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Capital Structure Adjustment Speed and Ownership Structure: A Research on BIST 100 Index Food Sector Firms

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Abstract

In this study, the capital structure adjustment speed of 19 food sector firms in the Borsa Istanbul (BIST) 100 index has been estimated between 2010 and 2021. The effect of ownership identity on the capital structure adjustment speed has been investigated within the scope of family and non-family firms. The seven firms have been classified as non-family firms (NFF) and twelve as family firms (FF). The capital structure adjustment speed for family and non-family firms has been composed of the classical dynamic partial adjustment model. The Generalized Moments Method (GMM) model has been used as the econometric model in estimating the models. The results obtained from the study revealed that there is no significant difference between the debt ratios of family companies and non-family firms. The adjustment speed of family firms has been determined as 68%, and the adjustment speed of non-family firms has been approximately 56%. The capital structure adjustment speed of family firms is higher than non-family firms. The results show that family firms are less exposed to financial constraints than other firms increasing their borrowing capability, thus enabling them to reach the target debt level faster. The findings suggest that ownership structure plays a vital role in capital adjustment behavior.

Keywords: *Capital Structure, Capital Structure Adjustment Speed, Family Firms.*

Öz

Bu çalışmada, Borsa İstanbul (BİST) 100 endeksinde yer alan 19 gıda sektörü firmasının 2010-2021 yılları arasındaki sermaye yapısı düzeltme hızları Genelleştirilmiş Momentler Yöntemi (GMM) ile tahmin edilmiştir. Sahiplik kimliğinin sermaye yapısı düzeltme hızına etkisi aile şirketi ve aile olmayan şirketler kapsamında incelenmiştir. Yedi firma aile olmayan şirket (NFF) ve on iki firma aile şirketi (FF) olarak sınıflandırılmıştır. Aile ve aile olmayan şirketler için sermaye yapısı düzeltme hızı, klasik dinamik kısmi uyum modeliyle oluşturulmuştur. Model tahmininde ekonometrik model olarak Genelleştirilmiş Momentler Yöntemi (GMM) kullanılmıştır. Çalışmadan elde edilen sonuçlar, aile şirketlerinin borçlanma oaranıyla aile olmayan şirketlerin borçlanma oranı arasında anlamlı bir fark olmadığını ortaya koymuştur. Aile şirketlerinin sermaye yapısı düzeltme hızı yaklaşık %68, aile olmayan şirketlerin sermaye yapısı düzeltme hızı ise yaklaşık %56 olarak belirlenmiştir. Aile şirketlerinin sermaye yapısı düzetlme hızı, aile olmayan şirketlere göre daha yüksektir. Sonuçlar, aile şirketlerinin diğer şirketlere göre finansal kısıtlamalara daha az maruz kaldıklarını, borçlanma kapasitelerini artırdıklarını ve bu sayede hedef borç düzeyine daha hızlı ulaşabildiklerini göstermektedir. Bulgular, sahiplik yapısının sermaye ayarlama davranışında önemli bir rol oynadığını göstermektedir.

Anahtar Kelimeler: *Sermaye Yapısı, Sermaye Yapısı Düzeltme Hızı, Aile Şirketleri.*

Introduction

The capital structure irrelevance theory of Modigliani and Miller (1958) is one of the crucial theories explaining the relationship between firm value and capital structure. After the irrelevance theory, which received significant criticism due to its assumptions, many theories regarding capital structure have been developed. The most important of these have the trade-off theory (Kraus & Litzenberger 1973) and the financial hierarchy theory (Myers & Majluf 1984). The trade-off theory (Kraus and Litzenberger, 1973) accepts that firms have an optimum debt ratio and have been offset by the costs of financial distress and tax savings. According to the financial hierarchy theory (Myers & Majluf 1984), firms should make their financing choices in order, and this hierarchy is related to the cost of the financing source. Both theories investigate the relationship between capital structure and firm value decisions by stretching the assumptions of the irrelevant theory. After these two theories, the effect of market failures on debt decisions has been empirically examined in many studies, and the debate on the existence of the optimum debt ratio continues.

Studies to test the balancing theory focus on the variability of firms' debt/equity ratio (Flannery & Rangan, 2006; Graham & Leary, 2011), Frank & Shen, 2013; Haron, 2014). Studies that argue that firms' capital structure is dynamic and that their financing decisions can be better characterized by partial adaptation to the target capital structure started with Jalilvand & Harris (1984). Afterwards, Fischer et al. (1989) examined the differences between firms' minimum and maximum borrowing rates and investigated the characteristics of firms with high deviations. They have concluded that, for firms with a debt ratio above the maximum debt ratio, the cost of financial distress caused by borrowing is greater than the adjustment costs to return to the target debt ratio. For firms with debt below the minimum debt ratio, the opportunity cost of tax savings is greater than the adjustment costs to return to the target debt ratio. Firms adjust to returning to the target borrowing rate only when these conditions are met. Apart from this, it allows the debt ratio to deviate from the target debt level within acceptable limits.

Another critical issue that has been discussed in the corporate finance literature in recent years is the concept of corporate governance. The corporate governance approach is based on the understanding of reviewing the interests of stakeholders in the decision process with a holistic approach by accepting the differences between the parties. While management expresses the fulfilment of planning, organizing, execution, coordination and control activities to achieve the objectives, corporate governance is concerned with how the interests of interest groups have been reflected in the organizational goals and how they have been satisfied in the fulfilment of all these activities (OECD, 2004).

The internal control mechanisms of corporate governance are the board and ownership structures. Ownership structure expresses who provides the capital of the firm and their capital shares (Gönenç, 2004). Ownership identity and ownership concentration are the two main components of ownership structure in firms (Tükenmez et al., 2016). Ownership identity defines the group that has a high impact on the control of firms, such as family ownership, corporate ownership, foreign ownership, institutional investor ownership and foreign corporate ownership. Ownership concentration represents the share of the large partner group in the total capital.

The concentration of ownership structure in certain persons/institutions and ownership identity affect the probability of shareholders becoming managers. In firms where the degree of attention to ownership structure is quantitatively low, management may be left to non-shareholders/professionals, which may cause a conflict of interest (agency theory) between the representative and the represented. In companies where the degree of ownership structure concentration is low, the agency costs between shareholders and managers increase the capital costs, making it difficult to change and balance the target capital structures of the firms (An et al., 2021).

When evaluated in terms of ownership identity, being a person or family member of the controlling shareholders may cause a conflict of interest between the controlling shareholder and the minority shareholder. Problems arising from identity and ownership structure can affect firms' financing opportunities and debt adjustment behaviours. Considering the agency costs on capital costs and financing opportunities, it is possible to say that firms play a crucial role in optimizing their adjustment speed (Morellec et al., 2012).

In this study, the target debt level adjustment speed of the food sector firms operating in the BIST 100 index for 2010-2021 have been estimated, and the differences between the adjustment speed has been examined by grouping the firms according to their ownership identity. In this context, firms have been grouped as family and non-family firms, and the differences between the debt adjustment speed of family and non-family companies have been revealed. With this study, a dynamic perspective on the capital structure decisions of firms have been developed by examining the debt ratio adjustment behaviours of family firms. In addition, the limited number of studies in the Turkish finance literature about the adjustment speed of the firms and the fact that this study has been one of the first studies to examine the relationship between the ownership structure and the capital structure adjustment speed make this study significant.

Literature

There are many empirical studies on the relationship between ownership structure and firms' capital structure decisions. These studies examine the effect of ownership structure on firms' debt decisions. In some of, it has been shown that the degree of ownership structure concentration has a positive effect on the debt ratio, while others have a negative impact (Kim & Sorensen, 1986; Johnson & Mitton, 2003; Brailsford et al., 2002; Céspedes, González & Molina, 2010; Marchica, 2008; Liu et al., 2011).

In recent years, studies on capital structure decisions have focused on the variability of the capital structure, aiming to reveal the degree of variability (adjustment speed) and the factors affecting variability. Özkan (2001) has estimated the capital structure adjustment speed at approximately 43%. Fama & French (2002) have found that the adjustment speed for Compustat database firms is 7-18%. Flannery & Rangan (2006) have shown that the adjustment speed of US firms varies between 33% and 34%. Lemmon et al. (2008) have examined all Compustat database firms and have found that the adjustment speed ranged from approximately 22% to 25%. Huang & Ritter (2009) have disclosed that the adjustment speed for US firms is near 23%; Mukherjee & Mahakud (2010) as about 33%. Elsas & Florysiak (2011) have estimated 26% adjustment speed for Compustat database firms. Haron et al. (2013) determined the adjustment speed for Malaysian firms to be 57%, while Matemilola et al. (2013) determined the adjustment speed to be 40% for South African firms.

Limited studies in the literature examine the relationship between ownership structure and capital structure adjustment speed.

López-Gracia & Sánchez-Andújar (2007) compared 422 family-owned and 436 non-family firms over the 1997-2004 period. The study concluded that small-scale family firms' capital structure adjustment speed is higher than that of non-family companies.

Wang et al. (2009) examined public and China private sector firms' target debt ratio adjustment behaviours between 1998 and 2007. The results show that private sector firms have a higher smoothing rate than state-owned firms.

Zhou & Xie (2015) examined the smoothing rates of state-owned and non-state enterprises in a study of Chinese firms between 1999 and 2009. They concluded that while the debt ratio of publicly-owned firms is high, their adjustment speed is lower than that of non-public-owned firms.

Burgstaller & Wagner (2015) examined the relationship between family ownership, capital structure decisions, and the adjustment speed of 470 small and medium-sized enterprises between 2005 and 2010. As a result, firms under the control of family members have higher leverage and adjustment speed.

Pindado et al. (2015) have examined the corporate capital structure decisions of Eurozone family firms and the ownership structure between 1996 and 2006. Since the cash flow sensitivity of borrowing is lower in family companies, the target debt ratio adjustment speed is higher.

Buvanendra et al. (2017) have investigated the relationship between corporate governance mechanisms and capital structure adjustment behaviours of Sri Lankan and Indian firms between 2003 and 2012. According to the results obtained from the study in which family firms have used as the ownership structure, it has concluded that the adjustment speed of family firms has higher than other firms.

Kayo et al. (2018) examined Brazilian family firms between 2003 and 2013 and found that family firms had a higher debt ratio and a lower adjustment speed.

Kasbi (2019) examined the relationship between the ownership structure concentration degree and the rate of adjustment of 766 companies from France, Italy, United Kingdom, Germany and Switzerland between 1196-2007. In the study, it has been concluded that the firms with a high degree of concentration have a high adjustment speed.

Guo et al. (2020) have investigated the relationship between executive share ownership and the adjustment speed of firms traded on the Shanghai and Shenzhen Stock Exchange between 2010 and 2017. According to the results, there is a positive relationship between the adjustment speed and the ownership of managerial shares. In the presence of managerial ownership, firms' adjustment speed increases. Managerial ownership helps reduce the cost of capital structure adjustment and narrows the deviation between the actual capital structure and the optimal capital structure.

Sardo et al. (2021) grouped small and medium-sized Portuguese firms into female-owned family firms and male-owned family firms between 2010 and 2017. They have examined firms in terms of financing decisions and adjustment behaviours. The results show that the adjustment speed of female-owned family firms is lower than that of male-owned family firms.

An et al. (2021) examined the relationship between ownership structure and capital structure adjustment speed based on foreign corporate ownership. The study reviewed 7246 firms from 38 different countries between 2000 and 2013 and a positive relationship has found between foreign corporate ownership and adjustment speed.

Methodology

In the study, the capital structure adjustment speed of 19 BIST food sector firms have been estimated from the period 2010-2021. The firms' ownership has been examined, and the effect of ownership identity on the capital structure adjustment speed has been investigated.

Ownership identity defines the group that has a high impact on the control of firms. Family businesses have advantages over other businesses in factors such as overcoming financial difficulties, access to financial resources, high level of relationship between family members and faster decision making. In this manner, firms have been classified "Family Firm-FF" and non-family firms. (non-Family Firm- NFF)".

As of 2021, there are a total of 19 firms in the BIST 100 index food sector. The sample is limited to these 19 firms. The annual financial data of the firms have been obtained from the BIST website, and the data regarding the ownership structure have been received from the Public Disclosure Platform (KAP).

There is no agreement on the definition of a family firm in the literature. Ang et al. (2000), for a business to be considered a family business, a family must own 50% or more of the shares of the business. According to Westhead and Cowling (1997), people whose family members have control and management should also own 60% or more of the firm's shares. According to Barth et al. (2005), if an individual or a family member owns more than 33% of the firm's shares, it is possible to define that business as a family firm.

By the definitions given in the studies mentioned above, 19 companies have been examined, and firms have been classified according to the report of Barth et al. (2005). In these circumstances, 7 firms are classified as non-

family companies (NFF), and 12 companies are classified as family companies (FF). The capital structure adjustment speed has been estimated by the classical dynamic partial adjustment model developed by Flannery & Rangan (2006). The partial adaptation model developed by Nerlove (1958) assumes that the change in observed output in the current period is adjusted for the difference between the desired output and the actual output in the present time.

y is the desired level of the dependent variable, $yt*$ is the expected but not directly observable variable. Since $yt*$ cannot be observed directly, the assumption of partial adaptation is made. The model is as in equation 1.

$y_t - y_{t-1} = \lambda\ (y_t* - yt_{-1})$

(Equation 1)

λ is the adaptation coefficient; $yt - yt{-}1$ denotes the actual change and $yt* - yt{-}1$ denotes the desired change (Lardaro, 1993).

If $\lambda = 0$, then $yt = yt{-}1$, indicating that adaptation did not occur at y.

If $\lambda = 1$, $yt = yt*$ actual and desired y values are equal. The realized y is adapted to the desired y in the same period.

If $\lambda > 1$, the adaptation of $y*$ 'a y is fast. For example, if $\lambda = 0.7$, the change in current y in each period is 70% of the desired change.

Flannery & Rangan (2006) used the classical dynamic partial fit model to estimate the target debt level of firms. In the model, the costs and benefits of firms in different debt and equity combinations are determined by the firm's other financial variables, and firms allow the target debt ratio to change over time. Under the efficient market assumption, the target debt ratio of the firms can be estimated as in equation 2.

$L^*_{(i,t)} = \alpha\ (X_{(i,t-1)}) + \varepsilon_{(i,t)}$

(Equation 2)

In the equation, $L^*_{(i,t)}$ is the target debt level of the firms (unobservable debt ratio), α is the parameter of the vector X. However, firms deviate from the target debt ratio in inefficient markets and may not correct these deviations. The partial adjustment model for the firms' capital structure is as in equation 3.

$L_{(i,t)} - L_{(i,t-1)} = \lambda\ (L^*_{(i,t)} - L_{(i,t-1)}) + \varepsilon_{(i,t-1)}$

(Equation 3)

$L_{(i,t)}$ denotes current period borrowing rate, $L_{(i,t-1)}$ denotes previous period borrowing rate, $L^*_{(i,t)}$ unobserved target borrowing rate of firms. When the equation in equation 2 is substituted in 3, it appears in equation 4.

$L_{(i,t)} = \gamma\ X_{(i,t-1)} + (1-\lambda)\ L_{(i,t-1)} + \varepsilon_{(i,t-1)}$

(Equation 4)

In Equation 4, X represents the financial variables that affect the firm's debt level, γ represents the parameter coefficients of the X variables, and $(1-\lambda)$ represents the firm's adjustment speed.

The firms have been classified according to the criterion of being a family company. Three models have been created to determine the capital structure adjustment rates of the firms.

Model 1 (Family Firms) $L_{(i,t)} = \gamma\ X_{(i,t-1)} + (1-\lambda_1)\ L_{(i,t-1)} + \varepsilon_{(i,t-1)}$

(Equation 5)

Model 2 (Non-Family Firms) $L_{(i,t)} = \gamma\ X_{(i,t-1)} + (1-\lambda_2)\ L_{(i,t-1)} + \varepsilon_{(i,t-1)}$

(Equation 6)

Model 3 (All Firms) $L_{(i,t)} = \gamma\ X_{(i,t-1)} + (1-\lambda_3)\ L_{(i,t-1)} + \varepsilon_{(i,t-1)}$

(Equation 7)

In Equation 5, $(1-\lambda 1)$ is the adjustment speed of family firms; In Equation 6 $(1-\lambda 2)$, the adjustment speed of non-family firms; In Equation 7 $(1-\lambda 3)$, it shows the adjustment speed of all firms.

Since the target debt ratios of the firms are an unobserved variable, they should be estimated with the partial adjustment model. The target debt ratio of the firms varies according to the country and firms characteristics (Frank & Goyal, 2009). X financial variables have been determined by considering the studies carried out to determine firm-specific variables that affect debt decisions (Jensen & Meckling, 1976; Easterbrook, 1984; Jensen, 1986; Drobetz & Wanzenried, 2006; Titman & Wessels, 1988; Titman & Wessels, 1988; Özkan, 2001; Fama & French, 2002).

The dependent and independent variables used in all three models are shown in Table 1.

Table 1. Variables

Variable	Definition

The dependent variable	Debt Ratio	Short-Term debt +Long-Term debts)/ (Short-Term debts+ Long-Term debts + Market Value of Equity)
Independent variables	Fixed Assets ratio	Tangible Fixed Assets / Total Assets
	Asset Profitability	Net Profit/ Total Assets
	Growth opportunities	Annual Growth Rate of Sales (%)
	Size	Natural Logarithm of Total Assets

Capital structure adjustment speed of firms can be estimated with various econometric models. In the study, the capital structure adjustment speed of firms has been assessed by Arellano and Bond (1991) Generalized Moments Method (GMM). One of the dynamic panel models, the GMM estimator, considers heterogeneity and potential autocorrelation in residues. System-GMM improves efficiency as it combines the equation with the first difference. In this approach, the first-order differences of the variables are taken and the previous period values of the dependent variable are used as the instrument variable, so that the differences that may occur in the dynamic panel estimation with GMM can be eliminated. In addition, the use of instrumental variables allows to find correct estimators under the current GMM conditions (İskenderoğlu, 2008).

Empirical Results

Descriptive statistics on the debt ratio of FF and NFF firms are shown in Table 2.

Table 2. Descriptive Statistics

	Statistics		
	Mean	**Median**	**Standard Deviation**
All Firms	0.4047	0.3648	0.2355
FF	0.4016	0.3504	0.2366
NFF	0.4101	0.3995	0.2350

When the descriptive statistics of firms' debt ratio are analysed, the total debt of all firms is 40.47%; family firms are 40.16%, and non-family firms are 41.01%. The standard deviation data for the debt ratios of all three groups is approximately 23%. In general, it is observed that the debt ratio of FF and NFF firms is around 40%, and the average debt ratio is very close.

Equation 5, Equation 6, and Equation 7 have been estimated by GMM. The results are shown in Table 3.

Table 3. GMM Results

	FF		**NFF**		**All Firms**	
$L_{(i,t-1)}$	**Statistics**	**Adjustment Speed $(1-\lambda_1)$**	**Statistics**	**Adjustment Speed $(1-\lambda_2)$**	**Statistics**	**Adjustment Speed $(1-\lambda_3)$**
Correlation Coefficient $\lambda 1$	0.3140***	0.6860	0.4379***	0.5621	0.3188	0.6812
AR 1	0.0002		0.0116		0.0002	
AR 2	0.3644		0.3098		0.6400	
J Statistics	78.441		65.106		83.346	
probability	0.0131**		0.0505*		0.0049***	

***, **, * respectively; 1%, 5% and 10% denote the level of significance.

Table 3 shows that the correlation coefficient of family companies (FF) is 0.31, and their adjustment speed $(1-\lambda_1)$ is 0.68. The correlation coefficient of non-family firms (NFF) has 0.43; adjustment speed $(1-\lambda_2)$ is observed to be 0.5621. The correlation coefficient of all family firms has 0.31; adjustment speed $(1-\lambda_3)$ is observed to be 0.6860. The correlation coefficient of firms in the entire food sector has 0.3188; adjustment speed $(1-\lambda_3)$ are honoured to be 0.6812. The autocorrelation in the models has been tested with AR1 and AR2 tests. For all three models, the probability value for the AR (1) test, which indicates the existence of first-order correlation, is less than the 5% significance level, while the probability results of the AR (2) test, which expresses the second -order correlation, are higher than the 5% significance level. These results show that the desired situation for the two-stage GMM analysis has been realized.

Conclusion

This study investigates the effect of ownership structure, which is one of the two main components of ownership structure, on the capital adjustment speed. The sample has been limited to 19 firms selected from the BİST 100 food industry between 2010 and 2021, and the firms have been grouped as family firms and non-family firms. The results showed that the adjustment speed of family firms is higher than that of non-family firms. This result supports the results of studies similar to those in the literature (López-Gracia & Sánchez-Andújar, 2007; Burgstaller & Wagner, 2015; Pundado et al., 2015).

It is striking that there is no significant difference between the debt ratio of family and non-family firms. However, when deviations from

the target debt ratio occur, it has been determined that family firms correct their target debt ratio faster than non-family firms. The fact that family firms are less exposed to financial constraints than other firms increases their borrowing capability, thus enabling them to reach the target debt level faster. Since reaching the target debt ratio is not only related to borrowing ability but also the equity financing ability is essential, it is expected that family firms have a high adjustment speed.

Family firms have a higher adjustment speed than other firms. When evaluated in terms of agency theory, the fact that family members have a say in the management and the high level of relationship of individuals in the family minimizes manager-shareholder conflict. In addition, since the managers in family firms are family members, the management has all the company-specific information necessary to monitor effectively, reducing the agency costs and making it easier to reach funding sources.

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