



DETERMINATION KEY PERFORMANCE INDICATORS FOR IMPROVING PERFORMANS IN TURKISH AIRLINES¹

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ABSTRACT

In this study, Key Performance Indicators (KPIs) have been investigated by using balanced scorecard model in aviation sector with example of Turkish Airlines. First part, the Concept of Key Performance Indicators and Performance Measurement, Elements and Feature of KPIs and Balanced Scorecard Models are discussed. Second Part, Secondary data used for obtaining information for creating balanced scorecard models for KPIs. Turkish Airlines was choosed as an example for creating KPIs. As a result of the analysis of the information obtained, the availability of KPIs in aviation performance measurement has been observed with the example of Turkish Airlines. Consequently, Turkish Airlines has been compared to competitors and forward performance targets have been determined.

Keywords: Key Performance Indicator, Performance Measurement, Key Performance Indicator in Aviation Sector

TÜRK HAVA YOLLARINDA PERFORMANS GELİŞİMİ İÇİN TEMEL PERFORMANS GÖSTERGELERİNİN BELİRLENMESİ

ÖZET

Bu çalışmada Türk Hava Yolları örneği ile havacılık sektöründe dengeli karne modeli kullanılarak Temel Performans Göstergeleri (KPI'lar) araştırılmıştır. İlk bölümde Temel Performans Göstergeleri ve Performans Ölçümü Kavramı ve bu kavramlara ek olarak KPI'ların Unsurları ve Özelliği ile Dengeli Karne Modelleri tartışılmaktadır. İkinci Bölümde ise ikincil veriler kullanılarak KPI'lar için dengeli karne modeli oluşturulmuştur. Türk Hava Yolları KPI'lar oluşturmak için örnek hava yolu şirketi olarak seçilmiştir. Elde edilen bilgilerin analizi sonucunda KPI'ların havacılık performans ölçümünde kullanılabilirliği Türk Hava Yolları örneği ile gözlemlenmiştir. Sonuç olarak, Türk Hava Yolları'nın rakipleri ile KPI yöntemi ile performansı karşılaştırılmış ve ileriye yönelik hedef olarak performans değerleri belirlenmiştir.

Anahtar Kelimeler: Temel Performans Göstergeleri, Performans Ölçümü, Havacılık Sektöründeki Temel Performans Göstergeleri

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1. INTRODUCTION

An economic, political or health crisis in a country immediately affects the aviation sector. As a matter of fact, the pandemic in 2020 hit the transportation sector the most, especially the aviation sector. In order to stand firm against crises, it is necessary to use the resources available efficiently. In the airline industry, performance efficiency measurements were made in the past, but these measurements were usually focused only on data that was financial in the old traditional methods, targets such as increasing revenues, increasing profitability, increasing cash flow were determined, but it is not possible for the aviation sector, which is also an important factor globally, to determine the target KPIs that are only financial, there are many internal, external and environmental factors.

Turkish Airlines' KPIs have been examined in terms of internal business, innovation and learning, financial perspective, customer perspective with a balanced scorecard method. At the same time, the effect of the pre-pandemic and pandemic period on KPIs has been shown and the target values for the future have been determined.

2. LITERATURE SURVEY

The performance consists of goods, services and thoughts that are established in advance of criteria and tasks to achieve the goals (Helvacı, 2002). Performance is a qualitative and quantitatively stated concept obtained as a result of a purposeful and planned activity (Williams, 1998). In the first stage of performance measurement, the main objectives should be determined and what is expected of them should be explained for the employees to achieve these goals. Other organizations within the company should set themselves targets based on the main objectives. Employees should receive the necessary training on this goal and employees should be provided with the guidance they will need. The system should be clear and understandable in a way that employees and managers can understand (Carney, 1999).

Businesses should first evaluate existing internal resources when making a new decision. It is important to use existing resources effectively. The effectiveness of resources in enterprises in terms of performance increases the efficiency of the company. Performance is a factor that influences future decisions (Yüncü, 2002).

Performance evaluation is a system that measures employees' abilities, working behaviors, habits or similar factors by comparing them (Örucu, and Köseoglu, 2003). With performance evaluation, the work that the person can do is investigated and analyzed and measured to understand the extent to which the person has achieved this work (Erdogan, 1991). The career of the staff often depends on their work. Businesses want to protect their staff to maintain company efficiency and want staff to achieve their company goals through performance assessment. Performance evaluation should be evaluated not only individually but also organizationally (Çalık, 2003).

After the measurement process, performance is evaluated and the audit phase begins. The results are interpreted by comparing them with the targeted values. After analyzing the results, if the necessary evaluations are made and the lessons are not taken, only the performance measurement remains a value (Kaynar, 2010).

Performance measurement systems should be designed to be compatible with organizational hierarchies. There should be a review of the past period and an effort to improve it for the future. Performance metrics in the organizational system should not be incompatible with each other but should be designed to support each other. It should support the strategic objectives of the enterprise and be compatible with the incentive system (Neely et al., 1996).

“It is not possible to manage what you cannot control, and you cannot control what you cannot



measure!” (Peter Drucker).

Key performance indicators first analyze an organization, identify needs, and set a goal to solve and improve the problem. Key performance indicators cover long-term targets and are generally long-term and show the change that is happening (Akal, 2000). Performance measurement identifies deficiencies in current performance and ensures progress towards the goal. That's why key performance indicators are carefully selected and improve performance (Weber, and Thomas, 2005).

In the process of determining the key performance indicators, the following questions need to be answered.

1. What are the problems that need to be solved?
2. What kind of data is required? (Financial, time, physical)
3. How will the data be used in the performance indicator?
4. What are the target values and how to reach them?
5. What should be done to improve key performance indicators? (Krause & Arora, 2019)

When creating an enterprise performance management, strategy maps must be determined and after KPIs are created, they can be assigned as targets to individuals, roles, or departments, and hierarchical collaborations should be established based on the data obtained from these KPIs (Kaynar, 2010).

2.1. Elements of KPIs

Elements of KPIs consist of strategy, targets, ranges, encodings, time frames, benchmarks.

2.1.1. Strategy

In a competitive environment, your strategy separates the organization from its competitors and shows the necessary ways to achieve its vision (Parmenter, 2015).

On the organization's strategy map, each unit is assigned key performance indicators and performance indicators are designed long-term in line with strategic objectives (Gabcanova, 2012). A successful performance measurement system facilitates the identification and implementation of strategies (Kaynar, 2010). Measurement systems need to be designed to reflect strategies and impact strategies in order to give what is expected of them in all these processes. Improvements in strategies should be monitored with at least some of the measurement systems, whether what is expected to be done is done, what is done should be monitored (Kaya, 2008).

2.1.2. Targets

On the organization's strategy map, each unit is assigned key performance indicators and performance indicators are designed long-term in line with strategic objectives (Gabcanova, 2012). A successful performance measurement system facilitates the identification and implementation of strategies (Kaynar, 2010). Measurement systems need to be designed to reflect strategies and impact strategies in order to give what is expected of them in all these

2.1.3. Ranges

Organizations usually set targets below target, above target or at target value (Eckerson, 2009). On the other hand, it is easier to set and achieve an acceptable target within a certain range than to set a fixed target and is more sensitive to environmental change (Parmenter, 2015).



2.1.4. Encodings, and Thresholds

When a user looks at the result of a KPI, it should be easily understood. In reports, encodings, formatting, graphics should be simply understandable. When looking at a table, it is important that all formatting is with the same feature, for example, if the red ones show negative situations, then the status of those of red color in the entire report should be negative. Coloring may vary if the target value is exceeded in performance indicators. There is no rule that all companies will use coloring, each company's reporting and indicator tools may be different, it may vary according to the culture and preference of the company (Eckerson, 2009).

2.1.5. Time Frames

Evaluation of KPIs should be carried out at certain time intervals, many companies choose the yearly as the time interval, 6-month, 3-month, monthly monitoring can be made to monitor the company and its staff to achieve the targets (Eckerson, 2009). In addition, indicators should not be determined as a one-time basis, continuity needs to include past and future values (Peterson, 2006).

2.1.6. Benchmarks

Benchmarking consists of practices for replacing the existing system with better. By comparison, it is decided what is intended to be changed (Parmenter, 2015). Companies often use KPIs to get in a better position than where they started. For this purpose, the previous year's data is used as an internal comparison. Improvement is also targeted by comparing with competitors (Eckerson, 2009). Well-defined KPIs often help improve internal and external performance (Lloyd GF, and et al, 2015).

2.2.Features of Key Performance Indicators

It is important to select and implement the right performance indicators within the company because these determined metrics can affect the behavior of the company and its employees and enable the company to move in line with its goals. Therefore, a miscalculated KPI can distract the company from its targets (Kaya,2008).

Eckerson (2007) describes the features that KPI must carry as follows “sparse, drillable, simple, actionable, owned, referenced, correlated, balanced, aligned, validated”.

2.2.1. Sparse

If too many KPIs are determined within the company, the control and efficiency of the KPIs are lost in the company, so it is important to identify and monitor a certain number of KPIs (Badawy et al., 2016). It is more useful to start with fewer KPIs and then renew it if needed (Eckerson, 2009).

2.2.2. Drillable

It is very important that the user can drill down into the data used in KPI so that he can better understand the data and better understand the missing point. For example, being able to access the invoice number and the image of the invoice in the KPI related to an expense will make it easier to define the measures to be taken (Presthuss & Canales, 2015).

2.2.3. Simple

It is very significant to train employees to set KPI targets, a high score can mean positive in one KPI, nevertheless negative in another KPI. For example, while a high score is good at measuring customer loyalty, a high score in customer confusion measurement is not a good result. Sometimes the measured value can mean more than one. For example, if a telemarketer makes 20 calls, they can speak effectively, but if they make 30 calls, they may not be able to speak efficiently, so while the increase up to a certain range of values is positive, it can be



negative when it exceeds a certain range of values. Therefore, the goals need to be understandable and simple (Eckerson, 2009).

2.2.4. Actionable

When organizations determine KPIs, they also need to determine what needs to be done according to their results, or they are simply expressed as numbers. Therefore, the measures to be taken by evaluating the results should be determined in line with the objectives. Organizations must identify their personnel tasked with taking action in KPIs. At this time, when the staff member leaves the company and the new staff is inaugurated, it is critical that the new staff are untrained and can make the wrong decisions, unfortunately, analytical literacy in many companies is quite low, so it is important that the newly appointed staff receive training (Eckerson, 2009).

2.2.5. Owned

Creation of persons responsible for KPIs; when a problem occurs, it is necessary to solve the problem, to take the necessary actions. It is possible to monitor whether the specified targets have been achieved, to take the necessary measures if the targets have not been realized, and to ensure improvements by assigning responsibility to a certain group (Eckerson, 2009).

2.2.6. Referenced

If the user does not believe the accuracy of the existing KPI calculation and sees a mismatch when comparing it with the data provided elsewhere, users may not make efforts to achieve its objectives, and if the trust in the company is undermined, it will not be possible to use the KPI to achieve strategic goals. Therefore, it is necessary to understand the methods used in KPI calculation, to know what data is being used, to understand when and how it is updated. The user's trust and understanding of KPI is a guiding force in achieving strategic missions and visions (Eckerson, 2009).

2.2.7. Correlated

KPIs are affected by many environmental and competitive factors, and due to these interactions, they lose their validity and effect over time. Therefore, it is essential to monitor the validity of KPIs. Many KPIs have a lifetime, after a certain period of time, the KPIs need to be renewed. It will be necessary to update the existing KPI targets from time to time to reach the targets in the company in changing situations. If the KPI loses its validity, the effort spent to reach the goal will be wasted. The validity of the KPI is decided in consultation with the relevant persons (Eckerson, 2009).

2.2.8. Balanced

While determining KPIs, the focus should not be on just one factor, but on many factors that the company is in. Many companies focus only on financial factors and do not focus on customers, internal and environmental processes. The determining factors in performance evaluation should be in many ways in balance (Uygur, 2009).

2.2.9. Aligned

Prioritization can be made during the implementation of KPIs. In this way, the work that needs to be done can be ordered and the performance can be used more efficiently (Eckerson, 2009).

2.2.10. Validated

In the process of determining KPIs, both the user and the administrator side should work together, there may be problems in the evaluation of the KPIs determined only by the managers, and it is important to decide together because the employees know these problems



better. In cases where a decision is not made together, users can produce results that deceive the system because they know the system vulnerabilities well, so it is important to decide together (Eckerson, 2009).

2.3. Reading KPIs

KPIs should be easy to read. Many employees do not know how to read KPIs. Understanding and reading the KPIs become easier by understanding the seven factors outlined below.

1. Status: Evaluation of performance against the purpose and is usually indicated by stoplights.
2. Trend: Evaluation should be made according to the performances in the previous period.
3. KPI Name: Names that are generally understandable and facilitate reaching the target should be chosen.
4. Actual Value: It shows the current value of the KPI.
5. Target Value: It specifies the value to be reached.
6. Variance: Microbar chart or bullet is used to measure the gap between actual and target value.
7. Variance Percentage: It is calculated by dividing the calculated variance by the target (Eckerson, 2009).

3. BALANCED SCORECARD

Performance evaluation is carried out on 4 dimensions with the balanced scorecard method, the aim here is to avoid one-way evaluation and focus on other dimensions as much as possible, and the desired target should be clearly stated in the reports (Horngren, and et al, 2003).

Balanced scorecard consists of customer process, financial process, internal business process and learning-growth process. For good performance, companies should be sensitive to customers, learning and development, internal processes and should make an effort to evaluate the performance in this regard (Kaplan, and Norton, 2004).

Financial factors generally focus on past values or values of the current period, but an important issue in KPI evaluation is to set targets for the future and to take the necessary actions in line with these targets. The performance scorecard is used not only in the management stage but in many stages. Decision-makers use performance reports in the decision-making phase, and these reports are usually requested to be on a single report. If there is more than one report, if the data in the reports are not compatible with each other, the decision-maker will be difficult, so the report should be understandable and clear (Zaim, 2002).

When the performance management system is mentioned, financial evaluation systems can be considered first, but other non-financial factors are also very important. With the harmony of financial and non-financial factors, companies will be more successful in reaching their long-term goals (MacStravic, 1999).

Focusing only on financial factors can cause a decrease in financial performance, there may be many factors that affect financially but there are inefficiency that companies are not aware of, increasing the performance of employees has an effect on the financial process, for example, while the completion time of a job is 1-2 months. While reducing this to 2-3 days



seems like an internal process, it is a financial process that affects the costs considerably (Klein, Delenay, and et al, 1999).

In the Balanced Scorecard method, there should be customer focus, financial focus, internal, learning and development focus, but there are different interpretations about which one should be more intense. Below is Norton's proposed system:

Table 1. Norton’s Balanced Scorecard Report

Company Name	Financial Perspective	Customer Perspective	Internal Business Process Perspective	Learning and Growth Process
Brown and Root (Rockwater)	24%	19%	33%	24%
Chemical Bank	22%	22%	34%	22%
Cinga P&G	17%	26%	35%	22%
Mobil USM&R	21%	16%	59%	13%
Norton's recommendation	22%	22%	34%	22%

Source: Mark L. Frigo (2001). 2001 CMG survey on performance measurement: Trends, and challenges in performance measurement, Cost Management Update

Institute of Management Accountants conducted a study with 1300 members. According to the results of the study, quite serious differences were observed between the companies that applied the performance evaluation method and the companies that did not. Balanced and successful performance criteria were determined by those who made performance evaluations. It has been observed that companies that do not make a balanced performance evaluation focus too much on financial processes. The results of the study carried out by the Institute of Management Accountants in 2021 are as follows.

Table 2. 2001 CMG Survey on Performance Measurement

Performance Perspective	Those Who Use Performance Scorecard	Those Who Do Not Use Performance Scorecard	Norton's Recommendation
Financial Perspective	34%	63%	22%
Customer Perspective	21%	8%	22%
Internal Business Process Perspective	29%	20%	34%
Learning and Growth Perspective	16%	9%	22%
Grand Total	100%	100%	100%

Source: Mark L. Frigo (2001). 2001 CMG survey on performance measurement: Trends, and challenges in performance measurement, Cost Management Update

4. METHODOLOGY

In the first stage, the studies published in the academic field were examined. The information obtained about KPIs after the research is used in performance efficiency measurement in airline companies. KPIs to be used in performance measurement in airline companies, the information obtained from the annual reports published by the companies and the studies shared on their own websites were used. The method followed is shown in the figure 3 below.

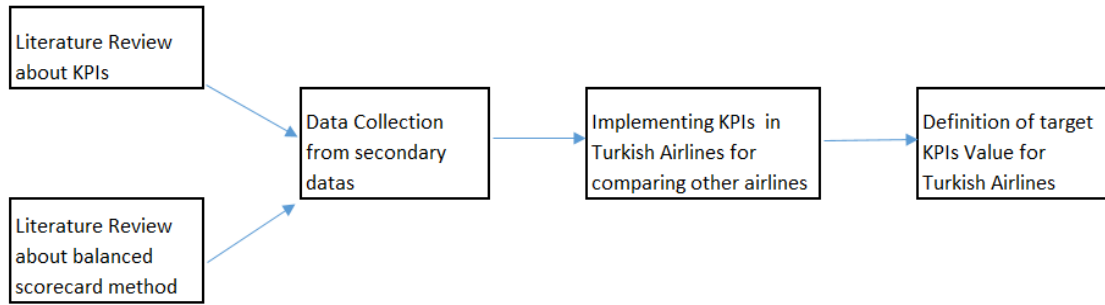


Figure 1. Proposed Methodology

This study was carried out in balanced scorecard methods in the Microsoft excel office program. As the term, 2017, 2018, 2019, and, 2020 affected by the pandemic were selected. The primary sources for the study were obtained from financial statements, annual reports, and other secondary data. The performance efficiency of Turkish Airlines before, and during the pandemic, has been analyzed with the KPIs in excel office programs.

5. CASE STUDY

The research on how KPIs can be used as performance indicators in airlines and how to set future targets has been carried out on the example of Turkish Airlines, established as the State Airlines Administration on May 20, 1933 with a fleet of 5 aircraft, the name of the business was changed to Turkish Airlines (THY) in 1955. Turkish Airlines is Turkey's flag carrier and largest airline operator. Providing service in 127 countries, 319 cities and 323 airports before the Covid-19 outbreak, THY serves as the airline that flies to the most destinations in the world.

Performance indicators were used to compare Turkish Airlines with competitors in aviation. Deutsche Lufthansa AG, Air France-KLM Group and Southwest Airlines were chosen as competitors. The information obtained from the secondary data about the competitors was analyzed by converting them into reports by excel.

5.1. Selected KPIs

The performance indicators to be used in the research created with the information obtained from secondary data are as follows. Some data could not be found in the reports published by the companies, so some comparisons were realized not with four airlines, but in two or even in some cases with the performance of the single airline over the years.



Table 3: Balanced Scorecard KPIs-1

Financial Perspective KPIs	Customer Perspective KPIs
Passenger Revenue to Total Revenue	Revenue Passenger Km
Cargo Revenue to Total Revenue	Revenue Cargo Ton Km
Operational Cost to Total Revenue	Passenger Load Factor
Cah Flow to Total Revenue	Cargo Load Factor
Debt to Equity Ratio	Passenger Carried
Net Income to Total Revenue Ratio	Passenger Catering, and Service Expenses to Number of Passengers
EBITDAR Margin	On-time Departure Rate
RASK	
CASK	
Internal Business Process Perspective KPIs	Organizational Learning, and Growth Perspective
Available Seat Km	Number of Employees
Available Cargo Ton Km	Passenger Per Employees
Average Fleet Age	Staff Cask
Number of Aircraft	Fuel Cask
Number of Flights (Passenger)	Baggage Irregularity Rate (per 1,000 passengers)
	Average Personel age

6. RESULTS AND DISCUSSION

The listed KPIs were analyzed in the pre-pandemic and post-pandemic situation with the balanced scorecard method and the target KPI values were determined.

6.1. Financial KPIs

Financial profitability is aimed at high profitability as a strategic goal, it is an important indicator for companies, and it can be easier to measure than other targets.

**Table 4.**Financial KPIs-1

Financial Perspective KPIs	THY				Deutsche Lufthansa AG			
	2017	2018	2019	2020	2017	2018	2019	2020
Passenger Revenue to Total Revenue	0,86	0,85	0,84	0,56	x	x	x	x
Cargo Revenue to Total Revenue	0,12	0,13	0,13	0,40	x	x	x	x
Operational Cost to Total Revenue	0,93	0,91	0,96	1,08	0,91	0,92	1,02	1,53
Cah Flow to Total Revenue	17,26	12,73	15,69	26,89	5,95	0,59	0,56	- 27,00
Debt to Equity Ratio	2,40	2,49	2,60	3,74	2,93	2,99	3,16	20,74
Net Income to Total Revenue Ratio	2,04	5,86	5,96	- 12,41	6,58	6,09	3,33	- 49,49
EBITDAR Margin	27,53	26,05	23,49	27,71	x	x	x	x
RASK	6,33	7,06	7,05	8,98	12,44	11,97	11,36	14,17
CASK	5,87	6,42	6,74	9,69	11,34	11,02	11,58	21,74

Table 5.Financial KPIs-2

Financial Perspective KPIs	Air France-KLM Group				Southwest Airlines				Target Value for THY
	2017	2018	2019	2020	2017	2018	2019	2020	
Passenger Revenue to Total Revenue	x	x	x	x	0,93	0,93	0,93	0,85	0,85
Cargo Revenue to Total Revenue	x	x	x	x	0,01	0,01	0,01	0,02	0,13
Operational Cost to Total Revenue	0,93	0,95	0,96	1,41	0,84	0,85	0,87	1,42	0,85
Cah Flow to Total Revenue	2,62	0,43	- 1,42	- 51,06	7,07	8,44	11,36	122,27	15,00
Debt to Equity Ratio	11,38	14,58	12,38	- 6,58	1,60	1,66	1,63	2,90	1,95
Net Income to Total Revenue Ratio	0,63	1,54	1,08	- 63,88	15,88	11,22	10,26	- 33,97	12,45
EBITDAR Margin	x	x	x	x	x	x	x	x	27,71
RASK	10,20	10,68	10,16	9,19	13,75	13,75	14,26	8,75	12,00
CASK	9,44	10,14	9,73	12,96	11,53	11,74	12,38	12,43	6,34

6.1.1. Passenger Revenue to Total Revenue

Southwest Airlines and THY compared to the share of passenger revenues in total revenue, a higher rate has been determined on Southwest Airlines, but the fact that it is low on Turkish Airlines does not mean that Turkish Airlines is inefficient. On the contrary, it means that the share of other revenues and cargo revenues on Turkish Airlines is higher than Southwest Airlines. Maintaining pre-pandemic levels of 0.85 is set as the target.

6.1.2. Cargo Revenue to Total Revenue

The ratio of cargo revenue in total revenue is higher than that of Southwest Airlines, which is a positive situation for THY. Some of the damage caused by passenger income less affected by the pandemic period was compensated by cargo revenue and THY compensated the reduced passenger capacity with cargo capacity. Maintaining pre-pandemic levels of 0.13 is set as the target.

6.1.3. Operation Cost to Total Revenue

Southwest Airlines has the least share of its operational expenses in revenue prior to the pandemic. Turkish Airlines is in an improved position than the other two airlines with a level of 0.93. On the other hand, with the pandemic, the situation has changed enormously. Turkish Airlines is in a better position than other airlines during the pandemic period, the reason it is in better condition may be that its cargo revenues have not fallen much. For Turkish Airlines, it was set as a target to return to its pre-pandemic levels in the first stage and then to go down to 0.85 levels in the second stage.



6.1.4. Cash Flow to Total Revenue

The high rate of generating cash from income is a positive situation for companies. The ratio of Turkish Airlines to generating cash from revenue is in good condition compared to other airlines. During the pandemic period, the rate increased with falling incomes, and the target of maintaining the average value of 15 before the pandemic was set as KPI.

6.1.5. Debt to Equity Ratio

Before the pandemic, Deutsche Lufthansa AG and Air France-KLM Group were 7-8 in the debt to equity ratio, while Turkish Airlines was at 2.81. This may indicate that Turkish Airlines manages its debts better. But southwest airlines has a lower rate. Reaching Southwest's 1.95 levels could be the target KPI for Turkish Airlines.

6.1.6. Net Income to Total Revenue Ratio

Both revenues and net income have fallen considerably, resulting in significant declines in net income to total revenue for all airlines. The decline in Turkish airlines during the pandemic period was less than in other airlines. The goal is for KPI to reach the mid-value of Southwest Airlines in the pre-pandemic period of 12.45 after the return to the pre-pandemic period for Turkish Airlines.

6.1.7. Ebitdar Margin

Data on Ebitdar margin to be examined on other airlines has not been found, so the development of Turkish Airlines over the years will be examined. The EBITDAR margin of Turkish Airlines has increased with the pandemic, this is the case that the rate is intended to be high, so maintaining the levels of 27.7 is set as the target.

6.1.8. Risk

Risk value measures the revenue obtained according to the capacity produced. The high risk value indicates that revenues are increasing. Due to the changing ASK values during the pandemic period, there were deviations in the rates. The 12 levels of the other three airlines with an average value before the pandemic were set as the target KPI for THY.

6.1.9. Cask

High risk and low cask values are important financial indicators of airlines' targets. During the pandemic period, all the airlines examined experienced increases due to the decreasing ASK value. Compared to pre-pandemic situations, THY has an advantage over other companies. Maintaining THY's pre-pandemic average of 6.34 may be the target KPI value.

6.2. Customer Perspective KPIs

Determining customer-focused KPI in performance measurement will contribute to the development of the company. The KPIs we have determined for THY in the aviation sector we have examined are as follows. Data that we cannot find in published data is shown as "x".

**Table 6.** Customer Perspective KPIs-1

Customer Perspective KPIs	THY				Deutsche Lufthansa AG			
	2017	2018	2019	2020	2017	2018	2019	2020
Revenue Passenger Km (million)	136.927	149.169	153.203	53.249	261.149	284.639	296.217	69.462
Revenue Cargo Ton Km (million)	x	x	x	x	10.819	10.896	10.664	7.373
Passenger Load Factor	79,1	81,9	81,6	71,0	80,9	81,5	82,6	63,2
Cargo Load Factor	x	x	x	x	68,67	66,65	61,36	69,62
Passenger Carried ('000)	68.632	75.168	74.283	27.950	129.300	141.900	145.300	36.400
Passenger Catering and Service Expenses to Number of Passenger	7.431	7.450	8.373	7.764	x	x	x	x
On-time Departure Rate	80%	83%	81%	90%	x	x	x	x

Table 7. Customer Perspective KPIs-2

Customer Perspective KPIs	Air France-KLM Group				Southwest Airlines				Target Value for THY
	2017	2018	2019	2020	2017	2018	2019	2020	
Revenue Passenger Km (million)	248.475	255.405	263.509	81.212	129.041	133.322	131.345	54.221	222.567
Revenue Cargo Ton Km (million)	8.595	8.657	8.467	6.829	x	x	x	x	>10.793
Passenger Load Factor	86,8	87,4	87,9	58,8	83,9	83,4	83,5	52,4	84,0
Cargo Load Factor	59,89	60,26	57,96	67,47	x	x	x	x	70
Passenger Carried ('000)	98.721	101.447	104.214	34.065	130.256	134.890	134.056	54.088	124.000
Passenger Catering and Service Expenses to Number of Passenger	7.972	7.718	5.038	7.427	x	x	x	x	7.751
On-time Departure Rate	x	x	x	x	x	x	x	x	>=90%

6.2.1. Revenue Passenger Km (million)

A revenue passenger kilometer denotes one paying passenger transported for one kilometer. In the pre-pandemic period, Turkish Airlines ranks last in comparison with competitors in RPK value, the reason for the low RPK value is not only due to the number of customers, the number of planes that exist and the low ask value produced compared to the competitors affects this performance criterion. For Turkish Airlines, this key performance indicator can set the target value at 222,567 as of the average of the three airlines.

6.2.2. Revenue Cargo Km (million)

A Revenue Cargo tonne Km denotes one tonne of load (passengers and/or cargo) transported one kilometer. No information about revenue cargo km was found on Turkish Airlines. Deutsche Lufthansa AG and Air France KLM were evaluated and the target value for Turkish Airlines to reach the higher value (10,793) than the average of the two was determined.

6.2.3. Passenger Load Factor

It measures capacity utilization in percent. Its formula is Revenue Passenger kilometers/ Available Seat Kilometers. The passenger load factor shows how effectively the company uses the capacity it supplies. Increasing this rate means that the number of passengers increases and the company's preferability increases. The occupancy rate of Turkish Airlines before the pandemic is close to Lufthansa but below the others. The target value for Turkish Airlines is to reach pre-pandemic levels and then the average level of other airlines is 84.



6.2.4. Cargo Load Factor

Information about the cargo load factor could not be found among the data published by Turkish Airlines. Therefore, the target KPI for Turkish Airlines has been determined through the data of Deutsche Lufthansa and Air France KLM group, where we have access to their data. It is set as a goal to perform above the highest value of the two airlines, 69.

6.2.5. Passenger Carried ('000)

Due to the pandemic on all airlines, the number of passengers has fallen significantly, the most important crisis affecting the number of passengers that the aviation sector has seen so far. Returning to pre-pandemic levels is the first goal of the aviation sector. When the performance before the pandemic is examined, it appears that Turkish Airlines has a low passenger number compared to its competitors, the low capacity produced in this data has an effect. Therefore, both increasing capacity and increasing the number of passengers will be the target of Turkish Airlines, and the target KPI value is 124,000, which is the average of the other three airlines, for the long term.

6.2.6. Passenger Catering, and Service Expenses to Number of Passengers

One of the important determinants of passengers' preference for airlines is the services and catering services offered by the airlines. There are also costs for these services for airlines. Therefore, the benefit and the cost should be harmonious. Prior to the pandemic, the cost of catering for Turkish Airlines was higher than in Air-France. Maintaining the average levels of 7,751 levels in the pre-pandemic period was determined as the target value.

6.2.7. On-Time Departure

Data on on-time departure rates can only be found on Turkish Airlines, so the performance efficiency of Turkish Airlines has been evaluated over the years. With the transition to the new airport, Turkish Airlines has increased its on-time departure rate. Maintaining this rate at 90% or even increasing it to higher levels is determined as the target value.

6.3. Internal Business Process Perspective KPIs

Internal business process perspective examined situations such as internal production capacity and average fleet age. The data that we cannot find in published data is shown as "x".

Table 8. Internal Business Process Perspective KPIs-1

Internal Business Process Perspective KPIs	THY				Deutsche Lufthansa AG			
	2017	2018	2019	2020	2017	2018	2019	2020
Available Seat Km (million)	173.084	182.031	187.713	74.960	322.875	349.391	358.803	109.828
Available Cargo Ton Km	x	x	x	x	15754	16349	17379	10591
Average Fleet Age	7,7	8,2	8,3	8,4	11,4	11,9	12,1	12,5
Number of Aircraft	329	332	350	363	728	763	763	757
Number of Flights (Passenger)	469.580	493.876	486.940	209.581	1.128.745	1.163.565	1.187.728	390.900

**Table 9.** Internal Business Process Perspective KPIs-2

Internal Business Process Perspective KPIs	Air France-KLM Group				Southwest Airlines				Target Value for THY
	2017	2018	2019	2020	2017	2018	2019	2020	
Available Seat Km (million)	286.190	292.184	299.624	138.167	153.811	159.795	157.254	103.456	292.666
Available Cargo Ton Km	14352	14365	14609	10121	x	x	x	x	>17754
Average Fleet Age	x	x	x	x	11,00	11,00	12,00	18,00	8,00
Number of Aircraft	545	548	554	546	706	750	747	718	546
Number of Flights (Passenger)	x	x	x	x	x	x	x	x	821.739

6.3.1. Available Seat Km (Million)

The ASK value produced has decreased significantly in Turkish Airlines as other airlines with the pandemic. Compared to the pre-pandemic period, THY is higher than Southwest Airlines at ASK value but it is lower than the other two airlines. The value of Air-France KLM group, which has a pre-pandemic average above Turkish Airlines and whose difference with Turkish Airlines is not very high, has been set as a target value of 292,666.

6.3.2. Available Cargo Ton KM (Million)

Available Cargo Ton KM generation higher than the average value of Deutsche Lufthansa AG and Air France-KLM group is set as the target value.

6.3.3. Average Fleet Age

Modern and new aircraft consume less fuel and are more environmentally conscious. As the age of the aircraft is less, expenses such as maintenance decrease. Turkish Airlines has newer aircraft than its competitors, and maintaining these levels is set as the target value.

6.3.4. Number of Aircraft

Among the airlines compared are Turkish Airlines with the fewest number of aircraft. With the increase in the number of aircraft, the capacity values produced will increase indirectly in values such as the number of passengers. The number of 2020 aircraft belonging to Air-France KLM, which is closest to THY, can be determined as the target value.

6.3.5. Number of Flights (Passenger)

In the number of flights (passenger) KPI, THY is well below Deutsche Lufthansa. It is aimed to reduce the difference with Lufthansa, so the target value is 821.736, which is half the difference with Lufthansa.

6.4. Organizational Learning, and Growth Perspective

Growth-focused KPIs in Turkish Airlines for organizational growth and development are determined as follows. The values that cannot be found are shown as "x".



Table 10. Organizational Learning and Growth Perspective KPIs-1

Organizational Learning and Growth Perspective	THY				Deutsche Lufthansa AG			
	2017	2018	2019	2020	2017	2018	2019	2020
Number of Employees	31.543	35.275	38.804	37.841	128.856	134.330	137.784	125.207
Passenger Per Employees	2,2	2,1	1,9	0,7	1,0	1,1	1,1	0,3
Staff Cask	1,0	1,0	1,1	1,5	2,9	3,0	2,8	6,7
Fuel Cask	1,7	2,1	2,1	2,2	1,8	2,0	2,1	2,0
Baggage Irregularity Rate (per 1,000 passenger)	0,51%	0,52%	0,50%	0,39%	x	x	x	x
Average Personnel age	34,6	34,5	34,5	35,2	42,2	41,5	41,6	42,4
Total Revenue to Number of Employees	347.399	364.422	340.918	177.955	311.595	311.267	295.910	124.307
Staff Costs to Total Revenue	0,2	0,1	0,2	0,2	0,2	0,2	0,3	0,5

Table 11. Organizational Learning and Growth Perspective KPIs-2

Organizational Learning and Growth Perspective									Target Value for THY
	2017	2018	2019	2020	2017	2018	2019	2020	
Number of Employees	83.522	84.714	86.138	82.167	56.110	58.803	60.800	56.500	38.804
Passenger Per Employees	1,2	1,2	1,2	0,4	2,3	2,3	2,2	1,0	2,3
Staff Cask	3,0	3,1	3,0	4,4	4,7	4,8	5,3	6,6	1,0
Fuel Cask	1,8	2,0	2,1	2,0	2,7	2,9	2,8	1,8	1,9
Baggage Irregularity Rate (per 1,000 passenger)	x	x	x	x	x	x	x	x	0,39%
Average Personnel age	x	x	x	x	x	x	x	x	35,2
Total Revenue to Number of Employees	349.499	368.215	353.308	154.558	376.867	373.535	368.882	160.142	373.095
Staff Costs to Total Revenue	0,3	0,3	0,3	0,5	0,3	0,3	0,4	0,8	0,2

6.4.1. Number of Employees

When the pre-epidemic period is examined, the minimum number of employees in THY is visible due to the low number of aircraft. It is aimed to increase the number of personnel by increasing capacity. Increasing the number of aircraft and personnel above 2019 levels may be the goal of the post-normalization future.

6.4.2. Passenger Per Employees

It is trying to understand how many passengers are obtained by the number of staffs working, the high rate is the target value. THY's value is greater compared to its other two competitors, but it is below Southwest Airlines, with Southwest Airlines' target value of 2.27.

6.4.3. Staff Cask

Before and after the pandemic, Turkish Airlines have a lower cask value than other airlines. Low cask value is a positive situation for airlines. Maintaining this level is the target value for THY.

6.4.4. Fuel Cask

With the decreasing ASK value in the post-pandemic period, the fuel cask ratio in THY has increased, but fuel cask KPI management before the pandemic is better than competitors. For



THY, maintaining pre-pandemic levels is set as the target value.

6.4.5. Baggage Irregularity Rate (per 1,000 passengers)

While THY's pre-pandemic value was 0.50%, it decreased to 0.39% after the pandemic. Maintaining or even going down to 0.39% levels is set as the target value.

6.4.6. Average Personnel Age

THY's staff age is younger than Deutsche Lufthansa AG, the younger the staff, the more dynamic and more innovative structure. Therefore, maintaining 35 levels is set as the target value.

6.4.7. Total Revenue to Number of Employees

In the pre-pandemic period, the ratio of total revenue to passenger numbers is close to the Air France KLM group and below Southwest Airlines. Southwest Airlines' average value is 373,095 target values.

6.4.8. Staff Costs to Total Revenue

When the pre-pandemic levels are examined, the ratio of personnel expense to total income is quite low, despite the number of personnel planned to be taken for future growth, keeping this rate low is determined as the target value, and it is also aimed to increase the personnel and revenues to be taken.

6.4.9. Social Responsibilities

Climate crises, natural disasters, water crises, environmental pollutions have led to increased environmental and social responsibility projects. There are many social responsibility projects of competitors and THY, some of which are aimed at reducing the environmental benefits. The continuation of these projects and the addition of new ones are designated as the target KPI.

7. CONCLUDING REMARKS

With the Balanced Scorecard method, Turkish Airlines was examined with three competitors we selected, taking into account the pre-pandemic and post-pandemic periods. The results found are our interpretations of the reviews, they are not definitive information and should not be used for decision making. The result of our review consists of our comments.

Our comments on financial KPIs are as follows.

Returning to pre-pandemic levels can be determined as the target value in the ratio of passenger revenue to total revenue KPI (%85) and Cargo revenue to total revenue KPI (%13). The importance of cargo revenue has increased with the pandemic, and it has been determined as the target value to return only to pre-pandemic rates without losing this income and market share.

Turkish Airlines is in a respectable position compared to its competitors in terms of operational cost in total revenue and cash flow to total revenue KPIs. Maintaining these levels is set as the target value.

Reaching Southwest's 1.95 levels in Debt to Equity ratio KPI was determined as the target value.

During the epidemic, Turkish Airlines increased the EBITDAR KPI value. Maintaining the 27.7 levels reached during the pandemic period has been determined as the target value.



There were also serious deviations in cask values during the pandemic period. Before the pandemic, Turkish Airlines has a lower cask value compared to other airlines and is beneficial. Maintaining 6.34 levels was determined as the target value.

Turkish Airlines has a low RASK value compared to its competitors. The target value was set to reach 12 levels, which is the average value of the other three airlines.

Our comments for customer-oriented KPIs are as follows.

Turkish Airlines has a low RPK value associated with its competitors. Reaching the value of 222.567, which is the average value of the other three airlines, was determined as the target value.

Detailed information on revenue cargo ton-km and cargo load factor could not be obtained from Turkish Airlines, therefore, it was determined as a target to generate revenue cargo-ton km (10.793) above the average of the values of Deutsche Lufthansa AG and Air France KLM.

Turkish Airlines are below their competitors in the passenger carried KPI, and the target value can be set to reach 124.000 levels, which is the average of the other three airlines, and performance can be increased.

The load factor ratio KPI is close to Lufthansa but below other airlines before the pandemic period. Achieving 84% levels, which is the average of the other three airways, will increase performance.

Maintaining the average level of 7,751 in the pre-epidemic period could be target value for Turkish Airlines in the services and catering services KPI.

With the move to the new airport, the on-time departure rate KPI has increased. It could be determined as the target value that this ratio, which is around 90%, is not to be lowered, and if possible, this ratio should be approached to 100%.

Our comments for internal business process perspective KPIs are as follows

In the ASK KPI target, the value of THY is below the values of Lufthansa and Air-France AG, but the difference with Air-France is less, so the target value can be determined as the target value of 292,666, which is the three-year average of the Air-France KLM group before the pandemic.

Kilometer tons of cargo can be selected as the target KPI for Turkish Airlines to be above the average value of Deutsche Lufthansa AG and Air France-KLM group.

The number of aircraft of THY is below its competitors. With the increase in the number of aircraft, the ASK value, the number of passengers and passenger revenues will also increase. The number of aircraft of Air-France KLM closest to THY for 2020 could be determined as the target value. However, Turkish Airlines has newer aircraft compared to its competitors, and keeping the aircraft fleet younger in its age is also a KPI that should be followed.

The number of flights (passengers) in THY is below Deutsche Lufthansa as KPI. Levels of 821,736, which is half the difference with Lufthansa, can be set as the target KPI value.

Our comments for organizational learning and growth perspective KPIs are as follows:

Turkish Airlines is below the other airlines due to the low number of aircraft in the KPI value for the number of personnel. The improvement of the situation that has worsened with the pandemic and exceeding the number of personnel in 2019 (38,804) have been determined as the target value.

The Passenger Per Employees KPI target is below Southwest Airlines' target value but above the other two airlines. 2.27 can be set as the target value for Turkish Airlines.



THY is more successful than its competitors in the management of fuel cask and staff cask KPIs. Maintaining pre-pandemic levels in fuel cask and staff cask KPIs could be selected as the target value for Turkish Airlines.

The baggage irregularity rate has decreased on Turkish Airlines after the pandemic. This low ratio is important for performance management. Therefore, maintaining 0.39% levels could be an indicator for a successful performance.

THY employees are younger than Deutsche Lufthansa AG. Maintaining the average age of THY as 35 and lowering it if possible can be set as the target value.

The ratio of total revenue KPI, THY is close to the Air France KLM group, but under Southwest Airlines. Choosing Southwest Airlines' average value as a target value of 373,095 could help to increase performance.

The ratio of personnel expenses to total income is low in Turkish Airlines. This shows that the staff is working efficiently. Maintaining this efficiency in the future has been determined as the target value.

Due to increasing environmental pollution, natural disasters, diseases, and water crises, the importance of social responsibility projects has become significant in the aviation sector as well as in all other sectors. THY and other rival airlines develop many projects in terms of social responsibility, many projects such as the development of aircraft that cause less harm to the environment and less noise pollution are involved in the aviation sector. The continuation of social responsibility projects and the addition of new ones have been determined as the target value for Turkish Airlines.



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