Correlation between Office Locations, Corporate Governance and Business Performance

Shih-Yao Lin[1]*, Ai-Chi Hsui[2]

[1]National Yunlin University of Science and Technology, R.O.C., Taiwan, [2]National Yunlin University of Science and Technology, R.O.C., Taiwan. *Email: yao0225@gmail.com

ABSTRACT

The concept of "corporate governance" developed in an era marked by global economic liberalization, continuing enterprise expansion, and separation enterprise ownership and management trends. Good corporate governance is important to enhance corporate value and national competitiveness. "Locations" refer to spaces wherein human social activities are held. Office activities have become important economic human activities, and enterprise headquarters are the primary places where enterprises issue orders, carry out corporate control, and make decisions. Hence, they are vital to the overall operation of enterprises. Do the locations of enterprise headquarters influence corporate governance quality, and thus, the overall business performance of enterprises? This research analyzes Taiwan's listed and over-the-counter companies. As per empirical results: (1) Corporate business performance significantly correlates with corporate governance and office locations, with a significant difference between various areas, and (2) the quality of corporate governance of Taiwanese enterprises significantly correlates and varies with their office locations.

Keywords: Corporate Governance, Business Performance, Location Theory
JEL Classifications: G34, M10, R39

1. INTRODUCTION

In the early 1930s, American academia began to discuss "corporate governance." It was not until investors and regulatory authorities witnessed various corporate governance issues from the financial crises and malpractices in enterprises to national economic recession and the financial tsunami did they realize the importance of a perfect corporate governance mechanism to optimize capital markets and attract more international capital (Yin-Hua et al., 2002). This impelled regulatory authorities to reflect on corporate governance so as to legislate mechanisms thereof. The organization for economic corporation and development (OECD) expressly argued that imperfect corporate governance was one of the key causes of failure of enterprises to enhance their international competitiveness. Research data shows that an imperfect corporate governance mechanism is one of the main causes of a financial tsunami (Rajan and Zingales, 1998).

Are locational factors important, and do the locations of enterprise headquarters correlate with corporate governance and business performance? Enterprises are established to earn maximized

profits. To this end, it is important to gain competitive advantage, by prices or quantities, from a short-term perspective; adopt state-of-the-art production technologies from a medium-term perspective; and select appropriate headquarter locations from a long-term perspective. The locations of factories or offices with a geographical advantage that reduces the clients' transport costs, while also attracting more clients and, in particular, enterprise headquarters from where enterprises primarily issue orders and make decisions are vital to overall enterprise operation (Ming-Yi and Jin, 2000).

In 2017, the US president Trump put forth the "Biggest Tax Cut in American History" and the "Made in America" policy. This is likely to influence the economic development and financial status of other countries. For example, several large enterprises in Taiwan (including Formosa Plastics and Hon Hai) have planned to invest and establish factories in the US, while Terry Gou, president of Hon Hai, visited the White House several times to discuss investments with the Trump administration. On April 1st, 2017, the Central Committee of the Communist Party of China and the State Council jointly announced a "millennial project"

with the same strategic significance as Shenzhen and Pudong to set up Xiongan New Area as China's Silicon Valley (a core area that develops innovative technologies in China). In order to reduce the intensity of investment in the Chinese Mainland and dependence upon foreign trade, the Taiwanese government carried out the "Go Southwards" policy, thus diversifying the investment risk and opening up new markets. Hence, the author began focusing on the influence of corporate governance and location theory.

Government policies stipulate general economic guidelines, which are of great concern to the business orientation of enterprises, national economy, and people's livelihood. Therefore, such policies should be treated with prudence. This paper discusses the correlation between the spatial locations of enterprise offices, quality of corporate governance, and business performance. Do the office locations of Taiwan's listed and OTC enterprises correlate with the quality of their corporate governance and business performance? This paper will focus on the two types of correlation and the relationship between them.

2. LITERATURE REVIEW

2.1. Corporate Governance
Yin-Hua (2015) defined corporate governance mechanism as the design and implementation of corporate institutions that are intended to improve the efficiency of strategic management. On the other hand, Shleifer and Vishny (1997) defined it as a way to ensure capital providers were duly rewarded. According to Cheng-En (2000), corporate governance refers to corporate institutions that are intended to protect the due rights and interests of enterprises' capital providers. In his view, corporate capitals are mainly provided by the shareholders; however, the self-interested principal shareholders or managers responsible for corporate management will not necessarily take into full account the due rights and interests of general shareholders. Therefore, it is imperative to build a supervisory mechanism to coordinate the interests between managers and shareholders to reduce agency costs and realize higher corporate value.

Corporate governance primarily deals with ensuring senior managers effectively create wealth for shareholders, while they are provided with autonomous rights and incentives (Epps and Cereola, 2008). A board of directors acts as a bridge between shareholders and managers, and on behalf of the shareholders, tries to protect and increase the enterprise's long-term interests (Veliyath, 1995). The corporate governance mechanism regulates managers' behaviors, which is directed toward ensuring that the enterprise investors receive a reasonable return on investment and preventing the losses of capital providers due to managers' misconducts (Shleifer and Vishny, 1986). The OECD (2015) proposes six guidelines for corporate governance, which are to (1) strengthen the functions of the board of directors, (2) exert the role of supervisors (the Audit Committee), (3) value the rights of shareholders and interested parties, (4) ensure the transparency of information exposure, (5) build and carry out an internal control and audit system, and (6) appoint high-caliber accountants and lawyers prudently.

To summarize, corporate governance is a system that protects the rights and interests of enterprise's capital providers. It is intended to solve the agency problem, reduce the agency costs, supervise the organizational activities of the enterprise effectively by implementing a reasonable check-and-balance design, and, ultimately, maximize the enterprise's economic value.

2.2. Location Theory
"Location" is built on the concept of social grouping. The location theory is a solution that scientists have proposed with respect to the competition and co-existence of ethnic groups, in nature, under resource-constrained conditions (Dimmick and Rothenbuhler, 1984). This theory relates to the selection of spatial locations for human economic behaviors with optimal combination of economic activities in those locations (Wei-Jhou, 2006). The location theory is an important concept in the field of economic geography, and it gives a clear exposition of the division of industrial location that arises from the difference in the conditions of the spatial locations.

Weber (1909) applied the location theory to scientific management. To select appropriate factory sites, he put forth the concept of "factory location," thus laying the basis for location selection. In 1909, Weber published the industrial location theory, where he argued that industrial locations were primarily influenced by three factors transport costs, labor costs, and agglomeration economy.

Currently, M.E. Porter and P. Krugman are considered the leading authorities in location theory. In 1990, M.E. Porter published "The Competitive Advantage of Nations," which stated that industrial clustering reflected a set of corporate organizations that were geographically adjacent to and interacted with each other in a particular field. He argued that organizations were linked with each other due to the communality and complementarity between them. Hence, industrial clustering is an important cause of a nation's competitive advantage. Weber proposed a diamond system regarding the competitive advantage of nations, as shown in Figure 1.

The location theory was originally oriented toward manufacturing activities. With the advance in industrial transformation, office-based economic activities became increasingly important, which some scholars successively studied (Armstrong, 1972; Rubin, 1978; Pivo 1993). The advantages, degree of concentration, and change with respect to the locations of enterprise offices influences enterprise competitiveness and urban development. Holloway and Wheeler (1991) found that the location changes of enterprise headquarters were continued on an intra- and inter-industry basis, while Shilton and Stanley (1999) found that 40% of the enterprise headquarters in the US were clustered in 20 cities.

3. METHODS

3.1. Research Hypotheses
3.1.1. Locational factor 1
Urban-rural differences (metropolitan areas vs. non-metropolitan areas) and Corporate Governance.

Ruei-Jhao et al. (2008) stated that economic globalization widened the economic gap between urban and rural areas. Specifically,
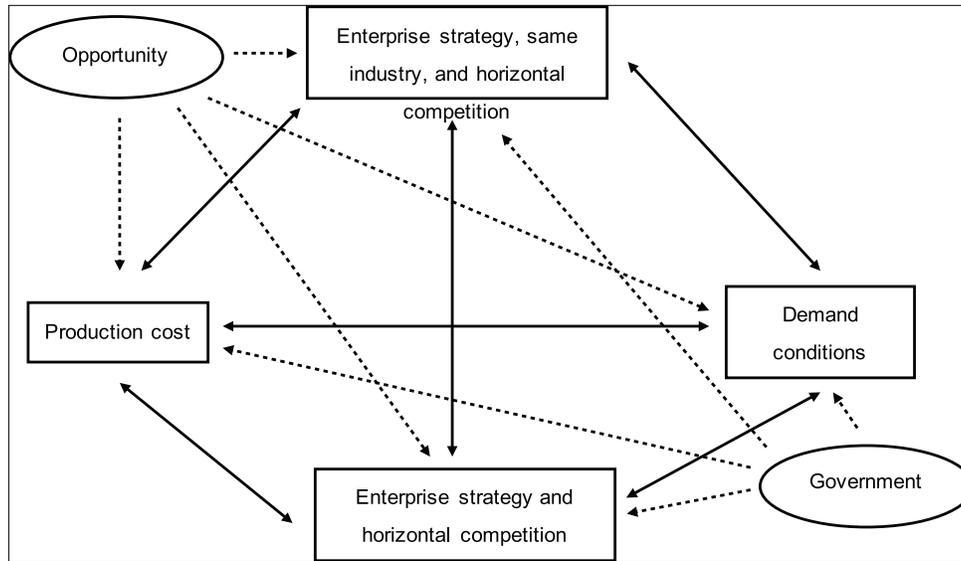
Figure 1: Architecture of diamond system

Table 1: Descriptive statistics data table (n=27,500)

Variable	Hypothesis I	Average number	SD	Hypothesis II	Average number	SD
DSP	Metropolitan area−Taipei city	19.95	13.953	The nearest	19.90	14.066
	Metropolitan area−Taichung city	21.44	13.798	The second nearest	20.61	14.478
	Metropolitan area−Kaohsiung city	24.30	16.419	The third nearest	20.64	14.387
	Non-metropolitan area−Science Park	18.33	14.241	The farthest	23.26	16.503
	Non-metropolitan area−Other	20.58	14.545	Total	20.35	14.374
DPP	Metropolitan area−Taipei city	9.09	18.094	The nearest	9.58	18.537
	Metropolitan area−Taichung city	7.76	16.027	The second nearest	6.43	14.511
	Metropolitan area−Kaohsiung city	9.91	18.502	The third nearest	9.43	18.485
	Non-metropolitan area−Science Park	9.40	18.839	The farthest	10.25	19.681
	Non-metropolitan area−Other	7.78	16.394	Total	8.62	17.505
IDN	Metropolitan area−Taipei city	1.27	1.309	The nearest	1.30	1.318
	Metropolitan area−Taichung city	1.32	1.274	The second nearest	1.43	1.270
	Metropolitan area−Kaohsiung city	1.17	1.294	The third nearest	1.45	1.263
	Non-metropolitan area−Science Park	1.82	1.291	The farthest	1.35	1.246
	Non-metropolitan area−Other	1.40	1.261	Total	1.35	1.297
SED	Metropolitan area−Taipei city	6.13	10.591	The nearest	6.22	10.823
	Metropolitan area−Taichung city	4.85	8.639	The second nearest	6.48	11.087
	Metropolitan area−Kaohsiung city	6.79	11.403	The third nearest	7.02	11.784
	Non-metropolitan area−Science Park	8.46	12.848	The farthest	6.36	12.125
	Non-metropolitan area−other	6.35	11.353	Total	6.37	11.058
CS	Metropolitan area−Taipei city	0.32	0.466	The nearest	0.31	0.462
	Metropolitan area−Taichung city	0.28	0.449	The second nearest	0.25	0.430
	Metropolitan area−Kaohsiung city	0.29	0.455	The third nearest	0.28	0.447
	Non-metropolitan area−Science Park	0.26	0.440	The farthest	0.20	0.398
	Non-metropolitan area−other	0.23	0.424	Total	0.28	0.449

DSP: Director shareholding percentage, DPP: Director pledge percentage, IDN: Independent director number, SED: Share earnings deviation, CS: Cross-shareholding

urban areas obtained more resources and opportunities to increase public expenditures and improve infrastructure, thus creating better environments for local residents and enterprises. In contrast, rural areas were confronted with problems, such as population outflow, population aging, and resource shortage, thus lagging far behind urban areas.

Jhao-Lan et al. (2008) studied government performance of 23 counties and/or cities of Taiwan. They found that (1) the relative efficiency of Taipei City, Taipei County, Taichung City, and Kaohsiung city was 1; and (2) the efficient values of most of Taiwan's 23 cities and/or counties decreased progressively

from north to south, when Taipei city/county is taken as the core of overall competitiveness. Considering that the urban-rural differences influence enterprises, this paper proposes the following hypothesis: H_1: Enterprises located in metropolitan areas exhibit higher quality of corporate governance.

3.1.2. Locational factor 2
Traffic Convenience (Distance to High-speed Railway Stations) and Corporate Governance.

Siao-Lin (2012) studied the influence of geographical locations on the quality of board governance. The study found that, for

Table 2: Hypothesis 3: Statistical table of regression model

Model	Unstandardized coefficient		Standardized coefficient	T	Significance
	B	Standard error	Beta		
Office location					
Constant	−0.527	0.097		−5.433	0.000
Local-Taipei	1.046	0.092	0.155	11.375	0.000
Local-Taichung	2.369	0.108	0.218	21.852	0.000
Local-Kaohsiung	1.830	0.121	0.134	15.130	0.000
Local-science park	0.337	0.096	0.044	3.507	0.000
Corporate governance					
IDN	0.228	0.017	0.088	13.629	0.000
DPP	−0.010	0.001	−0.054	−8.395	0.000
DSP	0.013	0.002	0.055	7.650	0.000
CS	−0.242	0.049	−0.033	−4.960	0.000
SED	−0.008	0.002	−0.024	−3.361	0.001

Table 3: Hypothesis 4: Statistical table of regression model

Model	Unstandardized coefficient		Standardized coefficient	T	Significance
	B	Standard error	Beta		
Distance to high-speed railway stations					
Constant	0.798	0.107		7.447	0.000
0-10 km	−0.468	0.101	−0.069	−4.651	0.000
11-20 km	−0.444	0.104	−0.061	−4.273	0.000
21-30 km	−0.323	0.123	−0.026	−2.627	0.009
Corporate governance					
IDN	0.233	0.017	0.090	13.720	0.000
DPP	−0.011	0.001	−0.057	−8.630	0.000
DSP	0.018	0.002	0.075	10.406	0.000
CS	−0.013	0.002	−0.044	−5.933	0.000
SED	−0.159	0.050	−0.021	−3.201	0.001

Table 4: Multiple comparisons between the various areas: Scheffe test

Dependent variable	Metropolitan area versus non-metropolitan area results of significant difference	Distance to high-speed railway station results of significant difference
DSP	For 1: (4)>(2)>(5)>(1)>(4)	For 1: (4)>(2)>(1)
	For 2: (3)>(2)>(1)>(4)	For 2: (4)>(2)>(1)
	For 3: (3)>(2)>(5)>(1)>(4)	For 3: (4)>(3)
	For 4: (3)>(2)>(5)>(1)>(4)	For 4: (4)>(3)>(2)>(1)
	For 5: (3)>(5)>(1)>(4)	
DPP	For 1: (1)>(5)	For 1: (1)>(2)
	For 3: (3)>(5)	For 2: (4)>(1)>(3)>(2)
	For 4: (4)>(5)	For 3: (3)>(2)
	For 5: (3)>(4)>(1)>(5)	For 4: (4)>(2)
IDN	For 1: (4)>(5)>(1)	For 1: (3)>(2)>(1)
	For 2: (4)>(2)	For 2: (2)>(1)
	For 3: (4)>(5)>(3)	For 3: (3)>(1)
	For 4: (4)>(5)>(2)>(1)>(3)	For 4: (4)>(3)>(2)
	For 5: (4)>(5)>(1)	
SED	For 1: (4)>(1)>(2)	For 1: (3)>(1)
	For 2: (4)>(3)>(5)>(1)>(2)	For 3: (3)>(1)
	For 3: (4)>(3)>(2)	
	For 4: (4)>(3)>(5)>(1)>(2)	
	For 5: (4)>(5)>(1)>(2)	
CS	For 1: (1)>(4)>(5)	For 1: (1)>(3)>(2)>(4)
	For 3: (3)>(5)	For 2: (1)>(3)>(2)>(4)
	For 4: (1)>(4)	For 3: (1)>(3)>(2)>(4)
	For 5: (1)>(3)>(5)	For 4: (1)>(3)>(2)>(4)

DSP : Director shareholding percentage, DPP: Director pledge percentage, IDN : Independent director number, SED: Share earnings deviation, CS: Cross-shareholding

Table 5: Hypothesis 1: Internal-subject effect test analysis

Source	Dependent variable	Sum of squares of category III	df	Square of average value	F	Significance
Urban-rural difference	DSP	34773.973	4	8693.493	42.328	0.000
	DPP	14355.399	4	3588.850	11.730	0.000
	IDN	601.050	4	150.263	90.545	0.000
	SED	11968.674	4	2992.168	24.555	0.000
	CS	41.092	4	10.273	51.267	0.000

DSP: Director shareholding percentage, DPP: Director pledge percentage, IDN: Independent director number, SED: Share earnings deviation, CS: Cross-shareholding

Table 6: Hypothesis 2: Within-subject effect test analysis

Source	Dependent variable	Sum of squares of category III	df	Square of average value	F	Significance
Distance to high-speed railway stations	DSP	15864.731	4	3966.183	19.246	0.000
	DPP	73653.645	4	18413.411	60.609	0.000
	IDN	127.866	4	31.967	19.064	0.000
	SED	4190.532	4	1047.633	8.578	0.000
	CS	42.063	4	10.516	52.487	0.000

DSP: Director shareholding percentage, DPP: Director pledge percentage, IDN: Independent director number, SED: Share earnings deviation, CS: Cross-shareholding

Table 7: Reliability of principal component analysis for hypothesis 1

Local	Factor 1	Factor 2	Factor 3	Average
Metropolitan areas	0.0146	0.0898	−0.0303	0.0741
Non-metropolitan areas	−0.0183	−0.1127	0.0380	−0.0930

Table 8: Reliability of principal component analysis for hypothesis 2

Distance to high-speed railway stations	Factor 1	Factor 2	Factor 3	Average
0-10 km	0.0150	0.0893	−0.0301	0.0742
11-20 km	0.0373	−0.0800	0.0367	−0.0060
21-30 km	−0.1782	0.1319	−0.0365	−0.0828
31 km	−0.1098	−0.2572	0.1517	−0.2153

smaller enterprises farther from (high-speed) railway stations, the quality of board governance was influenced more significantly by the adequacy of resources of local directors. On the other hand, Liang-Jie (2013) analyzed the entrepreneurial performance of micro-enterprises around the Science Park. This study found that the entrepreneurial performance was mainly influenced by key factors, such as prior knowledge and competence, market demand, innovative products, cooperation with the enterprises located in the Science Park, storefront location selection, and traffic convenience. Considering that the differences in traffic convenience influence enterprises, this paper proposes the following hypothesis: H_2: Enterprises located closer to high-speed railway stations exhibit higher quality of corporate governance.

3.1.3. Office locations, quality of corporate governance, and corporate business performance
Ertugrul and Hegde (2001) found that enterprises with high quality of corporate governance also had high corporate value and good business performance. Furthermore, a study by Jhu-San et al. (2009) found that R&D and capital expenditures influenced enhancement in corporate value, and could be achieved indirectly through good corporate governance.

Klapper and Love (2004) studied the reports on the rating of corporate governance of 495 enterprises in 25 emerging market countries. They found that the quality of corporate governance positively correlated with their market value and business performance. Based on the combination of hypotheses 1 and 2, this paper proposes the following hypotheses regarding corporate business performance: H_3: Under the urban-rural differences, an enterprise located in a metropolitan area, and with high quality of corporate governance, is more likely to exhibit better business performance.

H_4: Given the differences in traffic convenience, an enterprise located closer to a high-speed railway station, and with higher quality of corporate governance, is more likely to exhibit better business performance.

3.2. Data Source
The object of this research is the Taiwanese listed (OTC) enterprises sampled during the period of January 2010-December 2016. We use 27,500 samples, for analysis, to discuss the correlation between the locational factors of offices, quality of corporate governance, and corporate business performance. The financial data is available from the annual reports of the Taiwan's listed (OTC) enterprises, Taiwan Economic Journal, and an open governmental data platform (DATA.GOV.TW).

3.3. Sample Analysis
The research samples are based on the headquarters addresses registered with the Department of Commercial Affairs in the Ministry of Economic Affairs. 1585 Taiwan enterprises are surveyed.
1. There are 703 enterprises located in Taipei city, which account for 44.3% of the enterprises. Taichung city has 57 enterprises (3.5%), Kaohsiung city has 73 enterprises (4.6%), the Science Park has 112 enterprises (7.1%), and the non-metropolitan areas have 640 enterprises (40.5%).
2. There are 818 enterprises with a distance of <10 km from high-speed railway stations, which account for 51.6% of the enterprises. There are 535 enterprises (33.8%) at a distance of

11-20 km from high-speed railway stations, 143 enterprises (9.0%) at a distance of less than 21-30 km from high-speed railway stations, and 89 enterprises (5.6%) at a distance of more than 30 km from high-speed railway stations.

3.4. Definition and Measurement of Variables

3.4.1. Definition of pointer variable of corporate governance

1. Director shareholding percentage (DSP): (Number of shares by directors) ÷ (number of circulating ordinary shares) ×100%. Dalton and Kesner (1987) confirmed that the DSP positively and significantly correlated with business performance. If the majority share equity is held by directors, they are usually sufficiently motivated to supervise the managers, which impel these managers to improve business performance and minimize harmful behaviors towards shareholders and the enterprise.

2. Director pledge percentage (DPP): (Number of shares pledged by directors) ÷ (number of shares held by directors) ×100%. An-Lin et al. (2013) argued that the DPP positively and significantly correlated with business performance. Specifically, if the directors overused financial leverage to increase their shareholding ratio, the inflated shareholding ratio could only strengthen their management rights, but would affect the corporate business performance.

3. Independent director number (IDN): Fama (1980) found that the IDN positively and significantly correlated with corporate business performance. Specifically, independent outside directors have considerable expertise and experience, and are usually scholars, experts or social elites. Therefore, they can assist the enterprise to make major decisions and provide professional services.

4. Share earnings deviation (SED): (Direct shareholding + indirect shareholding) (control right) ÷ (right of claim for cash flow).
   Due to the separation of control right and cash flow right, a substantial number of shareholders will become more motivated to plunder the benefits of the enterprise or other minority shareholders, in case of insufficient disclosure of information. As a result, this will bring about higher agency costs, degradation in business performance, and reduction in corporate value (Claessens et al., 2000).

5. Cross-shareholding (CS): CS refers to the mutual shareholding between different enterprises with the aim of attaining a special purpose. Yin-Hua et al. (2002) argued that, when the controlling shareholders won the control right through CS, a major negative embezzlement would be produced, thus reducing the corporate business performance.

3.4.2. Definition of the variables related to locational factors

In light of the allocation of government resources and administrative efficiency under hypothesis 1, Taiwan is divided into metropolitan areas (including Taipei city, Taichung city, and Kaohsiung city), non-metropolitan areas (including Hsinchu Science Park, Central Taiwan Science Park, and Tainan Science Park), and other districts (the districts not listed within the Science Parks).

In light of the ease of shareholder supervision and distance to high-speed railway stations under hypothesis 2, the sampled enterprises are classified into four levels Level 1: A distance of 0-10 km from the nearest railway station; Level 2: A distance of 11-20 km from the nearest railway station; Level 3: A distance of 21-30 km from the nearest railway station; and Level 4: A distance of more than 30 km from the nearest railway station.

3.4.3. Definition of corporate business performance

Klapper and Love (2004) used the Return on Assets (ROA) to identify deficient legal systems in corporate governance. An enterprise with high quality of corporate governance usually had a positive market value and business performance. On the other hand, Huson et al. (2004) used ROA to measure the influence of the replacement of senior managers on corporate business performance. They found that after the CEOs were replaced, the accounting performance of the enterprises would improve significantly. In this research, ROA is used as a variable for measuring corporate business performance. The after-tax net profit per 1-TWD assets is equal to (post-tax profit or loss) + (interest expenses) × (1 - tax rate) ÷ (average total assets).

3.5. Design of Research Model

From the perspective of office directions, this paper discusses the correlation between corporate governance and business performance. We specifically estimate and analyze the correlation by using the fixed effect of Panel Data Regression, descriptive statistics, single-factor and multivariate analysis of variance, principal component analysis, and different multiple regression models.

Model (1): In order to measure the influence on corporate business performance made by corporate governance and different office location variables, the following regression model is built: In light of H_3 (Under the urban-rural differences, an enterprise located in a metropolitan area or with high quality of corporate governance is more likely to exhibit better business performance.), the following regression equation is developed:

$$ROA_{it} = \beta_0 + \beta_1(DSP_{it}) + \beta_2(DPP_{it}) + \beta_3(SED_{it}) + \beta_4(IDN_{it}) + \beta_5(CS_{it}) + \beta_6(AREA\text{-}T_{it}) + \beta_7(AREA\text{-}C_{it}) + \beta_8(AREA\text{-}K_{it}) + \beta_9(AREA\text{-}S_{it}) + \varepsilon_{it} \quad (1)$$

Where AREA-T is the office location (Taipei metropolitan area), AREA-C is the office location (Taichung metropolitan area), AREA-K is the office location (Kaohsiung metropolitan area), AREA-S is the office location (science park), and ε_{it} is the residual value.

In light of H_4 (under the differences in traffic convenience, an enterprise closer to a high-speed railway station or with high quality of corporate governance is more likely to exhibit better business performance), the following regression equation is developed:

$$ROA_{it} = \beta_0 + \beta_1(DSP_{it}) + \beta_2(DPP_{it}) + \beta_3(SED_{it}) + \beta_4(IDN_{it}) + \beta_5(CS_{it}) + \beta_6(DHK\text{-}1_{it}) + \beta_7(DHK\text{-}2_{it}) + \beta_8(DHK\text{-}3_{it}) + \varepsilon_{it} \quad (2)$$

Where DHK-1 is enterprises with a distance of 0-10 km from a high-speed railway station, DHK-2 is enterprises with a distance of 11-20 km from a high-speed railway station, DHK-3 is enterprises

with a distance of 21-30 km from a high-speed railway station, and DHK-4 is enterprises with a distance of more than 30 km from a high-speed railway station.

Model (2): In order to measure the influence of office locations on various corporate governance variables, the single-factor and multivariate analysis of variance is used. The analysis framework is as follows:

MANOVA mathematical formula:

$$\beta_1(DSP_{it})+\beta_2(DPP_{it})+\beta_3(SED_{it})+\beta_4(IDN_{it})+\beta_5(CS_{it})=(AREA_{it}) \quad (3)$$

The code names are the same as those under Model (1):

Urban-rural differences under hypothesis 1: $(AREA_{it})$ = (Location [Taipei city, Taichung city, Kaohsiung city, Science Park, other districts]).

Differences in the distance to high-speed railway stations under hypothesis 2: $(AREA_{it})$ = (Location [enterprises in the area that are closest to high-speed railway stations, enterprises in the area that are the second closest to high-speed railway stations, enterprises in the area that are the second farthest from high-speed railway stations, and enterprises in the area that are the farthest from high-speed railway stations]).

The null hypothesis tested by the MANOVA is as follows: The mean vectors of horizontal groups are all equal, and are all available from the same group.

$$H0 = \begin{pmatrix} U11 \\ U21 \\ U31 \\ U41 \\ U51 \end{pmatrix} = \begin{pmatrix} U12 \\ U22 \\ U32 \\ U42 \\ U52 \end{pmatrix} = \begin{pmatrix} U13 \\ U23 \\ U33 \\ U43 \\ U53 \end{pmatrix} = \begin{pmatrix} U14 \\ U24 \\ U34 \\ U44 \\ U54 \end{pmatrix} = \begin{pmatrix} U15 \\ U25 \\ U35 \\ U45 \\ U55 \end{pmatrix}$$

Model (3): Principal component analysis uses fewer variables to explain the majority of variables in the original data, as well as the composite pointers of the data. The main purpose is to set several indexes, and specifically: (1) Determine the weight of each variable and obtain the weighted average of variables, (2) assign a high weight to a critical variable and a low weight to a relatively unessential variable, and (3) set the overall index accordingly.

Regarding the principal component equation, the overall index (Y) is a linear combination that comprises K analysis variables. We assume that the only three analysis variables are standardized as $(Z_1, Z_2,$ and $Z_3)$, and the weights of their principal components are set as $(a_1, a_2,$ and $a_3)$. The principal component equation is then expressed as follows:

$$Y = a_1*Z_1+a_2*Z_2+a_3*Z_3 \quad (4)$$

Where, Y is the overall index, Z_k is the k-th analysis variable (k=1, 2, 3.), and a_k is the weight of the k-th analysis variable, namely, the weight of principal component.

The variance of the principal component Y is listed as follows:

$$Y=[a_1 a_2 a_3]*\begin{bmatrix} z_1 \\ z_2 \\ z_3 \end{bmatrix} \quad VAR(Y)=[a_1 a_2 a_3]*\begin{bmatrix} 1 & r_{12} & r_{13} \\ r_{21} & 1 & r_{23} \\ r_{31} & r_{32} & 1 \end{bmatrix}*\begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

(5)

Where R = $R=\begin{bmatrix} 1 & r_{12} & r_{13} \\ r_{21} & 1 & r_{23} \\ r_{31} & r_{32} & 1 \end{bmatrix}$ I is the correlation coefficient matrix of (Z_1, Z_2, Z_3).

a = $[a_1 a_2 a_3]$ is the weight vector of principal component.

Next, we use the maximized variance of principal component as the objective function, and use the constraint equation, where the sum of square weights is equal to 1, to ensure the uniqueness of the solution:

MAX: VAR(Y)= a' * R * a

S.T: a' * a =1

Where a '* a = 1 is the constraint equation where the sum of square weights is equal to 1.

To solve the above objective set, it is translated into a Lagrange equation.

$$L=[a_1,a_2,a_3]*\begin{bmatrix} 1 & r_{12} & r_{13} \\ r_{21} & 1 & r_{23} \\ r_{31} & r_{32} & 1 \end{bmatrix}-/*\begin{bmatrix} [a_1,a_2,a_3]*\begin{bmatrix} a_1 \\ a_2 \\ a_3 \end{bmatrix}-1 \end{bmatrix} \quad (6)$$

In the equation (6), λ is the lagrangian multiplier. Through the principal component analysis mode of the statistical software, we determine the λ value and principal component weight $[a_1 \ a_2 \ a_3]$. The λ value can be used to measure the representativeness of the principal component, namely, whether the principal components can represent all variables effectively. The $[a_1 \ a_2 \ a_3]$ are the elements used to construct the principal components.

4. RESULTS

4.1. Descriptive Statistics Analysis
Table 1 presents descriptive statistics analysis of the research samples involves average numbers and standard deviations.

The statistical results show that the DSP evidently correlates with the mode of management; specifically, the DSP is very high in areas where family enterprises account for a large proportion, while very low in the areas where the enterprises managed by professional managers account for a large proportion (for example, Taipei city and Science Park). The IDN of enterprises in the Science Parks is obviously higher than that in other districts, which correlates with the characteristics of the hi-tech electronic industry. The SED of the enterprises in the non-metropolitan areas is higher than that in the metropolitan areas. For enterprises in the metropolitan areas and a short distance from high-speed railway stations, the

CS proportion is relatively high. This shows that such enterprises are good at gaining the corporate control right by means of CS.

4.2. Stepwise Multiple Regression Analysis

When stepwise multiple regression analysis is conducted in light of the urban-rural differences under hypothesis 1 and differences of traffic convenience under hypothesis 2, office locations are replaced with dummy variables. In order to prevent multicollinearity, one of the dummy variables (the enterprises in other districts of the non-metropolitan areas under hypothesis 1 and the enterprises with a distance of more than 30 km from high-speed railway stations under hypothesis 2) is removed from the analysis. According to the Tables 2 and 3 multiple regression model, both hypotheses are statistically significant (<0.05) in terms of office locations with a difference between the different areas. This shows that corporate business performance will be influenced by locational factors. All corporate governance variables under both hypotheses are statistically significant, which shows that the quality of corporate governance is of great concern to corporate business performance.

4.3. Multivariate Analysis

Multivariate analysis is used to analyze whether the quality of corporate governance varies significantly with locational factors. If the level of significance reaches 0.05, Scheffe test is conducted for post hoc comparison.

The multivariate analysis on hypotheses 1 and 2 involves four types of multivariate statistics: Pillai's tracking value, Wilks' Lambda (λ) value, Hotelling's tracking value, and Roy's maximum root value. The (P = 000) of the significant difference test of them are all smaller than 0.001; the level of significance (0.05) is reached, and the centroid difference is significantly evident. This shows that there is a significant difference between various office locations in terms of the average number of at least one dependent variable in the difference comparison for the dependent variables of corporate governance.

Table 4 presents Scheffe test is used for the single-factor and multivariate analysis of variance regarding the two hypotheses. The results of post hoc comparison in Tables 5 and 6 are summarized as follows: Discussion of the urban-rural differences: There is a significant difference between the various areas in terms of DSP, SED, and IDN; there is a significant difference between enterprises in other districts of non-metropolitan areas and enterprises in other areas in terms of DPP and CS. Discussion of the differences in traffic convenient: There is a significant difference between various areas in terms of DSP, IDN, and CS, while there is no significant difference between them in terms of SED. Metropolitan areas versus non-metropolitan areas: (1) Taipei city, (2): Taichung city, (3) Kaohsiung city, (4) Science Park, (5) other districts of the non-metropolitan areas.

Distance to high-speed railway stations: (1) 0-10 km, (2) 11-20 km; (3) 21-30 km; (4) at least 31 km

4.4. Principal Component Analysis

Principal component analysis is used to extract the common factors for factor analysis. The number of common factors depends on

whether the eigenvalue is >1. As a result, three principal factors are selected in total to account for 63.279% of total variance. To discuss the influence of locational factors on corporate governance, this paper converts the extracted reliability into the validity of corporate governance performance indexes, and determines the weight of each corporate governance index accumulatively. According to hypothesis 1, this paper determines that enterprises in metropolitan areas are superior to those in non-metropolitan areas in terms of corporate governance (Table 7). According to hypothesis 2, this paper determines that enterprises that are closer to high-speed railway stations exhibit better quality of corporate governance (Table 8). The findings are consistent with the expected results.

5. CONCLUSIONS

This research is intended to probe the correlation between the office locations, corporate governance, and business performance of Taiwan's enterprises. The research findings are summarized as follows:

1. Empirical results show that the business performance of Taiwan's enterprises positively and significantly correlates with their corporate governance mechanisms, which is consistent with the expected argument of this research. Specifically, the better the corporate governance is, the better the business performance, which is also consistent with the research findings obtained by other scholars.

2. Empirical results show that under a specific corporate governance mechanism, various locational factors (including urban-rural differences and traffic convenience) significantly correlate with business performance. Specifically, corporate business performance varies significantly among Taiwan's different areas.

3. Empirical results show that various locational factors (including urban-rural differences and traffic convenience) correlate with the quality of corporate governance significantly. Specifically, the quality of corporate governance varies significantly with the locational conditions.

4. Empirical results show that the quality of corporate governance of enterprises in the metropolitan areas is higher than that of the enterprises in the non-metropolitan areas. Furthermore, the quality of corporate governance of the enterprises close to high-speed railway stations is higher than those that are further away from such stations. This shows that the differences in spatial locations will influence the mentality, ideas, and decision-making of enterprises' top managements. For example, it is difficult for the government to regulate a relatively remote enterprise. Its shareholders cannot manage their business status from time-to-time due to the long distance. In the absence of government regulation or shareholders' supervision, a negative effect is produced on the managers. The managers may fail to work hard or seize personal power at the expense of the benefits of minority shareholders, thus degrading corporate governance and business performance.

Finally, this paper gives the following suggestions for subsequent research:

1. The industrial sectors in question may be subdivided to discuss whether the quality of corporate governance would be influenced by different industrial sectors and locational factors.

2. Taiwan is not a large region, which may restrict further possibilities of differences, although the differences in locational factors bring about significant differences in the quality of corporate governance. Subsequent research may be extended to the Chinese Mainland or European and American countries. This would make the regional differences more significant, thus possibly leading to different results.

3. In the current research, the pointer variables of corporate governance mainly focus on the equity structure and structure of the board of directors. Considering the difficulty in data acquisition, subsequent research may incorporate the pointers on transparency of information disclosure and the indexes of enterprise social responsibility. This would, thus, cover as many indexes of corporate governance performance as possible.

REFERENCES

An-Lin, C., Yi-Kai, C., Lan-Fen, G. (2013), Study of equity pledge by directors and supervisors and corporate governance. Sun Yat-Sen Management Review, 1(21), 299-337.

Armstrong, R. (1972), The Office Industry: Patterns of Growth and Location. Cambridge, MA: MIT Press.

Claessens, S., Djankov, S., Lang, L. (2000), The separation of ownership and control in East Asia corporations. Journal of Financial Economics, 58, 81-112.

Cheng-En, K. (2000), Problems and suggestions for improvement regarding Taiwan's corporate supervision system. Accounting Research Monthly, 173, 75-81.

Dalton, D.R., Kesner, I.F. (1987), Composition and CEO duality in boards of directors: An international perspective. Journal of International Business Studies, 18, 33-42.

Dimmick, J., Rothenbuhler, E. (1984), The theory of the niche: Quantifying competition among media industries. Journal of Communication, 34(1), 103-119.

Epps, R.W., Cereola, S.J. (2008), Do institutional shareholder services (ISS) corporate governance ratings reflect a company's operating performance? Critical Perspectives on Accounting, 19(8), 1135-1148.

Ertugrul, M., Hedge, S. (2009), Corporate Governance Ratings and Firm Performance. Financial Management, 38(1), 139-160.

Fama, F.E. (1980), Agency problems and the theory of the firm. Journal of Political Economy, 88(2), 288-307.

Holloway, S.R., Wheeler, J.O. (1991), Corporate headquarters relocation and changes in metropolitan corporate dominance, 1980-1987. Economic Geography, 67(1), 54-74.

Huson, M.K., Malatesta, P.H., Parrino, R. (2004), Managerial succession and firm performance. Journal of Financial Economics, 74(2), 237-275.

Jhao-Lan, W., Yi-Jhong, S., Wei-Chu, S. (2008), Evaluation of efficiency and productivity of local governments in Taiwan. Public Administration and Policy, 84, 71-120.

Jhu-San, W., Ya-Syue, J., Jin-Fu, G. (2009), Correlation between corporate governance, investment and corporate value. Soochow Journal of Economics and Business, 66, 69-114.

Klapper, L.F., Love, I. (2004), Corporate governance, investor protection, and performance in emerging markets. Journal of Corporate Finance, 10(5), 703-728.

Liang-Jie, S. (2013), A Study of Entrepreneurial Performance of Micro Enterprises around Neihu Science Park, Master's Thesis of the Institute of Business Administration in the Private China University of Technology.

Ming-Yi, H., Jin, E.J. (2000), Location Selection for the Enterprise Headquarters in Different Sectors. Chinese Society of Housing Studies, Collected Papers of the 9th Annual Meeting. p477-491.

OECD. (2015), OECD Principles of Corporate Governance. Available from: http://www.oecd.org/corporate.

Pivo, G. (1993), A taxonomy of suburban office clusters: The case of Toronto. Urban Studies, 30, 31-49.

Rajan, R.G., Zingales, L. (1998), Which capitalism? Lessons from the East Asian crisis. Journal of Applied Corporate Finance, 11(3), 40-48.

Rubin, P. (1978), The theory of the firm and the structure of the franchise contract. Journal of Law and Economics, 21, 222-233.

Ruei-Jhao, D., Huei-Cin, W., Guo-Siou, H. (2008), A discussion of population and employment from a perspective of regional economy: Empirical analysis of Taiwan's Urban and rural areas. Chinese Journal of Management, 3(9), 69-85.

Siao-Lin, Y. (2012), The Influence of Geographical Locations upon the Quality of Board of Directors, Master's Thesis of the Institute of Finance in the National Yunlin University of Science and Technology.

Shilton, L., Stanley, C. (1999), Spatial patterns of headquarters. Journal of Real Estate Research, 17(3), 341-364.

Shleifer, A., Vishny, R. (1997), The limits of arbitrage. Journal of Finance, 52, 35-55.

Shleifer, A., Vishny, R. (1986), Large shareholders and corporate control. Journal of Political Economy, 94(3), 461-488.

Veliyath, R. (1995), Top management compensation and shareholder returns: Unravelling different models of the relationship. Journal of Management Studies, 36, 23-143.

Weber, A. (1909), Theory of the Location of Industries. Translated by Friedrich C.J. (1929). Chicago: University of Chicago Press.

Wei-Jhou, H. (2006), Economic Geography. Taipei: Soochow University Press.

Yin-Hua, Y., Cun-Siou, L., Cheng-En, K. (2002), Corporate Governance and Rating System. Taipei: Business Brain.

Yin-Hua, Y. (2015), Corporate Governance: Case and Analysis Mode. Taichung: Tsang Hai Publishing House.