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Financial Performance of Top 20 Airlines

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Abstract

This empirical research article intends to analyse the financial performance of the top 20 airlines in the World for the period of year 2011 and 2014. In order to measure the financial performance of the airlines on a unique base, a harmonic index is proposed by considering performance areas of profitability, operating, efficiency and liquidity. Next, each performance area is defined by using a various of performance ratios. Finally, all airlines companies examined are listed by their harmonic index scores. The total assets of the 20 biggest airlines are amounted over \$457 billion in 2014 and Delta Airlines with an asset size of \$54 billion is the biggest airlines. On the other hand, the highest revenue generated by Luftansa in 2011, 2012 and 2013 over \$40 billion per year. The empirical results show that the worst scores of harmonic index refer American Airlines in 2011, Southwest in 2012, China Eastern Airlines in 2013 and Qantas Airways in 2014, while the best scores of harmonic index point Delta in 2011, Hainan Airlines in 2012 and EasyJet in 2013 and 2014. This analysis supports that the measurement of financial performance based upon total revenue or profitability is somehow weak and may be extended by including other indicators.

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1. Introduction

This empirical research intends to analyse and rank the financial performance of the top 20 airlines in the World for the period of year 2011 and 2014. Over the last two decades, the troubled airlines were oftenly on news celebrating financial difficulties, layoffs and disrupted scheduled flights. Many well-known airlines needed financial rescue and either received government fundings or sought consolidation or a partnership. The previous literature are also interested in the financial performance of airlines and almost all agreed that the financial performance of airlines needs to capture more extensive measures than solely total revenues and net income. Hence, this paper concentrates on a comprehensive performance measurement for the biggest 20 airline company in the World. In order to measure the

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performance of the airlines a harmonic index is constructed considering the performance areas of profitability, operating, efficiency and liquidity. Based upon the key ratios representing each performance area an index value is produced for each company and for each year. The empirical findings support that the financial performance ranking by total income or net income may lead companies to follow different strategic decisions than otherwise stated by the harmonic index.

The paper is organized as follows. The next section covers the previous related literature. The section three explains the data employed and the model constructed. The later section presents the empirical results. The final section discusses the concluding remarks.

2.Literature Review

The financial performance of airlines influences short and long term decisions as well as shapes strategic planning. Literature usually indicates about the ongoing of operational performance metrics such as available seat kilometres, revenue per kilometre and load factor. In recent years however, financial performance for airlines doubted an interest of financial indicators and comparisons among firms. Feng and Wang (2000) indicates to analyse the financial performance of airlines by using metrics related to profitability, liquidity and solvency. Feng and Wang (2000) produced a performance indicator set.

There are several literature highlights the key financial performance indicators for the industry. Doganiz (1985) indicates that the profitability of an airline depends on the interplay of unit costs, unit revenues and load factors. He underlines that airlines should adjust costs and fares to generate more profitable pairs. Doganiz (1985) underlines that if the seats remain unsold, these seats flown or seat kilometers produced will be lost.

Although financial ratios derived from financial statements used in stock market evaluations are so many, main are identified on similar patterns. To avoid modelling financial ratios repeatedly, the ratios are suggested to be clustered in some basic categories. (Deogun et al., 1997, Dubes and Jains, 1988, Eom, 1999). Wang (2008) highlights to divide ratios for airlines into four categories according to their related patterns. Wang review financial ratios of domestic airlines in Taiwan in subcategories such as financial structure, solvency, turnover and profitability. Feng and Wang (2000) develops a performance evaluation model for airlines in Taiwan that includes the consideration of financial ratios. They group the total performance of an airline in three categories as production, marketing, and execution. They indicate that any one of the three types of indicators can be replaced by another or can stand independent of another. This result reveals that transportation indicators or financial ratios cannot alone measure all performance aspects of an airline. To evaluate financial performance of a firm, there are various indicators to include in modelling. Leverage, liquidity, operational efficiency, profitability, company size, growth and systematic risk are the main tools to certainly examine. Financial leverage is the extent to which a company relies on debt. A leveraged company is the company with some debt in its capital structure (Ross, Westerfield, Jaffe and Jordan, 2011). Modigliani and Miller (1958) show in their theory (the MM theory) that the company with higher financial leverage involves higher risk for stock investors thus they require a higher return on the stock.

Liquidity or accounting liquidity refers to the ease and quickness with which assets can be converted to cash (Ross, Westerfield, Jaffe and Jordan, 2011). Liquidity is an important indicator of the company because it represents the company's ability to meet its short-term liability. The more liquid a company's assets, the less likely the company is to experience problems meeting short-term obligations. Kettler and Scholes (1970) find that company systematic risk is negatively related with the liquidity.

Operational efficiency illustrates how efficiently the company generates outputs by inputs, which is how efficiently the company is managing its assets. The company which has a high efficiency may be facing a small probability of loss or actual failure due to excellent management and therefore the company exhibits low risk (Borde, 1998). However, high efficiency may be because of implementing aggressive business strategy (Borde, 1998), for example, the company pursues fast sales growth without paying much attention to controlling the cost. In this situation, the company is facing a higher risk (Gu and Gao, 2000). Profitability shows the company's ability of covering all costs and providing some returns relative to sales or investments (Gu, 2002). The logic behind profitability is that the higher the profitability the lower the probability of company failure (Logue and Merville, 1972).

One another aspect is to analyse the relation between risk and financial performance. There have been many papers studying the relationship between company systematic risk and size which usually figured out a negative relationship. These studies state that the large company is too large to fail. Firstly, the large company tends to diversify its business more efficiently because of strong financial ability. Secondly, diversification can lower the risk since the violation of one business section can be diversified by other sections. Thirdly, large company can achieve economies of scale,

which enable the company to maintain a lower unit cost thus increases the probability for the company to defend the distress risk (Ang, Peterson and Peterson, 1985). However, Bowman (1979) does not believe that company systematic risk is related to size because he thinks capital structure is the only financial indicator which is directly related to systematic risk. Since expanding the company size by new investments doesn't involve the capital structure of the company thus there is no necessary relationship between systematic risk and size. The results of studies on airline industry seem complicated. Lee and Jang (2007) find a positive relationship between airline systematic risk and size by US samples, meaning that the larger the airline the riskier it is. This finding is different from the results in above discussions which support the positive relationship. Company growth is often measured by asset growth and revenue growth. Empirical studies on the relationship between systematic risk and financial indicators generally hypothesize and observe the positive correlation between risk and growth (Bowman, 1979). Logue and Merville (1972) think that growing asset brings growing profit. If it is more profitable in particular business, more companies will enter the business and increase the competition which may lead to the company more sensitive to the economic fluctuations.

3.Data and Analysis

In order to measure the financial performance of the biggest airlines companies, a massive data search is conducted using Reuters Databank. All airlines companies traded in exchanges and having complete data for the period of 2011-2014 are listed. Out of this massive data search 172 companies are reached. By using the market capitalization values (marketcap) for the year 2014, the biggest 20 airlines are determined and the related data for these 20 airlines are filtered. Table 1 shows the biggest 20 airlines in alphabetical list including values of total assets and total equity for the period of 2011-2014.

Table 1. Top 20 Airlines – Total Assets and Total Equity

| # | Company Name | Total Assets | | | | | | | | Total Equity | | | | | | | |
|----|-----------------------|--------------|----|--------|----|--------|----|--------|----|--------------|----|-------|----|--------|----|-------|----|
| | | 2011 | R | 2012 | R | 2013 | R | 2014 | R | 2011 | R | 2012 | R | 2013 | R | 2014 | R |
| 1 | Air China | 27538 | 4 | 29762 | 4 | 33923 | 5 | 34169 | 5 | 7426 | 2 | 8071 | 2 | 8946 | 3 | 8806 | 3 |
| 2 | Alaska Air | 23186 | 7 | 24189 | 6 | 22691 | 9 | 21064 | 19 | 6257 | 7 | 6632 | 5 | 8140 | 5 | 7230 | 4 |
| 3 | American Airlines | 5167 | 19 | 5505 | 19 | 5838 | 19 | 6064 | 2 | 1174 | 17 | 1421 | 16 | 2029 | 18 | 2127 | 18 |
| 4 | Ana Holdings | 23848 | 6 | 23510 | 7 | 42278 | 2 | 43771 | 10 | -7111 | 20 | -7987 | 20 | -2731 | 20 | 2021 | 19 |
| 5 | Cathay Pasific Air | 17658 | 13 | 19972 | 10 | 22128 | 10 | 22179 | 9 | 7186 | 4 | 7229 | 3 | 8111 | 6 | 6671 | 6 |
| 6 | China Eastern Air | 17829 | 12 | 19529 | 11 | 22771 | 8 | 26358 | 8 | 3247 | 11 | 2877 | 14 | 4071 | 13 | 4464 | 11 |
| 7 | China Southern Air | 20537 | 9 | 22872 | 8 | 27280 | 7 | 30574 | 6 | 5097 | 9 | 5255 | 8 | 5639 | 8 | 5730 | 7 |
| 8 | Delta Air | 43499 | 1 | 44550 | 1 | 52252 | 1 | 54005 | 1 | -1396 | 19 | -2131 | 19 | 11643 | 1 | 8813 | 2 |
| 9 | Deutsche Luftansa | 36296 | 3 | 37707 | 2 | 40009 | 3 | 36864 | 4 | 7291 | 3 | 6305 | 6 | 8324 | 4 | 4800 | 8 |
| 10 | EasyJet | 6964 | 18 | 6942 | 18 | 7140 | 18 | 7266 | 18 | 2657 | 12 | 2900 | 13 | 3264 | 14 | 3521 | 14 |
| 11 | Hainan Airlines | 12917 | 14 | 14882 | 14 | 18603 | 12 | 19660 | 12 | 2300 | 14 | 3820 | 10 | 4480 | 11 | 4618 | 9 |
| 12 | Int. Consolidated Air | 24775 | 5 | 25037 | 5 | 28558 | 6 | 28612 | 7 | 5194 | 8 | 3533 | 11 | 5373 | 9 | 4216 | 12 |
| 13 | JetBlue Airways | 7071 | 17 | 7070 | 17 | 7350 | 17 | 7839 | 17 | 1757 | 16 | 1888 | 15 | 2134 | 17 | 2529 | 16 |
| 14 | Qantas Airways | 12176 | 15 | 12010 | 15 | 11463 | 16 | 12134 | 14 | 4184 | 10 | 4412 | 9 | 4195 | 12 | 4525 | 10 |
| 15 | Ryanair | 19475 | 10 | 17533 | 13 | 18084 | 14 | 18009 | 16 | 11271 | 1 | 10256 | 1 | 10554 | 2 | 10528 | 1 |
| 16 | Singapore Airlines | 18068 | 11 | 18596 | 12 | 19345 | 11 | 19723 | 13 | 6877 | 5 | 6992 | 4 | 7336 | 7 | 6775 | 5 |
| 17 | Southwest Airlines | 746 | 20 | 920 | 20 | 1181 | 20 | 1593 | 11 | 467 | 18 | 583 | 17 | 769 | 19 | 1003 | 20 |
| 18 | Sprit Airlines | 22353 | 8 | 21372 | 9 | 18301 | 13 | 16331 | 20 | 6588 | 6 | 5591 | 7 | 5331 | 10 | 2699 | 15 |
| 19 | Turkish Airways | 37988 | 2 | 37628 | 3 | 36812 | 4 | 37353 | 15 | 1806 | 15 | 481 | 18 | 2984 | 16 | 2396 | 17 |
| 20 | United Continental | 8708 | 16 | 10528 | 16 | 11842 | 15 | 13660 | 3 | 2388 | 13 | 3034 | 12 | 3246 | 15 | 3923 | 13 |
| | TOTAL | 386798 | | 400114 | | 447849 | | 457228 | | 74659 | | 71161 | | 103838 | | 97395 | |

Table 1 shows that Delta Airlines has the largest asset size from \$43 to \$54 billion from year 2011 to year 2014 while the highest value of equity is belonged to Rynair for the years 2011, 2012 and 2014 with a value range of \$10-11 billion.

Table 2. Top 20 Airlines – Total Revenues and Net Income

| # | Company Name | Total Revenues | | | | | | | | Net Income | | | | | | | |
|----|-----------------------|----------------|----|--------|----|--------|----|--------|----|------------|----|-------|----|-------|----|-------|----|
| | | 2011 | R | 2012 | R | 2013 | R | 2014 | R | 2011 | R | 2012 | R | 2013 | R | 2014 | R |
| 1 | Air China | 15032 | 8 | 15826 | 9 | 15881 | 10 | 17014 | 8 | 1157 | 1 | 778 | 3 | 540 | 6 | 614 | 9 |
| 2 | Alaska Air | 15852 | 6 | 17872 | 6 | 17868 | 6 | 15664 | 9 | 272 | 12 | 357 | 10 | 520 | 7 | 188 | 18 |
| 3 | American Airlines | 4318 | 18 | 4657 | 18 | 5156 | 19 | 5368 | 19 | 245 | 14 | 316 | 11 | 508 | 8 | 605 | 10 |
| 4 | Ana Holdings | 23979 | 4 | 24855 | 4 | 26743 | 4 | 42650 | 1 | -1979 | 20 | -1876 | 20 | -1834 | 20 | 2882 | 1 |
| 5 | Cathay Pasific Air | 12642 | 12 | 12812 | 12 | 12955 | 12 | 13668 | 12 | 707 | 8 | 111 | 15 | 338 | 13 | 406 | 13 |
| 6 | China Eastern Air | 12995 | 11 | 13697 | 11 | 14333 | 11 | 14567 | 10 | 756 | 7 | 503 | 6 | 384 | 10 | 555 | 11 |
| 7 | China Southern Air | 14346 | 9 | 16086 | 8 | 15963 | 9 | 17580 | 7 | 785 | 5 | 417 | 8 | 308 | 14 | 288 | 15 |
| 8 | Delta Air | 35115 | 3 | 36670 | 3 | 37773 | 3 | 40362 | 2 | 854 | 2 | 1009 | 2 | 10540 | 1 | 659 | 8 |
| 9 | Deutsche Luftansa | 39962 | 1 | 38728 | 1 | 39870 | 1 | 39798 | 3 | -19 | 19 | 1578 | 1 | 416 | 9 | 73 | 19 |
| 10 | EasyJet | 5543 | 15 | 6076 | 15 | 6644 | 15 | 7497 | 15 | 361 | 11 | 402 | 9 | 621 | 4 | 745 | 6 |
| 11 | Hainan Airlines | 4066 | 19 | 4576 | 19 | 5413 | 18 | 5850 | 17 | 407 | 10 | 306 | 12 | 351 | 12 | 421 | 12 |
| 12 | Int. Consolidated Air | 22396 | 5 | 23283 | 5 | 24656 | 5 | 26748 | 5 | 782 | 6 | -920 | 19 | 162 | 18 | 1302 | 2 |
| 13 | JetBlue Airways | 4504 | 17 | 4982 | 17 | 5441 | 17 | 5817 | 18 | 86 | 16 | 128 | 14 | 168 | 17 | 401 | 14 |
| 14 | Qantas Airways | 4794 | 16 | 6040 | 16 | 6286 | 16 | 6750 | 16 | 495 | 9 | 771 | 4 | 733 | 3 | 701 | 7 |
| 15 | Ryanair | 10909 | 13 | 11853 | 13 | 12152 | 13 | 12112 | 13 | 820 | 4 | 268 | 13 | 305 | 15 | 286 | 16 |
| 16 | Singapore Airlines | 15658 | 7 | 17088 | 7 | 17699 | 7 | 18605 | 6 | 178 | 15 | 421 | 7 | 754 | 2 | 1136 | 3 |
| 17 | Southwest Airlines | 1071 | 20 | 1318 | 20 | 1654 | 20 | 1932 | 20 | 76 | 17 | 109 | 16 | 177 | 16 | 226 | 17 |
| 18 | Spirit Airlines | 13132 | 10 | 15507 | 10 | 16306 | 8 | 14085 | 11 | 247 | 13 | -253 | 17 | 1 | 19 | -2608 | 20 |
| 19 | Turkish Airways | 37110 | 2 | 37152 | 2 | 38279 | 2 | 38901 | 4 | 840 | 3 | -723 | 18 | 571 | 5 | 1132 | 4 |
| 20 | United Continental | 7035 | 14 | 8208 | 14 | 9861 | 14 | 11049 | 14 | 11 | 18 | 643 | 5 | 359 | 11 | 832 | 5 |
| | TOTAL | 300459 | | 317286 | | 330933 | | 356016 | | 7081 | | 4344 | | 15922 | | 10843 | |

Table 2 presents the total revenues and net income of airlines for the period of 2011-2014. Luftansa generates the highest revenues of nearly \$40 billion in 2011, 2012 and 2013. A highest revenue in year 2014 over \$42 billion is generated by Ana Holdings. Air China recorded the highest net income in 2011 with a value of \$1.1 billion. Luftansa in 2012, Delta in 2013 and Ana Holdings in 2014 are registered the highest net income.

Table 3. Top 20 Airlines – Number of Employees and Number of Aircrafts

| # | Company Name | Number of Employees | | | | | | | | Number of Aircrafts | | | | | | | |
|----|-----------------------|---------------------|----|--------|----|--------|----|--------|----|---------------------|----|------|----|-------|----|-------|----|
| | | 2011 | R | 2012 | R | 2013 | R | 2014 | R | 2011 | R | 2012 | R | 2013 | R | 2014 | R |
| 1 | Air China | 24474 | 11 | 56890 | 8 | 64854 | 7 | 68553 | 7 | 432 | 7 | 461 | 7 | 497 | 7 | 521 | 7 |
| 2 | Alaska Air | 32731 | 10 | 32884 | 11 | 32634 | 11 | 33719 | 11 | 222 | 12 | 226 | 12 | 235 | 12 | 241 | 13 |
| 3 | American Airlines | 12806 | 15 | 12932 | 15 | 13177 | 15 | 12739 | 15 | 165 | 17 | 174 | 17 | 182 | 17 | 196 | 17 |
| 4 | Ana Holdings | 80100 | 3 | 77750 | 3 | 110400 | 2 | 113300 | 2 | 907 | 2 | 868 | 2 | 1528 | 1 | 1549 | 1 |
| 5 | Cathay Pasific Air | 23015 | 12 | 29900 | 12 | 31600 | 12 | 32900 | 12 | 175 | 14 | 183 | 15 | 192 | 16 | 200 | 16 |
| 6 | China Eastern Air | 59872 | 5 | 66207 | 6 | 68874 | 6 | 69849 | 6 | 389 | 8 | 416 | 8 | 478 | 8 | 494 | 8 |
| 7 | China Southern Air | 54326 | 7 | 73668 | 4 | 80175 | 4 | 82132 | 4 | 444 | 6 | 491 | 6 | 561 | 6 | 621 | 5 |
| 8 | Delta Air | 78392 | 4 | 73561 | 5 | 78000 | 5 | 79655 | 5 | 775 | 3 | 717 | 3 | 912 | 3 | 915 | 3 |
| 9 | Deutsche Luftansa | 120055 | 1 | 116957 | 1 | 118285 | 1 | 118781 | 1 | 696 | 5 | 627 | 5 | 622 | 5 | 615 | 6 |
| 10 | EasyJet | 8288 | 19 | 8446 | 18 | 8343 | 19 | 8987 | 19 | 204 | 13 | 214 | 13 | 217 | 14 | 226 | 14 |
| 11 | Hainan Airlines | 8558 | 18 | 9476 | 17 | 10347 | 17 | 10674 | 17 | 108 | 19 | 117 | 19 | 131 | 19 | 154 | 18 |
| 12 | Int. Consolidated Air | 56791 | 6 | 59574 | 7 | 60089 | 8 | 59484 | 8 | 348 | 9 | 377 | 9 | 431 | 9 | 459 | 9 |
| 13 | JetBlue Airways | 10243 | 16 | 10573 | 16 | 11021 | 16 | 11352 | 16 | 169 | 15 | 180 | 16 | 194 | 15 | 203 | 15 |
| 14 | Qantas Airways | 8560 | 17 | 8388 | 19 | 9137 | 18 | 8992 | 18 | 272 | 11 | 294 | 11 | 305 | 11 | 297 | 11 |
| 15 | Ryanair | 22282 | 13 | 22746 | 13 | 23189 | 14 | 23716 | 14 | 125 | 18 | 133 | 18 | 139 | 18 | 142 | 19 |
| 16 | Singapore Airlines | 45392 | 8 | 45861 | 9 | 44831 | 9 | 46278 | 9 | 698 | 4 | 694 | 4 | 681 | 4 | 665 | 4 |
| 17 | Southwest Airlines | 2456 | 20 | 2767 | 20 | 3224 | 20 | 4219 | 20 | 37 | 20 | 45 | 20 | 54 | 20 | 65 | 20 |
| 18 | Spirit Airlines | 33169 | 9 | 33584 | 10 | 33608 | 10 | 33745 | 10 | 283 | 10 | 308 | 10 | 312 | 10 | 308 | 10 |
| 19 | Turkish Airways | 87000 | 2 | 88000 | 2 | 87000 | 3 | 84000 | 3 | 1256 | 1 | 1253 | 1 | 1265 | 2 | 1257 | 2 |
| 20 | United Continental | 18489 | 14 | 19109 | 14 | 23160 | 13 | 24244 | 13 | 168 | 16 | 202 | 14 | 233 | 13 | 267 | 12 |
| | TOTAL | 786999 | | 849273 | | 911948 | | 927319 | | 9884 | | 9992 | | 11182 | | 11409 | |

Table 3 shows the number of employees and number of aircrafts of the companies. Luftansa has the highest number of employees for the whole sampling period with a figure of about 115,000 while the Turkish Airways has the highest number of aircrafts in 2011 and 2012, and Ana Hodings has the highest number of aircrafts in 2013 and 2014.

This reserach paper proposes a hormonic index to establish a unique way to measure comprehensive performance of airlines. The model is constructed based on overall performance which is measured by four fundamental basis namely; profitability, operating, liquidity and efficiency. Each area of performance is then measured by the following indicators presented in Table 4.

$$\text{Harmonic Index (HI)} = f(\text{profitability, operating, liquidity, efficiency}) \quad (1)$$

$$\text{HI} = w_{P1}P1 + w_{P2}P2 + w_{P3}P3 + w_{O1}O1 + w_{O2}O2 + w_{O3}O3 + w_{L1}L1 + w_{L2}L2 + w_{L3}L3 + w_{R1}R1 + w_{R2}R2 \quad (2)$$

$$\text{HI} = k_1P + k_2O + k_3L + k_4R \quad (3)$$

Where w_{P_i} 's are the equal weights for profitability indicators, P_i 's are the profitability indicators, w_{O_i} 's are the equal weights for operating indicators, O_i 's are the operating indicators, w_{L_i} 's are the equal weights for liquidity indicators, L_i 's are the liquidity indicators, w_{R_i} 's are the equal weights for efficiency indicators, R_i 's are the efficiency indicators, k_i 's are equal weights for the weighted indicators.

Table 4. Harmonic Index Performance Indicators

| Performance Areas | Indicator | Measurement |
|-------------------|---|--|
| Profitability | P1: Return on Asset (ROA) P2: Return on Equity (ROE) P3: Net Profit Margin (NPM) | Net Income / Assets Net Income / Equity Net Income / Revenues |
| Operating | O1: Ave.Days for Account Receivables O2: Ave.Days for Inventories O3: Ave.Days for Account Payables | Revenues / (Ave. Account Receivables/360) Cost of Goods Sold / (Ave. Inventories/360) Purchases / (Ave. Account Payables/360) |
| Liquidity | L1: Quick Ratio L2: Debt Ratio L3: Times Interest Earned | (Current Assets-Inventories)/Current Liabilities Long Term Debt / Equity Net Income Before Interest and Taxes/Interest Expense |
| Efficiency | R1: Revenue per Employee R2: Revenue per Aircraft | Revenues / Number of Employees Revenues / Number of Aircrafts |

4. Empirical Results and Analysis

The following Table 5, 6, 7 and 8 presents the results of empirical analysis. Table 5 shows the harmonic index values and ranking for the airlines for 2011. The top three performance companies for 2011 are Delta, International Consolidated Airlines and Cathay Pasific Airlines. Turkish Airways is ranked as the 4th best performers for 2011. The worst three performance companies for 2011 are listed as American Airlines, Singapore Airlines and Southwest.

Table 5. Financial Performance by Harmonic Index for the Year 2011

| # | Company | Profitability | | Operating | | Liquidity | | Efficiency | | HARMONIC | |
|----|------------------------|---------------|------|-----------|------|-----------|------|------------|------|----------|------|
| | | Index | Rank | Index | Rank | Index | Rank | Index | Rank | Index | Rank |
| 1 | Air China | 0,23 | 11 | 17,07 | 12 | 1,21 | 16 | 0,48 | 5 | 2,09 | 16 |
| 2 | Alaska Air | 0,30 | 4 | 23,50 | 10 | 1,92 | 8 | 0,30 | 16 | 2,75 | 9 |
| 3 | American Airlines | 0,19 | 17 | 14,67 | 14 | 0,81 | 19 | 0,28 | 19 | 1,43 | 20 |
| 4 | ANA Holdings | 0,20 | 15 | 15,33 | 13 | 1,40 | 13 | 0,60 | 3 | 2,35 | 12 |
| 5 | Cathay Pacific Airways | 0,24 | 10 | 10,30 | 18 | 2,83 | 3 | 0,64 | 2 | 3,81 | 3 |
| 6 | China Eastern Airlines | 0,29 | 5 | 81,67 | 1 | 1,67 | 9 | 0,28 | 20 | 3,05 | 6 |
| 7 | China Southern Air | 0,27 | 7 | 23,67 | 9 | 2,13 | 7 | 0,29 | 17 | 2,92 | 7 |
| 8 | Delta | 0,22 | 13 | 45,50 | 2 | 6,66 | 1 | 0,45 | 8 | 7,79 | 1 |
| 9 | Deutsche Lufthansa | 0,27 | 8 | 32,73 | 5 | 1,66 | 10 | 0,45 | 7 | 2,70 | 10 |
| 10 | EasyJet | 0,27 | 6 | 25,30 | 7 | 1,04 | 17 | 0,47 | 6 | 2,04 | 17 |
| 11 | Hainan Airlines | 0,17 | 20 | 8,83 | 19 | 2,66 | 5 | 0,43 | 10 | 3,34 | 5 |

| | | | | | | | | | | | |
|----|-----------------------|------|----|-------|----|------|----|------|----|------|----|
| 12 | Int. Consolidated Air | 0,31 | 3 | 10,80 | 17 | 3,98 | 2 | 0,52 | 4 | 4,92 | 2 |
| 13 | JetBlue Airways | 0,19 | 16 | 21,47 | 11 | 1,45 | 12 | 0,35 | 15 | 2,20 | 15 |
| 14 | Qantas Airways | 0,18 | 19 | 13,00 | 16 | 2,17 | 6 | 0,43 | 9 | 2,91 | 8 |
| 15 | Ryanair | 0,18 | 18 | 37,10 | 4 | 1,50 | 11 | 0,37 | 12 | 2,42 | 11 |
| 16 | Singapore Airlines | 0,21 | 14 | 24,37 | 8 | 0,62 | 20 | 0,68 | 1 | 1,76 | 19 |
| 17 | Southwest | 0,25 | 9 | 13,80 | 15 | 1,23 | 15 | 0,28 | 18 | 1,90 | 18 |
| 18 | Spirit Airlines | 0,61 | 1 | 42,07 | 3 | 0,86 | 18 | 0,36 | 13 | 2,25 | 14 |
| 19 | Turkish Airways | 0,22 | 12 | 6,33 | 20 | 2,78 | 4 | 0,40 | 11 | 3,47 | 4 |
| 20 | United Continental | 0,37 | 2 | 32,43 | 6 | 1,24 | 14 | 0,36 | 14 | 2,30 | 13 |

Table 6 shows the harmonic index values and ranking for the airlines for 2012. The top three performance companies for 2012 are Hainan, International Consolidated Airlines and Rynair. Turkish Airways is ranked as the 5th best performer for 2012. The worst three performance companies for 2012 are listed as Soutwest, EasyJet and JetBlue Airlines.

Table 6. Financial Performance by Harmonic Index for the Year 2012

| # | Company | Profitability | | Operating | | Liquidity | | Efficiency | | HARMONIC | |
|----|------------------------|---------------|------|-----------|------|-----------|------|------------|------|----------|------|
| | | Index | Rank | Index | Rank | Index | Rank | Index | Rank | Index | Rank |
| 1 | Air China | 0,19 | 14 | 20,47 | 13 | 1,27 | 12 | 0,31 | 16 | 1,97 | 16 |
| 2 | Alaska Air | 0,32 | 3 | 26,90 | 6 | 2,51 | 6 | 0,31 | 15 | 3,41 | 6 |
| 3 | American Airlines | 0,19 | 13 | 14,80 | 15 | 1,24 | 13 | 0,30 | 18 | 1,88 | 17 |
| 4 | ANA Holdings | 0,21 | 12 | 15,93 | 14 | 1,08 | 15 | 0,67 | 2 | 2,12 | 14 |
| 5 | Cathay Pacific Airways | 0,18 | 15 | 9,17 | 18 | 2,97 | 4 | 0,56 | 3 | 3,80 | 4 |
| 6 | China Eastern Airlines | 0,24 | 7 | 103,07 | 1 | 0,66 | 19 | 0,27 | 20 | 2,20 | 12 |
| 7 | China Southern Air | 0,23 | 9 | 25,40 | 8 | 1,40 | 11 | 0,27 | 19 | 2,15 | 13 |
| 8 | Delta | 0,23 | 8 | 42,83 | 2 | 1,83 | 10 | 0,50 | 4 | 2,99 | 9 |
| 9 | Deutsche Lufthansa | 0,34 | 2 | 34,47 | 5 | 2,21 | 8 | 0,47 | 8 | 3,37 | 7 |
| 10 | EasyJet | 0,29 | 5 | 26,57 | 7 | 0,57 | 20 | 0,50 | 6 | 1,62 | 19 |
| 11 | Hainan Airlines | 0,13 | 19 | 8,70 | 19 | 4,79 | 1 | 0,44 | 10 | 5,45 | 1 |
| 12 | Int. Consolidated Air | 0,17 | 17 | 11,20 | 17 | 4,64 | 2 | 0,50 | 5 | 5,42 | 2 |
| 13 | JetBlue Airways | 0,21 | 11 | 21,40 | 12 | 1,02 | 16 | 0,37 | 13 | 1,81 | 18 |
| 14 | Qantas Airways | 0,16 | 18 | 13,20 | 16 | 1,99 | 9 | 0,48 | 7 | 2,77 | 10 |
| 15 | Ryanair | 0,22 | 10 | 39,03 | 3 | 3,05 | 3 | 0,46 | 9 | 4,12 | 3 |
| 16 | Singapore Airlines | 0,18 | 16 | 24,93 | 10 | 1,11 | 14 | 0,71 | 1 | 2,24 | 11 |
| 17 | Southwest | 0,26 | 6 | 22,87 | 11 | 0,77 | 17 | 0,31 | 17 | 1,57 | 20 |
| 18 | Spirit Airlines | 0,52 | 1 | 37,83 | 4 | 0,77 | 18 | 0,38 | 12 | 2,05 | 15 |
| 19 | Turkish Airways | 0,31 | 4 | 6,63 | 20 | 2,73 | 5 | 0,42 | 11 | 3,52 | 5 |
| 20 | United Continental | 0,08 | 20 | 24,97 | 9 | 2,35 | 7 | 0,36 | 14 | 3,04 | 8 |

Table 7 shows the harmonic index values and ranking for the airlines for 2013. The top three performance companies for 2013 are EasyJet, Alaska Air and Delta. Turkish Airways is ranked as the 11th for 2013. The worst three performance companies for 2013 are listed as China Eastern Airlines, China Southern Air and Air China.

Table 7. Financial Performance by Harmonic Index for the Year 2013

| # | Company | Profitability | | Operating | | Liquidity | | Efficiency | | HARMONIC | |
|---|------------------------|---------------|------|-----------|------|-----------|------|------------|------|----------|------|
| | | Index | Rank | Index | Rank | Index | Rank | Index | Rank | Index | Rank |
| 1 | Air China | 0,16 | 18 | 26,97 | 9 | 0,75 | 17 | 0,28 | 17 | 1,46 | 18 |
| 2 | Alaska Air | 0,36 | 3 | 7,87 | 18 | 8,91 | 2 | 0,34 | 15 | 9,69 | 2 |
| 3 | American Airlines | 0,15 | 19 | 18,23 | 14 | 1,44 | 13 | 0,21 | 20 | 1,98 | 16 |
| 4 | ANA Holdings | 0,21 | 12 | 33,60 | 4 | 2,50 | 7 | 0,65 | 2 | 3,70 | 7 |
| 5 | Cathay Pacific Airways | 0,18 | 17 | 24,90 | 12 | 1,59 | 12 | 0,54 | 4 | 2,56 | 12 |
| 6 | China Eastern Airlines | 0,21 | 13 | 29,50 | 7 | -0,16 | 20 | 0,25 | 18 | 0,60 | 20 |
| 7 | China Southern Air | 0,19 | 16 | 23,70 | 13 | 0,33 | 19 | 0,24 | 19 | 0,99 | 19 |

| | | | | | | | | | | | |
|----|-----------------------|------|----|-------|----|-------|----|------|----|-------|----|
| 8 | Delta | 0,83 | 1 | 24,97 | 11 | 4,91 | 3 | 0,45 | 9 | 6,44 | 3 |
| 9 | Deutsche Lufthansa | 0,28 | 7 | 36,10 | 3 | 1,23 | 16 | 0,49 | 7 | 2,36 | 13 |
| 10 | EasyJet | 0,35 | 4 | 11,17 | 17 | 10,55 | 1 | 0,55 | 3 | 11,56 | 1 |
| 11 | Hainan Airlines | 0,12 | 20 | 30,60 | 5 | 0,70 | 18 | 0,47 | 8 | 1,59 | 17 |
| 12 | Int. Consolidated Air | 0,25 | 9 | 78,80 | 1 | 1,70 | 11 | 0,49 | 6 | 3,23 | 9 |
| 13 | JetBlue Airways | 0,23 | 10 | 13,57 | 16 | 2,15 | 9 | 0,39 | 13 | 2,90 | 10 |
| 14 | Qantas Airways | 0,20 | 14 | 27,17 | 8 | 1,28 | 14 | 0,50 | 5 | 2,25 | 14 |
| 15 | Ryanair | 0,23 | 11 | 7,80 | 19 | 3,21 | 5 | 0,45 | 10 | 3,96 | 5 |
| 16 | Singapore Airlines | 0,19 | 15 | 43,67 | 2 | 2,54 | 6 | 0,70 | 1 | 3,86 | 6 |
| 17 | Southwest | 0,29 | 6 | 30,37 | 6 | 4,55 | 4 | 0,33 | 16 | 5,46 | 4 |
| 18 | Spirit Airlines | 0,55 | 2 | 7,30 | 20 | 2,44 | 8 | 0,41 | 12 | 3,48 | 8 |
| 19 | Turkish Airways | 0,26 | 8 | 25,10 | 10 | 1,90 | 10 | 0,42 | 11 | 2,83 | 11 |
| 20 | United Continental | 0,35 | 5 | 16,17 | 15 | 1,26 | 15 | 0,37 | 14 | 2,14 | 15 |

Table 8 shows the harmonic index values and ranking for the airlines for 2014. The top three performance companies for 2014 are EasyJet, Alaska Air and Southwest. Turkish Airways is ranked as the 13th for 2014. The worst three performance companies for 2014 are listed as Qantas Air, China Eastern Airlines and China Southern Air.

Table 8. Financial Performance by Harmonic Index for the Year 2014

| # | Company | Profitability | | Operating | | Liquidity | | Efficiency | | HARMONIC | |
|----|------------------------|---------------|------|-----------|------|-----------|------|------------|------|----------|------|
| | | Index | Rank | Index | Rank | Index | Rank | Index | Rank | Index | Rank |
| 1 | Air China | 0,16 | 18 | 25,40 | 9 | 1,00 | 15 | 0,29 | 18 | 1,70 | 16 |
| 2 | Alaska Air | 0,37 | 3 | 9,07 | 18 | 11,76 | 2 | 0,35 | 12 | 12,57 | 2 |
| 3 | American Airlines | 0,26 | 9 | 14,23 | 16 | 2,45 | 8 | 0,33 | 16 | 3,18 | 9 |
| 4 | ANA Holdings | 0,20 | 14 | 32,70 | 4 | 1,80 | 11 | 0,56 | 8 | 2,89 | 11 |
| 5 | Cathay Pacific Airways | 0,18 | 16 | 24,00 | 10 | 1,79 | 13 | 0,55 | 11 | 2,76 | 12 |
| 6 | China Eastern Airlines | 0,20 | 13 | 32,13 | 5 | 0,46 | 20 | 0,25 | 20 | 1,23 | 19 |
| 7 | China Southern Air | 0,18 | 17 | 23,17 | 12 | 0,71 | 17 | 0,25 | 19 | 1,36 | 18 |
| 8 | Delta | 0,22 | 12 | 23,93 | 11 | 0,62 | 18 | 0,47 | 7 | 1,54 | 17 |
| 9 | Deutsche Lufthansa | 0,26 | 10 | 34,13 | 3 | 2,12 | 10 | 0,49 | 17 | 3,21 | 8 |
| 10 | EasyJet | 0,37 | 4 | 10,53 | 17 | 17,73 | 1 | 0,58 | 1 | 18,78 | 1 |
| 11 | Hainan Airlines | 0,13 | 19 | 30,70 | 6 | 0,82 | 16 | 0,46 | 3 | 1,71 | 15 |
| 12 | Int. Consolidated Air | 0,32 | 6 | 52,57 | 1 | 3,97 | 4 | 0,52 | 15 | 5,33 | 4 |
| 13 | JetBlue Airways | 0,27 | 8 | 15,40 | 14 | 2,24 | 9 | 0,40 | 4 | 3,06 | 10 |
| 14 | Qantas Airways | -0,06 | 20 | 20,40 | 13 | 0,52 | 19 | 0,44 | 13 | 1,11 | 20 |
| 15 | Ryanair | 0,23 | 11 | 6,93 | 19 | 3,27 | 5 | 0,49 | 2 | 4,06 | 7 |
| 16 | Singapore Airlines | 0,19 | 15 | 44,57 | 2 | 3,22 | 7 | 0,68 | 6 | 4,54 | 5 |
| 17 | Southwest | 0,32 | 5 | 26,03 | 8 | 7,63 | 3 | 0,34 | 14 | 8,54 | 3 |
| 18 | Spirit Airlines | 0,50 | 1 | 6,57 | 20 | 3,23 | 6 | 0,38 | 5 | 4,18 | 6 |
| 19 | Turkish Airways | 0,31 | 7 | 27,80 | 7 | 1,72 | 14 | 0,43 | 10 | 2,73 | 13 |
| 20 | United Continental | 0,39 | 2 | 15,03 | 15 | 1,79 | 12 | 0,39 | 9 | 2,72 | 14 |

5. Conclusion

This research investigates the financial performance of the 20 biggest airlines in the world. The paper proposes a harmonic index to construct a unique and a comprehensive base for performance measurement of the airlines companies. The harmonic index includes more financial measurements than considering sole total revenues or net income for ranking by financial performance. Although the largest asset size is belonged to Delta, most revenues are generated by Luftansa, most number of aircrafts are employed by Turkish Airways and most number of employees work for Luftansa, none of these airlines is ranked as one of the top three performers in the period of 2011 and 2014 by harmonic index. The financial performance of airlines influences short and long term company decisions as well as

shapes strategic planning. Hence, a better comprehensive financial performance measurement may be employed in strategic planning of airlines.

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