

## **Relative Contribution of Organizational Factors to the Discriminant Functions Associated with Corporate Performance \***

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### **Abstract**

This research presents an empirical investigation of the relative contribution of four dimensions of corporate performance to the discriminant function associated with sample of high-performing companies and another sample of low-performing companies in the service sector in Jordan. Multiple Discriminant Analysis was used to calculate the discriminant functions.

Results indicated that, profitability dimension variables dominated the discriminant functions associated with both groups, followed by variables related to the quality of debt management and survivability. Finally, results indicated that, management of the stock market failed to contribute in any significant way to the discriminant functions of either group.

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## 1- Introduction

Corporate performance is a multi-dimensional phenomenon that is influenced by internal as well as external environmental forces that shapes the way the company conducts its effective and efficient operations. In part, corporate performance is a function of how well management manages and emphasizes internal organizational factors in a way that contribute positively to the overall organizational performance. This study is trying to determine the relative contribution of four aspects of organizational factors to the overall corporate performance in a sample of companies from the service sector in Jordan.

Recent research indicated that both organizational factors and external factors are important in shaping corporate performance and competition <sup>[1]</sup>. Empirical evidences showed that the reciprocal interaction at multiple levels of analysis between external and internal factors shape business strategy and performance, while interaction between strategy and performance leads to influencing both organizational performance and competitive environment [1, pp.573-581].

### 1.1 Corporate Performance

Corporate performance is a topic that has been at the center of interest of corporate executives as well as researchers. Its has been viewed as the heart of Oevery business firm [2,p.203]. Many attempts were made to develop a comprehensive model for the assessment of corporate performance <sup>[3]</sup>. Although performance in the profitability area is not the only objective to be pursued, it is also not wise to be ignored. Profitability performance when not

managed carefully affects adversely all other business activities. Managers in all levels of managerial responsibility consider firm performance in profitability aspect as one of the central concern. The well-designed and proper executed managerial strategies are powerful tools for the attainment of a balance between profitability objective and other strategic objectives, such as market standing and competition related objectives. It is therefore important that the budgeting and proper dealing with measures of overall corporate profitability -like ROI- should stem from the strategic direction pursued by the firm [4.p.96-97]. This will lead to maintaining the proper corporate direction rather than having profitability considerations become goals for themselves.

Performance indicators and their contribution to overall business performance are of a great importance because they address organizational objectives that are vital to the short-term as well as long-term prosperity of the company <sup>[5]</sup>.

There are at least four dimensions of corporate performance that are very much inter-playing to give us a clear picture of how a firm is doing in terms of performance. The first aspect is profitability which is so important for most stakeholders. The management of the firm is interested in profitability levels because the management is responsible and accountable for operating efficiency and current as well as long term survivability of the corporation [6,pp.82-85].

Owners of the firm are also interested in the current as well as long range profitability of their equity investment [7,p.90]. Profitability means growing earnings and dividends, which is normally bring about growth in the economic value of owners' stake.

The second dimension of corporate performance is related to the performance of the company with regard to providers of capital [lenders and creditors] who extend funds to the firm to be used for investment purposes and to finance operations at all level. They are mainly interested in how debt is being managed by the company in a way that guarantees the repayments in due time [8,pp.24-27].

The third dimensions of corporate performance is related to those who watch and deal with corporate shares in the stock markets, who usually are interested in earnings behaviors of specific company's shares.

One of the most important performance measure is Return on Investment [ROI]. It primarily measures the management efficiency in the utilization of company's assets to generate earnings, thus it is viewed as a good indicator of how company exploit its environment to enhance its strategic performance position. Ansoff [9,pp.163], described ROI as the single most comprehensive measure of corporate performance that is influenced by everything happened and happening in the company. It is also a fair indicator of how future performance could be. Wheelen and Hunger [8,pp.323-328]. Considered ROI as a strong indicator of the process of management utilization of corporate assets. This means that ROI is a fair measure of corporate efficiency in selecting optimal methods of assets utilization.

This study is using ROI as a factor representing corporate overall ability to utilize company's assets to generate various levels of performance because of the many advantages ROI has: [8,pp.323-324].

1- ROI is a single comprehensive figure that is influenced by

all aspects of corporate achievement.

- 2- ROI measures how well management utilizes company assets to generate profit.
- 3- ROI is a common denominator that can be compared with and evaluated along many entities.
- 4- ROI provides management with an incentive to use assets efficiently.
- 5- ROI induces management to follow a strategy where acquiring new assets would be done only if doing as would increase the overall return.

Research on this topic indicated that Return on Investment [ROI] is at the top of all determinants because of its fundamental link to all aspects of corporate performance. [9,pp.170-172]

## **2- Objective of the study**

This study aims at investigating the relative contribution of organizational factors to the discriminant functions associated with corporate performance in a sample of high-performing and another sample of low-performing service companies in Jordan. The service sector contributes to more than 50 percent of all economic activities in Jordanian economy during the last decade [10,p.21]. It is therefore of vital importance to investigate the issue of the relative contribution of several organizational factors to corporate performance of the companies operating in this sector. For this purpose the following basic hypothesis is going to be tested:

*Organizational factors contribute significantly to the discriminant functions associated with corporate performance.*

This basic hypothesis states that, the organizational dimensions used in this study are expected to yield significant contribution to corporate performance of companies included in the study. The literature on this topic mentioned earlier as well as common sense support this probable outcome.

### **3- Methodology**

This section of the study presents the study factors and measurements, formulation of the study model, data sources, groups' formulation and statistical tool for the assessment of the contribution of organizational factors to the discriminant functions associated with performance.

#### **3.1- The dependent variable and the study groups**

In order to be able to determine the contribution of each organizational factor to overall corporate performance, a sample of 18 companies were chosen to be used in this study. The criterion for the inclusion of a company in the sample was that a company should have data available for the period of the study. Some companies were excluded because data was not available deposit attempts to collect it. The sample was classified into two groups. The first group is called high-performing one. In the process of grouping the study sample, the researcher did so based on the value of ROI for each company in the sample. ROI is calculated by dividing net profit after tax on total assets. A company is classified in group one [high-performing group] if the value of ROI is 5 or more otherwise it is classified in group two [low-performing group]. Table (1) shows companies classified in group one and Table (2) shows those classified in group two along with respective ROI. As shown in these tables, this formulation of sample resulted in having 9 companies in

group one and another 9 companies in group tow.

**Table (1)**

**Companies Classified in Group One**

<b>Company</b>	<b>ROI</b>
Jordan Press & Publishing	14.85
Jordan National Shipping Lines	14.08
Jordan Press Foundation	12.61
Vehicles Owners Federation	12.38
Arab International Hotels	11.37
National Portfolio Securities	7,77
Arab International for Investment	7,71
Jordan Himeh Minerals	6.11
Jordan Hotels & Tourism	5,88

**Table (2)**  
**Companies Classified in Group Two**

<b>Company</b>	<b>ROI</b>
United Mideast & Commodore Hotels	3.90
Real Estate Investment Akarco	3.60
Jordan Expatriates Investment Holding	2.46
Machinery Equipment Renting	1.99
Jordan Gulf Real Estate Investment	3.03
Jordan Electric Power	1.98
Jordan International Trading Center	1.65
Jordan Trade Facilities	1.38
Irbid District Electricity	1.215

This formulation of groups is an important condition for the use of Multiple Discriminant Analysis as a statistical tool for the calculation of the relative contribution of independent variables to the discriminant functions associated with corporate performance.

Data on dependent as well as independent variables for the sample were collected along a temporal line of the years (1992-1994). The researcher have chosen this temporal line in particular, because so many new companies were

incorporated in the period from 1992-1997 which can not be included in the study to allow for the use of the survivability dimension. The average value of dependent and independent variables were calculated and used in the analysis. This was done in order to, specifically filter the data to avoid the problem of autocorrelation that is expected when using time series data. In addition to that the use of the mean value of given overtime data provides us with more stable measurements of variables.

Four areas of corporate performance where selected for this investigation. Profitability in terms of satisfying stockholder was one of these areas. This dimension of corporate performance was measured by Return on Shareholders' Equity [ROE]. This measure of corporate profitability is normally used to indicate overall profitability of the firm. Another measure of profitability is Earning Per Share [EPS]. This is a measure to which both management and shareholders pay a great deal of attention [11,pp.575-579]. It is highly relevant measurement for the assessment of a firm economic performance. EPS is widely used in the evaluation of common stock and is often the basis for getting specific corporate objectives and goals as part of the strategic planning process [2,p.300].

Another area of performance used in this study was the quality of the management of corporate debt. This is quite an important area of performance because of the fundamental significance of using proper strategies to manage the company's debt. This dimension was measured by debt to equity ratio.

The third dimension of corporate performance used in this study was the quality of survival management. Literature

showed that as the company becomes older the survivability becomes more institutionalized [12,pp.692-710]. This is referred to the ability of the company to continue in existence over a period of time. This dimension was measured by the age of the company since incorporation.

The last dimension of corporate performance included in the study was the quality of financial market management. This area was measured by two variables: the earning per share which reflects the return on all outstanding shares and price. It normally captures the capital market assessment of the economic performance of the firm [2,pp.70-71]. Another measure was Market to Book value [M/B] which is a highly relevant measure for the assessment of company's performance in terms of value creation [2,pp.72-73].

**3.2. Calculation of the Study Variables**

This section shows the way the study dimensions were transformed into measurable variables.

**3.2.1. The Dependent Variable:**

ROI = NIAT/TA ..... (formula 101)

Where:

ROI is the return on investment

NIAT is net income after tax

and TA is total asset

**3.2.2. The Independent Variables:**

**3.2.2.1. The area of profitability:**

a) ROE = NIAT/SQ ..... (formula 2.1)

Where:

ROE is return on equity

NIAT is net income after tax

and SQ is shareholders' equity

$$b) \text{ EPS} = \text{NIAT}/\text{NSS} \dots\dots\dots \text{(formula 2.2)}$$

Where:

EPS is earning per share

NIAT is net income after tax

and NSS is number of subscribed shares

### 3.2.2.2. The area of debt management:

$$\text{DR} = \text{TD}/\text{TA} \dots\dots\dots \text{(formula 3.1)}$$

Where:

DR is the debt ratio

TD is total debt

and TA is total asset

This is a measurement that describes the proportion of “other people money” to the total claims against the assets of the company.

### 3.2.2.3. The area of stock market performance:

$$a) \text{ Per} = \text{MPS}/\text{EPS} \dots\dots\dots \text{(formula 4.1)}$$

Where:

PER is price earning ratio

MPS is market price per share

and EPS is earning per share

This is a stock market indicator of the relationship between current or expected earnings per share and the current market price of the stock. It is used to indicate how the stock market is judging the company’s earnings performance and prospects. [6.pp.82-85]

$$b) \text{ M/B} = \text{MVS}/\text{BE} \dots\dots\dots \text{(formula 4.2)}$$

Where:

M/B is market to book value

MVS is market value of shares

and BE is book value of owners’ equity

This ratio is an important measurement for the assessment of economic performance of a firm in terms of value creation [2,p.72]. Companies use this measurement for comparison with other competitors in terms of economic and financial performance [7,p.26]. Basically because it captures the market assessment of performance of the company [2,p.72]. It relates current market value on a per share basis to the book value of owners' equity [7,pp.30-35].

#### **3.2.2.4. The area of survivability:**

This area is measured by the age of the company since incorporation. Research in this area indicates that as number of years since incorporation is increased the likelihood of a firm encountering catastrophic life-threatening problem decreases. Others indicated that at the early years of the life cycle of a firm, the company faces consequences resulted from liability of newness, thus the probability of corporate death is high at these early stages diminishing as a company becomes older [12,pp.692-710].

### **3.3. Statistical Technique**

For the purpose of calculating the discriminant functions associated with corporate performance, Multiple Discriminant Analysis [MDA] was used. The linear two groups discriminant analysis is defined as:

$$Y_i = a_1 X_{1i} + a_2 X_{2i} + \dots + a_m X_{mi}$$

Where:

$Y_1$  is a binary variable used to indicate two alternative option.

$x_1, x_2, \dots, x_n$  are explanatory variables.

The purposes of using Multiple Discriminant Analysis are:

- (1) to test for the mean group differences and to describe the overlaps among the groups.
- (2) To construct a classification scheme based upon a set of variables in order of assign previously unclassified observations to appropriate groups.
- (3) Based on (1) and (2) above, the discriminant functions can be calculated. In calculating the discriminant functions, Multiple Discriminant Analysis compute a linear combination that distinguishes between groups by maximal separation.

Let us assume that  $x_1, x_2$  be the sample mean vectors of the groups and  $s$  be the pooled estimate of the population covariance matrix, then the Multiple Discriminant Analysis commutes the linear index of explanatory variables which best discriminant between groups. Therefore it maximizes the absolute difference  $|a'sa| = 1$ , then the critical ratio for the two group case is:

$$t^2_a = \frac{[a'(x_1 - x_2)]^2 N_1 N_2 (N_1 + N_2)}{a'sa}$$

Where:

$N_1$  = group 1 sample size

$N_2$  = Group 2 sample size

Therefore the discriminant functions associated with each group can be calculated [13, pp.291-311].

### Findings of the Study

The following section present test of the model goodness of fit, results of the discriminant analysis and discussion of

the findings of the study.

#### **4.1. Testing the model goodness of fit**

In order to guarantee that the model used to analyze the study data is suitable for testing the hypothesized outcome, two figures have to be assessed. These two figures are the F-Value and the probability associated with it in one hand, and Wilk's Lambda on the other.

The results of the multiple discriminant analysis showed that:

F-Value = 18.995

Prob. Level = 0.01

Wilk's lambda = 0.205

##### **4.1.1. F-Value and Probability Levels**

The rule for the F-Value and the probability level associated with it is that, the F-Value should be more than 2 in an absolute value in the same time the probability level should be 0.05 or less to guarantee that the model is suitable to give reliable results. Since the F-Value is 18.995 and in the same time the probability level is 0.01, the research concluded that this model is good to guarantee its use for data analysis.

##### **4.1.2. Wilk's Lambda**

Wilk's lambda is used to capture the overall discriminatory power of the model, that is the model ability to distinguish between the study groups based on the study variables. It ranges between zero and one, where values close to one indicate low insignificant discriminatory power [14,pp.80-112].

The value of Wilk's lambda is 0.205, which shows that the model is highly significant and suitable for data analysis.

These results permit the researcher to conclude that the data and the model used to analyze it are compatible with each other.

#### 4.2. Results of the Discriminant Analysis Procedures

Table (3) shows the classification matrix, which indicates that the discriminant function associated with the high performing group was able to distinguish between groups 100 percent of the time. Therefore, all companies in group one were classified correctly in the high performing group.

**Table (3)**

**The Classification Matrix**

FROM	GROUP ONE	GROUP TWO
Group one	9	0
Percent	100%	0%
Group two	1	8
Percent	12.5%	87.5%

On the other hand, the discriminant function associated with group two was able to distinguish between the groups 87.5 percent of the time. Only one observation was misclassified from group two into group one. This result left us with an overall classification accuracy of 95 percent. Classification accuracy shows the overall ability of the discriminant functions to distinguish between the study groups.

Tables (4) and (5) show the relative importance of the study variables in contributing to the discriminant functions.

The Discriminant function associated with group one:

**Table (4)**

**Result of Discriminant Analysis for Group One**

VARIABLES	DISCRIMINANT COEFFICIENT
EPS	37.282
PM	8.287
ROE	3.035
DR	1.282
Age	1.115
M/B	-0.0648
PER	-0.0618

**Group one = 37.282 EPS + 8.287PM + 3.035 ROE + 1.282DR + 1.115 age - 0.0648M/B - 0.0618PER ..... Discriminant Function (1)**

Table (4) shows that the discriminant function associated with group one -the high performing group- is dominated by the contribution of the profitability measures used in the study. Earning per share was at the top of the list, with 37.282 coefficient followed by profit margin with a coefficient of 8.287 and return on equity with a coefficient of 3.035.

The debt ratio became fourth with a coefficient of 1.282

followed by age with a coefficient of 1.115. Both market to book value ratio and price earning ratio showed a negligible contribution to corporate performance with coefficient of -0.0648 and -0.0618 respectively.

**Table (5)**

**Results of Discriminant Analysis for Group Two**

VARIABLES	DISCRIMINANT COEFFICIENT
EPS	50.400
PM	10.414
ROE	4.466
DR	1.408
Age	1.206
M/B	-0.175
PER	-0.113

**Group two = 50.400EPS + 10.414PM + 4.466ROE + 1.408DR  
+ 1.206Age - 0.175M/B - 0.113PER .....**  
**Discriminant Function (2)**

Table 5 shows the discriminant function associated with group two -the low performing group-. Again, profitability measures dominated the function with Earning Per Share having 50.400 coefficient followed by profit margin and return on equity with 10.414 and 4.414 and 4.466 coefficients respectively.

Debt management consideration became second with a coefficient of 1.408 followed by age with a coefficient of 1.206.

Lastly Market to Book value with a coefficient of -0.175 and Price Earning Ratio with a coefficient of -0.113 became last with a poor insignificant negative contributions to corporate performance.

### **4.3. Discussion of the Findings**

Findings of the study seem to indicate that profitability factors contribution to the discriminant functions associated with both groups in the study sample was highly significant. These results indicate that profitability contribution to both discriminant functions was dominant. This means that firms in the service industry in Jordan are in fact emphasizing profitability as major and most significant strategy of their businesses. While it is true that profitability is central for firm's performance objective, it should not be emphasized at the expense of other important considerations [15,pp.9-18]. For example, market to book value as an indicator of firm's value creation was almost neglected because all emphasis was exerted to guarantee high levels of short term profitability such as Earning Per Share and Profit Margin. This result is a reflection of short-term corporate mentality, which emphasizes short-term objectives rather than adopting strategies to create future prospects. Such mentality leads to short-term profitability coupled with long-term corporate stagnation.

The management of the corporate debt turned out to be significant contributor to firm performance, but the degree of significance was weak, which indicates that firms in the service sector in Jordan have usually not putting the right amount of care to manage this important corporate performance aspect.

Across the board and in both groups stock market

indicators of performance had very weak and insignificant negative contribution to corporate performance. This means that firms in the service industry in Jordan failed to manage this significant dimension of their business. This result may be due to the unusually exaggerated emphasis on short term indicator of corporate performance objectives such as profit margin.

Age of firm seems to have statistically significant contribution to the discriminant functions associated with both high-performing and low-performing groups. This result is consistent with literature which links age to survivability as discussed earlier.

## 5. Conclusions

This study is trying to shed lights on the relative contribution of organizational factors to the discriminant functions associated with a sample of high-performing and another sample of low-performing group of companies operating in the service sector of the Jordanian economy. Multiple discriminant Analysis was used as a statistical tool to calculate the discriminant functions associated with both groups.

Results indicate that companies in both groups are in fact reflecting similar patterns of behavior in their performance endeavor. Relative contribution of the study factors in forming the discriminant functions was relatively moving in the same direction of influence in both groups. Profitability variables' contribution to the discriminant function associated with both groups was strong and highly significant. The study conclusions can be summarized as follows:

- 1- Profitability variables' contribution to the discriminant functions was the strongest among all organizational variables used in this study.
- 2- Quality of the debt management ranked second in contributing to the discriminant functions in both groups.
- 3- Management of survivability became third and contributed significantly to the discriminant functions in both groups.
- 4- Stock market management variables came last with very low and insignificant degree of contribution to both discriminant functions.

These results may serve as starting effort to stimulate

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