Bank, S., Ünal, H. ve Güneysu, Y. (2022). "The Effects of International and Industrial Diversification on Firm Value: Evidence from Turkey", Eskişehir Osmangazi Üniversitesi İİBF Dergisi, 17(2), 519 – 534.
Doi: 10.17153/oguiibf.1082288

Başvuru: 03.03.2022 Kabul: 15.05.2022 *Araştırma Makalesi/Research Article*

The Effects of International and Industrial Diversification on Firm Value: Evidence from Turkey

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Uluslararası ve Endüstriyel Çeşitlendirmenin Firma Değeri Üzerindeki Etkileri: Türkiye Örneği	**The Effects of International and Industrial Diversification on Firm Value: Evidence from Turkey**
Öz	**Abstract**
Bu çalışma, Berger ve Ofek (1995) tarafından geliştirilen ve Fauver vd. (2004) tarafından modifiye edilen "Artık Değer Metodolojisi"ni kullanarak, Borsa İstanbul Pay Piyasası'nda işlem gören firmalardan İmalat Sektöründe yer alan firmalar için uluslararası çeşitlendirmenin firma değeri üzerinde herhangi bir anlamlı etkiye sahip olmadığını bununla birlikte endüstriyel çeşitlendirmenin firma değerlerini artırdığını tespit etmiştir. Elde edilen çeşitlendirme priminin, firmaların kurumsal yatırımcılarının sahiplik yapısı paylarının kontrol edilmesi durumunda da devam ettiği gözlenmiş; bununla birlikte, kurumsal yatırımcıların firma değeri ile düşük sahiplik oranlarında pozitif, yüksek sahiplik oranlarında ise negatif ilişkili olduğu belirlenmiştir.	This study determined that international diversification does not have a significant effect on the value of the firms operating in the manufacturing sector among the firms listed in the Borsa Istanbul Equity Market; however, that the industrial diversification increases the firm value by using the "Excess Value Methodology" developed by Berger and Ofek (1995) and modified by Fauver et al (2004). Acquired diversification premiums were also observed to continue in the case of control of institutional investors' share ownership; in addition, a positive relation was found between institutional investors' share ownership and firm value at low share ownership, while it is negative in high ownership rates.
Anahtar Kelimeler: Uluslararası Çeşitlendirme, Endüstriyel Çeşitlendirme, Firma Değeri, Kurumsal Yatırımcıların Pay Sahipliği	**Keywords:** International Diversification, Industrial Diversification, Firm Value, Institutional Investors' Share Ownership
JEL Kodları: C01, C12, G32	**JEL Codes:** C01, C12, G32

Araştırma ve Yayın Etiği Beyanı	Bu çalışma bilimsel araştırma ve yayın etiği kurallarına uygun olarak hazırlanmıştır.
Yazarların Makaleye Olan Katkıları	Çalışmanın tamamı üç yazar ile birlikte oluşturulmuştur
Çıkar Beyanı	Yazarlar açısından ya da üçüncü taraflar açısından çalışmadan kaynaklı çıkar çatışması bulunmamaktadır.

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1. Introduction

Even though the effects of international and industrial diversification strategies on firm value have been thoroughly investigated as part of the corporate finance literature, the issue has not yet been fully clarified. Due to the fact that both diversification strategies have benefit and cost dimensions for firms that can be explained under various theories, some studies emphasize a premium (e.g. Bodnar et al.,1997) or a discount (e.g. Denis et al., 2002) based on international/geographical diversification, while others focus on a premium (e.g. Lee et al., 2012) or a discount (e.g. Berger and Ofek, 1995) based on industrial diversification in terms of firm value. It is noteworthy in these studies that they focus mostly on firms in developed markets, while a more limited number of relatively recent studies emphasize emerging markets. However, diversification premium or discount may differ between developed and emerging countries depending on the development and international integration of capital markets (Fauver et al., 2003). For this reason, the issue of whether both diversification decisions increase the value of the firm appears like an issue that should be re-examined especially in terms of emerging markets.

Additionally, in the relevant literature, the ownership structure of firms is also considered in the context of the relationship between diversification strategies and firm value. However, the studies on ownership structure are also mostly oriented toward developed markets. In this respect, the firms in developed markets, such as the USA, commonly have a dispersed ownership structure with relatively better corporate management (Chen and Yu, 2012); capital markets in emerging countries are less developed and ownership concentration in such countries may be higher, and these features, eventually, may result in a distinctive picture for the relationship between diversification and firm value in emerging markets (Lee et al., 2012).

The Turkish capital market stands out as an emerging market and it is noteworthy that institutional ownership rates in the Turkish manufacturing sector are quite high (67%). In the relevant literature, Attig et al., (2012), arguing that institutional investors with longer investment horizons have more motivation and effectiveness in monitoring, suggest that this monitoring reduces asymmetric information and agency problems, while Jafarinejad et al., (2015) note the relationship between institutional ownership structure and the excess value of diversified firms. The findings of both studies draw attention to institutional ownership structure, which has generally been ignored by the literature and come up with questions such as whether a high level of institutional ownership translates into an advantage in terms of agency costs and whether it affects the influence of international and industrial diversification on firm value. However, it is seen that there is a limited number of studies in the literature that examine the relationship between international and industrial diversification decisions and firm value in terms of the Turkish capital market (e.g. Yücel (2012), Selçuk (2015)). The most prominent point in both studies is that both industrial and international diversifications are not distinguished or geographical diversification is neglected. It is concluded, therefore, that the effect of both diversification strategies on the value of Turkish firms is still unclear. In this context, research on the Turkish capital market (especially the Turkish manufacturing sector) will both contribute to the limited literature on emerging markets and reveal the effect of a high institutional ownership structure on the relationship between diversification decisions and firm value.

2. Literature Review

2.1. Theoretical Literature

On the question of whether international diversification increases firm value, four paradigms such as internalization theory[1], ineffective world capital markets, managerial purposes, and tax avoidance and low-cost inputs are taken into account (Morck and Yeung, 1991). In this context, firstly, firms internalize market imperfection in order to earn rent from firm-specific assets and transfer such assets to an internalized market abroad. It is also possible for firms to receive a return from these assets above the market return by internalizing market imperfections (Bodnar et al., 1997). Secondly, multinational firms represent a geographically diversified portfolio for an investor. In the event that investors valuing global diversification rather than domestic and geographic diversification are costly for investors, investors will consent to pay a premium to the shares of geographically diversified firms, as they provide this service to themselves. Such a premium will result in an increase in the value of geographically diversified firms compared with that of domestic firms (Bodnar et al., 1997; Denis et al., 2002). Thirdly, depending on factors such as inherent complexity and geographical distribution of transactions, monitoring costs may differ from company to company (Jensen and Meckling 1976). In this context, managers may act upon personal interests, and this behavior may sometimes come into conflict with shareholders' interests. The fact that multinational firms have more complex structures than domestic organizations because of their transactions at various locations further grows the aforementioned problems for such firms (Bodnar et al., 1997). Finally, multinational increases firm value since it enables the firm to further evade tax or to access relatively low-cost inputs from abroad (from less developed countries, in particular) (Morck and Yeung, 1991).

On the other hand, the literature on the relationship between industrial diversification and the firm value indicates that industrial diversification may have both benefit and cost dimensions for the firms, as is the case for geographical diversification. Bodnar et al., (1997) point out the contribution to the firm of industrial diversification from two viewpoints. Firstly, industrial diversification will provide an increase in value thanks to its benefits with regard to the size and scale/scope of economies and pooling risks. Secondly, firms operating in different business lines which have little relationship with each other have more stable cash flows and thus provide better external financing opportunities; this situation leads to increased leverage and the use of more tax shields, which will contribute to the value of shares. However, despite these benefits, industrial diversification can generally be described as a value-reducing strategy (Kim and Mathur, 2008). In this respect, the relevant literature (such as Jensen, 1986; Rajan et al., 2000; Lins and Servaes, 1999) indicates that costs related to industrial diversification generally result from agency problems or industrial diversification leading to power struggles between divisions.

Additionally, in the relevant literature, the main reference point of some studies is the presence of agent costs that can be associated with the ownership structure of firms and the role of such costs in the effect of institutional diversification on firm value or diversification level. For instance, evaluating the issue in terms of managerial ownership, if managers' share ownership in a firm increases, the managers are then further exposed to the costs related to value-reducing actions and they will therefore probably avoid policies that decrease shareholders' wealth. Thus, if diversification by its nature reduces shareholder wealth, there

would be a negative relationship between the level of diversification and managerial equity ownership, according to the agency cost hypothesis (Denis et al., 1997).

2.2. Empirical Literature Review

Examining the literature on the relationship between international diversification and firm value, it can be confirmed that it is not clear whether international diversification increases firm value. Within this context, Mikhail and Shawky (1979), among the first studies, found that multinational corporation (MNC) shares outperform the market (S&P 500 index) according to Jensen's risk-adjusted measure of performance, whereas Brewer (1981) did not find a statistically significant difference in the risk-adjusted performance of the stocks of US-based MNCs and US-based national corporations. Similarly, Fatemi (1984) points out that MNCs can provide their shareholders with the same risk-adjusted returns as single-national companies; Michel and Shaked (1986), on the other hand, suggest that domestic firms have higher risk-adjusted market-based performance than multinational firms. Errunza and Senbet (1981, 1984) and Kim and Lyn (1986) indicate some findings on a positive relationship between international diversification and a firm's excess market value or firm value. According to Morck and Yeung (1991), the positive effect of R&D and advertisement expenditures on market value increases with the multinationality of a firm; however, multinationality itself does not have a significant effect. Bodnar et al., (1997) draw attention to the increase in firm value by geographical diversification; Denis et al., (1999, 2002), Fauver et al., (2004), and Kim and Mathur (2008), on the other hand, draw attention to the discount that geographical diversification brings on firm value. Similarly, Schmid and Walter (2012), in one of the most recent studies, discovered a significant discount for securities firms and a significant premium for credit intermediaries and insurance companies relating to geographical diversification; Lee et al., (2012), on the other hand, found that international diversification does not have a significant effect on firm value. Volkov and Smith (2015) and Jafarinejad et al., (2015) argue that geographical diversification increases the relative firm value or firm value; however, according to Cho (2016) and Huaping et al., (2016), it reduces firm value. Finally, Panangian and Siregar (2019) suggest that geographical diversification damages firm performance measured through excess value.

Examining the industrial diversification literature, it seems that the empirical findings related to industrial diversification and firm value are more consistent than those concerning international diversification (Lee et al., 2012); industrial diversification, in general, reduces firm value. In this context, firstly, after Lang and Stulz (1994), who determined that firms with high diversification levels have lower average and median Tobin's q ratios than firms operating in one business line, Berger and Ofek (1995), Servaes (1996), Bodnar et al., (1997), Denis et al., (1997), Denis et al., (1999), Chen and Ho (2000), Claessens et al., (2001), Denis et al., (2002), Lins and Servaes (1999), Lins and Servaes (2002), Fauver et al., (2003), Fauver et al., (2004), Kim and Mathur (2008) and Jafarinejad et al., (2015) obtained some findings of firm value being reduced by industrial diversification or of a diversification discount. In addition, examining the findings of another group of studies, it seems that industrial diversification is positively related to firm value according to Lee et al., (2012), Choe et al., (2014), Selçuk (2015), Maskati et al., (2015), Rong and Xiao (2017) and Mackey et al., (2017), with firm performance according to Chen and Yu (2012), and with both firm value and firm performance according to Yücel (2012). While Borah et al., (2018) find that the relationship between industrial diversification and the value of technology firms is negative for low-tech firms and positive for high-tech firms,

Panangian and Siregar (2019) confirm that industrial diversification, like geographic diversification, damages firm performance as measured through excess value.

On the other hand, according to some studies in the literature, it is suggested that there is a negative relationship between diversification level, managerial equity ownership and outside blockholders' equity ownership by Denis, Denis and Sarin (1997); that concentrated insider ownership increases the valuation effect of diversification by Lins and Servaes (1999); that corporate diversification for firms with a low managerial ownership rate causes a significant reduction in value and that outside block ownership does not have a significant effect on the value of diversification by Chen and Ho (2000); that a corporate diversification discount exists for diversified firms with a management ownership concentration of between 10% and 30% by Lins and Servaes (2002); that firms with a higher percentage of insider stock ownership have higher excess value by Kim and Mathur (2008); that there is U-shaped relationship between managerial ownership and corporate diversification by Chen and Yu (2012); that ownership concentration does not significantly affect firm value by Lee et al., (2012); that the excess value of diversified firms increases and they have lower firm-idiosyncratic risk as institutional shareholding rates increase by Jafarinejad et al., (2015); and that family ownership does not play a moderating role in the effect of geographical diversification on firm performance but strengthens the adverse effect of industrial diversification on firm performance by Panangian and Siregar (2019).

The relevant literature has shown that there are many studies on the relationship between international and industrial diversification and firm value, and some of these studies also take into account the ownership structure of the firms, but they obtained contradictory findings regarding the said relationship. More importantly, it is observed that these studies mostly focus on developed markets (e.g. Berger and Ofek (1995), Denis et al., (1997), Denis et al., (2002), Kim and Mathur (2008), Volkov and Smith (2015) and Mackey et al., (2017) for the US; Lins and Servaes (1999) for Germany, Japan, and the UK; Fauver et al., (2004) for Germany, the UK, and the US; Choe et al., (2014) for Australia) and there are limited studies that include emerging markets (e.g. Lins and Servaes (2002) for Hong Kong, India, Indonesia, Malaysia, Singapore, South Korea, and Thailand; Chen and Yu (2012) for Taiwan; Lee et al., (2012) for Malaysia; Selçuk (2015) for Brazil, Chile, Indonesia, Malaysia, Philippines, Poland, South Africa, Thailand, and Turkey; Huaping et al., (2016) for China). However, Fauver et al., (2003) draw attention to the development of the capital market, international integration, and legal systems in relation to the factors affecting the value of institutional diversification value. Fauver et al., (2003), in their study based on data consisting of more than 8000 companies from 35 countries, found that there was a statistically significant diversification discount among high-income countries where highly developed and internationally integrated capital markets exist. On the other hand, either there is a significant diversification premium or there is no finding related to diversification discount in countries whose capital markets are less developed and are segmented from international capital markets. Given the fact that the capital markets in emerging countries are less developed (Lee et al.,2012) and may differ in international integration and legal systems, there is a possibility that the relationship between both international and industrial diversification and firm value may also differ between different types of country. Therefore, researching the subject in terms of different emerging markets such as Turkey appears as an important literature gap.

3. Data and Methodology

The study focuses on the firms in the manufacturing sector that were listed on the Borsa Istanbul Equity Market, in the 2006–2018 period[4] in order to investigate the effect of international and industrial diversification strategies on firm value. The Borsa Istanbul Industry Index (BIST Industrial) was taken as the basis in order to determine the firms in the manufacturing industry sector, and the firms included in the sample period in this index were incorporated into the research sample population.

At the sampling stage, the data of the BIST Industrial Index was extracted from the Borsa Istanbul Datastore. To classify the firms to be included in the sample population by business segment, the NACE Rev.2 Economic Activity Classification with Six Digits (2019), published on the Turkish Statistical Institute's (TurkStat) website, was followed by three digits. Financial reports on the Public Disclosure Platform (PDP) website were used to obtain the industrial classification codes of firms, and the final sample population was determined to comprise70 firms. Consolidated financial reports for each year for the firms in the final sample population were reviewed. Those firms with 'business segment information' included in these reports were accepted as industrially diversified and those without such information included were accepted as focused firms; firms with 'geographic business segment information' included in these reports were accepted as internationally diversified and those without such information included were accepted as domestic firms. The firms were divided into four categories, as indicated in Table 1, following Fauver et al., (2004) and Lee et al., (2012) on the basis of geographic/international and industrial diversification engagements.

Table 1: Categorization of Sampled Firms

	Singlecountry ($\mathbf{D_{INT}} = \mathbf{0}$)	Multiplecountrys($\mathbf{D_{INT}} = \mathbf{1}$)
Singleindustry($\mathbf{D_{IND}} = \mathbf{0}$)	Domestic/focused	International/focused
Multipleindustry($\mathbf{D_{IND}} = \mathbf{1}$)	Domestic/conglomerate	International/conglomerate

Considering the categorization in Table 1, the international and industrial diversification activities of firms are represented with the dummy variablesD_{INT} and D_{IND}. In order to measure the values of firms diversified internationally and industrially, the excess value measurement methodology developed by Berger and Ofek (1999) and modified by Fauver et al., (2004) was taken as a basis. Accordingly, the excess value of each firm is defined as:

$$EV_{i,t} = ln\left(\frac{Actual\ Value_{i,t}}{Imputed\ Value_{i,t}}\right) \quad (1)$$

$EV_{i,t}$indicates the excess value of firm i in year t; $Actual\ Value_{i,t}$ the market capital–sales ratio[5] for firm i in year t; $Imputed\ Value_{i,t}$the imputed value for firm i in year t.While actual value was calculated as the firm's consolidated market capital–sales ratio, the imputed value was calculated as the median market–sales ratio between all single-segment firms in the same

[4] Achieving harmony between the financial statements of firms, due to the transition to inflation accounting between 2003 and 2004, and access to firms' 'business segment information' were important factors in the selection of the time period.

[5] Following Fauver et al., (2004), the ratio of a firm's market value of equity plus book value of debt to its total sales is considered as the market capital–sales ratio.

industry for single-segment firms and as the weighted average of the imputed value of each firm segment for multi-segment firms.

Fauver et al., (2004) have two approaches, domestic and international benchmarks, for the calculation of imputed value. However, the current study, in line with Lee et al., (2012), as it is mainly intended to determine whether diversified firms are better than their counterparts that do not follow any diversification strategy, follows only the domestic benchmark in the determination of imputed value. This benchmark compares the value of a firm with that of other firms operating in the same industry/industries or country (as where its headquarters is located) and indicates whether an average firm trades at a premium or a discount compared with single-segment domestic firms in its country. Eventually, if the value of a firm as a whole is greater than the sum of its segments, the firm will have a positive excess value (or premium); however, if it is less than the imputed value that is to be obtained from a portfolio which consists of single-segment firms operating in the same industry, the firm will have a negative excess value (or discount) (Fauver et al., 2004).

In testing the effect of industrial and international diversification on a firm's excess value, the relevant literature pays attention to individual firm characteristics such as size, profitability, future growth opportunities, and leverage that are likely to affect the market–sales ratio of a firm (e.g. Berger and Ofek, 1995; Fauver et al., 2004; Lee et al., 2012). This study, while considering such determinants, also covers the institutional ownership rate differently from the relevant literature. However, in the first step, in line with Lee et al., (2012), the following equation was set:

$$Excess\ Value = f(leverage, profit, size, growth\ opportunities, industry\ diversification, international\ diversification, multi-industry-international\ diversification)$$

In the next step, this model was estimated by using the following panel regression model:

$$EV_{it} = \beta_0 + \beta_1 LTA_{it} + \beta_2 OIS_{it} + \beta_3 CES_{it} + \beta_4 LEV_{it} + \beta_5 D_{INT,it} + \beta_6 D_{IND,it} + \beta_7 D_{INT*IND,it} + \epsilon_{it} \quad (2)$$

where i and t represent the unit and time dimensions of the data. EV indicates the natural log of the ratio of actual value to imputed value; logarithm of assets (LTA) indicates firm size; capital expenditure–sales ratio (CES) indicates growth opportunities; operating–sales ratio (OIS) indicates firm profitability, and the ratio of debt to common share equity indicates firm leverage (LEV). All data relating to the control variables were extracted from the database of Finnet Analysis Expert. The multi-industrial-national diversification dummy variable (D_{INTIND}) is basically the product of international and industrial diversification dummies ($D_{INT*IND}$) and is equal to 1 for multi-industry-national firms (that operate in several industries internationally) and 0 for others.

In the study, the data set was created by obtaining the observed values of the variables given in Equation (2) of the firms in the period 2006-2018. Panel data analysis was used because there is both time dimension and unit dimension in the data set. Since the estimation of all variables over the 13-year data restricted the time dimension, the static panel data method was preferred in the estimation of the equation. The static panel data model is an analysis method in which any values of dependent variables or lagged values of independent variables are/are not included as the explanatory variable. Classical pooled least squares (LS), fixed effects (FE), and random effects (RE) estimators are used while estimating the static panel

models. If units do not have their own characteristics, the classic pooled LS model is used. In the case of the unit- and/or time-specific characteristics, the FE or RE models are preferred. If the unit effects are related to the explanatory variables, the FE model becomes more effective; otherwise, the RE model is more effective (Baltagi et al., 2010).

In the second step, Equation (3) is estimated in order to analyze the effect of the share ownership of institutional investors on a firm's excess value for the period of 2008–2018[6].

$$EV_{it} = \alpha_0 + \alpha_1 LTA_{it} + \alpha_2 OIS_{it} + \alpha_3 CES_{it} + \alpha_4 LEV_{it} + \alpha_5 D_{INT,it} + \alpha_6 D_{IND,it} + \alpha_7 D_{INT*IND,it} + \alpha_8 INV_{it} + \alpha_9 D_{INV,it} + \alpha_{10}(D_{INT} * INV)_{it} + \alpha_{11}(D_{IND} * INV)_{it} + \mu_{it} \quad (3)$$

The institutional investor rate variable (INV_{it}) shows the ratio of shares held by institutional investors to total shares in year t for firm$i$. The institutional investor ratio dummy variable ($D_{INV,it}$), which is incorporated into the model in order to investigate a potential non-linear relationship between the institutional investor's ratio and firm value, is considered as 1 for firms with an institutional investor ratio of more than 40% and 0 otherwise. The ($D_{INT} * INV$) and ($D_{IND} * INV$) variables show the institutional investor ratio interaction variables, and the institutional investor[7] ownership ratio data used in model estimation were obtained from the Central Registry Agency, the central securities depository of the Turkish capital markets.

4. Empirical Results

Table 2 includes summary statistics about 70 firms that are listed in the Borsa Istanbul Equity Market manufacturing sector for the period 2006–2018, divided into four categories: domestic/focused, domestic/conglomerate, international/focused, international/conglomerate. The first panel of the table displays the mean and standard deviation values of the variables calculated for the four firm categories; the second panel displays Satterthwaite–Welch's test (unequal variances t-test) and p-values, in which the mean value variances of the variables are tested.

As shown in Table 2, considering total asset values, it seems that the four types of firms do not display significant variance in terms of size; domestic/conglomerate firms have higher leverage than other firm types; international/conglomerate firms have a higher ratio of operating income to sales (a proxy for profitability); domestic/focused firms have a higher ratio of capital expenditures to sales (a proxy for growth), and international/focused firms have the highest excess value and, on the other hand, domestic/focused firms the lowest excess value. Evaluating as a whole, it is found that there are no significant differences among the calculations for international/focused and international/conglomerate firms. However, international/focused and international/conglomerate firms seem to trade at a significant premium compared with domestic/focused and domestic/conglomerate firms.

[6] Since the data obtained from the Central Registry Agency have an initial period of 2008, the estimation period for this model was set as 2008–2018.

[7] The Central Registry Agency considers all investor types as 'institutional investor' excluding 'individual'. Thus, this investor type is a consolidated version of investor types such as legal entities, mutual funds, investment trusts and provident funds.

Table 2: Summary Statistics for Firms Listed in Borsa Istanbul Manufacturing Industry Index by Industrial and International Diversification, 2006–2018

	Single-industry firms		Multi-industry firms	
	Domestic	International	Domestic	International
Variables	Mean (standard deviation)			
Total asset	18.9646 (1.3000)	20.2413 (0.9138)	19.4240 (1.6815)	20.4110 (1.2443)
Total debt/ share equity	0.6129 (13.2972)	0.2701 (2.3336)	2.6569 (24.8965)	1.0911 (1.3446)
Operating income/sales	0.0398 (0.2543)	0.1057 (0.0797)	0.0953 (0.1402)	0.1234 (0.0882)
Capital expenditure/sales	9.4559 (37.2891)	6.5328 (6.0136)	5.4256 (12.7713)	8.1899 (9.3801)
Excess value	−0.0719 (0.7619)	3.4985 (6.2041)	−0.0482 (0.4434)	2.7626 (1.7605)
Observations	274	63	500	73

	Domestic vs international	Domestic vs conglomerate	Domestic vs international conglomerate	International vs conglomerate	International vs international conglomerate	Conglomerate vs international conglomerate
	Satterthwaite–Welch's t-test (p-values)					
Total asset	83.917*** (0.000)	17.840*** (0.000)	76.409*** (0.000)	36.323*** (0.000)	0.835 (0.362)	36.258*** (0.000)
Total debt/ share equity	0.161 (0.689)	2.217 (0.137)	0.341 (0.560)	4.296** (0.039)	6.061** (0.016)	1.939 (0.164)
Operating income/sales	12.869*** (0.000)	11.194*** (0.001)	20.384*** (0.000)	0.761 (0.385)	1.513 (0.221)	5.392** (0.022)
Capital expenditure/sales	1.513 (0.220)	3.008* (0.084)	0.225 (0.614)	1.362 (0.245)	1.543 (0.216)	4.990** (0.027)
Excess value	20.793*** (0.000)	0.223 (0.637)	180.228*** (0.000)	20.576*** (0.000)	0.829 (0.366)	184.369*** (0.000)

Note(s): *, ** and *** represent 10%, 5% and 1% significance level, respectively

Following the determination of the descriptive statistics for the four types of firms categorized, Equation (1) is estimated with panel regression models. First of all, the presence of unit-specific unit effects was confirmed with the likelihood ratio (LR) test for the estimated regression model. In an attempt to determine whether these are fixed or random effects, the Hausman test was used and the RE model was found to be the appropriate model according to Hausman testing. After the estimation of the RE model was determined, it was subjected to basic econometric assumptions and the problem of heteroscedasticity was revealed. In the next step, the White test was undertaken to correct the problem of heteroscedasticity, and final RE models were thus estimated. Results are displayed in Table 3.

Table 3: Panel Regression Estimates for Firm Excess Value, 2006–2018

Dependent Variable: EXV					
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
C	−2.7629** (0.042)	−2.7904** (0.037)	−0.9545 (0.346)	−0.9729 (0.330)	−1.0975 (0.269)
LEV	−0.0002 (0.410)	−0.0001 (0.618)	0.0001 (0.682)	0.0002 (0.554)	0.0001 (0.585)
PRFT (OIS)	−0.2673 (0.287)	−0.2677 (0.280)	0.0174 (0.939)	0.0229 (0.917)	0.0082 (0.971)
SIZE (LTA)	0.1641** (0.033)	0.1712** (0.027)	0.0483 (0.364)	0.0537 (0.319)	0.0567 (0.286)
GO (CES)	0.0021*** (0.006)	0.0019** (0.021)	0.0031*** (0.000)	0.0029*** (0.000)	0.0030*** (0.000)
INT	-	−0.1756 (0.313)	-	−0.1312 (0.416)	−0.0253 (0.802)
IND	-	-	2.7288*** (0.000)	2.7114*** (0.000)	3.0458*** (0.001)
INT*IND	-	-	-	-	−0.6080 (0.428)
Number of observations	910	910	910	910	910
Number of groups	70	70	70	70	70
R^2	0.0603	0.0730	0.5684	0.5683	0.5756
F-statistics (probability)	28.05*** (0.000)	36.95*** (0.000)	53.30*** (0.000)	65.74*** (0.000)	59.60*** (0.000)
Hausman test (probability)	1.06 (0.899)	1.71 (0.887)	4.98 (0.418)	4.70 (0.583)	5.11 (0.646)

Note(s): *, ** and *** represent 10%, 5% and 1% significance level, respectively; values in brackets are probability values based on standard errors resistant to heteroscedasticity.

It is understood from Table 3 that F-tests that test the significance of the model as a whole are statistically significant and the results of RE models are more significant and valid according to the results of Hausman tests. In estimated RE models, the proportion of the variance for a dependent variable that is explained by independent variables (R^2)varies between 6% and 58%. The rate of explained variance for the dependent variable is high in models of industrial diversification in particular.

The first model in the Table 3 is Model 1, in which four control variables are included; however, international and industrial diversification dummy variables are excluded. It was found that, in this model, only the firm size (LTA) and capital expenditure–sales ratio (CES) variables have a statistically significant effect on firm excess value, while the operating sales ratio (OIS) and firm leverage (LEV) variables have a negative coefficient but do not, however, have any effect on firm value. Models 2 and 3 are the models in which four control variables and the international diversification (D_{INT}) and industrial diversification (D_{IND}) dummy variables, respectively, are included. These models indicate that international diversification has a negative effect on firms' excess value, but that this is not statistically significant; on the other

hand, industrial diversification has a meaningful positive effect. In fact, this result is also confirmed in Model 4, where both dummy variables are included, and Model 5, where the international diversification dummy variable is included. In line with the findings, it is concluded that the excess value of firms undertaking industrial diversification will be 2.71 to 3.05 units greater than that of firms not undertaking industrial diversification. On the other hand, when all models are discussed in terms of control variables, it is observed that the meaningful positive relationship between the variables firm size (LTA) and growth opportunities (CES) and the firm's excess value which was found in Model 1 is in question under Model 2, whereas only the growth opportunities variable has a positive and statistically significant effect on a firm's excess value in other models. This amounts to an increase in excess value in the range of approximately 0.0019 to0.0031 units as a result of a one-unit increase in growth opportunities. Finally, the statistically insignificant negative relationship between the firm profitability (OIS) and firm leverage (LEV) variables and firm excess value that was found under Model 1 exists only in Model 2; in all other models, the relationship turns into a positive one but is not significant.

Following the estimations of excess value as part of Equation (1), Equation (2), which includes the institutional investor ratio variable (INV), institutional investor rate dummy variable (D_{INV}), and institutional investor ratio interaction variables in the control variables under Equation (1) was estimated with panel regression models; the results are reported in Table 4.

Table 4: Panel Regression Estimates for Firm Excess Values, 2006–2018

Dependent Variable: EXV				
Variable	**Model 6**	**Model 7**	**Model 8**	**Model 9**
C	−0.2481 (0.771)	−0.4842 (0.619)	−0.2179 (0.786)	−0.4551 (0.617)
LEV	−0.0001 (0.466)	−0.0001 (0.522)	−0.0001 (0.462)	−0.0001 (0.517)
PRFT (OIS)	0.1829 (0.490)	0.1808 (0.511)	0.1833 (0.487)	0.1813 (0.508)
SIZE (LTA)	0.0072 (0.868)	0.0094 (0.830)	0.0073 (0.867) ***	0.0095 (0.830)
GO (CES)	0.0034*** (0.000)	0.0034*** (0.000)	0.0034*** (0.000)	0.0034*** (0.000)
D_{INT}	−0.1358 (0.246)	0.1791 (0.520)	−0,1346 (0.250)	0,1801 (0.517)
D_{IND}	3.0359*** (0.003)	2.9771*** (0.002)	2.7813** (0.018)	2.7291** (0.014)
$D_{INT*IND}$	−0.6732 (0.396)	−0.6304 (0.407)	−0.6443 (0.389)	−0.6023 (0.397)
INV	1.0164** (0.028)	1.3489* (0.054)	0.9822** (0.013)	1.3153** (0.032)
D_{INV}	−0.5759*** (0.004)	−0.5930*** (0.004)	−0.5853*** (0.007)	−0.6019*** (0.007)
D_{INT}*INV	-	−0.4878 (0.293)	-	−0.4875 (0.289)

D_{IND}*INV	-	-	0.3223 (0.849)	0.3133 (0.850)
R^2	0.5632	0.5644	0.5669	0.5678
Number of observations	770	770	770	770
Number of groups	70	70	70	70
F-statistic (prob.)	65.75*** (0.000)	71.70*** (0.000)	69.04*** (0.000)	75.0*** (0.000)
Hausman test (prob.)	9.27 (0.413)	8.94 (0.538)	10.48 (0.400)	10.07 (0.524)

Note(s): *, ** and *** represent 10%, 5% and 1% significance level, respectively; values in brackets are probability values based on standard errors resistant to heteroscedasticity.

According to Table 4, the F-statistics values of all estimated models are significant and RE models are valid according to the Hausman test. Model 6 is the model in which the institutional investor ratio variable (INV) and institutional investor ratio dummy variable (D_{INV}) have been controlled. Findings obtained from this model reveal, in line with Model 5 in Table 3, that international diversification does not have any statistically significant effect (though its effect is negative) on a firm's excess value and that the industrial diversification and growth opportunities (CES) variables have a significant positive effect. It was also found in the model that the institutional investor ratio has a positive effect on a firm's excess value, but for firms with an institutional investor ratio (D_{INV}) of above 40%, there is a negative and statistically significant effect. While the significant relationships obtained for each variable seem to retain their validity under Model 7, Model 8, and Model 9, it was concluded that the firm leverage (LEV), firm profitability (PRFT), firm size (SIZE), international diversification (D_{INT}) and interaction variables ($D_{INT*IND}$, D_{INT}*INV, D_{IND}*INV) did not have a statistically significant effect on firm value.

5. Discussion and Conclusion

This study investigates the effect of industrial and international diversification strategies on firm value for firms operating in the manufacturing sector and listed in the Borsa Istanbul Equity Market, using the 'excess value' methodology developed by Berger and Ofek (1995) and modified by Fauver et al., (2004). The results obtained from multi-panel regression models under the study, in line with Lee et al., (2012), on the one hand, confirm that an industrial diversification strategy increases the firm value and an international diversification strategy does not have a significant effect on firm value, and on the other hand reveal that, in terms of control variables, only the variable of growth opportunities (CES) has a positive and statistically significant effect on firm excess value. It is also confirmed that these findings survive in the next stage, in which the ownership percentage of institutional investors is included in estimation models; however, there is a positive relationship between institutional ownership and firm value at lower ownership rates (share ownership of below 40%), while the relationship is negative at higher ownership rates (share ownership exceeding 40%).

In conclusion, the study brings to the relevant literature new considerations within its scope and findings. Firstly, the finding of the current study which indicates that there is no relationship between international diversification and firm value contradicts the literature that suggests

that international diversification either increases (Bodnar et al., 1997; Jafarinejad et al., 2015) or decreases (Denis et al., 1999; Denis et al., 2002; Fauver et al., 2004) firm value. With regard to this contradiction, it can be concluded that the benefits and cost dimensions of international diversification are quite close to each other for firms operating in the manufacturing sector in the Turkish capital market. Evaluating this conclusion in terms of the theory of internalization (Caves, 1971 and Dunning, 1973), it is within the realm of possibility that synergistic benefits do not occur as a result of the insufficient assets of relevant firms based on valuable information, such that a considerable increase in firm value (Denis, 2002) has not been achieved. At this juncture, the question would be clarified if future research on the relationship between international diversification strategy and firm value also covered information-based assets. On the other hand, from a different perspective, this conclusion may also be related to the low rate of institutional investors with long-term investment horizons that internationally diversified firms have. According to Jafarinejad et al., (2015), firm-specific risks reduce, and firm value increases as the volume of shares of institutional shareholders increases. However, Attig et al., (2012) suggest that institutional investors with long-term investment horizons, compared with investors with short-term horizons, play a more valuable governance role by reducing asymmetric information and agency problems. In this case, a low level of share ownership by institutional investors with long-term investment horizons may not have allowed an expected increase in firm value in the presence of asymmetric information and agency problems. Therefore, although the current analysis indicates that an increase in share ownership by an institutional investor does not have any effect on firm value if international diversification is implemented, it would be beneficial in terms of strengthening the findings to reanalyze the relationship in question by considering the investment horizons of institutional investors.

Secondly, the current study confirms some of the findings of studies (Yücel, 2012; Choe et al., 2014; Selçuk, 2015; Maskati et al., 2015; Rong and Xiao, 2017) that suggest a positive relationship between industrial diversification and firm value; however, it also reports certain other findings inconsistent with the many studies (Denis et al., 1997; Lins and Servaes, 1999; Fauver et al., 2004; Kim and Mathur, 2008) which suggest that industrial diversification reduces firm value. As an explanation for this contradiction, the decline in costs related to industrial diversification due to diminishing agency costs can be pointed out. Therefore, the fact that the institutional investor rate of industrially diversified firms is high may reveal effective monitoring mechanisms among these firms, and possible agency problems between the managers and shareholders may reduce after all (Kim and Mathur, 2008; Attig et al., 2012). However, the findings of the current analysis suggest that an increase in the percentage rate of institutional investors does not have any effect on firm value. Therefore, future studies examining the relationship between institutional ownership and firm value for industrially diversified firms, considering the investment horizons of institutional investors, would help to clarify the current findings, as suggested by Attig et al., (2012).

Thirdly, the findings obtained as part of the study suggest that institutional ownership affects firm value in a positive way in the case of low share ownership (below 40%) whereas it has a negative effect in the case of high share ownership (above 40%) seem to overlap with the findings of Navissi and Naiker (2006). They indicate a non-linear relationship between institutional share ownership and firm value by suggesting that a low rate (up to 30%) of share ownership among institutional investors with board representation has a positive relationship with firm value, while the relationship turns into a negative one if share ownership increases

(above 30%). Based on their findings, Navissi and Naiker (2006) state that institutions with board representation are more inclined to monitor the management, and therefore the presence of these investors may have a positive effect on the firm value; however, these investors might cause the board of directors to make suboptimal decisions. As a final evaluation, the fact that the findings obtained by Navissi and Naiker (2006) can explain the non-linear relationship between the rate of institutional shareholdings and firm value determined in the current study constitutes a basis to consider the share ownership of institutional investors, as well as board representation, in the future studies on the subject.

In conclusion, evaluating terms of both diversification strategies, the fact that the current study is based on the Turkish capital market, which is defined as an emerging market, can be introduced as a reason for the contradictory findings between this study and the related literature. Studies in the industrial and international diversification literature generally take developed markets as their basis for analysis (e.g. Berger and Ofek, 1995; Denis et al., 1997; Denis et al., 2002; Fauver et al., 2004; Kim and Mathur, 2008). Emerging markets can differ from developed markets, especially in terms of the development level of capital markets, international integration, and legal systems (Fauver et al., 2003), which are among the factors affecting the value of corporate diversification. This situation may, therefore, create some results that are inconsistent with the literature on the relationship between industrial and international diversification and firm value. Indeed, this could also be the case in other studies on emerging markets, because the current study appears to have obtained some results consistent with certain studies in the literature (Lee et al., 2012); Selçuk, 2015) and inconsistent with certain others (Lins and Servaes, 2002; Huaping et al., 2016). Therefore, focusing on issues such as the development level of capital markets, international integration, and legal systems as part of future studies investigating the relationship between industrial and international diversification and firm value may be valuable in helping to clarify this relationship.

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