INDEPENDENT JOURNAL OF MANAGEMENT & PRODUCTION (IJM&P)
http://www.ijmp.jor.br v. 13, n. 2, March-April 2022
ISSN: 2236-269X
DOI: 10.14807/ijmp.v13i2.1777

Analysis of sector-specific operational performance metrics affecting stock prices of traditional airlines

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Submission: 8/24/2021
Accept: 12/1/2021

ABSTRACT

Factors such as the country's economic situation, future prospects and the efficiency of businesses are very significant in determining the stock price, along with the demand-supply effect. In this regard, it is intended to investigate the relationship between airlines' operational performance metrics and their stock prices. Quarterly operational data of 5 traditional airlines between the period 2005-2017 were researched by panel data analysis method and operational factors (RPK, CASK, LF and OPL) determining stock prices were determined. According to the inferences from the analysis, It has been concluded that the revenue passenger kilometres (RPK) has a positive effect on the stock price. It was found that aircraft load factor (LF) variable has a negative effect on stock price. Cost per available seat kilometers (CASK) variable seems to have a negative effect on the stock price. Finally, it was found that the OPL variable positively affects the stock price. According to the results, airlines should increase operational revenue and demand to boost their stock values, besides increase aircraft load factors. Along with the increase in revenue and load factor, the decrease in unit cost and break-even load factor increase profitability and stock value of airlines.

Keywords: Airline Finance; Panel Data Analysis; Airline Stock Price; Airline Specific Operational Ratios; Airline Operational Performance

1. INTRODUCTION

The continuous change and rapid growth in the airline industry has also brought complex problems for airline executives. Among these are: safety, lack of infrastructure, environmental and social pressures, sustainability, privatization and commercialization of airports, deregulation of markets, alliances and mergers between airlines and market entry of

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low-cost carriers. Such pressures and challenges have led airline executives to employ various performance management techniques to measure and manage airline performance (Francis et al., 2005).

Airlines need to manage their costs more effectively, thus they can maintain profitable operations. Performance analysis is used to evaluate the cost effectiveness and reliability of corporate governance and design. The purpose of performance analysis is to identify areas of improvement and to support strategic decision making (Schefczyk, 1993).

Companies usually utilize financial performance indicators while conducting performance evaluation. However, Birchard (1994), AICPA Committees (1994), Wallman (1995, 1996) and Amir and Lev (1996) expressed their concern that financial reporting did not keep pace with dynamic business world. Managers and investors might lead to wrong decisions due to the lack of financial data. This can lead to less efficient capital markets and lower financial efficiency. Policy makers (AICPA Jenkins Committee and Wallman) recommend that along with financial data, non-financial performance indicators should be taken into account to assess future financial performance (Behn & Riley, 1999; Riley et al. 2003).

In the measurement of financial performance, airlines mainly benefit from balance sheet, income statement, ratio analysis and horizontal/vertical analyses. Apart from these analyses, operational and service quality data are also analysed and used by airlines in performance management (Francis et al., 2005). The measurement and comparison of financial performance data is easier compared to non-financial (operational etc.) data.

However, financial performance measurement should not be limited to financial measures for airlines. For example, if an airline prefers growth strategy, it should seek ways to increase its load factor (Schefczyk, 1993). In this context, measuring financial performance, airlines should benefit from both financial performance indicators and operational performance indicators. In this respect, the study reveals whether operational (non-financial) data specific to the airline industry can affect stock prices.

There is only one study Riley (2003) in the literature that examined the relationship between airline industry-specific operational performance indicators and stock prices. Therefore, it is believed that this study will make a great contribution to researchers, managers and investors by filling this gap in the literature. Another feature that differentiates the study is that it is a comprehensive model that measures the relationship between the variables used in

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the study and the stock price. In addition, the OPL variable used in the study was tested in the model for the first time, including airlines efficiency and performance studies. As a result, it is thought that this study will make great contributions to researchers, managers and investors by filling the gap in the literature.

2. KEY PERFORMANCE INDICATORS FOR AIRLINE OPERATIONS

Before examining the relationship between key performance indicators and stock prices, key performance indicators are explained in detail.

Operating profit of airlines depends on the interaction of operational revenue, operational cost and aircraft load factor. Operating profit is also expressed as the case that unit revenue is higher than unit cost. Unit cost of an airline is associated with available seat kilometers (ASK) and cost available seat kilometers (CASK) indicators. Unit income is related to revenue passenger kilometers (RPK) and revenue available seat kilometers (RASK) indicators. Load factor, on the other hand, shows how much of the capacity generated (ASK) is actually sold (RPK) (Doganis, 2010).

There are two key metrics for airlines. These are ASK and RPK metrics. Other metrics cannot be calculated without these metrics. Combining these two metrics (ASK and RPK) and items on income statement and balance sheet give most of financial ratios used by airlines (Vasigh et al., 2015). The formulas for the relevant metrics (RPK and ASK) and the load factor (LF) associated with these metrics are shown below:

- Available Seat Kilometers (ASK): The total number of seats available X the total number of kilometers;
- Revenue Passenger Kilometers (RPK): The number of revenue passengers X the total distance travelled;
- Load Factor (LF) : RPK/ASK.

For profitability, it is necessary to consider the income and cost factor. While revenue per available seat-kilometers (RASK) is used to get the revenue per increment capacity, cost per available seat-kilometers (CASK) is used for measuring an airline's unit cost (Vasigh et.al., 2015).

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ISSN: 2236-269X
DOI: 10.14807/ijmp.v13i2.1777

- Revenue per Available Seat-Kilometers (RASK): Total Passenger Revenue/Total ASK;
- Cost per Available Seat-Kilometers (CASK): Total Cost/Total ASK.

RASK ratio is calculated by taking into account all seats offered by airlines. Revenue per Revenue Passenger Kilometers (RRPK) refers to the average amount that a passenger pays to fly one kilometers (Vasigh et.al., 2015).

- Revenue per Revenue Passenger Kilometers (RRPK): Total Passenger Revenue/Total RPK.

One of the most important indicators of airline operational profitability is breakeven load factor (BLF). It is the average percent of seats that must be filled on an average flight at current average fares for the airline's passenger revenue to break even with the airline's operating expenses (Vasigh et al., 2015). Comparing the breakeven load factor and the load factor indicates whether there is an operational profit or not. A BLF ratio higher than LF ratio indicates that there is operational profit, on the other hand, a LF ratio lower than BLF ratio shows that there is operational loss.

- Breakeven load factor (BLF): CASK/RRPK.

Five common industry metric used to measure the efficiency of airline operations; aircraft load factor (LF), available seat km (ASK), revenue per km (RPK), cost per available seat km (CASK), revenue per available seat km (RASK) (Barbot et al., 2008; Barros & Peypoch, 2009; Lee & Worthington, 2014; Li et al., 2015; Mallikariun, 2015)

RPK measures the actual demand for an airline. It shows the number of kilometers travelled by revenue passengers. RPK and ASK are the backbone of airline metrics. RPKs give airline senior management a clear indication of the demand and efficiency in a given market. Therefore, RPK is one of the main ratios that demonstrate the profitability and performance of airlines.

While Francis et al. (2005) classified RPK as one of non-financial operational indicators, Wald et al., (2010) classified it as one of financial performance indicators.

ASK is calculated by multiplying the number of seats with the flight distance flown. ASK captures the total flight passenger capacity of an airline (Doganis, 2010; Vasigh et al., 2015). Airline managers need to increase capacity (ASK) to increase profitability. Therefore,

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an increase in ASK results in improvement in long-term profitability. Along with profitability, it is expected that there will be a positive relationship between the ASK indicator and stock returns (Riley et al., 2013).

The capacity efficiency of aircraft can be measured by aircraft load factor (Vasigh et al., 2015; Doganis, 2010; Schefczyk, 1993). Aircraft load factor is one of the factors determining profitability of airlines. As aircraft load factor increases, operational revenues increase, positively affecting profitability of airlines (Doganis, 2010). This indicator not only shows the capacity utilization of airline companies but also is one of the factors affecting profitability. Also, rising aircraft load factors increases the pressure on airlines on airlines to buy or lease aircraft (Wensveen, 2011; Battal, 2002).

Airline operational cost is expressed as cost of available seat kilometre (CASK). RASK is expressed as unit income, while CASK refers to unit cost. Airline operating profit is generated out of the relationships between these indicators (Bood & Ison, 2017; Cook & Billig, 2017; Halloway, 2008; Doganis, 2010; Wittmer et al., 2011).

The profitability ratios group, which also shows business performance ratios, reflects the ability of the business to earn profits on sales, assets and equity, but also shows how well its resources are used to create the business's share value (Arkan, 2016). The long-term profitability of a business increases both the continuity of the business and the appeal to the business by shareholders and investors. Accordingly, the relationship is established between CASK and the stock price, as well as its potential to be determinant of airline operational performance.

Another of the most important indicators showing the operational profitability of airlines is the breakeven Load Factor (BELF). It is compared with passenger seat occupancy to reveal the operational profit/loss. A BELF ratio higher than LF ratio indicates that there is operational profit, on the other hand, a LF ratio lower than BELF ratio shows that there is operational loss. Accordingly, it is believed that the operating profit/loss ratio that has never been used in the literature, will be associated with the stock price.

Francis et al., (2005) classified non-financial performance indicators for airlines under three headings. These are performance indicators related to operational, environmental and service quality. In addition, Gudmondsson (1999) classified non-financial indicators under six headings. These are operations management, information and communication system,

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influence of external environment, general management and organization, financial management and marketing management. This study addressed some of the non-financial operational indicators based on the results of the study conducted by Francis et al.,(2005). These were RPK, LF, and CASK variables. In addition, operating profit/loss (OPL) was included in the model.

Table 1: Operational Performance Indicators

Operational Indicators
Revenue Passenger Kilometers (RPK)
Aircraft load factor (LF)
Available seat kilometers (ASK)
Cost per available seat-kilometers (CASK)
Break-even Load Factor (BELF)

Source: Francis et.al. (2005)

3. LITERATURE

Many studies in the literature covers the relationship between non-financial performance indicators and financial performance indicators in airlines (Schefczyk, 1993; Behn & Riley, 1999; Liedtka, 2002; Riley et al. 2003; Gudmundsson, 2002; Khim, 2010).

Behn and Riley (1999) examined the relationship between the non-financial variables (customer satisfaction, load factor (LF), market share, available seat kilometers (ASK) and financial variables (operating income and expense). According to findings of the analysis, LF and ASK metrics are related to operating income, besides ASK is related to operating expense. According to the results of the analysis, it has been suggested that these non-financial variables will be useful in terms of predicting financial performance.

Liedtka et al. (2002) conducted factor analysis using non-financial and financial performance indicators of 10 airlines, between the period 1988-1998. As a result of the analysis, non-financial performance indicators have complementary effect on financial performance indicators, and non-financial performance indicators such as LF and ASK have high explanatory power of financial performance of airlines due to their high factor loadings.

Francis et al. (2005) determined performance indicators of airlines, taking into account of RPKs of 200 major airlines in the World. Operational performance measures of the study are RPK, LF, ASK, CASK, labour cost, average fleet age, punctuality indicator, available tonne kilometres per employee, average turnaround time and Daily aircraft utilization (hours).

Riley et al. (2003) investigated the relationship between operational data and stock prices using data from 1988-1999 for 10 major airlines. According to the results of the study

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using panel data econometric techniques, it was revealed that there is a positive relationship between LF and ASK variables and stock returns.

In addition, in the literature, except for these studies, non-financial (operational) data has been used in performance studies related to airlines. These are; RPK (Min & Joo, 2016; Barros & Wanke, 2015; Demyduk, 2011; Yaghi, 2015; Assaf & Josiassen, 2012; Zou et al., 2014; Li et al., 2015; Jang et al., 2011; Tsikriktis, 2007), ASK (Borbot et al., 2008; Empeh, 2013; Demyduk, 2011; Yaghi, 2015; Mantin & Wang, 2012; Li et al., 2015; Jang et al., 2011), LF (Empeh, 2013; Demyduk, 2011; Yaghi, 2015; Mantin & Wang, 2012; Choi, 2017), CASK (Empeh, 2013; Demyduk, 2011; Jang et al., 2011; Choi, 2017), RASK (Jang et al., 2011; Choi, 2017), RRPK (Demyduk, 2011; Yaghi, 2015; Choi, 2017).

In most previous studies, operational variables were used to measure performance efficiency of airlines. The only study in the literature examining the relationship between LF and ASK variables and stock returns is Riley et al., (2003)'s study. In this context, it is thought that the inclusion of operational performance indicators (LF, RPK, CASK and OPL) to the analysis fills the gap in the literature and contributes to researchers, managers and investors.

The effect of operational indicators (ASK, LF, CASK and OPL) on airline stock prices was revealed by employing panel data analysis.

4. METHOD, DATA and MODEL

The main purpose of the study is to determine the specific operational rates of the airline sector that affect stock price of airlines. Quarterly operational data of five traditional airlines between the period 2005-2017 were researched. Operational data of airlines included in the sample; The annual/quarterly reports, operational reports and / or financial reports of airlines are created by analyzing them. Stock prices were provided from Thomson Reuters Datastream. Panel data analysis was used as a method and analyzes were carried out with 3 different sofware packages (EViews-10, GAUSS-9 and STATA-14).

Panel data; It is defined as bringing together the cross-sectional observations (cross-section series) of units such as individuals, countries, firms, households in a certain period (time series). While cross-section data gives information about only one period for many enterprises; time series data only gives the information of the unit according to the periods. If it is desired to obtain information according to both periods and units, panel data should be used (Yerdelen Tatoğlu, 2016).

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In this study, it is necessary to compare different airlines in a certain time constraint to examine how the operational ratios specific to airline companies make a difference on stock prices. For this purpose, a comparison should be made between cross section units. At the same time, since stock prices, which form the other part of the analysis, are a dynamic process, that is, stock prices change over time, the time series data of each cross-section unit should be used in this analysis.

Therefore, there is a need for a method that handles both cross-section and time series data together. Therefore, panel data analysis method will be applied in order to measure the effect of operational rates specific to airline companies on the stock price. Using the panel data method will also provide a more comprehensive and explanatory common result with short-term data (Brooks, 2008).

The method of estimating economic relationships using cross-section series with time dimensions is called panel data analysis. The reason for panel data analysis is that by combining time series and section series in this analysis, a data set with both time and section size is created, and panel data analysis has several advantages over only time series or cross section analysis. In panel data models, the number of observations will be higher than cross-section and time series. In this case, the parameter estimates to be obtained will be more reliable and the predicted models will be based on less restrictive assumptions (Turhan & Taşseven, 2010).

Panel data can be defined as a data set in which time series belonging to multiple sections are combined or section data with time dimensions. If panel data sets contain equal lengths of time series for each section, such panel data is called balanced panel data and if it contains different lengths of time series, unbalanced panel data is called. Simple functional representation of panel data is as follows;

$$Y_{it} = \alpha_{it} + \beta_{it} + X_{it} + \varepsilon_{it}$$

5 traditional airlines whose data between 2005-2017 were reached and considered to be reliable were included in the study. The airline companies included in the sample of the study are shown in the table below.

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Table 2: Sample of Airlines

Traditional Airlines
Turkish Airlines
American Airlines
United Continental Airlines
All Nipon Airways (ANA)
Singapore Airlines

In the study, the dependent and independent variables that determine the stock price were chosen from among the most used variables in the literature. In this context, "stock price" has been used as the dependent variable for traditional airlines. As independent variables, RPK, LF, CASK and OPL variables were used for airlines. Definitions about the variables are given in the table 3 below:

Table 3: Abbreviations and definitions of variables

Factors	**Signs**	**Measurement description**	**Measurement formula**
	SP	Stock Price	Stock Price
Dependent	RPK	Revenue per km	Total (number of revenue passengers × flight distance in miles)
	LF	Load factor	RPK/ASK
Independent	CASK	Cost per available seat km	Total expenses/Total ASK
	OPL	Operational profit/loss	BELF-LF

In Table 4 below, the model created to reveal the factors determining the stock price for traditional airlines is given.

Table 4: Model used for traditional airlines

Model Formulation
$SP_{it} = \beta_0 + \beta_1 RPK_{it} + \beta_2 LF_{it} + \beta_3 CASK_{it} + \beta_4 OPL_{it} + \varepsilon_{it}$

Before moving on the analysis part of the study, hypotesis of the relationship between variables are listed below as a result of literature reviews:

H_0: There are significant relationships between airline operational factors and stock prices

H_1: No significant relationships between airline operational factors and stock prices

Explanatory estimates about the effect of variables on stock price are listed below:

- Aircraft load factor (LF) positively affects the stock price.
- Cost per available seat km (CASK) negatively affects the stock price.
- Revenue per km (RPK) positively affects the stock price.
- Operational profit / loss (OPL) positively affects the stock price.

5. RESEEARCH FINDINGS

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In the study, the relationship between stock prices of traditional airlines and operational rates specific to airlines was investigated by using quarterly data between 2005 and 2017, and the relationship between them with the variable of stock price, RPK, LF, CASK and OPL was examined. In this context, findings have been reached for traditional airlines.

In this section, descriptive statistics for traditional airlines, pre-test test results and models and parameter estimates determined by taking into account the quality of the data are included. First, descriptive statistics about the variables are included.

Table 5: Descriptive statistics

	SP	RPK	LF	CASK	OPL
Avarage	15.124	26,582.830	0.776	0.116	0.287
Median	9.715	22,912.000	0.797	0.136	0.291
Maximum	75.250	59,145.000	0.934	0.217	0.535
Minimum	0.370	4,620.000	0.583	0.008	0
Std. Deviation	16.575	13,341.250	0.067	0.058	0.093
Skewness	1.603	0.799	-0.805	-0.915	0.109
Kurtosis	4.921	2.802	2.837	2.482	2.891
J-Bera	151.255	28.120	28.358	39.142	0.643
Probability	0.0000	0.0000	0.0000	0.0000	0.725

Table 6: Correlation matrix of variables

	RPK	LF	CASK	OPL
RPK	1	0.618674	0.443995	-0.18359
LF	0.618674	1	0.77706	0.122767
CASK	0.443995	0.77706	1	0.159855
OPL	-0.18359	0.122767	0.159855	1

Table 6 includes the correlation matrix between the independent variables belonging to the traditional airlines. The existence of a high correlation between the independent variables included in the regression model causes the multicollinearity problem. When the correlation matrix for traditional airlines is examined, it is seen that the correlation coefficient between variables is low.

If there is a correlation between variables (cross-sectioanal dependency) according to the CDLM test result, the 2nd generation unit root test is applied. If there is no correlation between variables, traditional unit root test is applied.

Table 7: CDLM test results

Variable	CDLM adj.		
	Statistics	Prob.	Decision
SP	40.426	0.000	Ho Ref.
RPK	8.062	0.000	Ho Ref.
LF	3.649	0.000	Ho Ref.
CASK	22.285	0.000	Ho Ref.
OPL	19.140	0.000	Ho Ref.

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Table 7 contains correlation between variables (cross-section dependecy) results for airlines. As regards test result, the Ho hypothesis that "there is no cross-sectional dependency" for all indicators is refused. Therefore, CADF test (2nd generation unit root test) was applied to the series.

Table 8: CADF unit root test

Variables	Model	Stat.	Critical Values		
			1%	5%	10%
SP	Fixed	-1.690	-2.55	-2.33	-2.21
	Fixed and Trend	-2.845	-3.06	-2.84	-2.73
∆SP	Fixed	-4.086	-2.55	-2.33	-2.21
	Fixed and Trend	-4.123	-3.06	-2.84	-2.73
RPK	Fixed	-4.431	-2.55	-2.33	-2.21
	Fixed and Trend	-4.884	-3.06	-2.84	-2.73
∆RPK	Fixed	-6.962	-2.55	-2.33	-2.21
	Fixed and Trend	-6.890	-3.06	-2.84	-2.73
LF	Fixed	-9.156	-2.55	-2.33	-2.21
	Fixed and Trend	-9.235	-3.06	-2.84	-2.73
∆LF	Fixed	-14.166	-2.55	-2.33	-2.21
	Fixed and Trend	-14.044	-3.06	-2.84	-2.73
CASK	Fixed	-6.888	-2.55	-2.33	-2.21
	Fixed and Trend	-6.894	-3.06	-2.84	-2.73
∆CASK	Fixed	-8.354	-2.55	-2.33	-2.21
	Fixed and Trend	-8.299	-3.06	-2.84	-2.73
OPL	Fixed	-2.900	-2.55	-2.33	-2.21
	Fixed and Trend	-6.574	-3.06	-2.84	-2.73
∆OPL	Fixed	-3.385	-2.55	-2.33	-2.21
	Fixed and Trend	-6.510	-3.06	-2.84	-2.73

According to the CADF second generations unit root test results, it was determined that all variable are stationary at the level.

After the cross sectional dependence and stationarity tests for traditional airlines, it should be determined which of the classical model, fixed effects model and random effects models are appropriate to use. In this context, in order to test the validity of the classical model against the fixed effects model, in other words, to test whether there are unit and / or time effects, the F-test, the Breusch-Pagan LM test to test the suitability of the classical model against the random effects model, and the choice between fixed effects and random effects models. Hausman test was used to do this.

Table 9: F test

Test hypothesis	Stat.	Prob.	Decision
There is no fixed unit effect	8.3522	0.0000	Ho Rej.
There is no fixed time effect	76.2767	0.0000	Ho Rej.
There is no fixed time and unit efffect	79.3075	0.0000	Ho Rej.

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ISSN: 2236-269X
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According to the results of the F test, which is used to the test the fixed effect model against the classical model, the Ho hypotesis is rejected. This situation shows that the classical model is not suitable.

Table 10: LM test

Test hypothesis	Stat.	Prob.	Decision
There is no random unit effect	237.0479	0.0000	Ho Rej.
There is no random time effect	5.2275	0.0222	Ho Rej.
There is no random time and unit efffect	242.2755	0.0000	Ho Rej.

Breusch-Pagan (1980) Lagrange Multiplier (LM) test was used to test the conformity of the classical model against the random effects model. As a result of LM test, the Ho hypothesis that the variances of unit effects are equal to zero is rejected. Therefore, it is understood that the classical model is not suitable for the model, and estimation should be made with one of the two-way fixed effects or random effects models. For the model, Hausman test was applied in order to choose between the bidirectional fixed effects model and the random model.

Table 11: Hausman test

Test Hypotesis	Stat.	Prob.	Decision
Random-effects model is suitable	7.6100	0.0223	Ho Rej.

According to Hausman test results applied to test the Ho hypotesis that the random effect model is appropriate, the Ho hypotesis is rejected. Therefore, it is appropriate to estimate the analysis with fixed effects model.

Table 12: Heteroscedasticity (modified wald) test

Test Hypotesis	Stat.	Prob.	Decision
There is no heteroskedasticity	4435.74	0.0000	Ho Rej.

The Ho hypotesis is rejected as a result of the heteroskedasticity test performed with the Modified Wald test. Therefore heteroskedasticity problem is determined in the model.

Table 13: Autocorrelation Test

Test Hypotesis	Stat.	Decision
Durbin Watson	0.6112	Autocorrelation
Baltagi-Wu (LBI)	0.6844	Autocorrelation

As a result of Baltagi-Wu (LBI) and Durbit Watson autocorrelation test results, the Ho hypotesis is rejected because the statistical values are less than 2. Therefore, the model should be estimated by considering the autocorrelation problem.

In the continuation of the analysis, heteroskedasticity and autocorrelation tests results applied according to the fixed effects model are included.

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Table 14: Driscoll and Kraay resistant with fixed effect panel data estimation results

Variable	Coefficient Estimation	Driscoll ve Kraay Standart Error	t	Probability	(95% Conf. Int.)	
RPK	0.0007905	0.0001727	4.58	0.000	0.0004438	0.0011372
LF	-67.09945	16.20531	-4.14	0.000	-99.63297	-34.56593
CASK	-74.51873	40.51443	-1.84	0.072	-155.8548	6.817372
OPL	39.53827	7.948268	4.97	0.000	23.58145	55.49508
C	42.44387	10.43758	4.07	0.000	21.48956	63.39818
Number of Observations: 260		F(4,51) = 27.23			R^2= 0.4040	
Grup Size: 5		Prob > F= 0.0000			Maximum Delay: 3	

According to the fixed effects panel model applied to identify the operational indicators affecting the stock prices of airlines, revenue passenger km (RPK) has a positive effect on the stock price at a significance level of 1%. Aircraft load factor (LF) has a negative effect at a significance level of 1%. Cost per available seat kilometers (CASK) variable has a negative effect on the stock price at a significance level of 10%. Finally, it was found that the operational profit / loss (OPL) variable positively affects the stock price at the 1% significance level.

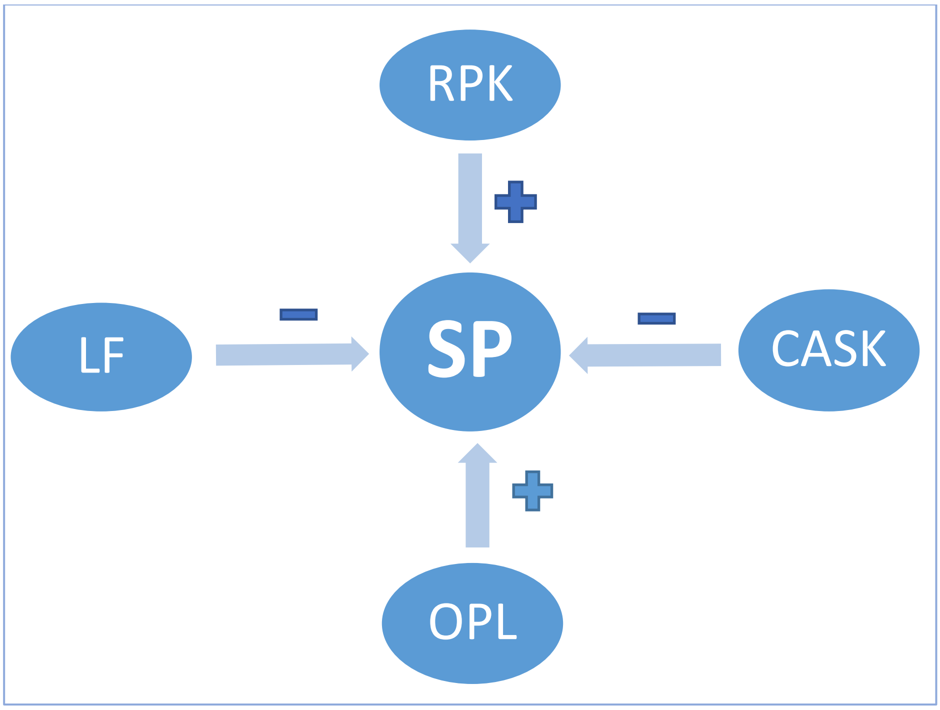

Figure 1: Diagram of relationships between stock prices and operational factors of airlines.

In the first study (Riley et al., 2003) that analyzed whether operational performance indicators are related to stock prices, it was found that aircraft load factor (LF) positively affects the stock price.. As a result of the analysis conducted on traditional airlines, it was detect that although this study supports Riley's study in terms of significance, Riley et al. found that LF has a positive relationship with stock price, on the other hand, we found that LF has a negative relationship with stock price. Therefore, our study partially supports Riley's study.

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It is thought that this study will contribute to the literature because it is the only study in the literature, taking into account all operational performance indicators (RPK, LF, CASK and OPL).

6. CONCLUSIONS AND RECOMMENDATIONS

Because airlines are effected by systematic and non-systematic risks, the financial and non-financial (operational) risks of airlines are quite high. Accordingly, it is essential to detect the indicators impacting airline stock prices. Identifying these factors and using them to test the financial performance of airlines contribute to the explanation of changes on financial tables in the context of systematic risk. At the same time, it is thought that determining the factors affecting stock prices will provide important decisions to managers in the performance evaluation of airlines.

The application part of the study, wihich aims to determine the operational indicators affecting the stock prices of airlines, was carried out with the panel data analysis method. According the findings, it was found that while RPK and OPL indicators have a positive effect on stock prices, LF and CASK indicators have a negative effect on stock prices.

The result that the RPK variable, which is the indicator of operational income (revenue passengers), positively affects the stock price of airlines, it is compatible with the hypothesis and supports the findings of studies on performance. Because the RPK variable refers to the demand and income, airlines should seek ways that increase airline demand in order to boost the value of their shares. Increasing passenger demand does not always mean that airlines will enhance their profitability and performance. Concurrently, airlines should focus not only on demand but also on revenue and cost management.

The first two factors that most affect airline revenue are capacity (ASK) and aircraft load factor (Airline Economic Analysis, 2018). In this context, airlines should first plan investments and strategies that will boost capacity. Airlines should increase the number of flight routes to increase capacity, as a result, expand fleet capacity (number and size of aircraft). Airlines employ different strategies to achieve a much higher load factor.

While low-cost airlines increase their load factors thanks to low ticket prices, some airlines boost their load factors by providing better quality and attractive services to customers. In brief, traditional airlines need to take measures to increase the capacity (ASK) and load

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factor (LF) to increase RPK (demand or revenue). Thus, the stock prices of airlines will increase even more.

The positive effect of the OPL variable on the stock prices of traditional airlines is compatible with the hypothesis and supports the findings of studies on profitability. According to the analysis result, traditional airlines need to increase operational profitability to maximize their stock values. Since OPL indicator is closely related to BELF and LF, they need to be examined and analyzed well. LF must be higher than BELF in order for airlines to be profitable.

Airlines should either increase aircraft load factors or decrease break-even load factors. The increase in load factors is directly proportional to the increase in airline demand, and strategies should be implemented to increase demand. In order to decrease BELF rate, it is necessary to reduce the unit cost. The BELF is the ratio of unit cost to passenger yield. In other words, in order to reduce the CASK ratio, which is a unit cost item, cost management should be given more importance.

The result that the CASK variable, which is the unit cost indicator, negatively affects the stock price of airlines, it is compatible with the hypothesis and supports the findings of studies on performance. Because the CASK metric is key to airlines' cost and profitability, airline managers need to pay more attention to cost management to increase stock values. Most of airline costs (50%) mainly consist of fuel and labour costs (Zhang & Zhang, 2018).

Therefore, airlines need to adjust fuel and personnel costs in a more optimized way. For example, fuel hedging strategies (options, forwards, futures and swaps) can be used and diversified for reducing airlines' exposure to volatile and rising fuel costs. Although airlines try to minimize risk by using hedging strategies, it is not possible to eliminate risks due to fluctuations in oil prices, one of systematic risks. It is very difficult for airlines to minimize personnel costs. Compared to employees in other industries, airline employees are more talented (O'connor, 2001).

Therefore, high wages are one of the reasons for the increase in costs. İn addition, union activities such as strikes and lockouts in the airline industry increase personnel and operational costs. Make it difficult for airlines to minimize personnel and operational costs. Despite the cost management issues outlined above, it is concluded that if traditional airlines cut operational costs, the profitability and stock value of them will increase.

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The result that LF variable, which is the aircraft load factor indicator, positively affects the stock price of airlines, it is compatible with the hypothesis and supports the findings of studies on performance. This result contradicts both the hypothesis and studies in the performance literature. It is concluded that increased load factors for traditional airlines have a negative impact on stock prices.

While load factor indicates seat occupancy rates, it is not the only factor determining performance and profitability. Low-cost airlines need to optimize revenue management while maximizing load factors. For example, an airline can achieve a 100% load factor if it sells tickets at low prices. However, it might experience operational losses, as the flight cost and operational cost are high. For profitability, it is necessary to consider the income and cost factor. Increasing load factor might lead to customer complaints. Airlines overbook to ensure higher load factors.

Substantial increase in sales and reservations also increases customer complaints (Mantin & Wang, 2012). Another problem is the mismatch between aircraft size and demand, two factors affecting aircraft load factor. Aircraft size or capacity may vary depending on aircraft type. For example, if Turkish Airlines operates Boeing 777-300ER aircraft on a route that there is little demand and it flies once a week, it might not fill flights to capacity (349-400 seats). This can reduce load factor.

Accordingly, fleet structure of airlines and optimization of the routes being flown should be well planned. Due to all these issues, airlines need to optimize their load factors rather than increase them excessively. According to the results of the study, traditional airlines should optimize their load factors in such a way that they also increase revenues.

When the findings of the analysis are evaluated in the general context, first of all, the impact of airline metrics (RPK and CASK) on financial performance is evident and these metrics play an increasing role for airlines. At the same time, it has been revealed that non-financial operational indicators have an impact on financial indicators. Thus, this result supports studies in the literature (Schefczyk; 1993; Behn & Riley, 1999; Liedtka, 2002; Riley et al. 2003; Gudmundsson, 2002; Khim, 2010).

In brief, according to the study's findings, airlines should increase operational revenue and demand, in other words load factor, to increase stock value. Along with the increase in

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revenue and load factor, the decrease in unit cost and break-even load factor increase profitability and stock value of airlines.

Thanks to result of the study it is believed that determining operational factors affecting the stock price will provide great convenience for all stakeholders, especially investors and airline managers. It is also believed that the results will contribute to the operational (non-financial) and financial performance of airlines. Finally, it allows the findings related to airlines to be tested with theories and approaches on stock price in the financial literature.

There are some limitations encountered in the study one of the most important limitations is that airlines are limited due to the difficulties in accessing the data of variables. Another important limitation is the duration of the data. The limited number of independent variables is another limitation. It is believed that further studies covering longer periods with more samples (airlines) and variables will lead to more accurate results.

7. ACKNOWLEDGEMENTS

This study was produced from the PhD Thesis named "Analysis of Factors Affecting Stock Prices in Airline Businesses".

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INDEPENDENT JOURNAL OF MANAGEMENT & PRODUCTION (IJM&P)
http://www.ijmp.jor.br v. 13, n. 2, March-April 2022
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DOI: 10.14807/ijmp.v13i2.1777

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INDEPENDENT JOURNAL OF MANAGEMENT & PRODUCTION (IJM&P)
http://www.ijmp.jor.br v. 13, n. 2, March-April 2022
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