As we found that the political ties can only yield their effects along with a certain level of market-oriented investment, corporate leaders must remind themselves that building up political connections is not a shortcut to success. Only by continuously devoting to technology development, firms with political ties have a better chance of profiting. Nonmarket strategies, such as corporate political ties, can only be treated as auxiliary means. As some scholars have warned, firms may get stuck in a trap of deeply connected political connections that erode their competitiveness in the long run (Bertrand *et al.*, 2018; Gargiulo and Benassi, 2000). Firms which develop political ties are often viewed as the dark side of cronyism because businesses of this kind thrive not as a result of competition but as a return on money amassed through collusion between the most powerful economic class and the ruling political class. Our finding about the balance between market- and nonmarket strategies also echoes the increasingly important concept of conscious capitalism (Mackey and Sisodia, 2014), implying that businesses should reconcile the economic and socio-political philosophy by serving key stakeholders, including their customers and the society as a whole. In addition to the general implications mentioned above, we have three managerial suggestions: (1) Firms

can establish dedicated units like public relations offices, monitor political ties' effectiveness regularly. For example, Ant Group, a subsidiary of Alibaba, has established a dedicated department to handle government relationship and policy affairs. (2) R&D heads should collaborate with external relationship personnel for enhanced interactions with the public sector, addressing specific needs of government assistance. (3) The top decision-maker must set up a joint evaluation mechanism for market and non-market actions in strategic planning.

This study is not without limitations. The most significant research limitation is the measure of political ties. Among a number of corporate political connections with governments, this study used the proportion of political directors to total directors to proxy for a firm's political ties. The method adopted in this study cannot fully reflect the degree of a firm's political ties although such a quantifiable measure helps to broaden the research sample and has been widely adopted in previous studies. Similarly, due to the limitations of the secondary data, we can hardly associate the specific R&D spending with market opportunities or even corporate political activities. For example, a board director with specific background in certain government branches may help the focal firm to access to the resources required in specific areas of innovation, but the lack of detailed data may have the synergistic effect of political ties and R&D investment underestimated. Future research may probe into the complex nature of corporate political ties via more fine-grained approaches, such as survey items or case interviews, to complement the measure used in this study. Additionally, although environmental dynamism may be the most important external contingency influencing the functions of R&D and political actions, researchers could explore other situational effects at the organizational, intra-industry- or institutional levels that may moderate the synergistic influence of R&D and political strategies on firm performance.

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