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Factors that Determine the Capital Structure: An Empirical Study on Low-cost Airlines

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Abstract

The purpose of this study is to identify the factors that determine the capital structure of low-cost airlines. Accordingly, it is aimed to test the factors that determine the capital structure in low-cost airlines in the context of capital structure theories. In the study, 15 airline companies, which had continuous financial data during the 2004-2015 period, were examined empirically. Panel data analysis was used as a method in the study. Findings of the study show that low-cost airlines generally operate based on the trade-off theory while borrowing in the short-term and based on the pecking order theory while borrowing in the long-term.

Keywords: low-cost airlines; Pecking order theory; trade-off theory; panel data analysis.

JEL classification: G32; L93; C23.

1. INTRODUCTION

The most important feature that distinguishes airline transport from other means of transport is that it offers the ability to cover long distances faster. This feature makes significant contributions to global economic welfare, increased productivity, development of multicultural societies and interaction of different nations. Airline transport provides many benefits to countries and societies in social, cultural and economic aspects in terms of offering the benefit of space and time thanks to its technical opportunities. In addition, airline transport is the only way of intercontinental fast transport where the distance is long. In this respect, air transport is of vital importance in establishing cultural link and interacting with transoceanic countries. Airline transport also makes positive contribution to the integration of countries in the field of education and culture as well as the use and dissemination of information and technology.

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In airline companies, tangible assets have an important place and therefore, airlines have a capital-intensive structure. This allows airline companies to borrow from a wide range of different channels. Also, activity and financial risks of airline companies are very high since they are highly sensitive to systematic and non-systematic risks. Therefore, it is crucial to determine the variables that affect composition of capital structure of airline companies and their borrowing decisions.

The issue of whether financing decisions of the companies and the composition of their capital structure are influential on their market value is one of the most studied topics in the finance literature. According to the theory first introduced by Modigliani and Miller (1958), there is no relationship between capital structure and market value of the companies in the perfect competition market where there are no taxes, transaction costs and other market distortions. Based on that theory of Modigliani and Miller (M&M), new theories have been developed where the relationship between financing decisions and capital structure and market value of the companies is examined. These theories mainly include the Trade-Off and Pecking Order Theories.

In the literature, it is observed that many studies have been conducted on capital structures of small, medium and large scale companies that operate in country, region, territory or sector based on the Trade-Off and Pecking Order Theories. For example; Colombo (2001), Chang *et al.* (2014), Gomez *et al.* (2014), Forte *et al.* (2013), Bauer (2004), Ahmad *et al.* (2011), Handoo and Sharma (2014) and Fattouh *et al.* (2008) studied the factors that determine capital structure of companies operating in the country. Arsov and Naumoski (2016), Booth *et al.* (2001), Deesomsak *et al.* (2004), Delcoure (2007) and Bancel and Mittoo (2004) studied the factors that affect capital structure decisions of companies operating in a country union, territory or certain commonwealths in the context of capital structure theories. Rungani and Fatoki (2010), Palacin-Sanchez and di Pietro (2016), Lopez-Gracia and Sogorb-Mira (2008), Michaelas *et al.* (1999) and Korkmaz *et al.* (2007) studied the factors that determine the capital structure for Small and Medium-Sized Enterprises (SMEs). Pacheco and Tavares (2015), Ovtchinnikov (2010), Nazir *et al.* (2012), and Burucu and Ondes (2015) studied the factors that affect capital structure decisions for the companies in different sectors. It is observed that these studies have focused on the factors that determine the capital structure and their consistency with the capital structure theories.

When capital structures of airline companies are examined it is seen that airlines have high debt dependency (Moon *et al.*, 2015) structure. On the other hand, it is also found that Southwest airlines, which is a low-cost airline, has a well-managed capital (Guzhvaa and Pagiavlas, 2003). Therefore, it is worth investigating how airlines with low-cost business model has a capital structure and what factors affect its capital structure. This study is considered complementary to the studies carried out in the literature. Unlike previous studies, the factors that determine low-cost airlines' debt/equity balance will be examined empirically. Another contribution of the study to the literature is to reveal the behaviour of low-cost airline companies in the context of capital structure theories. This will provide significant contributions to low-cost airlines' executives and stakeholders about the factors that determine the debt structure.

In this study where the factors that determine capital structure of low-cost airlines are examined in the context of Trade-Off and Pecking Order Theories, the second section will cover the theoretical framework on which this study is based and will discuss the studies conducted on this topic in the literature, the third section will give information about dataset and methodology, the fourth section will provide the research model, the fifth section will provide empirical findings, and the seventh section will cover the conclusions of study.

2. LITERATURE REVIEW

Foundations of capital structure theories emerged through the irrelevance theorem, which was proposed by M&M in 1958 and 1961. Hypotheses of these theories have formed a basis for the emergence of modern capital structure theories such as the Trade-Off and Pecking Order, despite the fact that they have been widely criticized on the grounds that they do not square with the real world. As part of theoretical framework of the study, Trade-Off and Pecking Order Theories will be covered.

The Trade-off Theory was first proposed by Myers (1984) as a result of discussions on M&M's irrelevance theory. According to the trade-off theory, the most appropriate capital structure can be achieved where borrowing costs (financial difficulty and bankruptcy costs) are balanced thanks to the tax shield advantage of the financing obtained by firms using external funds. Therefore, according to the theory, the capital structure cannot be evaluated independently of the debt/equity composition. Optimal capital structure is achieved when the tax advantage provided by foreign resources is balanced with financial difficulty and bankruptcy costs.

The Finance Hierarchy is a theory based on information asymmetry between managers and investors, reverse selection and representation assumptions. According to the Pecking Order Theory, firms tend to make their financial preferences in a certain hierarchical order. Accordingly, while companies finance their investments, they prefer internal funds over external funds. When internal funds are insufficient, firms tend to prefer low-risk borrowing options first. The issue of new shares is preferred as the last financing method in cases where debt financing is very costly for the firms (Bontempi, 2002, p. 2). The Pecking Order Theory, in which firms do not target a specific capital structure, is based on the assumption that insiders have more knowledge than outsiders (Chakraborty, 2010, p. 296). Accordingly, the main reason for the firms to follow a certain order in financing new investments is the differences in the level of knowledge about such resources (Antonczyk and Salzmann, 2014, p. 134).

Although many studies have been conducted on the factors that define capital structure, there are few studies on services industry and service enterprises. In this section of the study, studies conducted on service industry will be discussed and studies that focus on capital structure (outside service industry) will be shown in a table. As a study conducted on capital structure decisions of service industry firms, Karadeniz *et al.* (2009) studied capital structure decisions of accommodation businesses operating in Turkey and quoted in the İstanbul Stock Exchange. In the study, financial data of 65 firms that were traded in İstanbul Stock Exchange between 1994-2006 were analysed using the panel data analysis. In the study, it was found that there is negative relationship between the variables of tax ratio, asset structure and profitability and debt level and no significant relationship between the variables of free cash flow, non-debt tax shield, growth opportunities, firm size and commercial loan position and debt level. Pattweekongka and Napompech (2014) examined the factors that define capital structure of accommodation firms operating in Thailand. In the study, financial data of 140 accommodation businesses operating between 2006-2010 were analysed using the regression analysis. Empirical findings of the study show that there is a positive relationship between the variables of risk and asset structure and debt ratio, and a positive relationship between the variables of profitability and liquidity ratio and debt ratio. Serrasqueiro and Nunes (2014) empirically examined the capital structure decisions of small and medium-sized accommodation enterprises operating in Portugal. A total of 177 small

and medium-sized accommodation businesses operating between 2000-2009 were analysed using panel data analysis method. Findings of the study show that there is a negative relationship between the variables of profitability, growth opportunities and non-debt tax shield, and a positive relationship between the variables of firm size and asset structure and debt level. Ajanthan (2013) studied the factors that determine the capital structure of service industry businesses operating in Sri Lanka. The ANOVA method was used in the study where 15 firms that were operating between 2008-2012 and quoted in the Colombo Stock Exchange were studied. Empirical findings of the study show that there is a negative relationship between profitability and firm size and debt level of firms, and a positive relationship between asset structure and growth opportunities and debt ratio. The following table shows other studies conducted on capital structure and the signs of findings.

Table no. 1 – Literature summary

Study	Period	Sample	FS	GO	AS	PA	NDTS	FR	LR	VO
Booth *et al.* (2001)	1980-1990	727 firms	+		-			-		-
Colombo (2001)	1992-1996	1100 firms	+	+	+	**IS**			-	
de Miguel and Pindado (2001)	1990-1997	133 firms					+	-	-	
Ozkan (2001)	1984-1996	390 firms	+	-		-	-		-	
Vicente-Lorente (2001)	1990-1994	119 firms		-	**IS**	-	-	**IS**	**IS**	
Bhaduri (2002)	1989-1995	363 firms	+	+	**IS**	**IS**	**IS**		+/-	
Bontempi (2002)	1982-1995	29012 firms			-		+			
Fama and French (2002)	1965-1999	Uncertain	+				**IS**	**IS**		**IS**
Frank and Goyal (2003)	1971-1998	37578 observations	+	+						
Giannetti (2003)	1993-1997	150000 firms	**IS**	-		-	**IS**			
Bauer (2004)	2000-2001	72 firms	+	**IS**	-	-	**IS**	**IS**		+
Bancel and Mittoo (2004)	2001-2002	720 firms		+			+			
Chen (2004)	1995-2000	88 firms	+	-	+	-	**IS**	**IS**		
Deesomsak *et al.* (2004)	1993-2001	1527 firms	+	**IS**	+	-	-	**IS**	-	
Hovakimian *et al.* (2004)	1982-2002	13987 firms	**IS**	-		**IS**				
Akhtar (2005)	1992-2001	2189 firms	+		+	-	**IS**	-		
Tong and Green (2005)	2001-2003	44 firms	+	+		-				
Huang and Song (2006)	1994-2003	1200+ firms	+	-	+	-	-	**IS**		**IS**
Delcoure (2007)	1996-2002	129 firms	+	**IS**	+		+	-		+
Mazur (2007)	2000-2004	238 firms	-	**IS**	-	-	**IS**	**IS**	-	**IS**
Tang and Jang (2007)	1997-2003	1020 observations	+	+	-	-		+		
Antoniou *et al.* (2008)	1987-2002	4854 firms	+	-	+	-	+	**IS**		-
Fattouh *et al.* (2008)	1988-1998	6614 firms	+	**IS**	+	-	+			
de Jong *et al.* (2008)	1997-2001	11845 firms	**IS**		+	-		**IS**	-	**IS**
King and Santor (2008)	1998-2005	613 firms	+	**IS**		+				
Lemmon *et al.* (2008)	1965-2003	225839 firms		+	+	-		**IS**		**IS**
Cotei and Farhat (2009)	1980-2001	89591 firms	+/-		+		-			**IS**
Crnigoj and Mramor (2009)	1999-2006	3214-4280 firms	+	+	-	-		-		
Frank and Goyal (2009)	1950-2003	273537 observations	+	+	+	-		**IS**		**IS**

Study	Period	Sample	FS	GO	AS	PA	NDTS	FR	LR	VO
Psillaki and Daskalakis (2009)	1997-2002	8444 firms	+		-	-		+		
Chakraborty (2010)	1995-2008	1169 firms	-	-	**IS**	**IS**	+			
Gropp and Heinder (2010)	1991-2004	100 firms	**IS**		**IS**	**IS**	+			
Nunkoo and Boateng (2010)	1996-2004	7098 firms	-	+	+	+				
Ovtchinnikov (2010)	1966-2006	173190 firms	+	-	-	-		+		
Ahmad *et al.* (2011)	2005-2009	336 firms	-	+	+	+	+		-	+
de Jong *et al.* (2011)	1985-2005	2259 firms	+/-		+	-				
Kayo and Kimura (2011)	1997-2007	17061 firms	+	-	+	-		**IS**		
Serrasqueiro *et al.* (2011)	1999-2006	1547 firms	+	-	+	-	-	-		+
Sheikh and Wang (2011)	2003-2007	160 firms	+	**IS**		-	-	-	-	
Hovakimian *et al.* (2012)	1985-2008	11110 firms	+		+	+				
Oztekin and Flannery (2012)	1991-2006	15177 firms	+	+	+	-	+		-	-
Forte *et al.* (2013)	1994-2006	19272 firms	-	-	**IS**	+		**IS**		**IS**
Fosu (2013)	1998-2009	257 firms	+	-	+		**IS**			
Joeveer (2013)	1995-2002	2909 firms	-		-	**IS**				
Antonczyk and Salzmann (2014)	2000-2010	23815 firms	+	-	+	-	-			+
Baxamusa and Jalal (2014)	1981-2008	91711 firms	+		+	-				
Umer (2014)	2006-2010	37 firms	+	-	+	-	+	-	+	
Chang *et al.* (2014)	1998-2009	13107 firms	**IS**	+	**IS**	+	**IS**	**IS**		
Thippayana (2014)	2000-2011	144 firms	+	**IS**	**IS**	-		**IS**		
Handoo and Sharma (2014)	2001-2010	870 firms	-	+	+	-		**IS**	**IS**	-
Norvaisiene and Stankeviciene (2015)	2000-2005	Uncertain	+		+	-	-			
Pacheco and Tavares (2015)	2010-2013	70 firms	+	+	**IS**	-	**IS**	-	+	
Serrasqueiro and Caetano (2015)	1998-2005	53 firms	+	**IS**	**IS**	-	**IS**	**IS**		**IS**
Arsov and Naumoski (2016)	2008-2013	172 firms	+	+	-	-	-	-		
Bandyopadhyay and Barua (2016)	1998-2011	1594 firms	+	-	+			**IS**	**IS**	
Keefe and Yaghoubi (2016)	1974-2012	109613 observations	+		+	-		+		
Seo and Choi (2016)	2008-2012	86 firms	-	-	+	-	**IS**			
Palacin-Sanchez and di Pietro (2016)	1999-2007	8142 firms	+	+	+	-		+		

A number of abbreviations were used in order to save space in creating a table of studies in the literature. F.S.=Firm Size, G.O.=Growth Opportunities, P.A.=Profitability, N.D.T.S.=Non-Debt Tax Shield, F.R.=Firma Risk, A.S.=Asset Structure, L.R.=Liquidity Ratio. The positive sign (+) in the table indicates that there is a positive relationship between the variable(s) and the dependent variable, while - (negative sign) indicates that there is a negative relationship between the variable(s) and the dependent variable. The IS abbreviation (Insignificant) shows that a significant result is not obtained.

3. DATA SET AND METHOD

In this study, airline companies operating in the world are examined based on the business model they apply. Accordingly, the purpose of this study to determine the factors that affect capital structure of low-cost airlines (for more information, see Doganis, 2006;

Hanlon, 2007; Cento, 2009). In the study, 15 airlines (the list of airlines included in the analysis is shown in Table no. A-7) with fully accessible data between 2004-2015 in the Thomson Reuters Datastream database were studied using the panel data analysis.

Panel data equation can be defined as $Y_{it} = \alpha_{it} + \beta_{it}X_{it} + \varepsilon_{it}$, where *i* cross-sectional units are shown as (*i=1,…,N*), *t* change over time as (*t=1,…,N*), and dependent variable as *Y*, and independent variable(s) as *X*. Hereε_{it} shows the error terms.

In panel data analysis, it is first necessary to examine whether the series have cross-sectional dependency. Examination of cross-sectional dependency in series is important for determining whether first generation or second generation unit root tests will be applied to the series. After the series are subjected to stability test, it is necessary to make selection among classical, fixed effects and random effects models and determine whether the model will be unidirectional or bidirectional, taking into account whether the coefficients in panel data models vary with unit and/or time. In the following stage, heteroscedasticity and autocorrelation tests must be made on proper models.

The correlation matrix of the variables used in this study is shown in Table no. A-1, the cross-sectional dependency test results in Table no. A-2, the unit root test results in Table no. A-3, the tests made for identification of appropriate model in Table no. A-4, results of the heteroscedasticity test applied to the models in Table no. A-5, and autocorrelation test results in Table no. A-6.

4. RESEARCH MODEL

Studies in the literature show that leverage ratio is used as the dependent variable. In the studies, two different ratios are used to measure the leverage ratio of firms. The first one is book leverage, which is obtained dividing the book value of total liabilities by the book value of total assets. The second is market leverage, which is obtained dividing market value of total liabilities by book value of total liabilities and total market value of equity. This study covered the relevant leverage level related to the book value only considering the data set obtained in the study. Accordingly, 3 different models were established as dependent variable (see also Ajanthan, 2013; Arsov and Naumoski, 2016; Cotei and Farhat, 2009; Chang *et al.*, 2014; Bhaird and Lucey, 2010; Guler, 2010; Hovakimian *et al.*, 2012; Erol *et al.*, 2016; Demirhan, 2009; Handoo and Sharma, 2014) of the study considering the ratio commonly used in the literature Model 1 used the ratio of total liabilities to total assets (TLTA), Model 2 used the ratio of long-term liabilities to total assets (LLTA), and Model 3 used the ratio of short-term liabilities to total assets (SLTA) as the dependent variable. The models established within the scope of study are as follows.

$$TBTA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 GO_{it} + \beta_3 PA_{it} + \beta_4 NDTS_{it} + \beta_5 FR_{it} + \beta_6 AS_{it} + \beta_7 LR_{it} + \varepsilon_{it} \quad (1)$$

$$LLTA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 GO_{it} + \beta_3 PA_{it} + \beta_4 NDTS_{it} + \beta_5 FR_{it} + \beta_6 AS_{it} + \beta_7 LR_{it} + \varepsilon_{it} \quad (2)$$

$$SLTA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 GO_{it} + \beta_3 PA_{it} + \beta_4 NDTS_{it} + \beta_5 FR_{it} + \beta_6 AS_{it} + \beta_7 LR_{it} + \varepsilon_{it} \quad (3)$$

The independent variables and measurement indicators used in the study are as follows.

4.1 Firm size

In the literature, there are two different approaches about the relationship between firm size and borrowing level. According to the Trade-Off Theory, companies operating on a large scale have the ability to borrow at lower costs and in higher amounts. In addition, large-scale companies often have a consistent and diversified cash flow. It is therefore assumed that large-scale companies will have a lower probability of bankruptcy and a relatively lower cost of bankruptcy. Therefore, a positive relationship is expected between firm size and debt level. The Pecking Order Theory assumes that firms operating on a large scale will need less liabilities and therefore will be less likely to borrow. Accordingly, large firms have more internal resources than small firms. Besides, in large-scale firms, the level of asymmetric information and the cost of representation are lower. Therefore, it is expected that these companies tend to use primarily internal funds instead of liabilities (Deesomsak *et al.*, 2004, p. 394; Chang *et al.*, 2014, p. 92).

Measurement indicator = FS: Log (total assets)

4.2 Growth opportunities

In the literature, there is no theoretical consensus about the relationship between growth opportunities and debt ratio of the firms. According to the Trade-off Theory, firms with high growth opportunities have less tangible assets than other firms. These firms will have to borrow at higher costs since they cannot provide their high growth opportunities as a guarantee like tangible assets. In addition, firms with high growth opportunities have lower level of cash flows and higher level of financial difficulty and bankruptcy costs (Sayılgan and Süslü, 2011, p. 111; Antonczyk and Salzmann, 2014, p. 134). This causes the firms with high growth opportunities to borrow less and therefore leads to a negative relationship between growth opportunities and debt level. According to the Pecking Order Theory, firms with high growth opportunities need more funds. As a result, firms with insufficient internal funds will use external resources and prefer borrowing as the first option when meeting their need for external resources. Therefore, a positive relationship is expected between growth opportunities and debt level of the firms.

Measurement indicator = GO: % change in sales

4.3 Profitability

Although there are many studies in the literature that examine the relationship between profitability and leverage level, there is uncertainty about the existence of a significant and coherent relationship. According to the Trade-off Theory, firms with high profitability ratio have higher capacity to use liabilities and more need to benefit from the tax shield. Besides, firms with high profitability have the possibility of obtaining foreign sources with lower interest rates and have lower financial difficulty and bankruptcy costs (Chang *et al.*, 2014, p. 92; Chakraborty, 2010, p. 297). Therefore, a positive relationship is expected between profitability and debt level according to this theory. According to the Pecking Order Theory, firms mainly prefer to use their internal resources in the financing of investments and when such funds are insufficient, they prefer borrowing and issuing new shares. Therefore, this theory proposes that firms with high profitability tend to use external resources at a lower rate

(Sarioğlu *et al.*, 2013, p. 484; Demirhan, 2009, p. 682), Therefore, a negative relationship is expected between profitability and debt level according to the pecking order theory.

Measurement indicator = PA: Operating income/total assets

4.4 Non-debt tax shield

There are two ways in which companies can benefit from tax shield. The first way is that interest expense arising out of usage of external resources is not subject to the corporate tax. Thus, firms can record the interest paid on liabilities as expenses over the tax base and obtain tax saving effect. The second way is the use of instruments that are called as non-debt tax shield and used as replacement of tax advantages provided by debt financing. In this method, firms can use instruments such as depreciation, pension funds, investment credits and investment allowances as non-debt tax shields in order to pay less corporate tax (Wiwattanakantang, 1999,p. 385; Demirhan, 2009, p. 683). According to the trade-off theory, the reason for why firms use external funds in financing of investments instead of equity is to benefit from the tax advantages offered by the corporate tax. However, when a firm has high non-debt tax shield, this increases the cost of borrowing and decreases potential tax shield benefit. Therefore, a negative relationship is expected between leverage level and non-debt tax shield of the firms.

Measurement indicator = NDTS: Depreciation/total assets

4.5 Firm risk

Firm risk is used to express a company's likelihood of financial difficulty or bankruptcy. According to the trade-off theory, uncertain and volatile future cash flows of the firms increases the likelihood of financial difficulty and bankruptcy risk. Thus, high uncertainty in operating revenues of the firms is considered as one of the main indicators that show the possibility of firms to encounter financial difficulty. Uncertainty and volatility can cause the firms to have decreased borrowing capacity and fail to fulfil their obligations related to the borrowing (Demirhan, 2009, p. 683). Therefore, a negative relationship is expected between borrowing level and firm risk. According to the pecking order theory, in case the firms experience a financial difficulty due to decrease or changes in their future cash flows, the possibility of firms to issue shares will decrease, the possibility to get risky debt will increase, and the possibility to miss profitable investment opportunities will increase (Dincergok, 2010, pp. 71-72). For this reason, firms with volatile and uncertain cash flows and high financial difficulty and bankruptcy risk prefer lower leverage levels.

Measurement indicator = FR: EBIT Standard Deviation

4.6 Asset structure

Tangible fixed assets are significantly influential in determining leverage level of the firms. The fact that tangible fixed assets can create value even after bankruptcy and be provided as guarantee when borrowing enables the firms to find external funds on more favourable terms. Moreover, the fact that firms with tangible fixed assets are less likely to experience financial difficulty enables them to use the leverage ratio more actively. This indicates that a positive relationship can be established between tangible fixed assets and debt level of the firms.

Measurement indicator = AS: Fixed assets/total assets

4.7 Liquidity ratio

In the literature, there different views on the direction of the relationship between leverage level and liquidity ratio of the firms. According to the pecking order theory, firms use internal financing resources primarily to meet their funding needs. The internal financing resources that can be used in this context are the variables of profit and liquidity ratio. In this case, it is assumed that firms with high liquidity ratios will need less funds. In this case, a negative relationship is expected between liquidity ratio and debt level (Mazur, 2007, p. 500). On the other hand, there are studies which underline that firms with high liquidity ratio may have a higher debt/equity ratio since they do not have any difficulty to meet short-term liabilities (Umer, 2014, p. 55) and therefore a positive relationship may exist between liquidity ratio and debt level of these firms.

Measurement indicator = LR: Current assets/short-term liabilities

5. EMPIRICAL FINDINGS

This section of the study will cover the empirical findings obtained as a result of panel data analysis applied to the data of 2004-2015 in relation to low-cost airlines, and analysis of these findings in comparison with the capital structure theories. As a result of the analyses made in the study, it was found that the most appropriate panel data model for Model 1 and Model 2 is the classical model. Model 3 will be analysed using random effects model. The empirical findings and the robust estimation results obtained in the study are as follows.

Table no. 2 – Driscoll-Kraay robust estimator results for Model 1

Variable	Coefficient estimate	Driscoll-Kraay Standard Error	t	p-value	[95% Confidence Interval]	
FS	0.0057109	0.0032127	1.78	0.097	-0.0011796	0.0126014
GO	-0.0005934	0.0002773	-2.14	0.050	-0.0011882	1.36E-06
PA	-0.1690315	0.0930118	-1.82	0.091	-0.368522	0.0304591
NDTS	0.071243	0.1015019	0.70	0.494	-0.1464569	0.2889429
FR	2.32E-08	6.40E-08	0.36	0.723	-1.14E-07	1.60E-07
AS	0.4857815	0.1807402	2.69	0.018	0.0981324	0.8734306
LR	0.0127537	0.0069424	1.84	0.088	-0.0021362	0.0276437
C	-0.0921878	0.0362076	-2.55	0.023	-0.1698452	-0.0145303
Number of Observations: 149		F(7, 14) =22.25		R^2= 0.0892		
Number of Groups: 15		Prob > F=0.0000		Maximum Delay: 2		

Table no. 2 shows Driscoll-Kraay robust estimator results of Model 1, where the ratio of total liabilities to total assets is used as a dependent variable. According to the results of the classical (pooled) model which examines the factors that determine the long-term debt ratio, firm size and liquidity ratio in low-cost airlines have a positive impact on total debt ratio at a significance level of 10%. In addition, asset structure of low-cost airlines has a positive effect on total debt ratio at a significance level of 5%. On the other hand, it is seen that the growth opportunities and profitability of the firms have a negative effect on the total debt ratio at a significance level of 10%.

Table no. 3 – Driscoll-Kraay robust estimator results for Model 2

Variable	Coefficient estimate	Driscoll-Kraay Standard Error	t	p-value	[95% Confidence Interval]	
FS	0.0044908	0.0031915	1.41	0.181	-0.00235	0.011336
GO	0.0006843	0.000281	2.44	0.029	8.16E-05	0.001287
PA	-0.1163277	0.083528	-1.39	0.185	-0.29548	0.062822
NDTS	-0.1371805	0.0725186	-1.89	0.079	-0.29272	0.018356
FR	3.28E-08	5.40E-08	0.61	0.553	-8.29E-08	1.49E-07
AS	0.3773593	0.1696004	2.22	0.043	0.013603	0.741116
LR	0.0111199	0.0058367	1.91	0.078	-0.0014	0.023638
C	-0.0778347	0.0362012	-2.15	0.050	-0.15548	-0.00019
Number of Observations: 149		F(7, 14) =22.25		R^2= 0.0786		
Number of Groups: 15		Prob > F=0.0000		Maximum Delay: 2		

Table no. 3 shows robust estimator results of Model 2, where the ratio of long-term liabilities to total assets is used as a dependent variable. According to the results of the classical (pooled) model which examines the factors that determine the long-term debt ratio, growth opportunities and asset structure in low-cost airlines have a positive impact on long-term debt ratio at a significance level of 5%. In addition, liquidity ratio of low-cost airlines has a positive effect on long-term debt ratio at a significance level of 10%. On the other hand, it is seen that the non-debt tax shield usage level of firms has a negative effect on the long-term debt ratio at a significance level of 10%.

Table no. 4 – GEEE method estimation results for Model 3

Variable	Coefficient estimate	Robust Standard Error	z	p-value	[95% Confidence Interval]	
FS	0.0059411	0.0038963	1,52	0.127	-0.0016954	0.0135777
GO	-0.0005281	0.0001228	-4,3	0.000	-0.0007689	-0.0002874
PA	-0.0625365	0.0388082	-1.61	0.107	-0.1385992	0.0135261
NDTS	0.1231083	0.0252832	4,87	0.000	0.0735541	0.1726624
FR	1.84E-08	2.45E-08	0,75	0.452	-2.96E-08	6.65E-08
AS	0.1254071	0.0620383	2,02	0.043	0.0038141	0.247
LR	-0.0099619	0.0068501	-1.45	0.146	-0.0233879	0.0034641
C	-0.0100803	0.0559282	-0.18	0.857	-0.1196976	0.099537
Number of Observations: 149		Wald $\chi^2(7)$ = 4003.41		R^2= 0.0786		
Number of Groups: 15		Prob > χ^2=0.0000				

Table no. 4 shows robust estimator results of Model 3, where the ratio of short-term liabilities to total assets is used as a dependent variable. According to the results of the random effects model which examines the factors that determine the short-term debt ratio, the level of benefiting from non-debt tax shield in low-cost airlines have a positive impact on short-term debt ratio at a significance level of 1%. In addition, asset structure of low-cost airlines has a positive effect on short-term debt ratio at a significance level of 5%. On the other hand, it is observed that the growth opportunities of the firms have a negative effect on the short-term debt ratio at a significance level of 1%.

This section of the study aims to compare empirical findings with the Pecking Order and Trade-Off theories. Accordingly, sign expectations of Pecking Order and Trade-Off

theories towards independent variables (firm size, growth opportunities, non-debt tax shield, firm risk, asset structure and liquidity ratio) will be compared with the findings of empirical analysis. In the study, 3 different models were developed to find out the factors that determine total debt ratio, long-term debt ratio and short-term debt ratio in capital structure. The following table shows the findings of these 3 models and sign expectations of Pecking Order and Trade-Off theories.

Table no. 5 – Comparison of theoretical expectations with findings

Measurement Indicator	Pecking Order	Trade-Off	Model 1	Model 2	Model 3
Firm Size	-	+	+		
Growth Opportunities	+	-	-	+	-
Profitability	-	+	-		
Non-Debt Tax Shield	NA	-		-	+
Firm Risk	-	-			
Asset Structure	-	+	+	+	+
Liquidity Ratio	-	+	+	+	

Table no. 5 shows sign expectations on independent variables and realized signs of model 1, model 2 and model 3 in the Pecking Order and Trade-Off Theories. For Model 1, the firm size variable shows results that comply with the trade-off theory, which underlines that large-scale firms tend to use more external funds than small-scale firms, large-scale firms can borrow easier and with lower interest rate thanks to their assets that can be provided as guarantee, and revenues of such firms have a relatively more consistent trend.

The growth opportunities variable generated results that comply with the trade-off theory for Model 1 and Model 3, and pecking order theory for Model 2. For Model 1 and Model 3, trade-off approach is more suitable as it argues that firms with high growth opportunities have lower level of cash flow and higher level of financial difficulty and bankruptcy and thus they borrow less. For Model 2, pecking order theory is more suitable as it proposes that firms with high growth opportunities need more investment capital than other firms, information asymmetry is higher in these firms and thus they will need more resources.

The profitability variable generated results that comply with the pecking order theory for Model 1 only. This shows that companies with high profitability tend to use external resources at a lower rate. The non-debt tax shield variable generated results that comply with the trade-off approach for Model 2. According to the trade-off theory, firms use instruments such as depreciation, pension funds and investment credits as non-debt tax shields in order to pay less corporate tax. In this way, firms with non-debt tax shield may not need any tax shield that is provided by borrowing.

The asset structure variable gives results that comply with the for trade-off theory for all 3 models. Accordingly, the ability to provide tangible fixed assets as guarantee when borrowing and thus obtain external funds at a lower cost makes this relationship positive. The liquidity ratio variable generated results that comply with the trade-off approach for both Model 1 and Model 2. This indicates that liquidity ratio positively affects total and long-term debt ratio of airline companies. In other words, this shows that firms with high liquidity ratio have no difficulties in meeting their liabilities and thus tend to utilize more external funds. In the study, no result that is significant and complies with the theories was found from the firm risk variable for the low-cost airlines.

6. CONCLUSION

Since Modigliani and Miller (1958) irrelevance theory which proposes that value of firms is independent of their capital structure in full competitive markets, many theoretical and empirical studies have been conducted on whether the capital structure composition is actually influential on market value of a firm. The focus of these studies is on how and in which direction the factors that define the capital structure have an impact on debt level of firms. In this context, two generally accepted theories were proposed about capital structure in the financial literature. These are pecking order and trade-off theories. The pecking order theory states that the firms follow a certain hierarchy in financing decisions due to asymmetric information among the firm's stakeholders and therefore internal financing funds are preferred over external financing funds. On the other hand, trade-off theory proposes that the firms have a target debt ratio and debt-equity combination is realized at a point where income and corporate tax, financial difficulty and bankruptcy costs are balanced. These theories are very important in determining the factors that define capital structure of firms and finding out which motivations are influential in the composition of capital structure.

Capital structure decisions are extremely important to maintain operations and take and implement new investment decisions in the airline transport industry as in other business fields. Airline companies are in essence the businesses that need substantial capital requirement and have vast amount of fixed assets. Also, airline companies need funds to adapt to changing market conditions, keep up with the advancing technology and meet expectations and needs of customers in an intensively competitive environment. For this reason, the way how capital structures of airline companies are shaped, how debt-equity balance is achieved and the factors that affect the capital structure are the topics worth studying.

Findings of the study show that firm size positively affects total debt ratio in low-cost airlines. This shows that airline companies tend to use more external resources depending on their total asset size. Different results are found when the effect of growth opportunities in airlines on total debt ratio, long-term debt ratio and short-term debt ratio is examined. Accordingly, high growth opportunities of airline operators have negative effect on total and short-term debt ratio. This indicates that airline companies with high growth opportunities have a floating cash flow trend, relatively low level of tangible fixed assets and high level of information asymmetry. These factors cause companies to borrow at a lower rate. On the other hand, it is observed that growth opportunities of the airlines have a positive effect on the long-term debt ratio. Accordingly, airline companies with high growth opportunities need long-term liabilities in order to make new investments, open new lines or increase their frequency.

It is observed that profitability has a negative effect on total debt ratio in low-cost airlines. This indicates that low-cost airlines with high profitability use external funds at a lower rate. No significant result was found about the effect of profitability variable on long-term and short-term debt ratio. Findings of the study indicate that the level of non-debt tax shield level has a negative effect on long-term liabilities. Accordingly, the increase in amount of instruments, such as depreciation, which are used by firms to pay less corporate tax, enable the firms to need less funds and thus use less external funds. It is observed that this variable does not have a significant impact on total debt ratio and short-term debt ratio.

When the relationship between asset structure and debt ratio of airline companies is examined, it is observed that this relationship has a positive impact on total debt ratio, long-term debt ratio and short-term debt ratio. This indicates that firms can provide their tangible

fixed assets as guarantee when borrowing and thus obtain external funds at a lower cost. Therefore, capital structure of the firms has a positive effect on short-term, long-term and total debt ratio. Liquidity ratio of firms in the low-cost airline (LCA) group has a positive effect on total and long-term debt level. This shows that LCA companies with high liquidity ratio will not have any difficulty in meeting their obligations and thus can borrow at a low cost. The firm risk variable has no effect on the debt ratio that is significant and complies with the capital structure theories

When findings related to the low-cost airlines are evaluated theoretically, some determinants give results that comply with the trade-off theory, some complies with the pecking order theory and some complies with both theories depending on the model. Accordingly, the firm size variable generated results that comply with the trade-off theory for Model 1. The growth opportunities variable complied with the trade-off theory for Model 1 and Model 3, and with the pecking order theory for Model 2. The profitability variable was significant for Model 1 only, and generated results that comply with the pecking order theory. It was also found that non-debt tax shield variable generated significant findings for Model 2, which complies with the trade-off theory. The asset structure variable gives results that comply with the for trade-off approach for all 3 models. The liquidity ratio variable generated results that comply with the trade-off theory for both Model 1 and Model 2. In the study, no finding that is significant and/or complies with the theories was found from the firm risk variable.

References

Ahmad, F., Juniad-ul-Haq, Nasir, R. U., Ali, M., and Ullah, W., 2011. Extension of Determinants of Capital Structure: Evidence from Pakistani Non-Financial Firms. *African Journal of Business Management, 5*(28), 11375-11385. doi http://dx.doi.org/10.5897/AJBM11.218

Ajanthan, A., 2013. Determinants of capital structure: Evidence from hotel and restaurant companies in Sri Lanka. *International Journal of Scientific and Research Publications, 3*(6), 1-8.

Akhtar, S., 2005. The determinants of capital structure for Australian multinational and domestic corporations. *Australian Journal of Management, 30*(2), 321-341. doi http://dx.doi.org/10.1177/031289620503000208

Antonczyk, R. C., and Salzmann, A. J., 2014. Overconfidence and optimism: The effect of national culture on capital structure. *Research in International Business and Finance, 31*, 132-151. doi http://dx.doi.org/10.1016/j.ribaf.2013.06.005

Antoniou, A., Guney, Y., and Paudyal, K., 2008. The Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions. *Journal of Financial and Quantitative Analysis, 43*(01), 59-92. doi http://dx.doi.org/10.1017/S0022109000002751

Arsov, S., and Naumoski, A., 2016. Determinants of capital structure: An empirical study of companies from selected post-transition economies. *Journal of Economics and Business, 34*(1), 119-146. doi http://dx.doi.org/10.18045/zbefri.2016.1.119

Bancel, F., and Mittoo, U. R., 2004. Cross-Country Determinants of Capital Structure Choice: A Survey of European Firms. *Financial Management, 33*(4), 103-132.

Bandyopadhyay, A., and Barua, N. M., 2016. Factors determining capital structure and corporate performancein India: Studying the business cycle effects. *The Quarterly Review of Economics and Finance, 61*(august), 160-172. doi http://dx.doi.org/10.1016/j.qref.2016.01.004

Bauer, P., 2004. Determinants of capital structure: Empirical evidence from the Czech Republic. *Czech Journal of Economics and Finance, 54*(1-2), 2-21.

Baxamusa, M., and Jalal, A., 2014. Does religion affect capital structure? *Research in International Business and Finance, 31*, 112-131. doi http://dx.doi.org/10.1016/j.ribaf.2013.09.003

Bhaduri, S. N., 2002. Determinants of capital structure choice: a study of the Indian corporate sector. *Applied Financial Economics, 12*(9), 655-665. doi http://dx.doi.org/10.1080/09603100010017705

Bhaird, C. m., and Lucey, B., 2010. Determinants of capital structure in Irish SMEs. *Small Business Economics, 35*(3), 357-375. doi http://dx.doi.org/10.1007/s11187-008-9162-6

Bontempi, M. E., 2002. The dynamic specification of the modified pecking order theory: Its relevance to Italy. *Empirical Economics, 27*(1), 1-22. doi http://dx.doi.org/10.1007/s181-002-8356-9

Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V., 2001. Capital Structures in Developing Countries. *The Journal of Finance, 56*(1), 87-130. doi http://dx.doi.org/10.1111/0022-1082.00320

Burucu, H., and Ondes, T., 2015. Finansal Hiyerarsi ve Dengeleme Teorisinin Gecerliliginin Turk Imalat Sanayi Firmalarinda Test Edilmesi. *Sakarya İktisat Dergisi, 4*(3), 61-76.

Cento, A., 2009. *The Airline Industry: Challenges in the 21st Century*. Segrate: Physica-Verlag.

Chakraborty, I., 2010. Capital structure in an emerging stock market: The case of India. *Research in International Business and Finance, 24*(3), 295-314. doi http://dx.doi.org/10.1016/j.ribaf.2010.02.001

Chang, C., Chen, X., and Liao, G., 2014. What are the reliably important determinants of capital structure in china? *Pacific-Basin Finance Journal, 30*, 87-113. doi http://dx.doi.org/10.1016/j.pacfin.2014.06.001

Chen, J. J., 2004. Determinants of capital structure of Chinese-listed companies. *Journal of Business Research, 57*(12), 1341-1351. doi http://dx.doi.org/10.1016/S0148-2963(03)00070-5

Colombo, E., 2001. Determinants of corporate capital structure: evidence from Hungarian firms. *Applied Economics, 33*(13), 1689-1701. doi http://dx.doi.org/10.1080/00036840010015057

Cotei, C., and Farhat, J., 2009. The trade-off theory and the pecking order theory: Are they mutually exclusive? *North American Journal of Finance and Banking Research, 3*(3), 1-17.

Crnigoj, M., and Mramor, D., 2009. Determinants of Capital Structure in Emerging European Economies: Evidence from Slovenian Firms. *Emerging Markets Finance & Trade, 45*(1), 72-89. doi http://dx.doi.org/10.2753/REE1540-496X450105

de Jong, A., Kabir, R., and Nguyen, T. T., 2008. Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking & Finance, 32*(9), 1954-1969. doi http://dx.doi.org/10.1016/j.jbankfin.2007.12.034

de Jong, A., Verbeek, M., and Verwijmeren, P., 2011. Firms' debt-equity decisions when the static tradeoff theory and the pecking order theory disagree. *Journal of Banking & Finance, 35*(5), 1303-1314. doi http://dx.doi.org/10.1016/j.jbankfin.2010.10.006

de Miguel, A., and Pindado, J., 2001. Determinants of capital structure: New evidence from Spanish panel data. *Journal of Corporate Finance, 7*(1), 77-99. doi http://dx.doi.org/10.1016/S0929-1199(00)00020-1

Deesomsak, R., Paudyal, K., and Pescetto, G., 2004. The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management, 14*(4-5), 387-405. doi http://dx.doi.org/10.1016/j.mulfin.2004.03.001

Delcoure, N., 2007. The determinants of capital structure in transitional economies. *International Review of Economics & Finance, 16*(3), 400-415. doi http://dx.doi.org/10.1016/j.iref.2005.03.005

Demirhan, A., 2009. Bankaların sektörel paylarindaki değişimin nitel bağımlı değişkenli panel veri modeliyle analizi. *İstanbul Üniversitesi İşletme Fakültesi İşletme İktisadı Enstitüsü Dergisi-Yönetim, 20*(64), 78-97.

Dincergok, B., 2010. *Sermaye Yapisini Etkileyen Faktorlerin Mukayeseli Incelemesi*. Ankara: Gazi Universitesi.

Doganis, R., 2006. *The Airline Business*. Abingdon: Taylor & Francis Group.

Erol, A. F., Aytekin, S., and Abdidoglu, N., 2016. Isletmelerin Sermaye Yapilarinin Belirlenmesinde Finansal Hiyerarsi Teorisinin Kullanimi ve BIST'te Bir Uygulama. *KSÜ Sosyal Bilimler Dergisi, 13*(1), 113-128.

Fama, E. F., and French, K. R., 2002. Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies, 15*(1), 1-33. doi http://dx.doi.org/10.1093/rfs/15.1.1

Fattouh, B., Harris, L., and Scaramozzino, P., 2008. Non-linearity in the determinants of capital structure: Evidence from UK firms. *Empirical Economics, 34*(3), 417-438. doi http://dx.doi.org/10.1007/s00181-007-0128-3

Forte, D., Barros, L. A., and Nakamura, W. T., 2013. Determinants of the Capital Structure of Small and Medium Sized Brazilian Enterprises. *BAR - Brazilian Administration Review, 10*(3), 347-369. doi http://dx.doi.org/10.1590/S1807-76922013000300007

Fosu, S., 2013. Capital structure, product market competition and firm performance: Evidence from South Africa. *The Quarterly Review of Economics and Finance, 53*(2), 140-151. doi http://dx.doi.org/10.1016/j.qref.2013.02.004

Frank, M. Z., and Goyal, V. K., 2003. Testing the pecking order theory of capital structure. *Journal of Financial Economics, 67*(2), 217-248. doi http://dx.doi.org/10.1016/S0304-405X(02)00252-0

Frank, M. Z., and Goyal, V. K., 2009. Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management, 38*(1), 1-37. doi http://dx.doi.org/10.1111/j.1755-053X.2009.01026.x

Giannetti, M., 2003. Do Better Institutions Mitigate Agency Problems? Evidence from Corporate Finance Choices. *Journal of Financial and Quantitative Analysis, 38*(1), 185-212. doi http://dx.doi.org/10.2307/4126769

Gomez, G., Mena Rivas, A. M., and Lizarzaburu Bolaños, E. R., 2014. The determinants of capital structure in Peru. *Academia (Caracas), 27*(3), 341-354. doi http://dx.doi.org/10.1108/ARLA-01-2014-0007

Gropp, R., and Heinder, F., 2010. The Determinants of Bank Capital Structure. *Review of Finance, 14*(4), 587-622. doi http://dx.doi.org/10.1093/rof/rfp030

Guler, S., 2010. Istanbul menkul kiymetler borsasina (IMKB) kayitli kucuk ve orta buyuklukteki isletmelerin (Kobi) sermaye yapilari uzerine bir uygulama. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 15*(3), 353-371.

Guzhvaa, V. S., and Pagiavlas, N., 2003. Corporate capital structure in turbulent times: A case study of the US airline industry. *Journal of Air Transport Management, 9*(6), 371-379. doi http://dx.doi.org/10.1016/S0969-6997(03)00020-6

Handoo, A., and Sharma, K., 2014. A study on determinants of capital structure in India. *IIMB Management Review, 26*(3), 170-182. doi http://dx.doi.org/10.1016/j.iimb.2014.07.009

Hanlon, P., 2007. *Global Airlines: Competition in a transnational industry*. Burlington: Elsevier Ltd.

Hovakimian, A., Hovakimian, G., and Tehranian, H., 2004. Determinants of target capital structure: The case of dual debt and equity issues. *Journal of Financial Economics, 71*(3), 517-540. doi http://dx.doi.org/10.1016/S0304-405X(03)00181-8

Hovakimian, A., Kayhan, A., and Titman, S., 2012. Are Corporate Default Probabilities Consistent with the Static Trade-off Theory? *Review of Financial Studies, 25*(2), 315-340. doi http://dx.doi.org/10.1093/rfs/hhr101

Huang, G., and Song, F. M., 2006. The determinants of capital structure:Evidence from China. *China Economic Review, 17*(1), 14-36. doi http://dx.doi.org/10.1016/j.chieco.2005.02.007

Joeveer, K., 2013. Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics, 41*(1), 294-308. doi http://dx.doi.org/10.1016/j.jce.2012.05.001

Karadeniz, E., Yilmaz Kandir, S., Balcilar, M., and Beyazit Onal, Y., 2009. Determinants of capital structure: Evidence from Turkish lodging companies. *International Journal of Contemporary Hospitality Management, 21*(5), 594-609. doi http://dx.doi.org/10.1108/09596110910967827

Kayo, E. K., and Kimura, H., 2011. Hierarchical determinants of capital structure. *Journal of Banking & Finance*, *35*(2), 358-371. doi http://dx.doi.org/10.1016/j.jbankfin.2010.08.015

Keefe, M. O., and Yaghoubi, M., 2016. The influence of cash flow volatility on capital structure and the use of debt of different maturities. *Journal of Corporate Finance*, *38*(1), 18-36. doi http://dx.doi.org/10.1016/j.jcorpfin.2016.03.001

King, M. R., and Santor, E., 2008. Family values: Ownership structure, performance and capital structure of Canadian firms. *Journal of Banking & Finance*, *32*(11), 2423-2432. doi http://dx.doi.org/10.1016/j.jbankfin.2008.02.002

Korkmaz, T., Albayrak, A. S., and Karataş, A., 2007. Hisse senetleri İMKB'de işlem gören KOBİ'lerin sermaye yapısının incelenmesi: 1997–2004 dönemi (The Analysis of the Capital Structure of the SMEs Registered in the ISE: 1997-2004). *İktisat İşletme ve Finans, 22*(253), 79-96. doi http://dx.doi.org/10.3848/iif.2007.253.1548

Lemmon, M. L., Roberts, M. R., and Zender, J. F., 2008. Back to the beginning: Persistence and the cross-section of corporate capital structure. *The Journal of Finance*, *63*(4), 1575-1608. doi http://dx.doi.org/10.1111/j.1540-6261.2008.01369.x

Lopez-Gracia, J., and Sogorb-Mira, F., 2008. Testing trade-off and pecking order theories financing SMEs. *Small Business Economics*, *31*(2), 117-136. doi http://dx.doi.org/10.1007/s11187-007-9088-4

Mazur, K., 2007. The Determinants of Capital Structure Choice: Evidence from Polish Companies. *International Advances in Economic Research*, *13*(4), 495-514. doi http://dx.doi.org/10.1007/s11294-007-9114-y

Michaelas, N., Chittenden, F., and Poutziouris, P., 1999. Financial Policy and Capital Structure Choice in U.K. SMEs: Empirical Evidence from Company Panel Data. *Small Business Economics*, *12*(2), 113-130. doi http://dx.doi.org/10.1023/A:1008010724051

Modigliani, F., and Miller, M. H., 1958. The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, *48*(3), 261-297.

Moon, J., Lee, W. S., and Dattilo, J., 2015. Determinants of the payout decision in the airline industry. *Journal of Air Transport Management*, *42*, 282-288. doi http://dx.doi.org/10.1016/j.jairtraman.2014.11.009

Myers, S. C., 1984. The Capital Structure Puzzle. *The Journal of Finance*, *39*(3), 575-592. doi http://dx.doi.org/10.2307/2327916

Nazir, M. S., Siddiqui, A., and Nawaz, M. M., 2012. Determinants of capital structure of engineering sector of Pakistan. *Actual Problems of Economics*, *2*(1), 412-420.

Norvaisiene, R., and Stankeviciene, J., 2015. The Interaction of Internal Determinants and Decisions on Capital Structure at the Baltic Listed Companies. *The Engineering Economist*, *52*(2), 7-17.

Nunkoo, P. K., and Boateng, A., 2010. The empirical determinants of target capital structure and adjustment to long-run target: Evidence from Canadian firms. *Applied Economics Letters*, *17*(10), 983-990. doi http://dx.doi.org/10.1080/17446540802599671

Ovtchinnikov, A. V., 2010. Capital structure decisions: Evidence from deregulated industries. *Journal of Financial Economics*, *95*(2), 249-274. doi http://dx.doi.org/10.1016/j.jfineco.2009.10.003

Ozkan, A., 2001. Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data. *Journal of Business Finance & Accounting*, *28*(1-2), 175-198. doi http://dx.doi.org/10.1111/1468-5957.00370

Oztekin, O., and Flannery, M. J., 2012. Institutional determinants of capital structure adjustment speeds. *Journal of Financial Economics*, *103*(1), 88-112. doi http://dx.doi.org/10.1016/j.jfineco.2011.08.014

Pacheco, L., and Tavares, F. A., 2015. Capital structure determinants of Portuguese footwear sector SMEs: Empirical evidence using a panel data. *Tekhne (Instituto Politecnico do Cavado e do Ave)*, *13*(2), 145-157. doi http://dx.doi.org/10.1016/j.tekhne.2016.04.002

Palacin-Sanchez, M. J., and di Pietro, F., 2016. The Role of the Regional Financial Sector in the Capital Structure of Small and Medium-Sized Enterprises (SMEs). *Regional Studies, 50*(7), 1232-1247. doi http://dx.doi.org/10.1080/00343404.2014.1000290

Pattweekongka, S., and Napompech, K., 2014. Determinants of Capital Structure: Evidence from Thai Lodging Companies. *The International Journal of the Arts in Society, 7*(4), 45-52.

Psillaki, M., and Daskalakis, N., 2009. Are the determinants of capital structure country or firm specific? *Small Business Economics, 33*(3), 319-333. doi http://dx.doi.org/10.1007/s11187-008-9103-4

Rungani, E., and Fatoki, O., 2010. Determinants of capital structure of Small and Medium Enterprises in the Buffalo City Municipality, Eastern Cape Province, South Africa. *African Journal of Business Management, 4*(18), 3968-3977.

Sarioğlu, S. E., Kurun, E., and Güzeldere, H., 2013. Sermaye Yapisinin Belirleyicileri: IMKB'de Islem Goren Cimento, Otomotiv ve Bilisim Sektorlerinin Sermaye Yapisi Analizi. *Ege Akademik Bakış, 13*(4), 481-496. doi http://dx.doi.org/10.21121/eab.2013418082

Sayılgan, G., and Süslü, C., 2011. Makroekonomik Faktörlerin Hisse Senedi Getirilerine Etkisi: Türkiye ve Gelişmekte Olan Piyasalar Üzerine Bir İnceleme. *BDDK Bankacılık ve Finansal Piyasalar*, 73-96.

Seo, J., and Choi, W., 2016. What Determinants Affect the Capital Structure of Consumer Co-Operatives? The Case of Icoop Korea. *Annals of Public and Cooperative Economics, 87*(1), 117-135. doi http://dx.doi.org/10.1111/apce.12088

Serrasqueiro, Z., Armada, M. R., and Nunes, P. M., 2011. Pecking Order Theory versus Trade-Off Theory: Are service SMEs' capital structure decisions different? *Service Business, 5*(4), 381-409. doi http://dx.doi.org/10.1007/s11628-011-0119-5

Serrasqueiro, Z., and Caetano, A., 2015. Trade-Off Theory versus Pecking Order Theory: Capital structure decisions in a peripheral region of Portugal. *Journal of Business Economics and Management, 16*(2), 445-466. doi http://dx.doi.org/10.3846/16111699.2012.744344

Serrasqueiro, Z., and Nunes, P. M., 2014. Financing behaviour of Portuguese SMEs in hotel industry. *International Journal of Hospitality Management, 43*, 98-107. doi http://dx.doi.org/10.1016/j.ijhm.2014.09.001

Sheikh, N. A., and Wang, Z., 2011. Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. *Managerial Finance, 37*(2), 117-133. doi http://dx.doi.org/10.1108/03074351111103668

Tang, C.-H. H., and Jang, S. S., 2007. Revisit to the determinants of capital structure: A comparison between lodging firms and software firms. *Hospitality Management, 26*, 175–187.

Thippayana, P., 2014. Determinants of Capital Structure in Thailand. *Procedia: Social and Behavioral Sciences, 143*, 1074-1077. doi http://dx.doi.org/10.1016/j.sbspro.2014.07.558

Tong, G., and Green, C. J., 2005. Pecking order or trade-off hypothesis? Evidence on the capital structure of Chinese companies. *Applied Economics, 37*(19), 2179-2189. doi http://dx.doi.org/10.1080/00036840500319873

Umer, U. M., 2014. Determinants of Capital Structure: Empirical Evidence from Large Taxpayer Share Companies in Ethiopia. *International Journal of Economics and Finance, 6*(1), 53-65. doi http://dx.doi.org/10.5539/ijef.v6n1p53

Vicente-Lorente, J. D., 2001. Specificity and opacity as resource-based determinants of capital structure: Evidence for Spanish manufacturing firms. *Strategic Management Journal, 22*(2), 157-177. doi http://dx.doi.org/10.1002/1097-0266(200101)22:2<157::AID-SMJ152>3.0.CO;2-2

Wiwattanakantang, Y., 1999. An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal, 7*(3-4), 371-403. doi http://dx.doi.org/10.1016/S0927-538X(99)00007-4

ANNEX

Table no. A-1 – Correlation matrix of independent variables

	FS	GO	PA	NDTS	FR	AS	LR
FS	1						
GO	-0.1036	1					
PA	0.3987	-0.0394	1				
NDTS	0.2036	0.0323	-0.1602	1			
FR	0.4148	-0.0625	0.059	0.0373	1		
AS	-0.0635	0.2877	0.1268	0.0605	-0.089	1	
LR	0.0928	-0.0329	0.2501	-0.0051	-0.1072	-0.050	1

Table no. A-2 – Cross-sectional dependence test results

Variable	CDLM adj.		
	Statistics	p-value	Decision
TBTA	2.194	0.014	Ho Reject
LLTA	-0.508	0.694	Ho Accept
SLTA	2.426	0.008	Ho Reject
FS	1.275	0.101	Ho Accept
GO	-0.246	0.597	Ho Accept
PA	-0.961	0.727	Ho Accept
NDTS	1.574	0.058	Ho Accept
FR	-0.304	0.619	Ho Accept
AS	-0.783	0.783	Ho Accept
LR	1.431	0.076	Ho Accept

Table no. A-3.1 – First Generation unit root test results

Variable	Model	Levin, Lin & Chu -t		Im, Pesaran and Shin -W		ADF - Fisher Chi^2	
		Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
LLTA	Constant	0.8599	0.8051	0.8847	0.8118	30.3593	0.4474
	Constant and Trend	-4.2519	0.0000	-0.6078	0.2717	38.3157	0.1418
ΔLLTA	Constant	-8.8912	0.0000	-5.4462	0.0000	88.3377	0.0000
	Constant and Trend	-8.7714	0.0000	-2.1563	0.0155	69.3005	0.0001
FS	Constant	-11.6463	0.0000	-4.9565	0.0000	83.7654	0.0000
	Constant and Trend	-57.6118	0.0000	-57.6118	0.0000	54.2978	0.0043
ΔFS	Constant	-58.1696	0.0000	-58.1696	0.0000	84.5476	0.0000
	Constant and Trend	-12.5358	0.0000	-2.8275	0.0023	80.283	0.0000
GO	Constant	130.993	1.0000	-3.8952	0.0000	63.9429	0.0003
	Constant and Trend	163.392	1.0000	-3.49	0.0002	77.7825	0.0000
ΔGO	Constant	132.911	1.0000	-10.3091	0.0000	151.213	0.0000
	Constant and Trend	159.158	1.0000	-4.7514	0.0000	117.29	0.0000
PA	Constant	-1.8442	0.0326	-1.384	0.0832	49.6651	0.0134
	Constant and Trend	-7.5889	0.0000	-0.7304	0.2326	49.1378	0.0152
ΔPA	Constant	-24.0962	0.0000	-8.9305	0.0000	104.27	0.0000
	Constant and Trend	-7.6659	0.0000	-1.2763	0.1009	56.2449	0.0026
NDTS	Constant	-2.2195	0.0132	-0.0462	0.4816	27.9857	0.5712
	Constant and Trend	-12.3671	0.0000	-3.1263	0.0009	66.5771	0.0001
ΔNDTS	Constant	-12.6583	0.0000	-7.2807	0.0000	109.419	0.0000
	Constant and Trend	-11.1457	0.0000	-2.5733	0.0050	76.4206	0.0000
FR	Constant	-1.7576	0.0394	-0.7486	0.2271	46.112	0.0303
	Constant and Trend	-4.3492	0.0000	-1.7725	0.0382	52.4021	0.0069

Variable	Model	Levin, Lin & Chu -t		Im, Pesaran and Shin -W		ADF - Fisher Chi^2	
		Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
ΔFR	Constant	-16.6531	0.0000	-10.5484	0.0000	145.875	0.0000
	Constant and Trend	-16.2765	0.0000	-5.0534	0.0000	110.209	0.0000
AS	Constant	-1.754	0.0397	-0.8471	0.1985	37.6579	0.1587
	Constant and Trend	-6.4577	0.0000	-1.0095	0.1564	41.2146	0.0834
ΔAS	Constant	-9.3395	0.0000	-6.5516	0.0000	101.895	0.0000
	Constant and Trend	-10.1672	0.0000	-3.6052	0.0000	86.9802	0.0000
LR	Constant	-7.2418	0.0000	-1.589	0.0560	44.1467	0.0463
	Constant and Trend	-12.0298	0.0000	-3.2071	0.0007	65.143	0.0002
ΔLR	Constant	-18.059	0.0000	-8.9118	0.0000	122.72	0.0000
	Constant and Trend	-49.8727	0.0000	-6.3814	0.0000	84.5353	0.0000

Notes: The Δ notation shows the first-order difference of the series. The maximum delay length was taken as 1 and the optimal delay length was determined according to the SIC (Schwarz Info Criteria) criterion.

Table no. A-3.2 – Second Generation unit root test results

Variable	Model	Stat.	Critical Values		
			%1	%5	%10
TLTA	Constant	-1.715	-2.66	-2.35	-2.20
	Constant and Trend	-1.706	-3.31	-2.97	-2.78
ΔTLTA	Constant	-2.0550**	-2.66	-2.35	-2.20
	Constant and Trend	-18.4800*	-3.31	-2.97	-2.78
SLTA	Constant	-2.4630**	-2.66	-2.35	-2.20
	Constant and Trend	-4.0530*	-3.31	-2.97	-2.78
ΔSLTA	Constant	-4.0850*	-2.66	-2.35	-2.20
	Constant and Trend	-9.7590*	-3.31	-2.97	-2.78

CADF Panel Unit Root Test Results- **Notes**: The Δ notation shows the first-order difference of the series. *, **, and *** values indicate that the test statistic is significant at the 1%, 5% and 10% significance levels, respectively. Critical values of the CADF test statistic were obtained from tables 2b and 2c in Pesaran (2006).

Table no. A-4 – Tests for identification of appropriate model

MODELS	Test Type	Test Hypothesis	Stat.	Prob.	Decision
Model 1	**F-test**	No constant unit effect	0.3874	0.9762	Ho Accept
		No constant time effect	0.5544	0.8317	Ho Accept
		No constant time and unit effect	0.4495	0.9854	Ho Accept
Model 2	**F-test**	No constant unit effect	0.4752	0.9423	Ho Accept
		No constant time effect	1.0381	0.4141	Ho Accept
		No constant time and unit effect	0.7032	0.8344	Ho Accept
Model 3	**F-test**	No constant unit effect	9.1157	0.0000	Ho Reject
		No constant time effect	1.1941	0.3052	Ho Accept
		No constant time and unit effect	5.9515	0.0000	Ho Reject
Model 1	**LM Test**	No random unit effect	3.6658	0.0555	Ho Accept
		No random time effect	1.0672	0.3016	Ho Accept
		No random time and unit effect	4.733	0.0296	Ho Reject
Model 2	**LM Test**	No random unit effect	3.6755	0.0552	Ho Accept
		No random time effect	0.004	0.9496	Ho Accept
		No random time and unit effect	3.6795	0.0551	Ho Accept
Model 3	**LM Test**	No random unit effect	107.3917	0.0000	Ho Reject
		No random time effect	1.1821	0.2769	Ho Accept
		No random time and unit effect	108.5738	0.0000	Ho Reject
Model 3	**Hausman**	The difference between the parameters is not systematic	2,57	0.8601	Ho Accept

Table no. A-5 – Heteroscedasticity test results

MODELS	Test Type	Test Hypothesis	Stat.	Prob.	Decision
Model 1	White Test	No heteroscedasticity	24.881	0.8977	Ho Accept
	BP/CW $Chi^2(1)$	No heteroscedasticity	2.010	0.1559	Ho Accept
	BP/CW F(1, 147)	No heteroscedasticity	0.140	0.7105	Ho Accept
	BP/CW $Chi^2(1)$ $N*R^2$	No heteroscedasticity	0.140	0.7082	Ho Accept
Model 2	White Test	No heteroscedasticity	23.590	0.9287	Ho Accept
	BP/CW $Chi^2(1)$	No heteroscedasticity	0.820	0.3649	Ho Accept
	BP/CW F(1, 147)	No heteroscedasticity	0.060	0.8026	Ho Accept
	BP/CW $Chi^2(1)$ $N*R^2$	No heteroscedasticity	0.060	0.8010	Ho Accept
	Levene, Brown and Forsythe				
Model 3	WO	No heteroscedasticity	5.8021	0.0000	Ho Reject
	W50		4.4204	0.0000	Ho Reject
	W10		5.5024	0.0000	Ho Reject

Table no. A-6 – Autocorrelation test results

MODELS	Test Type	Test Hypothesis	Stat.	Prob.	Decision
Model 1	Wooldridge (2002)	No autocorrelation	6.903	0.0199	Ho Reject
Model 2	Wooldridge (2002)	No autocorrelation	11.114	0.0049	Ho Reject
Model 3	Durbin Watson (DW)	No autocorrelation	1.6507	---	---
	Baltagi–Wu (LBI)	No autocorrelation	1.9555	---	---
	LM-stat	No autocorrelation	107.92	0.0000	Ho Reject

Table no. A-7 – The list of airlines included in the analysis

AIRASIA BERHAD	JET AIRWAYS	SOUTHWEST
ALLEGIANT	JETBLUE	SPICEJET
CEBU AIR	NORWEGIAN	WESTJET
EASYJET	RYANAIR	AIR ARABIA
GOL LINHAS	SKYMARK	FASTJET

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