

THE IMPACT OF CORPORATE DIVERSIFICATION ON FIRM VALUE USING ENTROPY AND HERFINDEL INDICES FOR THE COMPANIES LISTED IN TEHRAN STOCK EXCHANGE

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Abstract

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There are a variety of different business activities. Some companies have lack of diversity but others are diversified. One of the most important parameters for evaluation for choosing company for investing is company's value. Therefore, this article investigates the effect of diversify by both indices of entropy and Herfindel on firm value for the companies listed in Tehran Stock Exchange. The effect of diversification on firm value is tested for the period of 2006 to 2014 for 88 companies. The target population for the period for investigation is chosen by using Cochran method and systematic elimination method. Panel analysis is used for hypothesis testing, estimating procedures and testing model assumptions. Results show that there is not significant linear and non-linear relationship between the two variables of entropy index of business diversification and firm value but there is a significant negative relationship between the two variables of Herfindel index of business diversification and firm value. Results show a U-shaped relationship between these variables and the dependent variable.

Keywords: Corporate Diversification, Firm Value, the Entropy Index, the Herfindel Index

1. INTRODUCTION

Companies in terms of diversification are different from each other. Diversity is of two dimensions:

A) Geographic, where the company has several branches and is active in different cities and countries. In other words, the place is diverse and operates in two or more geographical place. In fact, every detail geographical place of company is breakdown of the business unit to provide goods or services in specific geographic area consisting of a region or geographic regions other employment and have different risks and return from components that operate in other geographical areas.

B) product diversity, which the company has a variety of activities in two or more products from the market works and each part is an inseparable part of the entity's business that has a product or service or a group of related products or services offers has risks and return and different from the rest of the entity (Lorenz, 2014).

The results of Penrose (1959) and Morris (1964) show that companies grow, their need to diversify. Managers, creditors and other stakeholders have different views and opinions of the Company's

diversification of products. Diversification as a means of reducing corporate risk, which in turn could impact on their future bonuses will be watching by managers. The entity's creditors prefer that companies try to diversify because it would likely delay the incoming cash flow to repay the debt. In contrast, shareholders, because of reducing their investment risk, prefer the company specialize its' work (Martin et, al. 2003).

1.1. Theoretical Foundations

Dennis (2002) argues that managers to achieve personal interests use diversification as a means of getting benefits and rewards to the value of the company, managers think that more product variety of products, higher the company's value will be achieved.

In existing literature in this scope of research and diversification effect on company's value, mixed results f has been reported and there is no consensus, this means that some reports suggest a positive relationship between corporate diversification and firm value and some found the negative relationship and some did not find any

significant relationship (Major, 2015). Researches such as Berger and Ofek (1995), Ducasse and Kahn, (2006) and Rudolf and Shoutzer (2013), examined effect of diversifying on company's value, by comparing and examining the relationship between diversification and the value of the company for diversified companies and corporate monoculture. Study such as Hechel et al (2012) showed that the involvement of companies in a variety of products will damage its' value and this finding is opposite of results of research of Chun Chu et al. (2014) and Willa Long (2004). Corporate Diversification can mean that there is no core in company's activities. Grant (2012) believes that growth is the major reason that a company decides to diversify its products, the company's growth as a reason of diversification is an example for the Agency Cost, which is the result of companies' profitability. From the standpoint of Corporate Finance, firm value is affected by the synergistic factors. Important here is managing these effects that this would increase the competitive advantages of diversified companies. These synergistic factors can be financial and operational (Shamraeva, 2010).

For a long time, it was thought that the strategy of diversification is efficient and rational (Grigoriady, 2009). But then, according to researches, it was shown that it destructs enterprise value (Kuppuswamy, 2010; Berger, 1995; Lang, 1994). Past empirical researches show that companies with diversity (product and geographic), in capital market are less attractive (Lang and Stulz, 1994; Berger and Ofek, 1995).

Results of research conducted in past, show that diversity reduces the value. A review of the literature of recent years shows that the impact of diversification on firm value is not the same from industry to industry, and also in different economic environments. Santalo and Becerra (2008) concluded that diversification has different effects in different industries. The results of their research show that stocks of companies that have a variety of products and services are in some industries more attractive and less welcomed in others. Recent researches show that the effect of diversification is greater in the markets that rank lower in terms of performance (for example, Dimitrov and Tice, 2006; Yan et al., 2010; Hovakimian, 2011).

1.2. Background Research

Yang Yang et, al (2017) investigate the relationship between product diversification and hotel property performance as well as the moderators of this relationship in the urban lodging market. Using stochastic frontier analysis with panel data, and calibrate the efficiency scores of 377 urban hotels in Beijing from 1994 to 2005. Then investigate the impact of product diversification on performance as measured by efficiency score. Results from panel data models indicate that the degree of product diversification has a positive relationship with hotel performance. Hotel location, diversification expansion rate, and foreign ownership/operation are found to be significant moderating factors determining the effect of product diversification. Specifically, hotels that (a) are located farther from the city center, (b) expand diversification more slowly, and (c) are domestically owned are more

likely to leverage the benefits stemming from product diversification.

Panayiotis et al (2016) concluded that companies that their managers are too much trusted, governed between 12.5 to 14.1 percent compared to diversified companies that are run by managers with moderate confidence. Because of the destruction caused by the incorrect decisions of the Investment is additional Company's work that burden on company because of its diversity. The results of this paper show the new factor for value destruction in the company.

Santarelli et al (2016) was assumed that the company's profitability is determined according to the company degree of diversification. That had defined levels of diversification: diversification decisions, the degree of diversification and diversification of output. In this study, parametric and semi-parametric approaches have been used in testing dynamic models. After controlling for industry proven, enterprise-level results show a non-linear relationship between diversification and performance. A reversed U-shaped relationship is reported.

Rubin (2016) has been looking to find out how social responsibility can improve company performance and value through diversification of risk. By review of the literature, this study shows the internal diversification of the company reduces systemic risk, so it had a positive impact on company performance.

Andreou et, al (2016) investigate the role of organizational learning on the valuation effects of corporate diversification. The empirical findings suggest that corporate diversification reduces shareholders' wealth. However, consistent with the absorptive capacity viewpoint of organizational learning, diversification performance depends on repetitive and accumulative experiences that relate to a firm's prior diversification activity and/or a firm's experience in operating in multiple-business segments. Specifically, single-business firms that diversify once demonstrate significant value reduction. In contrast, multi-business firms that diversify once do not demonstrate value reduction, while single/multi-business firms that diversify multiple times demonstrate value creation. Findings also reveal that performance is conditional on the mode of diversification since internal growth diversification shows higher valuation effects than diversifications through acquisitions.

Ashraf et.al (2016) investigates the role that ownership structure and diversification of income plays in the financial stability of banks from the GCC region. This study finds evidence that suggests that higher concentration of ownership in any type of shareholding is associated with higher insolvency risk. However, this higher insolvency risk is not associated with any specific type of shareholders. Higher financial fragility is also associated with the size of Islamic bank. Banks engaged in substantial fee-based activities are more financially stable as compared with banks that predominantly generate their incomes from traditional intermediation activities.

Nazarova (2015) tests combination strategies used in various group companies, the combination of strategies. His research results show that diversification does not destroy the value of national

and international companies active in several trade issues.

Jungwoo Shin et.al (2015) quantitatively analyzes how the diversification strategies of firms in the information communication technology (ICT) affect their existing businesses. Moreover, this study proposes a corporate strategy by comparing the outcomes of diversification with and without a bundling strategy. This study performs an empirical analysis of firms that have diversified from high-speed Internet and wire telecommunication services to Internet protocol television service. For analysis, this study uses a mixed multiple discrete-continuous extreme value model that reflects product selection and usage, and market simulation is conducted to access the effect of diversification. The results show that related diversification positively impacts corporate performance and the impact of related diversification with commodity bundling is greater than that of related diversification without commodity bundling.

Lorenz (2014) has studied the diversification and its side effects on innovation and the future of the industry. The first results show the different relationship (Incidentally, means that in some meaningful relationship and the positive or negative and in some other nonsense) but by separating the phases of research companies, and place them in different samples, the significant correlation was obtained at any stage.

Yong Lu et, al (2014) find that international diversification is positively affected by firms' domestic industrial and domestic regional diversification. The study also finds that top management team (TMT)'s previous international experience strengthens the impact of domestic diversification on firms' international diversification, whereas TMT's prior political connections weakens the impact of domestic diversification on international diversification.

Karna et, al (2013) show the U-shaped relationship between diversification and leverage and also corporate performance, but show no significant relationship between geographical diversification and firm performance (linear and nonlinear).

Chih-lien (2013) analyze five-year data of the companies listed in the stock exchange of Thailand and the results show that companies that have more family property are more willing to diversify and because of this act, company's value caused to be damaged.

In literature review, there is no investigation on the effect of entropy and Herfindel indices of diversification on firm value. So, in this study, it is investigating these effects and relationships.

2. THE STUDY HYPOTHESIS

Based on the theoretical foundation and literature mentioned above, the hypotheses of this study are as follows:

1. There is a significant linear relationship between entropy index of diversification of the business (products) and firm value.
2. There is a significant non-linear relationship between entropy index of diversification of the business (products) and firm value.

3. There is a significant linear relationship between Herfindel index of diversification of the business (products) and firm value.

4. There is a significant non-linear relationship between Herfindel index of diversification of the business (products) and firm value.

3. METHODOLOGY

From the prospect of purpose of research, this study is applied research and in nature is descriptive correlational research and it was done by using regression analysis. The research population is all companies listed in Tehran Stock Exchange. Samples are selected based on the following criteria:

1. Financial information is available for the period of 2006-2014

5. To enhance the comparison and synchronization requirements to participate, the end of its fiscal year be on 19th of March (because the fiscal year in Iran lasts in 29th of Isfand [the last fiscal month of calendar in Iran]).

6. Due to the lack of transparency distinction between operating and financial activities, finance firms like investment companies, financial intermediaries, holding, Banks were removed from the study sample

7. The information required databases (financial statements and explanatory notes) have to be available.

8. Companies must not stop activities and not change their fiscal year for the period of 2006 to 2014

9. Based on the above conditions, 88 companies have been selected during the period of 2006 to 2014 as sample.

3.1. Variables

3.1.1. Dependent Variable.

Firm value: value of the company at the end of year t which is equal to the natural logarithm of the company's stock value at the end of the financial period

1.1.2. Independent variables

DR: One of the independent variables in this study is business diversification. This research uses entropy index for obtaining diversification. The concept of entropy was originally developed by Boltzmann (1986) as a tool in physics and mechanics. Entropy is a measure of the inverse focus, concentration decreases when the entropy increases.

$$\text{Equation 1: } DT = \sum_{i=1}^n P_i \times m \times \ln S_t$$

DT = diversification of products in a particular industry

P_i = the division achieved sales of product i in total sales. And n is the number of products which can be from 1 to n .

S = total industry sales

M = the number of products

Whatever the size of the DR is higher, the company's business diversification is more specific.

DR²: square entropy diversification is to find a nonlinear relationship.

HERF Herfindel index for the company i in year t calculated as follows:

$$\text{Equation 2: } \text{HERFi,t} = \sum (\text{SSale}/\text{Sale})^2$$

Where in:

HERF_{i,t}: sales revenue based on the Herfindel index for firm i in year t

SSale: sale of a particular part of the company

Sale: total sales

HERF is 1 for the companies that have one segment and is less than 1 for the companies with more segments. So, less of this index show more diversity.

HERF²: square Herfindel diversification is to find a nonlinear relationship.

3.1.3. Control variables

LN (PPE): the natural logarithm property and equipment at the end of the year.

lnCF: the natural logarithm of cash flow during fiscal period.

Leverage: the leverage ratio is the ratio of total debt divided by total assets at the end of the fiscal year t.

LNsize: the natural logarithm of the company's total assets at the end of fiscal year.

M / B: the ratio of market value to book value of the company's stock.

Profitability: the natural logarithm of net profit after tax.

The Jones model attempts to estimate expected accruals after controlling for changes in a firm's economic environment. Expected accruals under the Jones model is measured by:

$$\text{Equation 3: } (\text{accit}/\text{ait}-1) = \beta_1(1/\text{ait}-1) + \beta_2 (\Delta\text{revit}/\text{ait}-1) + \beta_3 \text{ppeit}/\text{ait}-1$$

Where Δrevit is the change in revenues in period t from period t-1; ppeit is the gross property, plant and equipment at the end of period t; and ait-1 is the book value of total assets at the end of period t-1. β_1 , β_2 and β_3 are firm-specific parameters that are estimated from the following regression:

$$\text{Equation 4: } \frac{\text{Acc}_t}{\text{TA}_{t-1}} = a \left(\frac{1}{\text{TA}_{t-1}} \right) + b \left(\frac{\Delta\text{Sales}_t}{\text{TA}_{t-1}} \right) + \gamma \left(\frac{\text{PPE}}{\text{TA}_{t-1}} \right) + e_{it}$$

Where:

Accit is the actual accruals of firm i in period t; in this equation accruals concluded from that changes in current assets minus current liabilities minus depreciation (CAit - ΔCLit - ΔDEPit), ΔSales , changes in net sales.

The remaining of prior equation is discretionary accruals:

$$\text{Equation 5: } \text{DAC}_{it} = \frac{\text{Acc}_t}{\text{TA}_{t-1}} - a \left(\frac{1}{\text{TA}_{t-1}} \right) - b \left(\frac{\Delta\text{Sales}_t}{\text{TA}_{t-1}} \right) - \gamma \left(\frac{\text{PPE}_{it}}{\text{TA}_{t-1}} \right)$$

The absolute value of discretionary accruals (ABS - DAS), obtained from the model, is considered as one of the control variables in this study.

Z: Financial crisis index considered as another control variable. In this study, the diagnosis of the financial crisis, this is used by Heydari et al (2010).

$$\text{Equation 6: } Z = 3.20784 \text{ EBIT}/\text{TA} + 1.80384 \text{ AE}/\text{TA} + 1.61363 \text{ WC}/\text{TA} + 0.50094 \text{ E}/\text{TL} + 0.16903 \text{ EBIT}/\text{S} - 0.39709 \text{ CA}/\text{CL} - 0.12505 \text{ NE}/\text{S} + 0.33849 \text{ TL}/\text{TA} + 1.42363 \text{ FS}$$

Where in:

Z = financial crisis

EBIT/TA = earnings before interest and tax divided by assets

AE/TA = ratio of retained earnings divided by assets

WC/TA = ratio of working capital divided by assets

E/TL = ratio of equity divided by total debt

EBIT/S = earnings before interest and taxes divided by total sales

CA/CL = ratio of current assets divided by current liabilities

NE/S = ratio of net income divided by total sales

TL/TA = ratio of debt divided by total assets

FS = size of the company

15.8907 = the Cutoff point

If Z < 15.8907, the company has the financial crisis.

If Z ≥ 15.8907, the Company has no financial crisis.

3.2. Research Models

Model 1 to test the first hypothesis of study:

$$\text{Firm value}_{it} = b_0 + b_1 (\text{DR})_{it} + b_2 \ln \text{PPE}_{it} + b_3 \ln \text{CF}_{it} + b_4 \ln \text{size}_{it} + b_5 \text{LEV}_{it} + b_6 \text{DAC-ABS}_{it} + b_7 Z_{it} + b_8 \text{Profitability}_{it} + \varepsilon$$

Model 2 to test the second hypothesis of study:

$$\text{Firm value}_{it} = b_0 + b_1 (\text{DR})_{it} + b_2 (\text{DR})_{it}^2 + b_3 \ln \text{PPE}_{it} + b_4 \ln \text{CF}_{it} + b_5 \ln \text{size}_{it} + b_6 \text{LEV}_{it} + b_7 \text{DAC-ABS}_{it} + b_8 Z_{it} + b_9 \text{Profitability}_{it} + \varepsilon$$

Model 3 to test the third hypothesis of study:

$$\text{Firm value}_{it} = b_0 + b_1 (\text{HERF})_{it} + b_2 \ln \text{PPE}_{it} + b_3 \ln \text{CF}_{it} + b_4 \ln \text{size}_{it} + b_5 \text{LEV}_{it} + b_6 \text{DAC-ABS}_{it} + b_7 Z_{it} + b_8 \text{Profitability}_{it} + \varepsilon$$

Model 4 to test the fourth hypothesis of study:

$$\text{Firm value}_{it} = b_0 + b_1 (\text{HERF})_{it} + b_2 (\text{HERF})_{it}^2 + b_3 \ln \text{PPE}_{it} + b_4 \ln \text{CF}_{it} + b_5 \ln \text{size}_{it} + b_6 \text{LEV}_{it} + b_7 \text{DAC-ABS}_{it} + b_8 Z_{it} + b_9 \text{Profitability}_{it} + \varepsilon$$

4. STATISTICAL RESULTS

4.1. Descriptive statistics

The following table shows the mean and median central tendency and dispersion measures such as standard deviation, skewness and kurtosis that are calculated for different variables. As it is seen, mean, median for the dependent variables, ie the firm

value closely symmetrical. This feature is important because symmetry is a characteristic of normal distribution. So it can be concluded that firm value is normal.

Table 1. Research Descriptive statistics

<i>Variables</i>	<i>MID</i>	<i>MEAN</i>	<i>Standard Deviation</i>	<i>kurtosis</i>	<i>Skewness</i>
Firm value	15.5623	4.5107	4.48216	4.918	29.112
Diversification of entropy index	0.4720	0.3900	0.25925	0.784	-0.486
Diversification of Herfindel index	0.2894	0.1495	0.30335	1.332	0.396
Fixed assets	11.8398	11.8399	1.72062	0.281	-0.799
Operating cash flow	14.6149	2.4501	1.58329	2.257	7.781
Firm size	13.3619	13.2690	1.30028	0.218	-0.694
Financial Leverage	0.0791	0.0485	0.09993	2.347	7.098
Discretionary accruals	0.7556	1.0925	0.43136	-1.203	-0.562
Crisis index	21.3597	21.4000	1.93239	-0.167	-0.470
Profitability	0.1833	0.1822	0.13474	1.425	3.545

4.2. Test of the first model

The first hypothesis: there is a significant linear relationship between entropy index of diversification

of the business (products) and firm value. The panel data is used to determine the linear relationship, so it is used software Eviews7.

Table 2. A panel data regression model using fixed effects

Firm value _{it} = b ₀ + b ₁ (DR) _{i,t} + b ₂ ln PPE _{it} + b ₃ lnCF _{it} + b ₄ lnsize _{it} + b ₅ LEV _{it} + b ₆ DAC-ABS _{it} + b ₇ Z _{it} + b ₈ Profitability _{it} + ε				
<i>Variables</i>	<i>Coefficients</i>	<i>t- statistic</i>	<i>prob</i>	<i>VIF- statistic</i>
C	0.067	0.432	0.666	-
Entropy index of diversification	0.098	0.504	0.615	1.729
Fixed assets	-0.222	-6.228	0.000***	1.356
Operating cash flow	0.024	1.262	0.209	1.484
firm size	0.042	2.314	0.446	2.122
Financial Leverage	-0.030	-2.127	0.035**	2.028
Discretionary accruals	4.275	2.01	0.047**	2.094
Crisis index	-5.627	-0.396	0.693	1.209
Profitability	0.058	2.469	0.015**	1.228
P < 0.10* ; P < 0.05** ; P < 0.01***				
F-stat: 24.79083 Prob: 0.0000 R2: 0.86 adjusted R2: 0.83 D_W: 2.18				

The coefficient (0.098) for entropy index of business diversification variable (DR), as well as its significance in the above regression (to the value of 0.615), suggests that in the sample examined in this study there is no significant linear relationship between two variables of diversification and firm value. Multicollinearity refers to the relationship between the independent variables in the model in a way that is non-zero. VIF statistic is used to determine the multicollinearity. The lower level of this index indicates high accuracy of regression model; this statistic should not be more than 10.

4.3. Test of the second model

The second hypothesis: there is a significant non-linear relationship between entropy index of diversification of the business (products) and firm value.

So quadratic test is used for the detection of relationship between independent variable of diversification (DR²) and the dependent variable, the firm value.

Table 3. Quadratic test between diversification and firm value

	<i>Summary</i>				<i>Estimation of parameters</i>			
	R2	F	Degree of freedom 1	Degree of freedom 2	Prob	C	b1	b2
Quadratic	0.014	0.966	2	132	0.383	0.246	-0.129	0.057

The above table shows clearly that this variable's significance level of quadratic is more than 0.05. So, as a result, assuming U-shaped relationship is rejected between the independent variable and the dependent variable.

As a result of a research hypothesis test, it cannot be accepted that there is a nonlinear relationship between the DR and the company.

Table 4. The results of the panel data regression model using fixed effects

Firm value _{it} = b ₀ + b ₁ (DR) _{i,t} + b ₂ (DR) ² _{i,t} + b ₃ ln PPE _{it} + b ₄ lnCF _{it} + b ₅ lnsize _{it} + b ₆ LEV _{it} + b ₇ DAC-ABS _{it} + b ₈ Zit+ b ₉ Profitability _{it} + ε				
Variables	Coefficients	t- statistic	Prob	-statistic VIF
C	-0.056	-0.415	0.679	-
Entropy index of diversification	0.073	2.002	0.047**	1.399
The square of entropy index of diversification	0.297	1.239	0.208	1.371
Fixed assets	-0.228	-7.339	0.000***	1.319
Operating cash flow	0.021	1.256	0.211	7.243
Firm size	-0.016	-1.378	0.171	6.349
Financial Leverage	-2.392	-1.309	0.193	1.98
Discretionary accruals	-3.967	-1.947	0.054*	1.291
Crisis index	0.069	3.351	0.001***	1.207
Profitability	0.303	3.194	0.002***	1.391
P < 0.10* ; P < 0.05** ; P < 0.01***				
F-stat: 6.05495 Prob: 0.0000 R2: 0.61 adjusted R2: 0.51 D_W: 2.31				

The coefficient of (0.297) for entropy index of business diversification variable (DR²), in above regression and also its significance (to the value of 0.208), shows that in the case of non-linear relationship, there is no-significant relationship between business diversification and firm value.

Which is consistent with the results obtained from the quadratic model?

4.4. Test of the third model

The third hypothesis: there is a significant linear relationship between Herfindel index of business diversification and firm value.

Table 5. Results of panel data regression model using fixed effects

Firm value _{it} = b ₀ + b ₁ (HERF) _{i,t} + b ₂ ln PPE _{it} + b ₃ lnCF _{it} + b ₄ lnsize _{it} + b ₅ LEV _{it} + b ₆ DAC-ABS _{it} + b ₇ Zit+ b ₈ Profitability _{it} + ε				
Variables	coefficients	t- statistic	Prob	-statistic VIF
C	12.094	13.176	0.000***	-
Herfindel index of diversification	-1.370	-3.519	0.001***	1.289
Fixed assets	-4.104	-11.943	0.000***	1.316
Operating cash flow	0.021	1.256	0.211	1.859
Firm size	0.618	8.768	0.000***	1.193
Financial Leverage	3.124	1.604	0.111	1.167
Discretionary accruals	-4.747	-0.344	0.732	1.292
Crisis index	0.481	2.155	0.033**	1.836
Profitability	-0.766	-0.803	0.423	1.222
P < 0.10*** ; P < 0.05** ; P < 0.01*				
F-stat: 16.12891 Prob: 0.0000 R2: 0.39 adjusted R2: 0.27 D_W: 1.86				

Coefficient (-1.370) for the variable Herfindel index of business diversification (HERF), as well as its significance in above regression (approximately 0.001), suggests that in the examined sample in this study, there is a significant negative relationship between the two variables of diversification and firm value. In other words, by increasing the variety of corporate Herfindel index, the value of the company's decline.

4.5. Test of the fourth model

The fourth hypothesis: there is a significant non-linear relationship between Herfindel index of business diversification and firm value.

So quadratic-test is used to determine the type of relationship between the independent variable of Herfindel index of business diversification (HERF²) and the dependent variable.

Table 6. Results of quadratic test between Herfindel index of diversification and firm value

	Summary					Estimation of parameters		
	R2	F	Degree of freedom 1	Degree of freedom 2	Prob	C	b1	b2
Quadratic	0.139	10.635	2	132	0.000	23.531	-6.883	3.721

As it seen in above table, significance of independent variable quadratic is 0.000 that is smaller than the significance level of 0.05. So, hypothesis of U-shaped relationship between these variables is not rejected and so approved.

Based on the fourth hypothesis result that there is a non-linear relationship between HERF and firm value, it concludes that the first, by increasing business diversification reduces firm value and then,

it causes firm value to be increased. Since the quadratic test is only testing the relationship between two independent and dependent variables, and the effects of control variables, is ignored, so to find a more accurate result with the control variables, multivariate regression analysis examines the relationship between Herfindel index of business diversification and firm value.

Table 7. Results of the fourth regression model in panel data using fixed effects

Firm value _{it} = b ₀ + b ₁ (HERF) _{it} + b ₂ (HERF) _{it} ² + b ₃ ln PPE _{it} + b ₄ lnCF _{it} + b ₅ lnsize _{it} + b ₆ LEV _{it} + b ₇ DAC-ABS _{it} + b ₈ Zit + b ₉ Profitability _{it} + ε				
Variables	Coefficients	t- statistic	prob	-statistic VIF
C	-0.033	-0.664	0.482	-
Herfindel index of diversification	0.043	3.203	0.002***	2.727
Square of herfindel index of diversification	0.178	4.724	0.000***	1.712
Fixed assets	-0.136	-11.742	0.000***	1.685
Operating cash flow	0.012	2.009	0.109	3.766
Firm size	-0.0096	-2.204	0.033**	3.301
Financial Leverage	-1.401	-2.094	0.036**	1.029
Discretionary accruals	-2.401	-3.115	0.003***	1.671
Crisis index	0.041	5.361	0.000***	3.627
Profitability	0.181	5.110	0.000***	1.723
P < 0. 10*** ; P < 0. 05** ; P < 0. 01*				
F-stat: 1.338048		Prob: 0.00617		R2: 0.25
		adjusted R2: 0.06		D_W: 2.007

The coefficient (0.1782) for the variable business diversification (HERF²), as well as its significance in above regression (the value of 0.000), suggests that there is a significant non-linear relationship between two variables of Herfindel index of diversification and firm value for examined sample in this study.

5. CONCLUSIONS

Companies today are to improve their financial performance for the survival and development. Many factors affect financial performance. Numerous papers today are investigating to identify these factors in the first place and secondly to examine the impact of these factors on financial performance. Companies in terms of business diversification and geographic diversity are different from each other. Contrary to issues related to profitability, diversification of the company is discussed less. So, it is the impetus for this study. The results show non-significant relationship between variable of entropy index of business diversification and firm value. Results show a non-significant level of quadratic entropy index of business diversification, so, it is rejected assuming U-shaped relationship between the independent variable and the dependent variable. Variable coefficient of business diversification entropy index (DR²), indicates that in examined sample in this study there is non-significant nonlinear relationship between the two variables of business diversification and firm value. Which is consistent with the results obtained from the quadratic model? Coefficient for variable Herfindel index of business diversification (HERF) indicates that there is a significant negative relationship between Herfindel diversification and firm value. Results of quadratic model show U-shaped relationship between these variables, so, hypothesis is not rejected. At the end, some suggestions are presented for future research: the researchers recommended, in addition to examining the effects of variables used in this study, use of other parameters that are effect to and by firm value. And also, examine the impact that diversity can have on the level of earnings quality. And more, the effect that family and the governmental ownership can have on diversifying. Researchers can divide sample companies by their diversification and then test the effect of their size of diversification on firm value. Finally recommended to examine the

relationship between corporate diversification (business and geographical diversification) and firm value in different industries and different countries.

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