



The Study of the Board Composition, Human Capital and Economic Value Added: An Empirical Study on Taiwan High-technology Industries

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Abstract

Board composition has gradually become a focal point in corporate governance research. Among others, director characteristics affecting firm performance are of prime interests (Ghosh, 2006). Krivogorsky (2006) suggests that the higher proportion of external director, the more independence, the better the corporate performance. Mak and Kusnadi (2005) discover that board size is negative related to corporate performance. Colley, Doyle, Logan and Stettinius (2003) find that independent of director, scale of board of directors, chairman holds dual position as general manager and the stock holding of board directors are important factors affecting corporate stock price, corporate maturity and corporate performance. Due to the agency problem between the managers and directors, ideal board composition and human capital policy are vital to value creation for a firm. To measure the performance of business operating, we use three economic value added (EVA) measures: EVA1 is economic value added without equity equivalent adjustments, EVA2 is economic value added with the equity equivalent adjustments, EVA3 is economic value added with the adjustment and economic depreciation. The sample of this study includes 72 firms of Taiwan high-technology industries from 1996 to 2005, and we use the multi-regression analysis to test the relationship between board composition, human capital and economic value added. The empirical results show that (1) the characteristic of board composition has significant relationship with the creation of economic value added on high-technology industries, (2) human capital is significantly related to EVA creation in high-technology industries, (3) adding human capital variables, the characteristic of board composition have more powerful to explain economic value added on high-technology industries.

Key words: Board composition; Intellectual capital; Economic value added

1. Introduction

Failed corporate governance is the single most important factor for corporate crisis. While establishing a good overseeing mechanism, corporate board is the organization responsible for talented recruiting and systems building. Therefore, good corporate governance must start with board composition and board composition.

Lajili and Zéghal (2006) indicated the company which has high labor cost information exposure, its market value and operating performance will greater than the company which has low information exposure. Huang (2002) found that the human resources management has significant relationship with organization performance, and the human capital management is most comprehensive affect the organization performance. Another key point of this research is intangible human capital invested by all company's employees whether can transform into corporate operating performance.

Traditional performance measurement focus only

on financial performance measurement. Financial indexes are lag indicators reflect only past operating performance. They report on achievement but neglect strategic activities that create long-term and future value, thus unable to appreciate the potential benefits from intangible asset. Therefore, on considering performance measurement indicator, this research chooses the economic value added, because it not only explore the essence of traditional financial performance but also the benefit of corporate intangible asset.

From the viewpoint of agency theory, board characteristic of will affect agency cost, corporate performance and corporate survival. But how to let right person to do right things in the enterprise depends on the perfect management and the monitoring system. So the corporate governance is an important guarantee that all talented people and the resources will be best utilized. Therefore, this research based on core resources from the enterprise— corporate governance and human capital, discusses the relationship of board composition, human capital and EVA under the perspective of corporate governance.

2. Literature Review

2.1 Board Composition and Corporate Performance

Corporate governance is one form of structure and authority. On enterprise's viewpoint, the corporate governance is a set of surveillance examines system to guide and control company, corporate governance structure should be to promote market transparent and effectiveness, to establish the uniform law, and clearly showing surveillance, controls and carries out responsibility division of labor between the power and responsibility unit's, to achieve the goal of corporate value maximization. On financial viewpoint, to surveillance its organization activities effective can prevent management malpractice of illegal activity, to realize the high goal of enterprise community responsibility (World Bank, 1999; OECD, 2004).

Jensen and Meckling (1976) advocated that the stockholder's rights are more centralized in the management, will have enough voting right or influence power to guarantee its own benefit, and will cause the corporate value reduction. Moreover, Navissi and Naiker (2006) pointed out that high percentage of share held by management, who will have enough voting right to seek after the personal gain, and harms the corporate value. Chiang (2005) also pointed out that high percentage of share held by CEO, management and the highest management, who will favor carries on personal gain behavior, and has negative relationship with corporate performance. So we can inference when the percentage of share held by management is higher, the agency question is more serious, and the situation of information non-symmetry is more serious.

Farrell and Whidbee (2000) thought that independent director holds stocks is easy to be consistent with shareholder's benefit, and easy to play a role who supervises management's duty. Chiang (2005) also pointed out that company has more independent directors, it will has better overall performance.

When the proportion of outside directors to be higher, the correlation of board composition and independence is bigger, the corporate performance will be better (Krivogorsky, 2006 ; Ghosh, 2006). Weisbach (1988) and Balotti and Elson (2000) all thought that the percentage of outside directors is higher, the board of directors have more surveillance ability to management, and the possibility of company corrupts will be lower (Beasley, 1996), so can increase corporate operating performance. Other empirically studies also found that the percentage of outside directors is higher, the wages of management is lower (Xie, Davidson & DaDalt, 2003), and its statement will expression steadily. Another, independent director's existence can affect certain scopes of decision-making of board of directors, like to dismissal CEO who has no performance

(Weisbach, 1988). Dechow, Sloan and Sweeney (1996) found that if company's board of directors controlled by management, the independence is lower, Securities and Exchange Commission (SEC) will even more pay attention to and supervises this company.

Donaldson and Davis (1991) indicated that chairman holds a concurrent position of general manager can eliminate non-asymmetry information, which will increase benefit of investment of shareholder (market value of stock). When chairman and general manager for identical person, that can eliminates situation of non-symmetry information, and lets general manager based on own benefit to do his best of corporate operating performance. Chen and Huang (2005) thought that chairman holds a concurrent position of general manager can increase creation of shareholder value added, because chairman holds a concurrent position of general manager's dual roles can let decision-making quickly.

Kiel and Nicholson (2003) indicated that the less organization investor shareholder has specialized knowledge, technology and information obtains is easy than little shareholder, which more supervision management need, and its pays for surveillance cost also lower than little shareholder, therefore, organization investor's existence may reduce agency question between shareholder and management, and then can enhance corporate performance. The organization investor can more effective monitoring management, because they can use more control power to supervise management, and exerts pressure to management to force them to make well decision to corporate (Navissi & Naiker, 2006). Therefore, we can inference that proportion of stocks held by organization legal person is higher, the agency cost will reduce, and the degree of non-asymmetry information will slow down (Karathanassisa & Drakos, 2004).

Colley, Doyle, Logan and Stettinius (2005) indicated that the typical company, board of directors is composed of 8-16 directors, and in large or mature company, which has more directors, the small company has few directors. However, the goal of board of directors is embrace each kind of talented person to deals with each subject effectively which the enterprise faces. Small scale of board of directors has more sense of participation, the focal point is also explicit, directors each other has trust, and also easy to cooperate, but the shortcoming is easy to control by some authority persons or factions. Jensen (1993) and Lipton and Lorsch (1992) pointed out that scale of board of directors is become bigger, board of directors will change inefficiency by the questions of communication and procedure, even if more people participation still had its profit, but the cost will be bigger.

Beasley (1996) advocated that the scale is smaller, the board of directors is not easily to control by management, thus will easily to display the surveillance function. Barnhart and Rosenstein (1998) indicated that scale of board of directors has negative relationship with Tobin's Q. Eisenberg, Sundgren and Wells (1998) empirically found that scale of board of directors has negative relationship with corporate operating performance. Mak and Kusnadi (2005) and Ghosh (2006) discovered that scale of board of directors has negative relationship with corporate operating performance.

2.2 Human Capital and Corporate Performance

Knight (1999) pointed out that the human capital is the most common item for related composition project. Han and Chen (2006) indicated that people is the most core foundation resources of organization. Human capital comes from individual employee ability, specialized technology, intelligence and ability and loyalty of staff (Mayo, 2001 ; Edvinsson and Malone, 1997). Roos, Edvinsson and Dragonetti (1998) thought that person contact each other and relations, and individual qualities, as prestige, experience, manner and judgment, and obtain knowledge to be able to increase the productive forces, namely as human capital. On the other hand, relatively individual employee, Edvinsson et al. (1997) and Roos et al. (1998) all thought that knowledge, skill and experience of management also have strong character. Another, Fitz-enz (2000) pointed out that human capital is an aggregate of working ability of individual and organization.

Besides employees and directors must have specialized knowledge, members of board of directors also need to have specialized knowledge. Two most important responsibilities of board of directors are surveillance company's long-term operating strategy and select company's high-level management. Directors except to maintain own independence, and duty of best supervisor, himself should also have certain specialization, experience and knowledge (Bhagat & Black, 1999). Hope to monitor and management company effectively, and promote corporate performance.

Huang (2002) thought that the human resources management will be helpful in promote organization to attract, encourage, remaining employee in office and ability develop by employee, or promotes organization to study, organization approval and strategy execution potency. Internal potency's promotion will become resource base of organization to mold organization competitive advantage, which will promote market performance (Chen and Lin, 2002 ; Widener, 2006). This market competitiveness promotion finally reflects in increasing financial performance (Wang and Chang, 2004).

Quantification human capital is not a simple matter, because human capital information is predominately qualitative. For measuring human capital reasonably and truly, people measure know-how, education standard, specialized license, specialized knowledge, specialized gauge capacity, psychological judgment ability, work competence ability, entrepreneur's business center of figure, perspective strength and reaction capacity (Fitz-enz, 2000; Han and Chen, 2006). Agent variable of measure human capital mostly use homogenization target, as employee's age, specialized period of service, education level and rate of employee flow (Grossman, 2000; Edvinsson et al., 1997).

Widener (2006) finds that human capital as regards CEO's salary has positive relationship with enterprise growth. Lajili and Zéghal (2006) finding that human capital disclosure(average contribution operating income per employee, average marginal product per employee, average each unit manpower cost have to produce marginal benefit, employee salary and related expenditure) has positive relationship with market value (market price per share at the end of year multiplied by number of outstanding stocks) and performance (book value).

2.3 Economic Value Added

The Economic Value Added (EVA) model was an indicator broached by Stern Stewart & Co.. Under the EVA approach performance measurement gains a new meaning in contrast with the traditional approach which is merely based on the simple notions of accounting profits. EVA's concept come from Residual Income (RI) that is one financial quantification indicator of measure corporate operating performance, is developed by Stern Stewart & Co. finance consultant firm, and gives to register registration for patent EVA. Stewart (1991) made definition of EVA that EVA is a firm's net operating profit after taxes (NOPAT) less the cost of invested capital (equity and debt), was equal to return of invested capital less the cost of capital, then multiplied by invested capital.

Stewart (1991) thought that traditional profit ability indicator according to generally accepted accounting principles (GAAP), is under conservative principle of accounting, twisted company's real return. Accounting statement is based on accrual basis, not cash basis. The subject need to adjust accounting book value to economical book value, which avoid the latent information misinterprets create by GAPP, namely as reserve for equity equivalent. The goal of accounting adjustment is mainly because people develop the EVA to think the financial information obtained by GAAP to be often unable to express the true financial circumstance, therefore, two item of earning before interest after tax, after the earnings and operating capital must

to undergo the adjustment, then we can use to calculate EVA.

The research reference studies of Stewart (1991), Savarese (2000) and Young and O'Byrne (2001) to induces important accounting adjustment item, such as reserve for LIFO inventory, reserve(such as allowance for uncollectible accounts - accounts receivables, allowance for uncollectible accounts- accounts receivable, allowance for uncollectible accounts - overdue receivables, allowance for uncollectible accounts-other receivables, allowance for reduction of inventory to market, allowance for reduction of short-term investment to market, allowance for reduction of long-term investment to market), deferred income tax, operating lease, goodwill, research and development expenses, selling expenses, amortization of intangible asset, depreciation expense, gain (loss) from disposal of discontinued segments.

The study of Ferguson, Rentzler and Yu (2005) use 65 companies of Stern Stewart EVA to discuss that when company implements EVA whether to be helpful promote the stock price, its findings that stock price of the company implements EVA is higher than same business's mean value.

3. Research Method

3.1 Hypothesis

Barnhart and Rosenstein (1998), Ghosh (2006), Krivogorsky (2006) and Mak and Kusnadi (2005) use traditional accounting performance indicators, such as return on assets (ROA), earnings before interest and tax (EBIT), return on equity (ROE), earnings per share (EPS), return on investment (ROI) to measure each factor of board composition to influence corporate operating performance. But these traditional operating performance measurement indicators can not measure the future company intangible assets and the future value. Performance measurement of the EVA is titled the key point for the wealth created by enterprises, if the company can succeed using the EVA replaces other performance measurement indicators that will bring the greatest benefit for the company. Studies of Machuga, Pfeiffer and Verna (2002), Griffith (2004), and Ferguson, Rentzler and Yu (2005) indicated that EVA is a better measurement indicator than traditional financial and accounting indicators in measuring corporate operating performance and corporate value. So the first hypothesis is:

H1 : *The characteristics of board directors are highly related to the EVA*

Widener (2006) finds that human capital in regarding to CEO's salary has positive relationship with enterprise growth. Lajili and Zéghal (2006) find that human capital disclosure (average contribution operat-

ing income per employee, average marginal product per employee, average each unit manpower cost have to produce marginal benefit, employee salary and related expenditure) has positive relationship with market value (market price per share at the end of year multiplied by outstanding stocks) and performance (book value). So the second hypothesis is:

H2 : *Human capital is highly related to the EVA*

To comprehensive H1 and H2, this study want to probe into joins the human capital variable, the characteristic of board of directors whether have more powerful to explain EVA. Develop the third hypothesis is:

H3 : *Joins the human capital variable, the characteristics of board directors have higher explanatory power in explaining EVA*

3.2 research Variables and Variables Definition

3.2.1 Dependent Variables

The dependent variable in this study is EVA, that measure incremental value created by corporate operating activities, and calculate by definition of Stewart (1991) and Savarese (2000). The accounting items of reserve for equity equivalent need to be adjustment, we reference the adjustment items that bring up by Stewart (1991), Savarese (2000) and Young and O'Byrne (2001), and considers in Taiwan's public instruction booklet annotation has limited explanation of the related variable, therefore, we make the uniform adjustment for accounting items that obtained by TEJ, such as research and development expenses, selling expenses and reserves. The model of EVA as follows:

$$EVA = NOPAT - (WACC \times IC)$$

Where NOPAT = net operating income (sales revenue - cost of goods sold - operating expenses) ± non-operating revenue and expenses - corporate income tax + items of equity equivalent

WACC = the cost of liability capital × the percentage of liability capital to total capital × (1 - tax rate) + the required return of common stock equity × the percentage of common stock equity to total capital

IC = total asset - liability with no interest + items of equity equivalent. Where, liability with no interest include accounts payable, notes payable, accrued expenses, advance receipts, other payables, income taxes payable and other current liabilities; items of equity equivalent include research and development expenses, selling expenses, deferred income tax, appraisal items of investment, allowance for reduction of

inventory to market, allowance for uncollectible accounts

This study reference Savarese (2000) use three methods to calculate the EVA.

EVA1 : economic value added without the adjustment items of equity equivalent

Where $NOPAT = \text{operating income} - \text{tax}$

$IC = \text{total asset} - \text{liability with no interest}$

EVA2 : economic value added with the adjustment items of equity equivalent

Where $NOPAT = \text{operating income} - \text{tax} + \text{items of equity equivalent}$

$IC = \text{total asset} - \text{liability with no interest} + \text{items of equity equivalent}$

items of equity equivalent = adjustment items of research and development expense, selling expense, allowance for uncollectible accounts, allowance for reduction of inventory to market and appraisal items of investment

EVA3 : economic value added with the adjustment items of the economic depreciation

Where $NOPAT = \text{operating income} - \text{tax} + \text{items of equity equivalent} \pm \text{adjustment items of the economic depreciation}$

$IC = \text{total asset} - \text{liability with no interest} + \text{items of equity equivalent}$

adjustment items of the economic depreciation : if economic depreciation based on annuity method greater than depreciation expense of accounting books, then less adjustment items of the economic depreciation ; Otherwise, then adds on adjustment items of the economic depreciation

reserve for equity equivalent = adjustment items of research and development expense, selling expense, allowance for uncollectible accounts, allowance for reduction of inventory to market and appraisal items of investment

adjustment items of the economic depreciation = economic depreciation of the year - depreciation expense of accounting books at the same year

2. Independent Variables

(1) Board composition and characteristic

the percentage of independent directors (BDIDP) : the percentage of independent directors is the percentage of number of directors,

who is the natural shareholder, who does not hold a concurrent position of the management of the company, does not direct or indirect hold 1% above published stocks, not legal person or its representative, and have no benefit relationship with corporate controller, to number of total persons of board of directors.

the scale of board of directors (BDS) : the scale of board of directors is numbers of total persons of board of directors

the chairman whether holds a concurrent position of general manager : dummy variable that takes the value 1 if the chairman holds a concurrent position of general manager, and takes the value 0 if the chairman not holds a concurrent position of general manager.

the percentage of share held by board of directors (BDSHARE) = number of shares held by directors \div number of outstanding stocks

(2) Human capital

the percentage of the employees who had graduated from university and college(include master and doctor degrees) (EPEG) = number of employees who had graduated from university and college (include master and doctor degrees) \div number of total employees

the average years of service of employees (EPAY) : the average years of service of all employees

the average age of employees (EPAGE) : the average age of all employees

the human capital return on investment (HCROI) = [revenue - (expense - payroll expense and employee benefits/welfare)] \div payroll expense and employee benefits/welfare. Where, revenue = net operating revenue + non-operating revenue; expense = operating costs + operating expenses + non-operating expenses; payroll expense and employee benefits/welfare = labor cost, include payroll expense, insurance expense, retirement benefit, meal expenses, employee benefits/welfare, other labor cost.

3.3 The Sample and Data Sources

Study object of this research for Taiwan listed companies. enters and is stationed in the campus important document Based on OECD definition for high-technology industries, and the scientific and technical park establishment rule and the manufacturer regarding the high-technology industries, selects the high-technology industries (electric-wire electric-cable in-

dustry, mechanical and electrical industrial, chemistry industry and information electron industry) for the research sample. The sample selected over the period 1996-2005, hope by elongates the sample selection time to eliminates the boom-and-bust to produce leaning to the findings harms. In order to consider integrity of the sample, if company listed after 1996, or had the financial crisis, the sum total to finalize and under the listed before 2005, we eliminated it. Another check the ratio of research and development expenses to the earning for each listed companies, then found that 6 companies are not OECD definition high-technology industries, which the ratio of research and development expenses to the earning of 2005 were bigger than the ratio of the national research and development expenses to the GDP in 2005, therefore, this study integrates these 6 companies. A sample of this study is 72 companies. The scale of board of directors, independent of board of directors, the chairman holds a concurrent position of general manager and the scale of company information were obtained from TEJ database. Human capital of board of directors and EVA information was obtained from TEJ database and company annual reports.

4. Empirical Results

4.1 Descriptive Statistics

Table 1 reports descriptive statistics among all variables. Make the preliminary analysis for sample, which collect, computation and reorganization of this study, found that Taiwan high-technology industries can gain positive EVA only 23.15-35.42% to total sample. And they can continue or average gain positive EVA in research period are also few.

There are average 7.56 persons of board of directors of the firms. There are average 18.15% of share held by board of directors of the firms. There are 10.41% independent directors of board of directors of the firms. That were pointed out that board of directors of Taiwan high-technology industries composes have the relative scale, but independent director of board of directors is not high. The chairman holds a concurrent position of general manager about 71.11% of the firms, expressed that rate of chairman holds a concurrent position of general manager on Taiwan high-technology industries is not high. Therefore, we may know corporate governance of the Taiwan high-technology industries need to promote. The average percentage of the employees who had graduated from university and college (include master and doctor degrees) is about 49%. The average years of service of employees are 7.08 years. The average age of employees is 34.66 years old. The results expressed that the high-technology industries need high quality manpower, but the employee's age generally is not high, this also

shows that technology crowded degree of the high-technology industries is very high, therefore, the relative average return of human capital investment also reaches as high as 44%.

Table 1. Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Dev.
EVA1	-35,876,941.04	61,697,109.94	-553,192.37	4,975,242.05
EVA2	-32,505,891.60	64,160,195.82	-350,188.15	5,156,241.17
EVA3	-19,084,001.27	117,324,887.37	469,870.36	7,960,198.42
BDIDP	0.00	0.60	0.10	0.13
BDS	3.00	20.00	7.56	3.53
BDGM	0.00	1.00	0.28	0.45
BDSHARE	0.03	0.58	0.18	0.10
EPEG	0.00	0.98	0.49	0.20
EPAY	0.50	18.00	7.08	3.27
EPAGE	24.60	45.16	34.66	3.71
HCROI	-16.37	18.87	0.44	3.35

4.2 Pearson Correlation

Table 2 reports Pearson correlations among all variables. This research uses the Pearson correlation coefficient analysis to examine all independent variables in each hypothesis model whether to have highly correlation. If the correlation coefficient of independent variables of the various models is bigger than 0.8, then meant that the relativity of independent variables of the various models is high, that will reduce the explanatory power of the independent variable to the dependant variable, then should delete the independent variable, which has weak explanatory power, from the model. The calculation of the correlation coefficient for these four models, the result demonstrated that the correlation coefficient of independent variables of various models is smaller than 0.8, therefore, we can indicated that relativity of independent variables of the various models is not high.

4.3 Regression Results

Table 3 reports multicollinearity among all variables. To make sure that multicollinearity between independent variables is not a problem in the regressions, I calculate tolerance and variance inflation factor (VIF) for all regression models. The tolerance value is between 0 and 1, and all VIF value are less than 10, indicating that multicollinearity is not a problem.

Table 4 was empirically analysis the relationship of the characteristic of board and EVA. The result found that adjustment under three EVA, all the portion of independent directors has positive relationship with EVA, the result is consistent with Ghosh (2006) and Krivogorsky (2006) that expressed if the portion of independent directors is higher, the EVA is higher. All scale of board of directors has negative relationship with EVA, the result is consistent with Mak and Kusnadi (2005) and Ghosh (2006) that meant the smaller

Table 2. Pearson Correlation

	BDIDP	BDS	BDGM	BDSHARE	EPEG	EPAY	EPAGE	HCROI
BDIDP	1.000							
BDS	.349	1.000						
BDGM	-.007	-.175	1.000					
BDSHARE	-.174	-.075	-.106	1.000				
EPEG	.017	-.051	.030	.079	1.000			
EPAY	-.048	.195	-.052	-.059	-.323	1.000		
EPAGE	-.106	-.056	-.001	-.064	-.247	.797	1.000	
HCROI	-.064	.036	-.104	.028	.196	-.082	-.161	1.000

Table 3. Multicollinearity

	EVA1		EVA2		EVA3	
	tolerance	VIF	tolerance	VIF	tolerance	VIF
BDIDP	.821	1.218	.815	1.227	.820	1.219
BDS	.702	1.424	.703	1.422	.700	1.428
BDGM	.936	1.068	.934	1.071	.927	1.078
BDSHARE	.942	1.061	.942	1.062	.943	1.060
EPEG	.829	1.206	.829	1.206	.830	1.205
EPAY	.281	3.564	.281	3.560	.283	3.539
EPAGE	.302	3.310	.302	3.315	.301	3.323
HCROI	.687	1.456	.681	1.469	.673	1.487

scale of board of directors can be helpful promotion in the EVA. All ratio of board of directors owns stocks has positive relationship with EVA, the result is consistent with Farrell and Whidbee (2000), that meant if the ratio of board of directors owns stocks is higher, the EVA is higher. In addition to use the EVA as dependent variable of three calculate method to observe explanatory power of the board of directors characteristic, found that the variable of the board of directors characteristic has the strongest explanatory power with EVA3.

Table 5 was empirically analysis the relationship of human capital and EVA. The result found that adjustment under three EVA, the percentage of the employees who had graduated from university and college (include master and doctor degrees) has positive relationship with EVA. The result is consistent with Vind-

ing (2006) and Ling and Jaw (2006), expressed that employee of the higher education has positive benefit to promote the EVA of the high-technology industries. The average years of service of employees has negative relationship with the EVA. The result is consistent with Uang, Wu and Ding (2004) that meant the years of service of employees has negative relationship with corporate value. The average age of employees has positive relationship with EVA. The result is consistent with Wang and Chang (2004), indicated that the age is higher meaning has the experience much and enriches, that can execute activities more effective, and also be helpful in the technology accumulates and promotes, then influence performance. The human capital return on investment has positive relationship with EVA, that result is consistent with Lajili and Zéghal (2006) and Widener (2006).

Table 4. The Relationship of the Characteristic of Board and EVA

	Coefficient	t	Probability	Coefficient	t	Probability	Coefficient	t	Probability
Intercept		-.402	.688		-.514	.607		-1.101	.271
BDIDP	.096	2.391	.017**	.065	1.600	.110	.076	1.877	.061*
BDS	-.152	-3.777	.000***	-.113	-2.796	.005*	-.024	-.596	.551
BDGM	.003	.077	.939	.030	.779	.436	.060	1.564	.118
BDSHARE	.119	3.156	.002***	.110	2.900	.004**	.094	2.459	.014**
F-value		6.391			4.443			269.366	
P-value		0.000***			0.001***			0.034**	
R ²		0.035			0.025			0.015	
adjusted R ²		0.029			0.019			0.009	
N(observations)		710			710			710	

*, **, *** denote significance at the 10%, 5% and 1% levels, respectively

Table 6 was empirically analysis that joins the human capital variable, the characteristic of board composition have more powerful to explain EVA. In addition to use three EVA (EVA1, EVA2 and EVA3) as dependent variable, simultaneously joins the board composition variable, the human capital variable and value drive variable to analysis, the result found that

three models has significant at the 0% significance level. And adjusted R² prompt to 46.8%, 58.3% and 76.6%, separately, which indicated that joins the human capital variable, the characteristic of board composition have more certainly powerful to explain EVA. The result is consistent with Widener (2006) and Vinding (2006).

Table 5. The Relationship of Human Capital and EVA

	Coefficient	t	Probability	Coefficient	t	Probability	Coefficient	t	Probability
Intercept		-4.247	.000***		-3.745	.000***		-0.086	.932
EPEG	.177	4.745	.000***	.187	5.112	.000***	.138	3.688	.000***
EPAY	-.132	-2.219	.027**	-.127	-2.175	.030**	-.054	-0.898	.369
EPAGE	.185	3.182	.002***	.158	2.766	.006***	-.012	-.204	.839
HCROI	.319	8.895	.000***	.355	10.094	.000***	.308	8.537	.000***
F-value		31.885			40.26			29.39	
P-value		0.000***			0.000***			0.000***	
R ²		0.154			0.186			0.144	
adjusted R ²		0.149			0.181			0.139	
N(observations)		704			704			704	

*, **, *** denote significance at the 10%, 5% and 1% levels, respectively

Table 6. Joins the Human Capital Variable, the Characteristic of Board Composition Have More Powerful to Explain EVA

	Coefficient	t	Probability	Coefficient	t	Probability	Coefficient	t	Probability
Intercept		-3.104	.002***		-2.928	.004***		-.457	.648
BDIDP	.123	3.258	.001***	.090	2.419	.016**	.092	2.413	.016**
BDS	.108	3.052	.002***	.095	2.744	.006***	.079	2.211	.027**
BDGM	-.146	-3.610	.000***	-.105	-2.622	.009***	-.032	-.766	.444
BDSHARE	.032	.919	.359	.059	1.687	.092*	.083	2.321	.021**
EPEG	.172	4.654	.000***	.180	4.959	.000***	.129	3.461	.001***
EPAY	-.044	-.696	.487	-.061	-.977	.329	-.033	-.520	.603
EPAGE	.129	2.101	.036**	.117	1.939	.053**	-.014	-.228	.820
HCROI	.332	9.289	.000***	.368	10.448	.000***	.326	8.986	.000***
F-value		19.803			22.855			16.68	
P-value		0.000***			0.000***			0.000***	
R ²		0.186			0.208			0.161	
adjusted R ²		0.176			0.199			0.151	
N(observations)		703			703			703	

*, **, *** denote significance at the 10%, 5% and 1% levels, respectively

Table 6 was empirically analysis that joins the human capital variable, the characteristic of board composition have more powerful to explain EVA. In addition to use three EVA (EVA1, EVA2 and EVA3) as dependent variable, simultaneously joins the board composition variable, the human capital variable and value drive variable to analysis, the result found that three models has significant at the 0% significance level. And adjusted R² prompt to 46.8%, 58.3% and 76.6%, separately, which indicated that joins the human capital variable, the characteristic of board composition have more certainly powerful to explain EVA. The result is consistent with Widener (2006) and Vinding (2006).

5. Conclusion

As a result of change of the resource base theory ideological, that caused the ponder pattern from outside “the environment - strategy” to change inward “the organization resources – strategy.” In particular the basic characteristic (has high crowded of research and development, knowledge -intensive, the capital denseness and the risk of marginal benefit) of the high-technology industries, deepened the relationship between the enterprise interior resources assignment decision-maker (board composition), the internal resources performer (human capital) and the corporate operating performance (EVA).

This research empirically result found that the percentage of independent directors and the percentage of share held by board of directors have significant positive relationship with EVA, the scale of board of directors has significant negative relationship with EVA, therefore, we can deduce that the board composition characteristic has high relationship with the creation of the EVA on high-technology industries. The percentage of employees who had graduated from university and college (include master and doctor degrees), the average age of employees and the human capital return on investment have significant positive relationship with the EVA, the average years of service of employees has significant negative relationship with the EVA, therefore, we can deduce that human capital has high relationship with the creation of EVA on high-technology industries.

The previous research only considered that the influence of corporate governance to corporate value and the relationship, or the influence of intelligence capital to corporate value and the relationship, like the research of Du, Huang and Lin (2002) was study the influence of the board of directors characteristic to operating performance and the financial decision-making. Huang (2002) further pointed out that the human resources management will be helpful in promotes the organization to attract, drive, the remaining in of-

office employee and the ability of the employee development, or promotes the organization to study, the organization approval and the strategy execution potency. Therefore, this research further empirical analysis that joins the human capital variable, the characteristic of board composition whether have more powerful to explain EVA. The result is affirmative, expressed that the human capital has ability to executive competition strategy that choice by board of directors, and assists decision-making of the board of directors to increase creation of the corporate value.

Moreover, EVA is a better indicator in the measurement of corporate value. Previous researches, such as Griffith (2004) and Ferguson, Rentzler and Yu (2005), did not consider adjustment of the economical depreciation. This research reference Savarese (2000) to use annuity method computation the influence of economy depreciation, simultaneously considered that the relationship between the board composition, the human capital and three EVA (EVA1, EVA2, and EVA3). The result found that adjustment R² are the highest of regression model of use EVA3 as the dependant variable that meant EVA3 most to be able to represent corporate value and operating performance. Its reason is the high-technology industries most use the accelerated depreciation method to amortize the depreciation expenses that are not real representing the efficiency of use of property. After calculates, the average EVA3 on high-technology industries is \$469,870,360, and EVA1 and EVA2 are -\$553,192,370 and -\$350,188,500, respectively. We find that in Taiwan high-technology industries, besides maintenance good talented person quality and the control system, also often maintain the innovation and the renewal of the research and equipment, to maintain the international competitiveness.

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