Abstract
Diversification is a form of corporate strategy used by many managers to improve the performance of their firms. Firms are different in terms of diversity of activities and geographical diversity. Diversity is explored from two perspectives: A) geographical diversification and B) business diversification. Accordingly, the effect of corporate diversification on corporate governance in the company's life cycle was analyzed in this study. The study was conducted based on financial statements in a five-year period from 2007 to 2011 on a population of firms listed in Tehran Stock Exchange. The data were analyzed using panel analysis in this study. The results of the testing the main research hypothesis showed that diversification including business diversification and geographical diversification affects the corporate governance at the time of the firm growth and decline.

Keywords: corporate diversification, business diversification, geographic diversification, corporate governance, corporate life cycle

Introduction and Statement of the Problem
Diversification is a form of corporate strategy used by many managers to improve the performance of their firms. Diversification aims to increase profitability through greater sales volume obtained from new products and new markets.

The choice of a diversification strategy involves answering two following questions:
1. How is the quality of industrial attraction that is supposed to join us?
2. Can the firm gain create a competitive advantage by a new industry?

There are many factors that can work in conjunction with the involvement of the firm in a new industrial business. However, business diversity can be justified in terms of the possibility of high profitability of an industry or the ability of a firm to create competitive advantage in new industry.

The concept of diversification depends on the subjective interpretation of a new market or a new product that should reflect the customers’ perceptions of the market or the product rather than managers perceptions of them. In fact, products stimulate or result in the creation of new markets and in turn new markets promote the product innovation.

Over the years, diversity has been introduced as a key strategy in the strategic management literature. Today, the diversity of the parent companies has been turned into an unavoidable aspect of the modern economy and increasing attention to the diversity of the parent companies and mostly to their benefits, including reduced costs and breaking down risks is in summary related to the centralized economic scope and scale.

The American’s experiences in the twentieth century provide some evidence for and against the corporate diversification. During the 1950s and 1960s, diversification was seen as common practice for many American companies. This trend continued until 1980 but it became reversed when the companies began their specialization process. While the positive trend towards diversification in the 1960s showed an increase in firm value due to diversification, the reversion trend in the 1980s showed a decrease for other companies (e.g. the firm value decreased because of the diversification process).

Since diversification and the quality of corporate governance can be regarded as factors affecting the firm value, a question that posed her is: How these factors are related to the corporate life cycle?
To this end, the preset study aims to explore the relationship between the corporate diversification and corporate governance in different firm’s life-cycles. To measure the corporate diversification (here the business diversification), the entropy index was used in this study.

**Literature Review**

**Corporate Life Cycle**

Various models have been already presented in the finance and accounting literature to measure a corporate life cycle. One of the most commonly used models was developed by Anthony and Ramesh (1992). They used three variables, sales growth, capital expenditures, and the corporate life cycle to classify different firms. Miller and Friesen (1984) in a longitudinal study on corporate life cycle observed that the five common stages in the corporate life cycle are: birth, growth, maturity, revival, and finally decline. A number of environmental, strategic, structural factors and methods of decision-taking should exist in each of these stages to complete them. The authors studied variables that make each stage distinct from other stages. They also identified 54 variables related to the strategy, structure, environment, and decision-taking style that make a distinction between various stages. The results also indicated that organizations have not entered each of these stages with the same sequence.

**Corporate Diversification**

Most studies conducted have focused on finding an answer to the problem whether corporate diversification is beneficial or harmful to shareholders? Early research on this issue favors corporate diversification, but recent studies suggest that corporate diversification can reduce the firm’s performance. Mitton (2009) examined the relationship between corporate diversification and workforce effectiveness. The results suggested a negative relationship between corporate diversification and workforce effectiveness. Anderson et al. (2009) studied the impact of between corporate diversification on corporate risk. They found that the corporate diversification reduces risk within some firms but increases it in others. However, it can be said that the corporate diversification in general does not reduce the corporate risk. Andrews et al., (2010) explored the relationship between corporate diversification and the firm value and concluded that multi-sector firms reduce the shareholders’ wealth significantly than single-sector firms. He (2009) performed an empirical analysis of the data before and after 1997 and observed a decrease for the first period and an increase the second period. He provided three explanations for this finding. First, the post-1997 data reveal more information about different sectors because of the reforms in the United States and therefore they increase the actual level of diversification. Second, the diversification indicators are more appropriate the post-1997 data as they provide more information about the relationships among different parts of a firm. Finally, useful variables used in the post-1997 data are more useful to control the consistency. The discussions presented here aim to systematize the decrease or increase in the firm value as a result of the diversification. The interpretations of the listed firms, theoretical discussions, the characteristics of senior managers, and the structures of corporate governance are different. Anyway, there is a wide scope for research to be done in the field. Gomes and Livdan (2004) stated that that diversification has a positive effect on shareholder value. They showed that the diversification enables the firm to find better opportunities for efficiency. It was also noted that there is a positive relationship between the corporate diversification and performance.

**Corporate Governance**

Corporate governance was introduced since the 1990s in the advanced industrial countries of the world such as the UK, Australia, and some European countries. It dates back to a well-known report that was published in 1992. The report was revised in 1995 by the Greenbury Committee and was finalized in 1998 by the Hampel Committee. Most of the countries in the world such as UK, China, Korea, Canada, and Australia have such a codified system of governance. In addition, the disclosure of Watergate scandal and the fraud in the American Capital Market in the U.S.A in 2001 resulted in the legislation of an act called Sarbanes Oxley Act or Corporate
Governance. Ditmar and Smith (2006) investigated the two corporate governance indicators and their relations to the firm market value. They found that in firms with a weak governance structure every one dollar change in the market equity will change the firm market value by 0.42 to 0.88 while the same figure for firms with good governance would be two times larger. Gompers, Ishii, Metrick (2003) conducted a study in the United States and showed that the corporate governance and performance are related. They used time-series and regression analysis to demonstrate that there is a strong correlation between the size of the board of directors and the stock market value.

Hartzel et al., (2009) examined corporate diversification, corporate governance, and firm performance. Their results indicate corporate diversification and corporate governance are correlated. It was also noted that diversification has a strong correlation with institutional investors but it has a weaker correlation with other corporate governance variables.

Jae-Seung, Jun-KooK, and Kyung-Suhp (2004) found that more capable managers bring about better corporate governance and pay attention to the stockholders’ interests. They also noted that there is a positive relationship between the firm value and the corporate governance. Demsetz and Lehn (1985), Mark, Shleifer, and Vishny (1988), and Hermalin and Weisbach (1991) explored the impact of ownership on the firm performance. The results of their study suggested that there is a positive significant relationship between the ownership structure and the firm performance. In contrast, Himmelberg, Hubbard, and Palia (1999) did not observe a correlation between non-executive members and the firm performance.

As can be seen, the results of most studies conducted on corporate diversification and corporate governance point to the improvement of corporate governance. In line with previous research, the present study explores the relationship between business diversification and corporate governance in different corporate life cycles; an issue that has not been addressed in Iran. To this end, the following hypotheses are going to be tested in this study:

**The main research hypothesis:** There is a significant relationship between business diversification and corporate governance in the different corporate life cycles.

**Sub-hypotheses:**
1. There is a significant relationship between business diversification and the percentage of institutional investors in the different corporate life cycles.
2. There is a significant relationship between business diversification and the percentage of non-executive managers in the different corporate life cycles.
3. There is a significant relationship between business diversification and the size of the board of directors in the different corporate life cycles.

**Methodology**

Concerning the type of research, the present study is an ex post facto research. The sample under study included the diversified firms listed in Tehran Stock Exchange that were selected using random sampling. The required data were collected using the reports released by the firms and the data archive published by the Tehran Stock Exchange. The sample firms were studied over a five-year period from 2007 to 2011 in the Tehran Stock Exchange. Accordingly, all firms in the population under study with the following conditions were included in the research sample. Besides, the firms that did not meet the following requirements were excluded from the sample:

1. The business or geographically diversified firms, namely the firms with diverse markets for their products or the firms that produced diverse products.
2. The firms whose fiscal year ended in March and did not change it during the period under study.
3. The firms whose shares were traded at the time when this study was conducted.
4. The firms whose data were available.

Concerning to the above constraints, the research sample consisted of 40 firms listed in Tehran Stock Exchange. Besides, three variables of corporate diversification, corporate governance, and corporate life cycle were manipulated in this study. Furthermore, diversification was divided into business and geographical diversification for the purpose of the present study.

To measure business diversification, the entropy index was used, which is defined as follows:
\[ E = \sum_{i=1}^{n} P_i \ln P_i \]

Where, \( n \) is the number of the firm activities, \( P_i \) is equal to the relative weight of each evaluated activity, which is estimated by having the firm total sales divided by the sales of the activity.

To examine geographic diversification, the ratio of the export sales to total sales was used. The firms with export sales were considered as geographically diversified firms in this study. Given the low level of export sales to total sales in the listed companies in Tehran Stock Exchange, no significance level was used in this study.

\[
\text{Geographical diversification} = \frac{\text{Export sales}}{\text{Total sales}}
\]

Panel analysis was used in this study to test the research hypotheses. In this technique, first the model with no effect and then the model with fixed effects are analyzed. Finally, the model selection will be done through Limer test which shows the efficacy of the model with no effects and the model with fixed effects. Besides, the Hausman test evaluates the model with fixed effects and the model with random effects. Finally, the model with random effects will be analyzed.

**Data Analysis**

The data from 40 firms under study over a five-year period from 2007 to 2011 were analyzed to determine the relationship between the variables and to test the research hypotheses. The collected data were calculated using Excel and were analyzed using SPSS Software (Version 18) Eviews (Version 6).

**Model Selection**

The appropriate model would be selected from among the models (e.g. the combined model, the model with fixed effects, or the model with random effects). The results of the Chow and Hausman tests used to determine the appropriate model are presented in the following table:

<table>
<thead>
<tr>
<th>Models</th>
<th>Chow/Limer tests</th>
<th>Hausman test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Testing effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>value</td>
<td>df</td>
<td>Probability</td>
</tr>
<tr>
<td>Model 1</td>
<td>F-value</td>
<td>18.206</td>
<td>(39153)</td>
</tr>
<tr>
<td></td>
<td>Chi-square</td>
<td>346.007</td>
<td>39</td>
</tr>
<tr>
<td>Model 2</td>
<td>F-value</td>
<td>45.876</td>
<td>(39153)</td>
</tr>
<tr>
<td></td>
<td>Chi-square</td>
<td>508.225</td>
<td>39</td>
</tr>
<tr>
<td>Model 3</td>
<td>F-value</td>
<td>1.260</td>
<td>(39153)</td>
</tr>
<tr>
<td></td>
<td>Chi-square</td>
<td>55.697</td>
<td>39</td>
</tr>
</tbody>
</table>

The Chow test probability values for the first and second models are lower than 0.05. Therefore, it can be said that the used models produce different effects for the firms under study. In addition, the probability values from the Hausman test for the first model and the second model are equal to 0.916 and 0.91, respectively that both are higher than 0.05. Therefore, the used models are models with random effects. In contrast, the third model is with no effects as the Chow test probability value is 0.16. These models were used to test the research hypotheses.

**Model with Random Effects**

The assumed model is as follows:
Outside Directors\(_u\) = \(\beta_0 + \beta_1 \text{ENTROP}_u + \beta_2 D_u + \beta_3 \text{ENTROP} \times D_u + \beta_4 \text{Size}_u + \beta_5 \text{Age}_u + \beta_6 \text{Lev}_u + \beta_7 \text{ROE}_u + \varepsilon_u\)

The value of D is variably zero for growth firms and 1 for the declining firms. Therefore, \(\text{ENTROP} \times D\) shows the relationship between ENTROP and the dependent variable among the two groups of the firms.

The null hypothesis and the alternative hypothesis in this model are as follows:

\[
\begin{align*}
H_0 & : \beta_1 = \beta_2 = \ldots = \beta_7 = 0 \\
H_1 & : \beta_i \neq 0 \quad i = 1, 2, \ldots, 7 \\
H_0 & : The \ model \ is \ not \ significant. \\
H_1 & : The \ model \ is \ significant.
\end{align*}
\]

The results of the panel analysis are presented in the following table:

**Table 1: Results of Panel analysis**

<table>
<thead>
<tr>
<th>Dependent Variable: Outside Directors</th>
<th>Method: Pooled EGLS (Cross-section random effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included observations: 5</td>
<td>Cross-sections included: 40</td>
</tr>
<tr>
<td>Total pool (balanced) observations: 200</td>
<td>Swamy and Arora estimator of component variances</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prob.</th>
<th>t-Statistic</th>
<th>Std. Error</th>
<th>Coefficient</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.004</td>
<td>2.901</td>
<td>0.114</td>
<td>0.330</td>
<td>C</td>
</tr>
<tr>
<td>0.000</td>
<td>-5.158</td>
<td>0.040</td>
<td>-0.207</td>
<td>ENTROP</td>
</tr>
<tr>
<td>0.426</td>
<td>-0.798</td>
<td>0.046</td>
<td>-0.037</td>
<td>D</td>
</tr>
<tr>
<td>0.000</td>
<td>6.604</td>
<td>0.052</td>
<td>0.342</td>
<td>ENTROP*D</td>
</tr>
<tr>
<td>0.610</td>
<td>0.511</td>
<td>0.015</td>
<td>0.008</td>
<td>SIZE</td>
</tr>
<tr>
<td>0.111</td>
<td>1.602</td>
<td>0.066</td>
<td>0.105</td>
<td>AGE</td>
</tr>
<tr>
<td>0.649</td>
<td>0.456</td>
<td>0.060</td>
<td>0.027</td>
<td>LEVERAGE</td>
</tr>
<tr>
<td>0.093</td>
<td>-1.686</td>
<td>0.001</td>
<td>-0.001</td>
<td>ROE</td>
</tr>
</tbody>
</table>

Random Effects (Cross)

<table>
<thead>
<tr>
<th>Prob.</th>
<th>Coefficient</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.083</td>
<td>_C01--C</td>
<td></td>
</tr>
<tr>
<td>-0.357</td>
<td>_C02--C</td>
<td></td>
</tr>
<tr>
<td>-0.442</td>
<td>_C03--C</td>
<td></td>
</tr>
<tr>
<td>-0.283</td>
<td>_C04--C</td>
<td></td>
</tr>
<tr>
<td>0.121</td>
<td>_C05--C</td>
<td></td>
</tr>
<tr>
<td>0.085</td>
<td>_C06--C</td>
<td></td>
</tr>
<tr>
<td>0.204</td>
<td>_C07--C</td>
<td></td>
</tr>
<tr>
<td>0.001</td>
<td>_C08--C</td>
<td></td>
</tr>
<tr>
<td>0.022</td>
<td>_C09--C</td>
<td></td>
</tr>
<tr>
<td>0.214</td>
<td>_C10--C</td>
<td></td>
</tr>
<tr>
<td>-0.073</td>
<td>_C11--C</td>
<td></td>
</tr>
<tr>
<td>0.204</td>
<td>_C12--C</td>
<td></td>
</tr>
<tr>
<td>0.004</td>
<td>_C13--C</td>
<td></td>
</tr>
</tbody>
</table>
As can be seen in the above table, the F-value is 0.000 that is less than 0.05. As a result, the null hypothesis is rejected at 95% confidence level. In other words, there is a significant model at 95% confidence level. Besides, the value of coefficient of determination is 0.23, indicating that about 23% of the variations of the dependent variable are explained by the variations in the dependent variable. The value of the Durbin-Watson statistics is 1.78. The values closer to 2 show the non-autocorrelation of the residuals, which is another assumption of the
regression analysis. To estimate the coefficients, the following hypotheses can be tested using partial t-statistics. The null hypothesis and the alternative hypothesis for the intercept with the constant value are as follows:

\[
\begin{align*}
H_0 : \beta_0 &= 0 \\
H_1 : \beta_0 &\neq 0
\end{align*}
\]

These hypotheses are written for the independent and control variables as follows:

\[
\begin{align*}
H_0 : \beta_i &= 0 \\
H_1 : \beta_i &\neq 0
\quad \text{for } i = 1, 2, \ldots, 7
\end{align*}
\]

The value of the test statistics is calculated as follows:

\[
t_{p_i} = \frac{\beta_i - 0}{S_{\beta_i}} \quad i = 0, 1, 2, \ldots, 7
\]

The distribution of the above statistics for large samples is standard normal distribution. Therefore, the areas of rejection and non-rejections of the null hypothesis are shown in Figure 1 as follows:

As shown in the above figure, if the t-value is placed in the rejection area the null hypothesis will be rejected.

**Results**

The main research hypothesis is restated here: *There is a significant relationship between business diversification and corporate governance in the different corporate life cycles.*

The value of t-statistics for ENTROP is equal to –5.16 (which is negative and significant). Besides, the value of t-statistics for D is -0.80 (which is not significant). The same value for ENTROP * D is equal to 6.60 (positive and significant), 0.51 for SIZE (insignificant), 1.60 for the AGE (insignificant), 0.46 for LEVERAGE (insignificant), and -1.68 for ROE (insignificant). The value of the t-statistics for the intercept is equal to 2.90, so the null hypothesis is rejected at 95% confidence level.

Interpretation of ENTROP*D: There is a positive significant relationship between the dependent variable (ENTROP) and the dependent variable for declining firms. In contrast, there is a negative significant relationship between the two variables in the growing firms. Therefore, it can be concluded that there is a positive significant relationship between business diversification and corporate governance for declining firms but there is a negative significant relationship between business diversification and corporate governance for growing firms.
Suggestions for Users of the Study

Firms can explore the effects of the geographical diversification on the corporate life cycle, the firm value, and other variables in terms of internal geographical sales rather than the export sale and by determining the internal sales and taking into account the sales level to different cities. Moreover, researchers can examine how the corporate diversification is related to other variable and use the findings to improve the firm performance.

Suggestions for Future Research

Following this study, conducting other studies on the following topics is of significance:
1. The research sample in this study included all industries. Future research can focus on specific industries to control the impact of the industry differences on the results.
2. The present study investigated the impact of corporate diversification on the corporate life cycle. Further research can explore the possible impact of diversification on other variables such as earnings management, cash holdings, and corporate risk.

References