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# Analyzing The Relationship Between Profitability and Traditional Ratios: Major Airline Companies Sample (Karlılık ve Geleneksel Oranlar Arasındaki İlişkinin İncelenmesi: Büyük Havayolu Şirketleri Örneği)[1]

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Airline Industry, Liberalization, Profitability, Financial Ratios, Airline-Specific Ratios.

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**Abstract**
The new conditions in airline industry due to the effects of liberalization have changed the market considerably since the 1980s. The difficulties in the industry force the airline companies to compete that financial analysis became indispensable to compare their profitability among the rivals worldwide.
For this reason; it is aimed to reveal the relationship between profitability and traditional financial and airline-specific ratios for 17 leading major airlines for the 2011-2013 period in the study. Here; it is suggested to display the impact of traditional ratios on profitability rates for the companies. Operating Profit Margin (OPM), Net Profit Margin (NPM), Return on Assets (ROA) are selected as the profitability rates while Current Ratio (CR), Debt Ratio (DR), Total Assets Turnover Rate (TATR) and Revenue per Revenue Passenger Kilometers (RRPK) are chosen in the study as traditional financial and airline-specific ratios.
The methods as Descriptive Statistics, Correlation and Regression Analyses (the profitability rates as dependent variables and traditional financial and airline-specific ratios as independent variables) are studied respectively by running SPSS 20.0 Software Package to reveal the mentioned relationship between profitability rates and traditional ratios and to interpret the outcome for major airlines.

**Anahtar Kelimeler**
Havayolu Sektörü, Liberalleşme, Karlılık, Finansal Oranlar, Havayoluna Özel Oranlar.

**Jel Sınıflandırması**
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**Özet**
Liberalleşme nedeniyle havayolu sektöründe oluşan yeni şartlar piyasaları 1980'lerden beri önemli ölçüde değiştirmiştir. Sektördeki zorluklar havayolu şirketlerini rekabet etmeye zorlamakta olup küresel rakiplerle karlılığın karşılaştırılabilmesi için finansal analiz kaçınılmaz hale gelmiştir.
Bu nedenle çalışmada 17 lider havayolu şirketi için 2011-2013 dönemi karlılık ile geleneksel finansal ve havayoluna özel oranlar arasındaki ilişkilerin açıklanması hedeflenmektedir. Bu noktada şirketlerin geleneksel oranlarının karlılık oranlarına etkisinin açığa çıkarılması amaçlanmıştır. Verileri özetleyen Açıklayıcı İstatistik Tablosu ile Korelasyon ve Regresyon analizleri yardımıyla sözkonusu ilişkiler ortaya konulmuş ve yorumlanmışlardır.

[1] The study is derivated from Hatem YAGHI's master thesis titled as "Comparing The Performances of Major Airline Companies by Traditional and Airline-Specific Ratios and Measures" and accepted on 23rd June 2015 in Sakarya University, Institute of Social Sciences.

## Introduction

Airlines industry is one of the most important sectors worldwide because of its global nature. In the recent years; the airline industry has experienced the new conditions of liberalization; increasing competition, economic and traffic growth, acquisition and merger, bankruptcy, volatility in earnings, considerable profits and losses, innovation and the emergence of low cost carriers. Because of the global competition in the mentioned new era; corporate finance and financial analyses play an essential role in maintaining efficient airline operations in short also long-term decision-making and results.

Therefore; the relationship between profitability and traditional ratios for leading major airlines is aimed to reveal in the study to compare their profitability for the 2011-2013 period. It is suggested to display the impact of traditional financial ratios and airlines-specific ratios on profitability rates for the airline companies. Operating Profit Margin (OPM), Net Profit Margin (NPM), Return on Assets (ROA) are selected as the profitability rates while Current Ratio (CR), Debt Ratio (DR), Total Assets Turnover Rate (TATR) and Revenue per Revenue Passenger Kilometers (RRPK) are chosen as traditional financial and airline-specific ratios. The methods of Descriptive Statistics, Correlation and Regression Analyses are run respectively for the mentioned reasons.

Consequently; the following sections are included in the study as The Global Airline Industry, Traditional Financial and Specific Ratios for Major Airline Companies, Analyzing The Relationship Between Profitability and Traditional Ratios For Major Airline Companies. Furthermore; the results of the analyses are acquired and concluded, respectively.

## 1. The Global Airline Industry

The chapter consists the subtitles; Key Organizations in Airline Industry, Airline International Economic Regulations and Liberalization additionally Major Airline Companies, to share market general information.

### 1.1. Key Organizations in Airline Industry

Though a large number of public and private organizations shape the policies related to economic, regulatory and technical matters about airline industry worldwide; International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) are suggested to be the fundamental ones about the sector. Hence; brief information about ICAO and IATA and their contribution to the industry are shared in the section.

ICAO is founded in 1947 in Montreal, Canada after Chicago which is held in 1944. The organization can be likened to a “United Nations of Civil Aviation” and, in fact, its official status is that of a specialized agency of the UN. The functions as developing, approving and

updating the international technical standards and recommended practices for airports and air traffic control, as well as the preparation and publication of broad regulatory guidelines regarding international air transport has belonged to the mentioned institution. ICAO has 191 member nations (ICAO, 2015a), i.e., it includes practically every nation in the world engaging in aviation activities of any significant level.

As the other fundamental institution; IATA is founded in 1945, the year after the Chicago Convention, as the trade association of most of the international airline companies worldwide, representing the 84 % of air traffic (IATA, 2015). The aim of the institution is to coordinate international airfares during annual traffic conferences and the organization played a critical role in the development of international air transportation over more than three decades. However; the deregulation of USA also EU countries in 1978 and 1999 respectively, IATA (2015) adopted a dual organizational structure, which is still in existence today. Belobaba et al (2009: 42) states that the first structure operates as a trade association offering various technical, legal and financial services like defining the legal responsibilities of carriers in relation to passengers and cargo, advising airlines regarding such issues as the transportation of dangerous goods, condition and costs of airports' facilities and organizing airport schedule coordination conferences twice a year while the second structure still operates as a tariff coordination organization, assisting in the setting of passenger airfares and cargo rates, commissions for travel agents, etc. including one-third of the IATA's members.

The guiding principle of IATA is that fares and rates should not involve intense competition but it should be as low as possible. With the spread of liberalization and deregulation in international air transportation the influence of IATA has been steadily diminishing over the past three decades; however, the organization is still treated in many countries as a semi-official international body, rather than a trade association.

### 1.2. Airline International Economic Regulations and Liberalization

The airline companies operated in a regulated environment up to 1978 in the US and before 1999 in Europe, in which governments had full control over where airlines could fly and what rates they could charge. During the regulated era in the airline industry, firms were protected from intense competition, because governments limited the number of airline companies flying a particular route and pricing was based largely on a cost-plus formula. Because of the regulation, carriers earned relatively stable and healthy profits, as a result, financial analysis was not of utmost importance to the airlines, then. Additionally, many airlines globally were owned and controlled by governments, creating further regulation in the airline industry.

Due to the new conditions since last 1970s; the airlines have been subjected to increased competition, placing downward pressure on costs and airfares. As a result, in the post-regulation period, the airline industry has become much riskier and even many major airlines have difficulties to compete and eventually some are forced out of business.

The liberalization changed the market environment considerably leading to several major aspects such as Economic and Traffic Growth, Bankruptcy and Consolidation also the Emergence of Low-Cost Carriers (LCCs).

According to (ICAO, 2015b); opposite of the legacy carriers (full service airlines) i.e. the LCCs, are the airline companies that squeeze its airfares by limiting its passengers' services to attract more consumers willing to save money. As an example; Southwest Airlines marked the most noticeable LCC expansion, from an intra-Texas airline to the fourth largest domestic carrier with a route network covering most of the US area (Vasigh et al, 2015: 5). By 2012, LCCs' share is 31 % of the US market while notes that LCCs account for 37 % of the total EU market (ICAO, 2015b). According to ILO (2013: 7); LCCs have taken passengers from legacy carriers to reach 22 % of all passengers by 2013 globally.

### 1.3. Major Airline Companies

In order to have a broader image about the global airline industry, a sample of 17 major airline companies worldwide are analyzed in the study, which are the most well known major airlines from the 4 continents; Asia, Europe, Oceania and North America.

The mentioned companies are aligned respectively as follows: Aeroflot, Air Asia, Air Berlin, Air Canada, Air France/KLM, Air New Zealand, All Nippon Airways (ANA), Cathay Pacific, Delta Airlines, Emirates, IAG (British Airways & Iberia), Korean Air, Lufthansa, Qantas, Ryanair, Singapore Airlines and Turkish Airlines, as they are shown in the table below.

**Table 1: List of Airline Companies Under Study**

| N | Airlines | Nationality | N | Airlines | Nationality |
|---|---|---|---|---|---|
| 1 | Aeroflot | Russia | 10 | Emirates | UAE |
| 2 | Air Asia | Malaysia | 11 | IAG | UK/Spain |
| 3 | Air Berlin | Germany | 12 | Korean Air | South Korea |
| 4 | Air Canada | Canada | 13 | Lufthansa | Germany |
| 5 | Air France/ KLM | France/ Netherlands | 14 | Qantas | Australia |
| 6 | Air New Zealand | New Zealand | 15 | Ryanair | Ireland |
| 7 | ANA | Japan | 16 | Singapore Airlines | Singapore |
| 8 | Cathay Pacific | China | 17 | Turkish Airlines | Turkey |
| 9 | Delta Airlines | USA | | | |

While the airline companies such as Air Asia, Air Berlin and Ryanair are the well known LCCs, the other 14 are legacy carriers.

## 2. Traditional Financial and Specific Ratios For Major Airline Companies

The income statement table, balance sheet, and cash flows are often focused on to analyze a company besides every industry has specific unit measures which are essential to be arranged. To analyze the major airline companies; Traditional Financial Ratios and Traditional Airline-Specific Measures and Ratios are used which are reminded below.

### 2.1. Financial Ratios

Financial statements provide the primary means for managers to communicate about the financial condition of their organization to outside parties. Managers, investors, lenders, financial analysts, trade unions and government agencies are among the users of financial statements. The objective of financial statement analysis is to use historical accounting data to help in predicting how the firm will be valued in the future.

As one of the most used analysis techniques, Financial Ratio Analysis; a static method, involves studying various relationships between different items reported in a set of financial statements to evaluate various aspects of a company's operating and financial performance such as its liquidity, leverage (financial structure-solvency), efficiency (activity) and profitability.

Some of the ratios in the literature are selected to benefit in the study, as the proxy belonged to the groups of liquidity, leverage, efficiency and profitability which are shown in the table below respectively.

**Table 2: The List of Selected Financial Ratios Under Study**

| Ratios | Calculation |
|---|---|
| Current Ratio (CR) | Current Assets / Current Liabilities |
| Debt Ratio (DR) | Total Liabilities / Total Assets |
| Total Assets Turnover Rate (TATR) | Total Revenue / Total Assets |
| Operating Profit Margin (OPM) | Operating Profit / Total Revenue |
| Net Profit Margin (NPM) | Net Income / Total Revenue |
| Return on Assets (ROA) | Net Income / Total Assets |

CR is the most common used liquidity rate to evaluate a company's ability to meet its short-term obligations. It is to just compare the total current assets and current liabilities. The

current ratio is generally expected to be about "2" but in airline industry around "1" is welcomed due to the industry's heavy indebted nature (Morrell, 2012: 62).

DR measures the proportion of debt relative to the total asset value of the company. The higher this ratio, the more leveraged the company and the greater its financial risk. In general the ideal value of debt ratio is around "0,5" while in airline industry it is slightly above "0,7".

The TATR measures total revenue against the total assets of the company. It notes how effectively the company is able to generate revenue with the assets currently on its balance sheet.

OPM enables managers to determine how much operating income is generated from every dollar of revenue earned through normal business operations. The operating profit margin can be particularly useful because it excludes items such as interest expense and taxes, which largely reflect the capital structure of the company. By excluding special items from the income statement, the operating profit margin ratio should tend to remain more stable over time.

Unlike OPM; NPM takes company's financial structure, including taxes, interest, and other non-operational items into consideration. It shows how much net income is generated for every dollar of revenue.

ROA is a quick way to show the investment return that the assets have provided as it highlights how efficiently assets are used to generate earnings.

### 2.2. Airline-Specific Measures and Ratios

Aviation is a unique industry for which specific measures and ratios are developed to provide a greater in-depth analysis and understanding of the sector such as Available Seat Kilometers (ASK) and Revenue Passenger Kilometers (RPK) are the fundamental measures while Average Load Factor (LF) and Revenue per Revenue Passenger Kilometers (RRPK), or "yield" are fundamental ratios in the sector (Vasigh et al, 2015: 240).

Though merely RRPK is used in the study as an airline-specific ratio; the mentioned measures and ratios are presented in the table and explained below respectively as RRPK is related to others.

**Table 3: Airline-Specific Measures and Ratios**

| Ratio | Calculation |
|---|---|
| Available Seat Kilometers (ASK) | Number of Seats per Aircraft × Flight Distance in Kilometers |
| Revenue Passenger Kilometers (RPK) | Number of Revenue Passengers per Aircraft × Flight Distance in Kilometers |
| Load Factor (LF) | RPK / ASK |
| Revenue per Revenue Passenger Kilometers (RRPK), or "Yield" | Total Passenger Revenue / RPK |

ASK is a basic measure of an airline's output, since it represents the number of kilometers that the airline has flown with its available seats regardless of whether the seat is filled by a passenger.

RPK represents the number of kilometers that revenue passengers fly on the airline. Whereas ASK does not differentiate between whether the seat is occupied or not, RPK includes only seats occupied by revenue passengers in the calculation.

LF is simply the proportion of an airline's seats that are filled by revenue passengers, in other words; it is a measure of capacity utilization.

RRPK or yield represents the average amount that a passenger pays to fly one kilometer, therefore; it is used to determine the average amount of revenue acquired for a paid seat.

## 3. Analyzing The Relationship Between Profitability and Traditional Ratios For Major Airline Companies

In the last chapter of the study; the relationship between profitability and traditional ratios of major airline companies selected is analyzed and concluded. Therefore; aim, scope and limitations are given before the methods and findings of the study.

### 3.1. Aim, Scope and Limitations

It is aimed to reveal the relationship between profitability and traditional ratios for major airlines, hence; the effect of traditional financial ratios and airlines-specific ratios on profitability rates is suggested to be displayed.

The airline companies to be analyzed, additionally, key measures and ratios are chosen for the industry in order to assess for consecutive years between 2011 and 2013, which are the three years period after global financial crisis.

The companies to study here, shown above in Table 1, are selected from IATA and Skytrax ranking lists. The selection of the airline companies is based on leadership and variety, to say; the carriers under study are the 17 leading airlines from 4 continents. While about 20 companies are listed in the mentioned ranks, 17 of them are analyzed due to lack of financial and traffic data needed to perform full examination and comparison equal to other airlines. In addition; the selection covers both legacy and LCCs with different operating strategies as short-haul flights, medium-haul flights and long-haul flights.

Even though a lot more financial ratios could be used in the analysis; only CR, DR, TATR, RPRK, OPM, NPM and ROA are selected, considering the structure of the airline industry. Hence; the relationship between profitability rates as dependent ones and traditional financial besides airline-specific ratios as independent ones are tried to be displayed. The mentioned profitability rates and traditional ratios are shown below.

**Table 4: The List of Profitability Rates and Traditional Ratios Under Study**

| Profitability Ratios (Dependent Variables) | Traditional Financial and Airline-Specific Ratios (Independent Variables) |
|---|---|
| Operating Profit Margin (OPM) | Current Ratio (CR) |
| Net Profit Margin (NPM) | Debt Ratio (DR) |
| Return on Assets (ROA) | Total Assets Turnover Rate (TATR) |
| | Revenue per Revenue Passenger Kilometers (RRPK), or "Yield" |

All the values within the analysis indicated in the tables below are calculated by the authors from the financial tables of airline companies indicated in each of their annual reports.

### 3.2. The Methods of the Study

Aiming to reveal the relationship between profitability ratios and traditional ratios for major airlines shown in Table 4; Descriptive Statistics, Correlation and Regression Analyses are studied respectively by running SPSS 20.0 Software Package to interpret the outcome.

Regression analysis, to reveal the relationship between profitability and traditional financial and airline-specific rates, is held according to the profitability ratios as dependent variables also traditional rates as independent ones while it is seen in Table 4. Hence; the equations are estimated as the following:

$$OPM_{it} = \beta_0 + \beta_1(CR_{it}) + \beta_2(DR_{it}) + \beta_3(TATR_{it}) + \beta_4(RRPK_{it}) + \varepsilon \quad \text{(Equation 1)}$$

$$NPM_{it} = \beta_0 + \beta_1(CR_{it}) + \beta_2(DR_{it}) + \beta_3(TATR_{it}) + \beta_4(RRPK_{it}) + \varepsilon \quad \text{(Equation 2)}$$

$$ROA_{it} = \beta_0 + \beta_1(CR_{it}) + \beta_2(DR_{it}) + \beta_3(TATR_{it}) + \beta_4(RRPK_{it}) + \varepsilon \quad \text{(Equation 3)}$$

The variables here are as follows;

$i$: The 17 companies analyzed in the study,

$t$ : Time as the 3 years between 2011 and 2013,

$OPM_{it}$: Operating Profit Margin of company i at time t,

$NPM_{it}$: Net Profit Margin of company i at time t,

$ROA_{it}$: Return on Assets of company i at time t,

$CR_{it}$: Current Ratio of company i at time t,

$DR_{it}$: Debt Ratio of company i at time t,

$TATR_{it}$: Total Assets Turnover Ratio of company i at time t,

$RRPK_{it}$: Revenue per Revenue Passenger Kilometers company i at time t,

$\beta_0$ : The intercept of equation,

$\beta_i$ : Coefficients of variables,

$\varepsilon$ : The error term.

### 3.3. The Findings of the Study

The results of the mentioned analyses are indicated and explained below, respectively.

#### 3.3.1. The Findings of Descriptive Statistics

The following table presents the descriptive statistics including mean, median, minimum, maximum and standard deviation values of CR, DR, TATR, RRPK, OPM, NPM and ROA.

**Table 5: Descriptive Statistics**

| | Operating Profit Margin (OPM) | Net Profit Margin (NPM) | Return on Assets (ROA) | Current Ratio (CR) | Debt Ratio (DR) | Total Assets Turnover Rate (TATR) | Yield (RRPK in USD cents) |
|---|---|---|---|---|---|---|---|
| N | 51 | 51 | 51 | 51 | 51 | 51 | 51 |
| Mean | ,05014 | ,02876 | ,01470 | 1,0182 | ,77176 | ,82282 | 10,925 |
| Median | ,03700 | ,02000 | ,02000 | ,9900 | ,72300 | ,78700 | 10,500 |
| Minimum | -,058 | -,099 | -,198 | ,40 | ,402 | ,018 | 6,4 |
| Maximum | ,260 | ,279 | ,202 | 2,14 | 1,416 | 2,199 | 16,9 |
| Std. Deviation | ,061526 | ,063034 | ,056963 | ,36750 | ,196115 | ,436999 | 2,6468 |

As it is seen from the table above; profitability rates are between 1 % and 5 % in general while each of them includes both lower negative and higher positive values. Current ratios are concluded to be low comparing to other industries, as estimated. Besides; values of debt ratio are about 77 %, a touch more than sector's ideal rate which indicates the indebted structure of industry. Additionally, TATRs are about 80 % while Yield or RRPK differentiates between 6 and 16 USD cents due to the classification of the company; LCC or legacy carrier.

### 3.3.2. The Findings of Correlation Analysis

The correlation between the profitability rates (dependent variables) and traditional financial and airline-specific ratios (independent variables) are indicated in Table 6.

**Table 6: Correlation Analysis**

| | | Current Ratio (CR) | Debt Ratio (DR) | Total Assets Turnover Rate (TATR) | Yield (RRPK) |
|---|---|---|---|---|---|
| Operating Profit Margin (OPM) | Pearson Correlation | ,645** | -,270 | -,526** | -,321* |
| | Sig. (2-tailed) | ,000 | ,055 | ,000 | ,022 |
| | N | 51 | 51 | 51 | 51 |
| Net Profit Margin (NPM) | Pearson Correlation | ,483** | -,352* | -,434** | -,100 |
| | Sig. (2-tailed) | ,000 | ,011 | ,001 | ,486 |
| | N | 51 | 51 | 51 | 51 |
| Return on Assets (ROA) | Pearson Correlation | ,339* | -,370** | -,547** | ,094 |
| | Sig. (2-tailed) | ,015 | ,008 | ,000 | ,513 |
| | N | 51 | 51 | 51 | 51 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

According to the correlation analysis held; TATR has negative and strongly significant relations with profitability ratios in each of the years similarly DR and the mentioned profitability rates are negatively correlated. Besides; CR has significant and positive relations with both OPM, NPM and ROA, furthermore; the correlation between RRPK and profitability ratios do not resemble each other.

### 3.3.3. The Findings of Regression Analysis

The results of the regression analysis between profitability rates and traditional ratios are shown below. At first; the regression between OPM and traditional ratios is analyzed by using Equation 1 and indicated in Table 7.

**Table 7: Regression Analysis for Operating Profit Margin and Traditional Ratios**

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,767[a] | ,589 | ,553 | ,041121 | 2,031 |

a. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR)

b. Dependent Variable: Operating Profit Margin (OPM)

**ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | ,111 | 4 | ,028 | 16,483 | ,000[b] |
| | Residual | ,078 | 46 | ,002 | | |
| | Total | ,189 | 50 | | | |

a. Dependent Variable: Operating Profit Margin (OPM)

b. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR)

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | ,017 | ,048 | | ,347 | ,730 | | |
| | Current Ratio (CR) | ,087 | ,019 | ,518 | 4,675 | ,000 | ,729 | 1,372 |
| | Debt Ratio (DR) | ,074 | ,037 | ,235 | 2,011 | ,050 | ,654 | 1,529 |
| | Total Assets Turnover Rate (TATR) | -,066 | ,016 | -,469 | -4,149 | ,000 | ,699 | 1,431 |
| | Yield (RRPK) | -,005 | ,002 | -,225 | -2,231 | ,031 | ,878 | 1,139 |

a. Dependent Variable: Operating Profit Margin (OPM)

According to the tables above; Adjusted R Square value as 0,553 and F value as 16,843 are sufficient for significance and validity of Equation 1. Additionally t-test indicates that the coefficients of all variables are significant. Ratios such as CR and DR have the positive impact on OPM while TATR and RRPK are the opposite. The regression between NPM and traditional ratios is analyzed by using Equation 2 and indicated in Table 8.

**Table 8: Regression Analysis for Net Profit Margin and Traditional Ratios**

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,561[a] | ,315 | ,255 | ,054390 | 1,952 |

a. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR) b. Dependent Variable: Net Profit Margin (NPM)

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | ,063 | 4 | ,016 | 5,289 | ,001[b] |
| | Residual | ,136 | 46 | ,003 | | |
| | Total | ,199 | 50 | | | |

a. Dependent Variable: Net Profit Margin (NPM)

b. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR)

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | ,009 | ,063 | | ,139 | ,890 | | |
| | Current Ratio (CR) | ,063 | ,025 | ,365 | 2,553 | ,014 | ,729 | 1,372 |
| | Debt Ratio (DR) | -,017 | ,049 | -,053 | -,353 | ,726 | ,654 | 1,529 |
| | Total Assets Turnover Rate (TATR) | -,040 | ,021 | -,279 | -1,912 | ,062 | ,699 | 1,431 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Yield (RRPK) | ,000 | ,003 | ,010 | ,077 | ,939 | ,878 | 1,139 |

a. Dependent Variable: Net Profit Margin (NPM)

Due to the tables above; Adjusted R Square value is 0,255 and F value is 5,289. Since the equation is significant; its validity is lower than Equation 1. Besides t-test indicates that coefficients of CR and TATR are significant; CR has the positive impact on NPM but TATR has the opposite. To estimate a better equation; the following results are acquired by extracting the variables of DR and RRPK.

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Total Assets Turnover Rate (TATR), Current Ratio (CR)[b] | | .Enter |

a. Dependent Variable: Net Profit Margin (NPM) b. All requested variables entered.

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | ,560[a] | ,313 | ,285 | ,053317 | 1,928 |

a. Predictors: (Constant), Total Assets Turnover Rate (TATR), Current Ratio (CR)

b. Dependent Variable: Net Profit Margin (NPM)

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | ,062 | 2 | ,031 | 10,942 | ,000[b] |
| | Residual | ,136 | 48 | ,003 | | |
| | Total | ,199 | 50 | | | |

a. Dependent Variable: Net Profit Margin (NPM)

b. Predictors: (Constant), Total Assets Turnover Rate (TATR), Current Ratio (CR)

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -,001 | ,032 | | -,040 | ,968 | | |
| | Current Ratio (CR) | ,065 | ,022 | ,377 | 2,955 | ,005 | ,878 | 1,139 |
| | Total Assets Turnover Rate (TATR) | -,044 | ,018 | -,302 | -2,365 | ,022 | ,878 | 1,139 |

a. Dependent Variable: Net Profit Margin (NPM)

As it is seen from the tables; forming Equation 2 with merely CR and TATR causes to have better Adjusted R Square and F values. The t-test results indicate that the coefficients of the mentioned variables are more significant then.

Finally; the regression between ROA and traditional ratios is analyzed by using Equation 3 and indicated in Table 9.

**Table 9: Regression Analysis for Return on Assets and Traditional Ratios**

**Model Summary[b]**

| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **Durbin-Watson** |
|---|---|---|---|---|---|
| 1 | ,591[a] | ,349 | ,293 | ,047912 | 1,894 |

a. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR) b. Dependent Variable: Return on Assets (ROA)

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | ,057 | 4 | ,014 | 6,169 | ,000[b] |
| | Residual | ,106 | 46 | ,002 | | |
| | Total | ,162 | 50 | | | |

a. Dependent Variable: Return on Assets (ROA)

b. Predictors: (Constant), Yield (RRPK), Total Assets Turnover Rate (TATR), Current Ratio (CR), Debt Ratio (DR)

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | ,015 | ,056 | | ,274 | ,785 | | |
| | Current Ratio (CR) | ,030 | ,022 | ,192 | 1,381 | ,174 | ,729 | 1,372 |
| | Debt Ratio (DR) | -,029 | ,043 | -,100 | -,682 | ,499 | ,654 | 1,529 |
| | Total Assets Turnover Rate (TATR) | -,055 | ,019 | -,425 | -2,984 | ,005 | ,699 | 1,431 |
| | Yield (RRPK) | ,003 | ,003 | ,158 | 1,244 | ,220 | ,878 | 1,139 |

a. Dependent Variable: Return on Assets (ROA)

Adjusted R Square value is equal to 0,293 and F value is 6,169 besides the significance is sufficient for Equation 3. According to t test; only the coefficients of TATR are significant and it has a negative but weak impact on ROA.

All of the equations indicate that variables do not have multicollinearity between themselves in respect of VIF values besides autocorrelation is not included for Durbin-Watson test.

**Results and Conclusion**

The airline industry has an essential role in the creation of global economy due to their services provided to almost every country in the world. Because the sector has relations with air transport, aircraft manufacturing and tourism; airline industry engages about billions of investment.

The new conditions of liberalization have changed the market since the 1980s; the emergence of Low-Cost Carriers (LCCs), economic and traffic growth besides bankruptcy and consolidation issues have been observed in the last 3 decades considerably. So the companies in the sector met the increased competition that's why airline industry has become much riskier and even many major airlines have difficulties to compete that some

are forced out of business. As a result; financial analysis became indispensable for the airline companies to compare their profitability among the rivals worldwide.

For this reason; it is aimed to reveal the relationship between profitability and traditional ratios for 17 leading major airlines in the study such as Aeroflot, Air Asia, Air Berlin, Air Canada, Air France/KLM, Air New Zealand, All Nippon Airways (ANA), Cathay Pacific, Delta Airlines, Emirates, IAG, Korean Air, Lufthansa, Qantas, Ryanair, Singapore Airlines and Turkish Airlines. It is suggested to display the impact of traditional financial ratios and airlines-specific ratios on profitability rates, therefore; key measures and ratios are chosen for the industry in order to assess the term between 2011 and 2013, which is known as the post crisis period. Operating Profit Margin (OPM), Net Profit Margin (NPM), Return on Assets (ROA) are selected as the profitability rates while Current Ratio (CR), Debt Ratio (DR), Total Assets Turnover Rate (TATR) and Revenue per Revenue Passenger Kilometers (RRPK) are chosen as traditional financial and airline-specific ratios.

The methods as Descriptive Statistics, Correlation and Regression Analyses (the profitability rates as dependent variables and traditional financial and airline-specific ratios as independent variables) are studied respectively by running SPSS 20.0 Software Package to reveal the mentioned relationship between profitability rates and traditional ratios and to interpret the outcome for major airlines. The findings are as the following:

The profitability rates calculated are between 1 % and 5 % in general while each of OPM, NPM, ROA includes both lower negative and higher positive values. Because the CRs in the study are about 1; they are concluded to be low comparing to other industries. Additionally, the DR values are about 77 %, a touch more than sector's ideal rate indicating the indebted structure of airline industry. Lastly, TATRs have a mean value about 80 % and the yield values differentiate between 6 and 16 USD cents due to the classification of the airline company; as a LCC or legacy carrier.

According to the correlation analysis held; TATR has negative and strongly significant relations with profitability ratios in each of the years similarly DR and the mentioned profitability rates are negatively correlated. Besides; CR has significant and positive relations with both OPM, NPM and ROA, furthermore; the correlation between RRPK and profitability ratios do not resemble each other.

The regression analysis indicates that Equation 1 explains 55 % of the relation between OPM and traditional ratios besides the equation is sufficient for significance and validity. The t-test indicates that the coefficients of all variables are significant while ratios such as CR and DR have a positive impact on OPM while TATR and RRPK are in the opposite way.

According to the second regression relation; Equation 2 explains merely 25 % of the relation between NPM and traditional ratios which is suggested to be low. A better equation is estimated then by extracting the variables of DR and RRPK, hence; forming Equation 2 with CR and TATR causes to have a better Adjusted R Square value about 29 %. The t-test results indicate that the coefficients of the mentioned variables are more significant besides CR has positive and TATR has the negative impact on NPM.

The regression analysis between ROA and traditional ratios by using Equation 3 displays that the equation explains more than 29 % of the relation between ROA and traditional ratios besides the equation is sufficient for significance and validity. According to t test; only the coefficients of TATR are significant and it has a negative but weak impact on ROA. All of the equations indicate that variables are not multiple linear between themselves in respect of VIF values besides autocorrelation is not included for Durbin-Watson test.

Due to the each regression analyses held; TATR is concluded to have the significant and negative impact on profitability rates. Additionally; the CR values have the positive impact on profitability while most of the coefficients are significant which displays the liquidity necessity of airline industry. Contrary to CR; DR has negative impact on profitability since most of the coefficients are insignificant. Finally; RRPK has only one significant relation with profitability rates, only OPM, having a negative impact on the mentioned ratio.

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