The Factors Determining the Profitability of Low Cost Airlines

Article · March 2020

CITATIONS
0

READS
28

1 author:

Kasım Kiracı
Iskenderun Technical University
57 PUBLICATIONS **66** CITATIONS

SEE PROFILE

The Factors Determining the Profitability of Low Cost Airlines

Dr. Kasım KİRACI (kasim.kiraci@iste.edu.tr)
Iskenderun Technical University, Department of Aviation Management Turkey

ABSTRACT

Airline have developed a set of business models to increase their market share and gain competitive advantage against each other. One of the business models that have recently captured attention is the low-cost business model. The purpose of this study is to identify financial variables that affect profitability of airlines with a low-cost business model. For this purpose, 16 airlines with a continuing financial performance for the period 2004-2017 have been examined empirically. Panel data analysis was used as a method in the study. Within the scope of the study two different models were created. In the first model, return on assets (ROA) and in the second model, return on equity (ROE) is used as a dependent variable. The findings of the study indicate that in the first model, growth opportunities and asset structure have an effect on profitability. In the second model, growth opportunities, asset structure and leverage level have an impact on profitability.

Keywords: *Profitability, Airlines, Business model, Panel data*
JEL Classification: *L93, C23, D22*

1. INTRODUCTION

After the deregulation started in 1978 in the United States, the growth rate of the airline industry has increased considerably. In the process, many new airlines have been established and the competition between airlines has increased considerably over time. Meanwhile, airlines have developed new business models to gain competitive advantage and increase market share. The low-cost business model is at the forefront of business models that have recently come to the forefront and allow airlines to increase their market share. According to the International Civil Aviation Organization (ICAO), one of the most important organizations in the aviation industry, low-cost airlines are consistently growing above the sector average. In this context, approximately 1.2 billion passengers were transported by airlines with a low-cost business model as of 2017. This rate accounts for approximately 30% of the total scheduled passengers in the world. There are many factors that

affect profitability in the airline industry. These include some factors that are specific to air transportation (Doganis, 2002; Wensveen, 2007; Hanlon, 2007; Vasigh et al., 2013; Kiracı and Yaşar, 2020). For example, seasonal demand in the air transport industry affects profitability. This is a characteristic of the air transport industry. In addition, it can be said that social, political and economic developments (such as the Gulf War, September 11 terrorist attacks, SARS, 2009 global financial crisis, COVID-19) have had a significant impact on sector profitability. Finally, it is possible to say that the fluctuations in the oil and rate of exchanges affected the profitability of the industry (Yun and Yoon, 2019; Lee et al., 2016; Kristjanpoller and Concha, 2016). It is possible to examine the factors determining the profitability by using the financial factors accepted in the literature besides all these aviation specific factors. There are several studies in the literature that examine profitability in the airlines using financial indicators (Menta, 2015; Abebe, 2017; Kiracı, 2019). However, the factors determining profitability for airlines with low cost business model have not been studied in the literature. Therefore, this study is expected to contribute to the literature and fill the gap in the literature.

This study examining the financial variables affecting the profitability of airlines that employ low-cost business models will contribute to the literature in several respects. First, this study focuses on financial determinants that affect profitability of airlines, unlike studies in the literature. In the literature, no studies have examined the financial determinants that affect profitability. Therefore, this study is expected to fill this gap in the literature. Secondly, this study focused on airlines employing low-cost business model. Airline companies develop business models by taking into account many factors such as their fleet structure, network structures, and customer profile. Therefore, considering the business model, examining the financial factors affecting the profitability of the airlines may contribute to the aviation literature. Finally, there is rarely seen in the literature on aviation companies' financial reviews on the basis of low cost business model. Therefore, it is expected that this study will contribute to the aviation literature in the context of low-cost business model. The rest of this study is planned as follows. In the second part of the study, the studies done in the literature; in the third part, the data related to research model and variables; in the fourth part, the data set and method in the study; in the fifth part, the empirical findings obtained; in the sixth part, the results and the evaluation of the study will be given.

2. LITERATURE

In the literature, it is generally seen that profitability-related indicators are used when measuring firm performance or financial performance. Therefore, there are studies which relate profitable variables to firm performance (Şahin, 2011; Abbas et al., 2013). It appears that many studies have been carried out in the literature that determine the profitability of firms in different industries and groups of companies. For example; Goddard et al. (2005) examined the factors that determine the profitability of manufacturing and service businesses in Europe using panel data analysis.

Glancey (1998) examined the variables affecting the growth and profitability of small manufacturing firms operating in a region of Scotland. Joh (2003) discussed the relationship between ownership structure and profitability of companies operating in South Korea prior to the Asian crisis of 1998. Kocaman et al. (2016) investigated the factors determining economic profitability of ISO 500 industrial enterprises by using panel data analysis method. Asimakopoulos et al. (2009) empirically examined the financial and macroeconomic factors affecting the profitability of non-financial firms traded on the Athens Stock Exchange. Okuyan (2013) analyzed the profitability of the 1000 largest industrial enterprises in Turkey empirically. Korkmaz and Karaca (2014) investigated the financial determinants of the profitability of production enterprises traded in Stock Exchange Istanbul through panel data analysis method. Aissa and Goaied (2016) have empirically considered the financial determinants of profitability for a hotel in Tunisia. In addition to this, it is also possible to find studies that the profitability analysis of enterprises from different industries traded on the stock market is carried out. Among these studies, Albayrak and Akbulut (2008) analyzed manufacturing and service businesses; Kutter and Demirgunes (2007) analyzed retail sector enterprises, and Karadeniz and İskenderoğlu (2011) analyzed tourism enterprises by approaching the factors that affect / determine profitability emprically.

In the literature, there are also studies which the profitability of the enterprises has been studied in the context of aviation sector. Among these studies, Zuidberg (2017) has discussed the operational factors that determine the profitability of airports. According to the study, the traffic structure of the airport, business model applied by the airlines and season have significant effects on profitability. Bourjade et al. (2017) empirically examined the impact of leasing (airline leasing) activities of airlines on profitability. According to the results from 73 airlines, it was found that aircraft leasing affects profitability. Garefalakis et al. (2016) addressed the factors affecting profitability in the aviation industry in two regional contexts (Europe and USA). The results

of the study show that the regions where airlines operate have an impact on profitability and that the profit margins of airlines operating in the United States are higher.

Douglas and Tan (2017) investigated the impact of global alliances on profitability. It is emphasized that membership in global alliances provides economic advantage. Zou and Chen (2017) investigated the effects of strategic alliances and code sharing agreements on airline profitability. The results of the study indicate the existence of a positive relationship between the code-sharing agreements and the profit margins. Oum et al. (2004) investigated the effect of horizontal alliances on the performance, efficiency and profitability of airlines. Findings from the study of 22 airlines show that the level of cooperation in horizontal alliances is effective on productivity and profitability. Mellat-Parast and Fini (2010) empirically examined the effect of efficiency and service quality on profitability in airlines. The results of the study show that operational indicators such as labor productivity, oil prices, maintenance costs and employee wages have an impact on profitability. Mellat-Parast et al. (2015) analyzed the relationship between operational strategy and service quality and profitability for domestic airlines operating in the US. It was emphasized that operating strategy and service disruptions of airlines had an effect on profitability. Raghavan and Rhoades (2005) examined the relationship between safety indicators and profitability of airlines operating in the United States. The results of the study show that there is a close link between airline safety and profitability. Kiracı (2019) investigated the financial determinants of profitability for airlines with traditional business model. The empirical results of the study show that there are financial factors that affect the profitability of the airlines. In the literature, there are many studies investigating profitability of airlines in different dimensions but no work has done on financial determinants of profitability for low-cost airlines. Therefore, it is expected that this study will fill this gap and contribute to aviation stakeholders in terms of the financial determinants of profitability.

3. RESEARCH MODEL

When the researches on financial determinants of profitability are examined in the literature, it is seen that rates related to profitability are generally used as dependent variables. In the literature, the two ratios are usually at the forefront of the profitability indicator. The first of these is the return on assets (ROA), which is the ratio of net profit to total assets. The second is the ratio of net profit to total assets, which is the ratio of return on equity (ROE). In this study, both dependent and independent variables were

determined based on the literature. The independent variables of the study are firm size, growth opportunities, tangibility, liquidity, leverage ratio-1, leverage ratio-2 and firm risk. The independent variables used in the study were also chosen among the variables frequently used in the literature. The variables used in the study and their measurement methods are shown in table 1.

Definitions of variables

Table 1

	Acronym	Variables	Formula
Dependent variables	ROA	Return on assets	Net profit (income) / total assets
	ROE	Return on equity	Net profit (income) / total shareholders' equity
Independent variables	SIZE	Firm size	Log (total assets)
	GROW	Growth opportunities	Percent change (%) in operating income
	TANG	Tangibility	Property, plant & equip / total assets
	LIQ	Liquidity	Current assets / current liabilities
	LEV1	Leverage ratio-1	Total debt / total assets
	LEV2	Leverage ratio-2	Short term debt / total assets
	RISK	Firm risk	Standard deviation of EBIT

Within the scope of the study, two different models were established by using the variables in Table 1. In the first model, ROA is used as the dependent variable, while in the second model, ROE is used as the dependent variable. Models established within the scope of the study are as follows.

Model 1-

$$ROA_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 GROW_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \beta_5 LEV1_{it} + \beta_6 LEV2_{it} + \beta_8 RISK_{it} + \varepsilon_{it}$$

Model 2-

$$ROE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 GROW_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \beta_5 LEV1_{it} + \beta_6 LEV2_{it} + \beta_8 RISK_{it} + \varepsilon_{it}$$

In the mentioned models, ROA and ROE variables indicate the dependent variable of each model. The independent variables used in the study are firm size, growth opportunities, tangibility, liquidity, leverage ratio-1, leverage ratio-2 and firm risk.

4. DATA SET AND METHOD

In this study, it is aimed to reveal the financial factors affecting the profitability according to the business model applied to airlines operating in different markets of the world. In this context, the data related to the 16

airlines with a continuing financial performance, which have a low-cost business model, are analyzed empirically. The data for the period 2004-2017 were analyzed using panel data analysis method. The data used in the study were obtained from the Thomson Reuters Eikon database (Thomson Reuters, 2018)

The panel data equation can be expressed as: $Y_{it} = \alpha_{it} + \beta_{it} X_{it} + \varepsilon_{it}$. Here ε_{it} indicates error terms. Panel data analysis first examines whether the series have cross sectional dependency (Yerdelen Tatoğlu, 2015). Examination of cross sectional dependency in the series is important for determining whether the first generation or second generation unit root tests will be applied to the series. It is necessary to select between classical, fixed effects and random effect models considering that the coefficients in the panel data models change according to unit and / or time after the series has been tested for stationarity. In the panel data analysis, heteroscedasticity and autocorrelation tests need to be done to the determined models. In the final stage of the study, it is necessary to obtain resistant errors based on pre-test results.

5. EMPIRICAL FINDINGS

In this part of the study, the descriptive statistics of the variables used in the study, the pre-test results and the findings obtained from the analysis will be included.

Descriptive statistics for variables

Table 2

	ROA	ROE	SIZE	GROW	TANG	LIQ	LEV1	LEV2	RISK
Mean	-0.0213	0.0519	6.2113	0.3829	0.6559	1.1659	0.3604	0.0675	115646
Max	0.2753	4.5335	7.3998	218.99	30.131	10.421	1.2940	0.4126	1163898
Min	-3.6879	-11.978	2.8543	-36.285	0.0043	0.1654	0.0000	0.0000	0.7071
Std. Dev.	0.3209	1.1539	0.8586	15.821	2.0662	0.9642	0.2332	0.0650	163825
Observations	208	208	208	208	208	208	208	208	208

Table 2 contains descriptive statistics of dependent and independent variables used in the study.

Correlation table of the independent variables

Table 3

	SIZE	GROW	TANG	LIQ	LEV1	LEV2	RISK
SIZE	1						
GROW	-0.0616	1					
TANG	-0.2078	-0.0152	1				
LIQ	0.0560	-0.0344	-0.1043	1			
LEV1	0.2524	-0.0441	-0.0503	-0.3511	1		
LEV2	-0.0641	-0.0255	-0.0562	-0.3676	0.6035	1	
RISK	0.3911	-0.0393	-0.0295	-0.1272	0.1660	0.0607	1

Table 3 shows the correlation matrix of the independent variables used in the study. The correlation of the independent variables with each other above 0.80 causes the problem of multicollinearity. When the correlation coefficients of the variables included in the study are examined, it is seen that there is not a high correlation between them.

Cross-sectional dependency test results

Table 4

CDLM adj. Cross-sectional dependency test		
Variable	**Stat**	**Prob**
ROA	1.334	0.9090
ROE	1.408	0.9200
SIZE	1.030	0.8480
GROW	0.232	0.5920
TANG	0.695	0.2440
LIQ	0.014	0.4940
LEV1	1.085	0.8610
LEV2	1.541	0.9380
RISK	0.793	0.2140

Table 4 presents cross-sectional dependency test results for the variables used in the study. Accordingly, the hypothesis H_0 established as "no cross-sectional dependency" is accepted for all variables. Therefore, it seems that there is no cross-sectional dependency problem in the study.

Unit root test results

Table 5

Variable	Model	Levin, Lin & Chu -t		Im, Pesaran & Shin W		ADF - Fisher Chi^2	
		Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
ROA	Constant	-10.9841	0.0000	-3.38896	0.0004	69.6848	0.0001
	Constant and Trend	-9.19691	0.0000	-1.74577	0.0404	49.2644	0.0262
ROE	Constant	-19.0268	0.0000	-6.36041	0.0000	71.0317	0.0001
	Constant and Trend	-22.0689	0.0000	-5.38882	0.0000	61.513	0.0013
SIZE	Constant	-7.22146	0.0000	-4.61617	0.0000	88.5221	0.0000
	Constant and Trend	-49.8317	0.0000	-13.6896	0.0000	75.0036	0.0000
GROW	Constant	1.8688	0.9692	-3.95407	0.0000	68.3579	0.0000
	Constant and Trend	2.56447	0.9948	-2.37189	0.0088	51.9827	0.0142
TANG	Constant	-1.22585	0.1101	-0.56937	0.2846	38.2549	0.2066
	Constant and Trend	-6.1841	0.0000	-0.28182	0.3890	37.9886	0.2152
ÄTANG	Constant	-5.94584	0.0000	-4.53041	0.0000	77.7529	0.0000
	Constant and Trend	-4.04782	0.0000	-2.58932	0.0048	55.1361	0.0067
LIQ	Constant	-7.0733	0.0000	-2.94457	0.0016	60.4869	0.0017
	Constant and Trend	-6.64613	0.0000	-1.94938	0.0256	53.5014	0.0100
LEV1	Constant	-2.49328	0.0063	-1.50311	0.0664	47.8128	0.0358
	Constant and Trend	-3.58441	0.0002	-0.81444	0.2077	37.2286	0.2409
LEV2	Constant	-0.17633	0.4300	-2.16485	0.0152	53.0472	0.0111
	Constant and Trend	0.62141	0.7328	-1.17466	0.1201	45.1907	0.0611
RISK	Constant	-3.08926	0.0010	-2.39856	0.0082	53.6539	0.0096
	Constant and Trend	-3.52838	0.0002	-1.67008	0.0475	46.4734	0.0472

Table 5 shows the unit root test results of the variables used in the study. Accordingly, all of variables except TANG are stationary at the level. As a result, the TANG variable became stationary after the taking first difference.

Tests for identification of appropriate model

Table 6

	F Test		LM Test		Hausman Test	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Model 1	3.25058	0.0000	1.953945	0.1622	43.530	0.0000
Model 2	0.31619	0.9932	5.003064	0.0253	3.510	0.6211

Table 6 shows F, LM and Hausman test results for determining the appropriate model to be used in the study. Accordingly, it is seen that the fixed effects for the first model (model 1) and the random effects model for the second model (model 2) are appropriate.

Heteroscedasticity and Autocorrelation test results

Table 7

	Test	Stat.	Prob.
Model - 1	Modified Wald test	5.2e+06	0.0000
	Durbin-Watson	2.39478	
	Baltagi-Wu LBI	2.49655	
Model - 2	W0	4.35624	0.0000
	W50	3.06949	0.0001
	W10	3.10080	0.0001
	Durbin-Watson	2.11609	
	Baltagi-Wu LBI	2.16403	

Table 7 shows the variance and autocorrelation test results for Model 1 and Model 2. For the first model, modified Wald variance and Bhargava, Franzini and Narendranathan's DW autocorrelation test, Baltagi and Wu's LBI test autocorrelation tests were used. In the second model, heteroscedasticity developed by Levene, Brown and Forsythe and Bhargava, Franzini and Narendranathan's DW autocorrelation test, Baltagi and Wu's LBI test autocorrelation tests were used. The test results show that there is heteroscedasticity and autocorrelation problem in both models. Arellano, Froot and Rogers correction was applied to solve the heteroscedasticity and autocorrelation problems in the model estimation and to obtain resistant standard errors.

Regression results for Return On Assets (ROA)

Table 8

Dependent Variable: ROA						
Variable	**Coef.**	**Std. Err.**	**Z**	**P>|z|**	**[95% Conf.**	**Interval]**
SIZE	-0.1521	0.12344	-1.2300	0.2370	-0.4152	0.11097
GROW	0.00398	0.00124	3.22000	0.0060	0.00135	0.00662
ÄTANG	0.01291	0.00230	5.62000	0.0000	0.00801	0.01781
LIQ	-0.0001	0.01612	-0.0100	0.9950	-0.0344	0.03426
LEV1	-0.3452	0.27396	-1.2600	0.2270	-0.9291	0.23868
LEV2	0.20673	0.86506	0.24000	0.8140	-1.6371	2.05056
RISK	0.00000	0.00000	0.86000	0.4050	0.00000	0.00000
cons	1.03686	0.78363	1.32000	0.2060	-0.6333	2.70712
Number of Observations:192		F (7, 15): 1269.10				
Number of groups: 16		Prob > F: 0.0000		R^2= 0.6549		

Table 8 shows the results of the fixed resistance effect model for the model where the Return On Assets (ROA) variable is used as a dependent variable. The results show that the growth opportunities and asset structure

variables are statistically significant. Accordingly, growth opportunities and asset structure variables have a positive effect on ROA. In other words, it can be said that the growth opportunities and the asset structure have a positive and significant effect on the profitability of airlines employing low-cost business model.

Regression results for Return On Assets (ROE)

Table 9

Dependent Variable: ROE						
Variable	**Coef.**	**Std. Err.**	**Z**	**P>|z|**	**[95% Conf. Interval]**	
SIZE	-0.05718	0.08122	-0.70000	0.4810	-0.21637	0.10201
GROW	-0.00639	0.00246	-2.59000	0.0090	-0.01121	-0.0015
ÄTANG	-0.02045	0.00903	-2.26000	0.0240	-0.03815	-0.0027
LIQ	-0.02336	0.02626	-0.89000	0.3740	-0.07482	0.02810
LEV1	0.662640	0.26287	2.520000	0.0120	0.147420	1.17785
LEV2	-5.29547	0.65816	-8.05000	0.0000	-6.58544	-4.0055
RISK	0.00000	0.00000	-1.41000	0.1590	0.00000	0.00000
cons	0.55943	0.44023	1.27000	0.2040	-0.30340	1.42226
Number of Observations:192		Wald χ^2 (8): 1385.04			R^2 = 0.7931	
Number of groups: 16		Prob > χ^2 =0.0000				

In Table 9, the model findings that the Return On Equity (ROE) variable is a dependent variable are given. Accordingly, the results show that variables related to growth opportunities, asset structure and leverage level have a significant effect on profitability. Unlike the first model, growth opportunities and asset structure variables have a negative effect on ROE. LEV1 variable is positive and LEV2 variable has negative effect on leverage level. In other words, the LEV1 variable, which is the ratio of total liabilities to total assets, is positive on profitability and the LEV2 variable, which is the ratio of short-term liabilities to total assets, has a negative effect on profitability.

6. CONCLUSION

The aim of this study is to reveal the financial performance indicators that affect profitability of airlines adopting low cost business model. For this purpose, the data of 16 airlines which financial data have been continuing for the period of 2004-2017 were analyzed by panel data analysis method. ROA and ROE variables were used as dependent variables in the study. The independent variables used in the study were determined by considering the studies in the literature.

Model-1 findings, which used ROA as a dependent variable, indicate that growth opportunities and asset-structure variables have a positive effect on profitability for airlines with low-cost business models. In other words, the high rate of increase in the operating income of low-cost airlines (growth opportunities) and the share of tangible fixed assets in total assets (especially aircrafts) are positively affecting profitability. This shows that low-cost airlines need to increase their operating income and tangible assets in order to raise ROA. Particularly, it is thought that purchasing aircrafts instead of leasing can increase ROA.

The model-2 findings that ROE is used as a dependent variable reveal that the growth opportunities, asset structure, total debt level and short term debt level variables have a significant effect on profitability. Accordingly, for airlines employing low-cost business model, growth opportunities and asset structure seem to have a negative impact on ROE. In this study, two different ratios were used to reveal the effect of leverage level on profitability. The first ratio is the LEV1 variable indicating the total debt level and the second ratio is the LEV2 variable indicating the short-term debt level. Findings of the study show that the total debt level of airlines has a positive effect on ROE. On the other hand, the short term debt level has a negative effect on ROE. This necessitates that low-cost airlines should behave differently than model 1 in order to increase ROE. In addition, the cost structure of airlines is expected to have a positive impact on ROE by increasing the ratio of long-term liabilities to total assets.

In this study, which focuses on the factors determining the profitability of airline companies, one of the rarely mentioned topics in the literature, it is seen that independent variables have different effects on ROA and ROE dependent variables. One of the main reasons for this is the differences in the debt equity balance of airlines. In further studies, it is suggested to examine airlines with a business model different than the low-cost business model. Thanks to this, it can be determined whether there is a difference between the financial indicators that determine the profitability among the airline groups employing different business models and if there is a difference, the probable causes of this difference can be examined.

References

1. **Abbas, A., Bashir, Z., Manzoor, S., & Akram, M. N.,** 2013, *Determinants of firm's financial performance: An empirical study on textile sector of Pakistan*, Business and Economic Research, 3(2), 76-86.
2. **Abebe, G.,** 2017, *Determinants of aviation profitability: the case of Ethiopian Airlines* (Doctoral dissertation, Addis Ababa University).
3. **Aissa, S. B., & Goaied, M.,** 2016, *Determinants of Tunisian hotel profitability: The role of managerial efficiency*, Tourism management, 52, 478-487.

4. **Albayrak, A. S., & Akbulut, R.,** 2012, *Karliligi etkileyen faktorler: IMKB sanayi ve hizmet sektorlerinde islem goren isletmeler uzerine bir inceleme*, Uluslararasi Yonetim Iktisat ve Isletme Dergisi, 4(7), 55-82.
5. **Asimakopoulos, I., Samitas, A., & Papadogonas, T.,** 2009, *Firm-specific and economy wide determinants of firm profitability: Greek evidence using panel data*, Managerial Finance, 35(11), 930-939.
6. **Bourjade, S., Huc, R., & Muller-Vibes, C.,** 2017, *Leasing and profitability: Empirical evidence from the airline industry*, Transportation Research Part A: Policy and Practice, 97, 30-46.
7. **Doganis, R.,** 2013, *Flying off course: The economics of international airlines*. Third edition, Routledge.
8. **Douglas, I., & Tan, D.,** 2017, *Global airline alliances and profitability: A difference-in-difference analysis*, Transportation Research Part A: Policy and Practice, *103*, 432-443.
9. **Garefalakis, A., Mantalis, G., Lemonakis, C., & Vassakis, K.,** 2016, *Determinants of profitability in aviation industry of Europe and America*, International Journal of Supply Chain Management, 5(2), 131-137.
10. **Glancey, K.,** 1998, *Determinants of growth and profitability in small entrepreneurial firms*, *I*nternational Journal of Entrepreneurial Behavior & Research, 4(1), 18-27.
11. **Goddard, J., Tavakoli, M., & Wilson, J. O.,** 2005, *Determinants of profitability in European manufacturing and services: evidence from a dynamic panel model*, Applied Financial Economics, 15(18), 1269-1282.
12. **Hanlon, P.,** 2007, *Global airlines*: *Competition in a transnational industry*. Third Edition, Routledge.
13. **Joh, S. W.,** 2003, *Corporate governance and firm profitability: evidence from Korea before the economic crisis*, Journal of financial Economics, 68(2), 287-322.
14. **Karadeniz, E., & Iskenderoglu, O.**, 2011, *Istanbul menkul kiymetler borsasi'nda islem goren turizm isletmelerinin aktif karliligini etkileyen degiskenlerin analizi*, Anatolia: Turizm Arastirmalari Dergisi, 22(1).
15. **Kiraci, K., & Yaşar, M.** 2020, *The Determinants of Airline Operational Performance: An Empirical Study on Major World Airlines*. Sosyoekonomi, 28(43), 107-117.
16. **Kiraci, K.**, 2019, *Which Factors Affect Financial Profitability of Traditional Airlines?*. *Yilmaz*. (Ed.), New Trends in Management Studies, 233-248, Peter Lang Publishing
17. **Kocaman, M., Altemur, N., Aldemir, S., & Karaca, S. S.,** 2016, *Ekonomik karliligi etkileyen faktorler: ISO 500 sanayi isletmeleri uygulamasi*, Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 13(35).
18. **Korkmaz, O.**, & **Karaca, S. S.**, 2014, *Uretim isletmelerinde firma karliliginin finansal belirleyicileri ve bist imalat sanayi uygulamasi*, Ege Akademik Bakis, 14(1), 21.
19. **Kristjanpoller, W. D., & Concha, D.** 2016, *Impact of fuel price fluctuations on airline stock returns*. Applied energy, 178, 496-504.
20. **Külter, A. G. B., & Demirgüneş, A. G. K.,** 2007, *Perakendeci Firmalarda Karliligi Etkileyen Degiskenler Hisse Senetleri IMKB'de islem Goren Perakendeci Firmalar Uzerinde Ampirik Bir Calisma*, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, *16*(1).
21. **Lee, S., Seo, K., & Sharma, A.** 2013, *Corporate social responsibility and firm performance in the airline industry: The moderating role of oil prices*. Tourism management, 38, 20-30.
22. **Mellat Parast, M., & Fini, E. E. H.,** 2010, *The effect of productivity and quality on profitability in US airline industry: an empirical investigation*, Managing Service Quality: An International Journal, 20(5), 458-474.

23. **Mellat-Parast, M., Golmohammadi, D., McFadden, K. L., & Miller, J. W.,** 2015, *Linking business strategy to service failures and financial performance: Empirical evidence from the US domestic airline industry*, Journal of Operations Management, 38, 14-24.
24. **Menta, F.,** 2015, *Factors Affecting Profitability in the Airlines Industry: an Empirical Study on Major Airlines in Sub-Saharan Africa* (Doctoral dissertation, Addis Ababa University).
25. **Oum, T. H., Park, J. H., Kim, K., & Yu, C.,** 2004, *The effect of horizontal alliances on firm productivity and profitability: evidence from the global airline industry*, *Journal of Business Research*, *57*(8), 844-853.
26. **Şahin, O.,** 2012, *Kobi'lerde finansal performansi belirleyen faktorler*, Uluslararasi Yonetim Iktisat ve Isletme, *7*(14), 183-200.
27. **Okuyan, H. A.,** 2013, *Türkiye'deki En Büyük 1000 Sanayi Isletmesinin Karlilik Analizi*/The Profitability Analysis of the Largest 1000 Industrial Firms in Turkey*, *Business and Economics Research Journal*, *4*(2), 23.
28. **Raghavan, S., & Rhoades, D. L.,** 2005, *Revisiting the relationship between profitability and air carrier safety in the US airline industry*, Journal of Air Transport Management, *11*(4), 283-290.
29. **Vasigh, B., & Fleming, K.,** 2013, *Introduction to air transport economics: from theory to applications*. Second Edition, Routledge.
30. **Tatoglu, F. Y.**, 2012, *Panel Veri Ekonometrisi*. Beta Yayinevi
31. **Yun, X., & Yoon, S. M.** 2019, *Impact of oil price change on airline's stock price and volatility: Evidence from China and South Korea*. Energy Economics*,* 78, 668-679.
32. **Zou, L., & Chen, X.,** 2017, *The effect of code-sharing alliances on airline profitability*, Journal of Air Transport Management, *58*, 50-57.
33. **Zuidberg, J.,** 2017, *Exploring the determinants for airport profitability: Traffic characteristics, low-cost carriers, seasonality and cost efficiency*, Transportation Research Part A: Policy and Practice, 101, 61-72.
34. **Wensveen, J.,** 2018, *Air transportation: A management perspective*. Sixth Edition, Routledge.

- https://eikon.thomsonreuters.com/index.html
-https://www.icao.int/Newsroom/Pages/Continued-passenger-traffic-growth-and-robust-air-cargo-demand-in-2017.aspx