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Performance Evaluation for 59 Listed Electronic Corporations in Taiwan

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Abstract

Most previous studies concerning company performance evaluation focus merely on operational efficiency. Operational effectiveness, however, which might directly influence the survival of a company is usually ignored. As a result, this paper presents a study which uses an innovative two-stage data envelopment analysis (DEA) model that separates efficiency and effectiveness to evaluate the performance of 59 Listed corporations of the electronics industry in Taiwan. The empirical result of this paper is that a company with better efficiency doesn't always mean that it has better effectiveness. There is no apparent correlation between these two indicators.

Key Words: Performance Evaluation; Data Envelopment Analysis (DEA); Electronic Industry

1. Introduction

Data envelopment analysis (DEA) is a mathematical programming approach for characterizing the relationships among multiple inputs and multiple outputs. There is a wealth of literature on both basic and applied research in DEA. Since the DEA model was proposed by Charnes, Cooper, and Rhodes in 1978[3], it has been widely used in non-profit organizations. Since then, numerous applications have appeared in profit organizations, such as the banking industry (see [21] [17] [6]), securities (see [12]), insurance (see [13]), medical services (see [10]), real estate brokerage (see [4]), construction (see [5]), the mutual fund industry (see [22] [14]), the airline industry (see [11] [18]) and so on. But, most previous studies concerning company performance evaluation focus merely on operational efficiency. Operational effectiveness, however, which might directly influence the survival of a company is usually ignored. As a result, the paper attempts to evaluate the company performance in terms of efficiency and effectiveness.

This purpose of the paper is to construct a conceptual framework, based on the return on assets, a ratio commonly discussed in financial analysis, to define the meanings of performance. Besides, the paper uses a recently developing model of data envelopment analysis proposed by Cooper, Seiford and Tone in 2000 [7].

The remainder of the paper is organized as follows. Section 2 defines the meanings of efficiency, effectiveness and performance and its evaluation process. Section 3 describes the DEA methodology. Finally, a case study is conducted using the example of Taiwan's 59 listed corporations of electronics industry.

2. Evaluation Process

2.1 The Meanings of "Efficiency", "Effectiveness" and Performance"

Most scholars define performance as the degree of achievement towards the set goal. However, some suggest differently. The following are some suggestions on the meaning of performance from a variety of literature:

(1). Management guru Peter Drucker (1963) [9] uses efficiency and effectiveness in analyzing performance, defining efficiency as "doing things right" and effectiveness as "doing the right thing". If a manager maximizes the output for a given level of input, we could say that he has achieved efficiency. On the other hand, we could say that he achieves no efficiency. Effectiveness refers to the degree of achieving the set goal of the organization. In order to avoid " doing the right things using the right method or the wrong method", enterprises need to distinguish between effectiveness and efficiency. In principle, effectiveness should be set as the primary goal, from which efficiency is enhanced.

(2). Venkatraman and Ramanujam (1986) [23] look into the issue from the perspective of strategic management. They suggest that business performance is a part of organizational effectiveness, and proposed three levels of performance evaluation, namely: (i) financial performance; (ii) financial + operational performance; and

(iii) organizational performance.

(3). Sailaggyi, A. D. (1984)[20] holds that performance evaluation is a global concept, representing the result of organizational activities.

(4). Traditionally performance measures have been seen as a means of quantifying the efficiency and effectiveness of action [15].

(5). Nanni et al. (1990) [16] use the analogy of a thermostat to explain how performance measures are part of a feedback loop, which control operations against a specific value.

(6). Berliner and Brimson (1988) [2] state that performance evaluation is a key factor in ensuring the successful implementation of a company's strategy.

(7). Appropriate performance measures are those which enable organizations to direct their actions towards achieving their strategic objectives [8].

The above summary of literature indicates that different researchers define performance differently, depending on the focus of their study. However, there is also inconsistency in the use of the terms "efficiency", "effectiveness" and "performance". For the purpose of allowing readers to distinguish the meanings of the three terms, the author explains the distinction of the three in terms of Return on Assets, a topic commonly discussed in financial analysis:

Return on Assets (Performance) =
Earning Before Taxation / Total Assets
(This can be broken down into 2 equations)

= Earning Before Taxation / Net Sales ×
Net Sales / Total Assets

= Profit Ratio (Effectiveness) ×
Total Assets Turnover (Efficiency)

Return on Assets (Performance): It assesses the profitability of total assets before taxation, and could be treated as performance in this study. It contains two elements, efficiency and effectiveness.

Profit ratio (Effectiveness): It assesses the net profitability before taxation during the current accounting period. It could be treated as the element of effectiveness in this study and is defined as the ability to achieve the expected goal (result or output).

Total Assets Turnover (efficiency): It assesses the ability of the firm to use its assets and it could be treated as efficiency in this study. It is defined as the output generated by given resources under the influence of the environmental factors.

Performance = Effectiveness ×Efficiency

The above analysis shows that performance is indeed the product of multiplying efficiency by effectiveness.

2.2 A Two-Stage Evaluation Process

Based on the above definition of performance, this paper evaluates the performance of Taiwan's 59 listed corporations of electronics industry via a two-stage evaluation process that separates efficiency and effectiveness.

Figure 1 is an introduction of a two-stage evaluation process. The process is divided into two stages and the six factors are expressed as inputs and outputs at each stage. The first stage (Stage 1) measures efficiency, i.e., a company's ability to generate the sales in terms of its capital, asset, and employee. The second stage (Stage 2) measures effectiveness, i.e., a company's profit and operating revenues by the sales it generates.

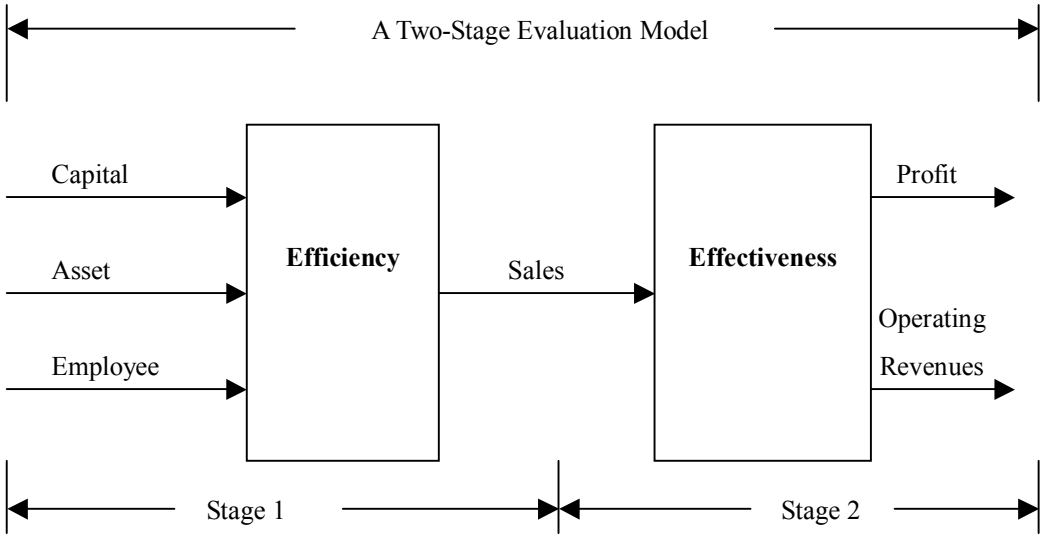


Figure1: A Two-Stage Evaluation Model

3. Methodology

DEA, a mathematical programming approach for characterizing the relationships among multiple inputs and multiple outputs, has proven itself as a metric for measuring company performance. The concept of Pareto Optimality in economics is used to measure efficiency, and is the core of DEA. This method was proposed by Charnes, Cooper and Rhodes in 1978. Based on the concept of envelopment in economics, the three projected the input and output of all units subject to evaluation (Decision Making Unit, DMU) on a geometric map to find the limits. If both the input and the output fall above the efficiency margin, then the DMU is efficient. Likewise, if the input and output fall within the efficiency margin, then the DMU is inefficient. The basic idea of DEA is to identify the most efficient DMU among all DMUs. The most efficient DMU is called a Pareto-optimal unit and is considered the standard for comparison for all other DMUs. The Pareto-optimal unit is the one such that any change that makes some people better off makes other worse off.

The most widely used models for DEA are the CCR and the BCC. The former was proposed by Charnes, Cooper and Rhode in 1978 based on the concept of "two inputs and one output" originally spelled out by Farrell in 1957. The three scholars have modified the concept to "multiple inputs and multiple outputs" in order to meet the needs of the complex production procedure of today. The fundamental premise is that under fixed scale of return is used to measure the overall technological efficiency of DMU. The latter was proposed by Banker, Charnes and Cooper in 1994, with the purpose of extending the concept of the CCR model and scope of application. The fundamental premise of the latter is that where scale of return is changeable, the overall technical efficiency of the CCR model could be compartmentalized into pure technical efficiency and scale efficiency.

In this study, the author will use the revised CCR model proposed by Cooper, Seiford and Tone in 2000 to evaluate the performance of Taiwan's 59 listed corporations of electronics industry. The model is demonstrated below:

Assuming that there are n decision units and each DMU_j uses m input X_{ij} to produce S output Y_{rj}, we find the CCR model from the following equation if the scale of return is constant:

$$\max \Phi_0^t + \varepsilon\left(\sum_{i=1}^{m} S_i^- + \sum_{r=1}^{s} S_r^+\right) \quad t = 1, 2 \qquad (1)$$

$$s.t.\ X_{io} = S_i^- + \sum_{j=1}^{n} X_{ij}\,\lambda_j$$

$$\Phi_0^t\, Y_{ro} = -S_r^+ + \sum_{j=1}^{n} Y_{rj}\,\lambda_j$$

$\lambda_j, S_r^+, S_i^- \geqq 0$ *for all j, r, i*

$r=1\ldots\ldots s$

$i=1\ldots\ldots m$

$j=1\ldots\ldots n$

$t=1$ is stage 1; $t=2$ is stage 2

X_{ij} is the ith input of the jth DMU

Y_{rj} is the rth output of the jth DMU

S^- is the difference input variable

S^+ is the difference output variable

λ_j is the jth DMU weight value

ε is the Archimedes value, usually set as 10E-4 or10E-6

In Stage 1, we have n = 59 DMUs (corporations); i = 3 inputs: capital, asset, and employee; and r = 1 outputs: sales.

In Stage 2, we have n=59 (corporations); i = 1 inputs: sales; and r = 2 outputs: profit and operating revenues.

4. Case Study

4.1 Data and Sample

59 listed Corporations of electronics industry in the Taiwan Stock Exchange Corporation (TSEC) for Year 1999 will be measured. All input and output data of these companies are obtained from Taiwan Stock Exchange Corporations (as shown in Appendix 1).

4.2 The Software for Calculating DEA Efficiency Value

The data from all DMU in this study is subject to the calculation of the Frontier Analyst software based on the revised CCR model in order to obtain the DEA efficiency value. If the DEA efficiency value is equal to 1, it means it is the best efficiency and hence the unit is the most efficient unit.

4.3 The Correlation Coefficient Between the Input and Output Variables

The Pearson Product Moment Correlation Coefficients of all input and output variables calculated by the Frontier Analyst software are shown in Table 1 and Table 2. From the both tables, we find out that all input and output variables chosen for this study are strongly correlated.

Table 1 The Pearson Product Moment Correlation Coefficients of All Input and Output Variables of the Stage 1 Efficiency Model.

Input / Output	Capital	Asset	Employee
Sales	0.96	0.99	0.98

Table 2 The Pearson Product Moment Correlation Coefficients of All Input and Output Variables of the Stage 2 Effectiveness Model.

Output / Input	Profit	Operating Revenues
Sales	0.91	0.95

4.4 The Evaluation Result of 59 Listed Corporations

Table 3 report the CCR efficiency scores, only nine corporations, namely POTRANS (2378)[1], EMC (2383), AVISION (2380), Q-RUN (2354), ACER (2353), HON HAI (2317), SYNNEX (2347), QCI (2382) and ACER (2306), are CCR-efficient in the stage 1 efficiency model. Five corporations, namely, TMC (2338), POE (2370), ABILITY (2374), RITEK (2349) and TSMC (2330), are CCR-efficient in the stage 2 effectiveness model. Table 3 also reports the total performance scores of the two models and the rank of 59 listed electronic corporations. The top 5 performing companies are as follows. AVISION (2383) (score = 71.42%) ranks first, next is TSMC (2330) (score = 57.03%), ABILITY (2374) (score = 54.67%) is third, ASUSTEK (2357) (score = 46.95%) is fourth, QCI (2382) (score = 34.66%) is fifth.

Note the relation between both models (efficiency and effectiveness). In our case, within 59 Listed corporations of electronics industry, the company with best efficiency doesn't always mean having best effectiveness. For example, TMC (2338) ranks first in effectiveness but ranks last second in efficiency. There is no apparent correlation between these two indicators. Further, from the efficiency distribution of 59 corporations, we find that only 15.25% (9/59 DMUs) of the companies were efficient for the stage 1 and 8.47% (5/59 DMUs) of the companies were efficient for the stage 2.

4.5 Process Improvement

The analysis of the previous section indicated which electronic companies were efficient and which are inefficient. For each stage, inefficient electronic companies are able to improve their performance and the DEA projections provide a prescription for improvement. For example, 2383(EMC) was CCR-efficient in stage 2 effectiveness model; however, it can move its performance to best-practice by either (1) increasing its profits and operating revenues, or (2) decreasing its sales. Thus, inefficient electronic companies are able to improve the overall performance via the stage 1 or the stage 2.

4.6 The Relation between Efficiency and Effectiveness

The author employs the business strategy matrix derived by Boston Consulting Group (BCG matrix) to illustrate the individual evidence in the relationship between efficiency and effectiveness (see Table 4). It has been observed that 4 (EMC, TSMC, ABILITY and ASUSTEK) of 59 companies are in the "super star" group which is characterized by high efficiency and high effectiveness. Conversely, 25 (BTC, FIC, SOLOMON, TECOM, PICVUE, SILITEK, ASKEY, DELTA, LITE-ON, Q-RUN, TATUNG, AURORA, LPI, BENQ, MTI, WUS, COMPEQ MFG, YAGEO, MXIC, GCE, CHIN-POON, D-LINK, RECTRON, MIC) of 59 companies are characterized by low efficiency and low effectiveness and placed in the "problem child" group. The author can argue that the 25 problem child companies should rearrange input to improve their performance.

[1] The numbers stand for the stock-number code of the company in Taiwan Stock Exchange Corporation (TSEC).

5. Conclusions

This paper uses a recently developing model of data envelopment analysis proposed by Cooper, Seiford and Tone in 2000 to evaluate the performance of 59 Listed corporations of the electronics industry in Taiwan. The estimated results show that for the stage 1 efficiency model only nine corporations, namely, POTRANS (2378), EMC (2383), AVISION (2380), Q-RUN (2354), ACER (2353), HON HAI (2317), SYNNEX (2347), QCI (2382) and ACER (2306), are efficient, and for the stage 2 effectiveness model only five corporations, namely, TMC (2338), POE (2370), ABILITY (2374), RITEK (2349) and TSMC (2330), are efficient. The inefficient companies can effectively promote resource utilization efficiency by better handing their labour and capital operating efficiency. The result also indicates that the corporation with better efficiency doesn't always mean that it has better effectiveness. There is no apparent correlation between these two indicators.

References

[1] Banker, R. D., A. Charnes and W. W. Cooper, "Model for the Estimation of Technical and Scale Efficiencies in Data Envelopment Analysis," *Management Science*, 1984, 30, 1078-1092.

[2] Berliner, C. and J. A. Brimson (Eds), *Cost Management for Today's Advanced Manufacturing*, New York: Harvard Business School Press, 1988.

[3] Charnes, A., W. W. Cooper and E. Rhodes, "Measuring the Efficiency of Decision Making Units," *Europeans Journal of Operational Research*, 1978, 2(6), 429-444.

[4] Chang, Chia-Chin, *To Apply DEA Method to Evaluate Performance for Real Estate Industry*, Unpublished Master Thesis, Department of Business, Chung Yuan Christian University, 2000.

[5] Chen, Chiao-Wen, *To Build Up a Model for the Evaluation of Financial Performance of the Construction Firm*, Unpublished Master Thesis, Department of Civil, National Central University, 2000.

[6] Chen, Tser-Yieth and Tsai-Lien Yeh, "A Study of Efficiency Evaluation in Taiwan's Banks," *International Journal of Service Industry Management*, 1998, 9(5), 1-8.

[7] Cooper, William W., Lawrence M. Seiford and Kaoru Tone, *Data Envelopment Analysis: A Comprehensive Text with Models, Applications, References and DEA-Solver Software*, Boston: Kluwer Academic Publishers, 2000.

[8] Dixon, J.R., Nanni, A.J. and T.E. Vollmann, *The New Performance Challenge: Measuring Operations for World-Class Competition*, Homewood: Business One Irwin, 1990.

[9] Drucker, Peter F., *Peter Drucker On the Profession of Management*, Chinese Edition, Taipei: Commonwealth Publishing Co. Ltd, 1963.

[10] Grosskopf, S. and V. Valdmanis, "Measuring Hospital Performance: A Nonparametric Approach," *Journal of Health Economics*, 1987, 6, 89-107.

[11] Huang, Chung-Hsing and Lan-Kuai Huang, "A DEA Application to Route Operational Effectiveness of Airlines," *Journal of Management*, 2000, 17(1), 149-181。

[12] Lin, Chi-Huang, "A Study of Efficiency Evaluation in Taiwan's Securities Dealers," *Securities Finance Quarterly*, 1998, 58, 1-24.

[13] Mahajan, J., "A Data Envelopment Analytic Model for Assessing the Relative Efficiency of the Selling Function," *European Journal of Operational Research*, 1991, 53(2), 189-205.

[14] McMullen, P. R. and R.A. Strong, "Selection of Mutual Funds Using Data Envelopment Analysis," *Journal of Business and Economic Studies*, 1998, 1, 1-12.

[15] Neely, A., M. Gregory and K. Platts, "Realizing Strategy Through Measurement," *International Journal of Operation and Production Management*, 1995, 14(3), 140-152.

[16] Nanni, A.J., J.R. Dixon and T.E. Vollmann, "Strategic Control and Performance Measurement- Balancing Financial and Non-Financial Measures of Performance," *Journal of Cost Management*, 1990, 4(2), 33-42.

[17] Oral, M. and R. Yolalan, "An Empirical Study on Measuring Operating Efficiency and Profitability of Bank Branches," *European Journal of Operational Research*, 1990, 46, 3, 282-294.

[18] Schefcyzyk, M., "Operational Performance of Airlines: An Extension of Traditional Measurement Paradigms," *Strategic Management Journal*, 1993, 14(4), 301-317.

[19] Sengupta, Jati K., "Comparing Dynamic Efficiency Using a Two-Stage Model," *Applied Economic Letters*, 2000, 7(8), 521-525.

[20] Sailagyi, A. D., *Management and Performance*, Section Edition, 1984.

[21] Sherman, H. D. and F. Gold, "Bank Branch Operating Efficiency: Evaluation with Data Envelopment Analysis," *Journal of Banking and Finance*, 1985, 9, 297-315.

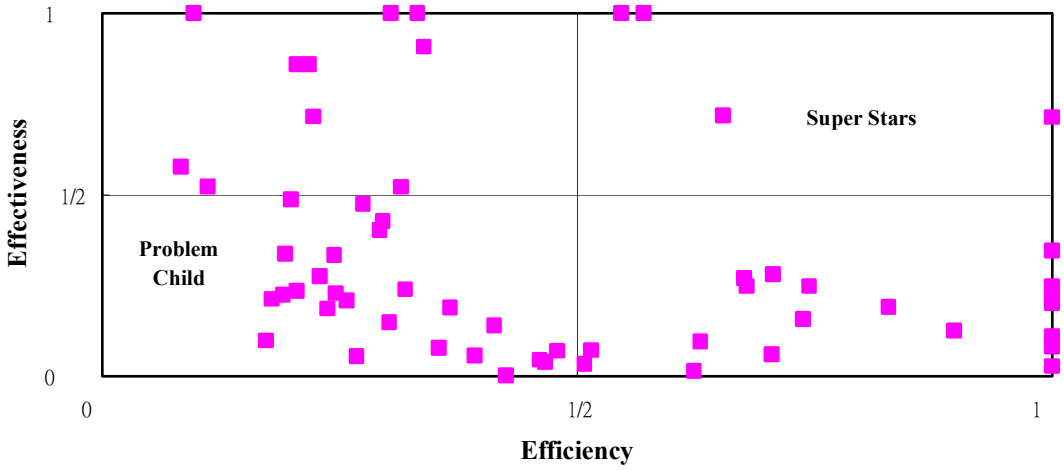
[22] Tarim, S. Armagan and Mehmet B. Karan, "Investment Fund Performance Measurement Using Weight-Restricted Data Envelopment Analysis," *Russian and East Eutopean Finance and Trade*, 2001, 37(5), 64-84.

[23] Venkatraman, N. and V. Ramanujam, "Measurement of Business Performance in Strategy Research: A Comparison of Approaches," *Academy of Management Review*, 1986, 11(4), 801-814.

Table 3 Efficiency Results

Company	Code	Stage 1: Efficiency	Stage 2: Effectiveness	Total Performanc	Rank	Company	Code	Stage 1: Efficiency	Stage 2: Effectivenes	Total Performan	Rank
EMC	2383	100.00%	71.42%	71.42%	1	SPIL	2325	24.42%	33.34%	8.14%	31
TSMC	2330	57.03%	100.00%	57.03%	2	SYSTEX	2343	31.90%	23.98%	7.65%	32
ABILITY	2374	54.67%	100.00%	54.67%	3	ACCTON	2345	36.61%	18.90%	6.92%	33
ASUSTEK	2357	65.37%	71.82%	46.95%	4	OPTO	2340	19.25%	33.72%	6.49%	34
QCI	2382	100.00%	34.66%	34.66%	5	UNITECH	2367	22.91%	27.64%	6.33%	35
POE	2370	33.20%	100.00%	33.20%	6	MIC	2315	62.95%	9.57%	6.02%	36
RT	2379	33.87%	90.75%	30.74%	7	Rectron	2302	11.14%	52.30%	5.83%	37
RITEK	2349	30.41%	100.00%	30.41%	8	D-LINK	2332	41.27%	13.91%	5.74%	38
POTRANS	2378	100.00%	24.82%	24.82%	9	CHIN-POON	2355	24.58%	22.94%	5.64%	39
AVISION	2380	100.00%	23.90%	23.90%	10	GCE	2368	25.75%	20.82%	5.36%	40
HON HAI	2317	100.00%	22.60%	22.60%	11	MXIC	2337	20.50%	23.52%	4.82%	41
ACER	2306	100.00%	20.18%	20.18%	12	YAGEO	2327	8.29%	57.66%	4.78%	42
GIGABYTE	2376	70.63%	28.01%	19.78%	13	COMPEQ MFG	2313	30.23%	14.80%	4.47%	43
CHROMA	2360	21.79%	85.89%	18.72%	14	WUS	2316	23.72%	18.69%	4.43%	44
MSI	2377	74.44%	24.87%	18.51%	15	MTI	2314	19.06%	22.40%	4.27%	45
COMPAL	2324	67.60%	27.09%	18.31%	16	BENQ	2352	70.52%	6.03%	4.25%	46
CMC	2323	20.46%	85.88%	17.57%	17	LPI	2369	17.84%	21.35%	3.81%	47
ELITEGROUI	2331	67.86%	24.83%	16.85%	18	AURORA	2373	51.51%	7.19%	3.70%	48
UMC	2303	31.44%	52.09%	16.38%	19	TATUNG	2371	47.94%	7.08%	3.39%	49
SDI	2351	22.22%	71.52%	15.89%	20	Q-RUN	2354	100.00%	2.79%	2.79%	50
ARIMA	2381	82.80%	19.14%	15.85%	21	Lite-On	2301	35.43%	7.80%	2.76%	51
WINTEK	2384	27.45%	47.37%	13.00%	22	DELTA	2308	39.22%	5.76%	2.26%	52
WEC	2344	29.57%	42.67%	12.62%	23	ASKEY	2366	46.06%	4.48%	2.06%	53
SIS	2363	29.24%	40.26%	11.77%	24	SILITEK	2310	46.65%	3.98%	1.86%	54
USI	2350	73.83%	15.78%	11.65%	25	PICVUE	2333	17.26%	9.89%	1.71%	55
INVENTEC	2356	89.73%	12.68%	11.38%	26	TECOM	2321	50.76%	3.35%	1.70%	56
SYNNEX	2347	100.00%	11.04%	11.04%	27	SOLOMON	2359	26.80%	5.60%	1.50%	57
ASE	2311	19.90%	48.70%	9.69%	28	FIC	2319	62.30%	1.44%	0.90%	58
TMC	2338	9.69%	100.00%	9.69%	29	BTC	2341	42.55%	0.27%	0.11%	59
ACER	2353	100.00%	8.16%	8.16%	30						

Table 4 The efficiency-effectiveness matrix of 59 E-companies



Appendix 1: Financial Data of the Firms in the Empirical Study

Company	Code	Sales	Profit	Operating Revenues	Capital	Asset	Employee
Lite-On	2301	12,743.00	807.00	393.00	5,245.00	16,093.00	1,236
Rectron	2302	1,933.00	290.00	160.00	1,811.00	6,183.00	265
UMC	2303	29,147.00	10,498.00	5,521.00	65,612.00	146,139.00	3,452
ACER	2306	128,243.00	7,309.00	3,737.00	30,328.00	87,152.00	5,323
DELTA	2308	21,885.00	3,648.00	77.00	7,121.00	29,329.00	3,864
SILITEK	2310	14,378.00	1,015.00	210.00	3,271.00	13,355.00	934
ASE	2311	17,499.00	7,795.00	3,223.00	19,747.00	50,456.00	5,635
COMPEQ MFG	2313	12,965.00	1,188.00	763.00	5,611.00	19,980.00	4,391
MTI	2314	2,973.00	719.00	168.00	2,554.00	5,252.00	867
MIC	2315	30,260.00	1,735.00	1,057.00	7,623.00	23,014.00	1,986
WUS	2316	5,916.00	357.00	386.00	3,810.00	10,224.00	2,517
HON HAI	2317	51,813.00	7,413.00	4,119.00	10,496.00	50,338.00	1,300
FIC	2319	46,478.00	46.00	242.00	13,340.00	38,538.00	3,687
TECOM	2321	8,426.00	432.00	104.00	1,850.00	5,784.00	598
CMC	2323	13,392.00	7,463.00	4,586.00	9,572.00	41,120.00	2,747
COMPAL	2324	47,018.00	5,398.00	4,571.00	11,717.00	37,942.00	2,857
SPIL	2325	11,916.00	1,507.00	1,571.00	11,271.00	23,443.00	4,383
YAGEO	2327	3,744.00	1,832.00	630.00	11,788.00	29,330.00	1,230
TSMC	2330	73,131.00	24,650.00	25,917.00	75,726.00	161,423.00	7,460
ELITEGROUP	2331	10,901.00	932.00	1,059.00	1,531.00	5,901.00	222
D-LINK	2332	10,313.00	705.00	556.00	3,011.00	10,249.00	1,303
PICVUE	2333	4,191.00	410.00	127.00	5,397.00	9,874.00	1,176
MXIC	2337	16,612.00	907.00	1,543.00	19,644.00	49,896.00	3,109
TMC	2338	1,563.00	71.00	105.00	2,673.00	6,146.00	180
OPTO	2340	3,649.00	295.00	359.00	2,824.00	7,037.00	726
BTC	2341	8,188.00	118.00	7.00	2,310.00	7,191.00	669
SYSTEX	2343	7,482.00	901.00	659.00	3,242.00	9,432.00	1,216
WEC	2344	31,009.00	4,446.00	4,903.00	29,274.00	100,889.00	4,093
ACCTON	2345	9,605.00	474.00	698.00	2,347.00	10,913.00	1,206
SYNNEX	2347	39,000.00	1,734.00	1,564.00	3,322.00	17,708.00	1,043
RITEK	2349	14,314.00	5,307.00	5,772.00	5,148.00	53,790.00	2,797
USI	2350	28,906.00	1,412.00	1,700.00	3,989.00	17,797.00	3,375
SDI	2351	1,950.00	125.00	225.00	1,483.00	3,696.00	811
BENQ	2352	37,902.00	2,170.00	800.00	7,889.00	33,817.00	1,739

ACER	2353	18,148.00	571.00	577.00	1,621.00	7,796.00	858
Q-RUN	2354	15,050.00	74.00	168.00	1,457.00	4,959.00	145
CHIN-POON	2355	4,620.00	418.00	342.00	1,742.00	7,054.00	1,407
INVENTEC	2356	63,780.00	3,162.00	2,870.00	11,350.00	36,472.00	3,922
ASUSTEK	2357	48,999.00	14,285.00	12,619.00	11,454.00	48,646.00	4,213
SOLOMON	2359	6,127.00	386.00	119.00	2,385.00	9,119.00	552
CHROMA	2360	2,159.00	472.00	349.00	1,522.00	3,924.00	522
SIS	2363	10,840.00	1,960.00	1,704.00	4,877.00	24,705.00	909
ASKEY	2366	7,564.00	272.00	124.00	1,646.00	5,689.00	1,152
UNITECH	2367	4,926.00	334.00	450.00	2,992.00	8,395.00	1,741
GCE	2368	6,029.00	471.00	440.00	2,673.00	9,413.00	1,969
LPI	2369	2,150.00	84.00	86.00	2,083.00	4,356.00	1,406
POE	2370	1,602.00	252.00	161.00	1,265.00	2,917.00	490
TATUNG	2371	61,477.00	4,630.00	1.00	36,764.00	95,465.00	18,633
AURORA	2373	15,220.00	898.00	425.00	4,961.00	12,677.00	2,564
ABILITY	2374	2,302.00	65,374.00	34.00	1,735.00	2,800.00	546
GIGABYTE	2376	16,166.00	1,665.00	1,794.00	2,144.00	9,131.00	1,348
MSI	2377	15,800.00	1,392.00	1,562.00	1,872.00	10,554.00	1,759
POTRANS	2378	2,089.00	308.00	92.00	951.00	2,748.00	520
RT	2379	3,197.00	740.00	785.00	1,510.00	3,838.00	303
AVISION	2380	6,337.00	479.00	538.00	768.00	3,205.00	517
ARIMA	2381	39,536.00	2,810.00	2,753.00	5,830.00	22,825.00	2,123
QCI	2382	75,307.00	9,249.00	8,517.00	11,533.00	38,947.00	3,475
EMC	2383	1,675.00	94.00	138.00	1,176.00	2,317.00	246
WINTEK	2384	4,169.00	451.00	613.00	1,597.00	5,033.00	1,303

Source: All financial data obtained from Taiwan Stock Exchange Corporations (TSEC)

Fiscal Year Ending is Year 1999