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Relationship of Covid-19 Pandemic on Performance and Internal Operation of The Airline

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Abstract. *Air transport business is challenged to oversee their performance and operations to preserve their business presence within the COVID-19 widespread. It is fundamental to distinguish the suitable performance and operation and their relationship with the pandemic. In this way, we used the indicators to employ a systematic literature review and experts' point of view to select and group suitable indicators to address the literature gap. Twenty performance and internal operations indicators are identified and redefined from the review. The Delphi method's result suggests eight indicators categorized in airline performance indicators and seven indicators categorized in internal operation indicators. We investigate the relationship of COVID-19 pandemic on the selected indicators using SmartPLS based on fifty-two weeks performance, and operation report of one of full-service airline started from 08 March 2020 until 28 February 2021. It can be deduced that the COVID-19 pandemic has a significant and negative influence on the airline's performance. This study fills the gap by synthesizing and creating suitable and comprehensive performance and operation indicators of air transport carriers in a pandemic situation and their relationships. Finally, this study provides an invaluable point for analyzing the air transport carrier industries in a pandemic to maximize performance through profitability and load factors indicators.*

Keywords: *Airline, Pandemic, Performance, Operation*

1. Introduction

Many studies have been conducted to distinguish performance and operations indicators to assist companies in preparing their strategic plan (Jenatabadi & Ismail, 2014). Chen, Chen, and Wei (2017) researched to analyze the relationship between state ownership as the external factor and profitability as a performance indicator and fleet size as operation indicators of Chinese Airlines using regression. See and Abdul Rashid (2016) analyze the total factor productivity using the number of passengers, RTK, and load factor as performance indicators and the number of employees, fleet size, and the fuel burned as operation indicators.

The air transport carrier is confronting complex challenges due to the COVID-19 widespread. Worldwide RPK is assessed to diminish by 58% at the beginning semester of 2020 compared to last year (IATA, 2020). COVID-19 widespread has sensational results for nearly all carriers universally, driving to a sharp increment in liquidations (Czerny, Fu, Lei, & Oum, 2021). Air transport carrier business in such highly challenging conditions will depend intensely on their strategic performance and operations that permit them to adjust rapidly and viably to the conditions (Ismail & Jenatabadi, 2014) of the COVID-19 pandemic. Hence, recognizing the leading and appropriate indicators for the performance and operations amid the COVID-19 is vital.

In any case, most of these were carried out beneath ordinary conditions. The aviation industry is now facing difficult challenges due to the pandemic condition. Peoples, Abdullah, and Satar (2020) said that the potential crisis in the aviation industry due to the current pandemic is predicted to be more severe than economic crises. Carriers have to decide on special critical operations to differentiate and meet the challenges of widespread conditions. Hence, it is fundamental to distinguish the

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suitable performance and operation and their relationship with the pandemic. In this study, we explore the indicators of performance and internal operation of the airlines using a systematic literature review. Furthermore, Experts consisting of five panels select and rank the most suitable indicators obtained.

Then the relationship of the selected indicators and COVID-19 Pandemic will be investigated. This study seeks to bridge the existing literature gap by synthesizing and developing new and more complete airline performance and internal operation indicators in a pandemic context and investigating their relationship.

2. Literature Study

The airline business model has various shapes and sizes, such as full-service airlines, low-cost airlines, and charter operators. A full-service carrier or FSC is defined as an airline developed from a former state-owned airline through market deregulation. LCC is defined as an airline that is designed to have a competitive advantage in terms of cost of operation. A charter airline or CC is defined as an airline that operates flights outside the regular schedule. The ticket is not sold directly by the airline but rather by the tour operator that has chartered the flight (Hanlon, 2007).

According to Castro, Rocha, and Olivera (2014), airlines operate in a dynamic and highly competitive business environment. Airline operations are vulnerable to external factors such as rising fuel prices, increased competition, weakening consumer demand, and political conditions. So many airlines develop, operate, and continuously improve their businesses in response to market conditions.

According to Slack, Brandon-Jones, and Johnston (2011), operation management is the activity of managing resources that create and provide services and products. The function of operation is essential for the organization because it creates services and products that are the reason for its existence. Research on operational of airlines divide the type of operations into two categories namely operating inputs and operating outputs (Barbot, Costa, & Sochirca, 2008), (Caridá & Bonizio, 2018), (da Silveira Pereira & de Mello, 2021), (Ismail & Jenatabadi, 2014), (KeskİN, UlaŞ, & BİLek, 2018), (KİRaci & Yaşar, 2020), (Peoples et al., 2020), (See & Abdul Rashid, 2016), (Singh, Sharma, & Srivastava, 2019), (Zhang, Koutmos, Chen, & Zhu, 2019), (Teker, Teker, & Güner, 2016).

The category of internal operation according to da Silveira Pereira and de Mello (2021), Barbot et al. (2008), Bhadra (2009), and See and Abdul Rashid (2016), divided the category of internal operation into the categories of operating inputs and operating outputs indicators. The input category in operations is resources (da Silveira Pereira & de Mello, 2021) owned by airlines such as fleet size (Bhadra, 2009), network size (Ismail & Jenatabadi, 2014), number of take-offs (da Silveira Pereira & de Mello, 2021), fuel burn (Zhang et al., 2019), and number of employees (Barbot et al., 2008).

Table 1.
Airlines Operational Inputs

No	Internal Operations Indicators	Definition
1	Fleet Size	The number of aircraft used by the airline (Budd & Ison, 2017).
2	Network Size	The number of the route between two cities or airports (Ismail & Jenatabadi).

Table 1. (Continued)
Airlines Operational Inputs

No	Internal Operations Indicators	Definition
3	Number of Take-offs	The number of conditions in which the aircraft is accelerated from rest to airspeed to provide sufficient lift for flight (FAA, 2004).
4	Fuel Burn	The actual quantity of fuel consumed by an airline (See & Abdul Rashid, 2016).
5	Number of Employees	The number of individuals that are employed by the airline (Ismail & Jenatabadi, 2014).

Meanwhile, the output category is the result of operating activities (da Silveira Pereira & de Mello, 2021) such as available seat kilometers (Ismail & Jenatabadi, 2014), aircraft kilometers (Ismail & Jenatabadi, 2014), available tones kilometers (da Silveira Pereira & de Mello, 2021), and the number of departures (Czerny et al., 2021).

Table 2.
Airlines Operational Output

No	Internal Operations Indicators	Definition
1	Available Seat Kilometers	The number of seats and route distance available for sale (Doganis, 2002).
2	Aircraft Kilometers	The distances flew by aircraft (Doganis, 2002).
3	Available Tones Kilometers	The number of cargo freight volumes and route distance available for sale (Doganis, 2002).
4	Number of Departures	The number of accessibility of an airline to its customers (Ismail & Jenatabadi, 2014).
5	Passengers Service Expense	The amount of money expands on passengers service (Vasigh, Fleming, & Humphreys, 2015 2015).
6	Promotion Expense	The amount of money expands on communication with customers (Shaw, 2007).

According to Jenatabadi and Ismail [4], airline performance was divided into financial and non-financial performance indicators. Financial performance is defined as performance indicators that have a direct impact on profit (Jenatabadi & Ismail, 2014), such as revenue passengers kilometers (Ismail & Jenatabadi, 2014), revenue tones kilometers (Czerny et al., 2021), stock prices (Chuang, Chiu, & Edward Wang, 2008), profitability and solvency ratios (Chen et al., 2017).

Table 3.
Airlines Financial Performance Indicators

No	Airline Performance Indicators	Definition
1	Revenue Passengers Kilometers	The number of fare-paying passengers on a flight by the distance flown (Kearns, 2018).
2	Revenue Tones Kilometers	The number of fare-paying cargo freight on a flight by the distance flown (Budd & Ison, 2017).
3	Stock Prices	The firm's market value (Chen et al., 2017 2017).
4	Profitability	The ratios consist of return on assets, return on equity, gross margin, operating margin, and net margin (Banks, 2007).
5	Solvency	The ratios consist of debt to equity and debt to assets (Banks, 2007).
6	Ancillary Revenue	The revenue earned by an airline from sources other than the sale of passengers seats (Cook & Billig, 2017).

Non-financial performance is an indicator of performance that does not directly impact the profitability of an airline (Ismail & Jenatabadi, 2014), such as load factor (Gyanwali & Walsh, 2019), market share (Jenatabadi & Ismail, 2014), and the number of passengers (See & Abdul Rashid, 2016).

Table 4
Airlines Non-Financial Performance Indicators

No	Airline Performance Indicators	Definition
1	Load Factor	The ratio of the number of passengers to the number of seats on a flight (Budd & Ison, 2017).
2	Market Share	The percentage of total demand earned by a company compare to the industry over a specified period (Cook & Billig, 2017).
3	Number of Passengers	The numerical number of fare-paying passengers transported by the airline (KİRaci & Yaşar, 2020).

In the implementation of this research, several related studies are used as references. In 2014, Hashem Salarzadeh Jenatabadi and Noor Azina Ismail conducted research entitled "Application of Structural Equation Modeling for Estimating Airline Performance." (Jenatabadi & Ismail, 2014). This empirical study presents SEM procedures with latent variables to analyze the influence of economic condition and estimate performance indicators consisting of the load factor, operating profit, RPK, market share, and internal operation indicators consisting of departures, aircraft length stage, advertising expense, and aircraft vehicle kilometers in airlines. The sample in this study amounted to 214 global airlines. The finding of this research is the economic situation has a significant effect on internal operation and performance. This research is the primary reference journal for this research, with some modifications to be made.

The first modification is related to the scope of Jenatabadi and Ismail (2014) research which uses a sample of 214 airline companies in normal condition. At the same time, this study will focus on one company, namely

Garuda Indonesia, with a sample size of the airline's performance and operational achievements for 52 weeks from February 2020 to February 2021 in the COVID-19 condition. The air transportation demand dropped significantly since the COVID-19 outbreak, impacting the first quarter of 2020 for airlines around the world IATA (2020). The airlines began adjusting their air network to these new conditions. Daily departures in South America fell by more than 90% in March 2020. Whereas according to Quilty, Clifford, Flasche, and Eggo (2020), air transportation is critical because it has to do with the economics of any country.

Modifications Furthermore, related to the determination of airline performance indicators and internal operations. Airline performance and internal operation indicators will be identified using a systematic literature review and expert judgment in aviation. If Jenatabadi and Ismail (2014) only rely on indicators from previous research, the Delphi method will be used in this study to obtain reliable indicators of airline performance and internal operations with high consensus. According to Hirschhorn (2019), The Delphi method is designed as an organized participatory process for building consensus. Delphi relies on a sequence of questionnaires distributed to selected experts through several stages consisting of brainstorming, narrowing, and ranking. There is no specific amount regarding the number of experts required in the Delphi process.

The main focus is not on the number of experts involved but rather the quality of experts with good experience and knowledge (Skinner, Nelson, Chin, & Land, 2015). Smaller groups are better than larger groups for accuracy and consensus speed (Chao & Yu, 2013). However, according to Akkermans, Bogerd, Yücesan, and Van Wassenhove (2003) to avoid the risk of Delphi method results with expert responses containing biases, there is one important aspect in the characteristic of Delphi method is the size of the group panel must consist of at least 20 respondents of experts.

3. Methodology

This research uses qualitative and quantitative methods. The qualitative method that used in this research is the systematic literature review, and Delphi. Furthermore, follows by a quantitative method to describe, explain, and predict the situation based on secondary data from the weekly report of Garuda Indonesia for 52 weeks from 08 March 2020 to 28 February 2021 using SmartPLS v.3.3.3. In general, this research was conducted with the following stages:

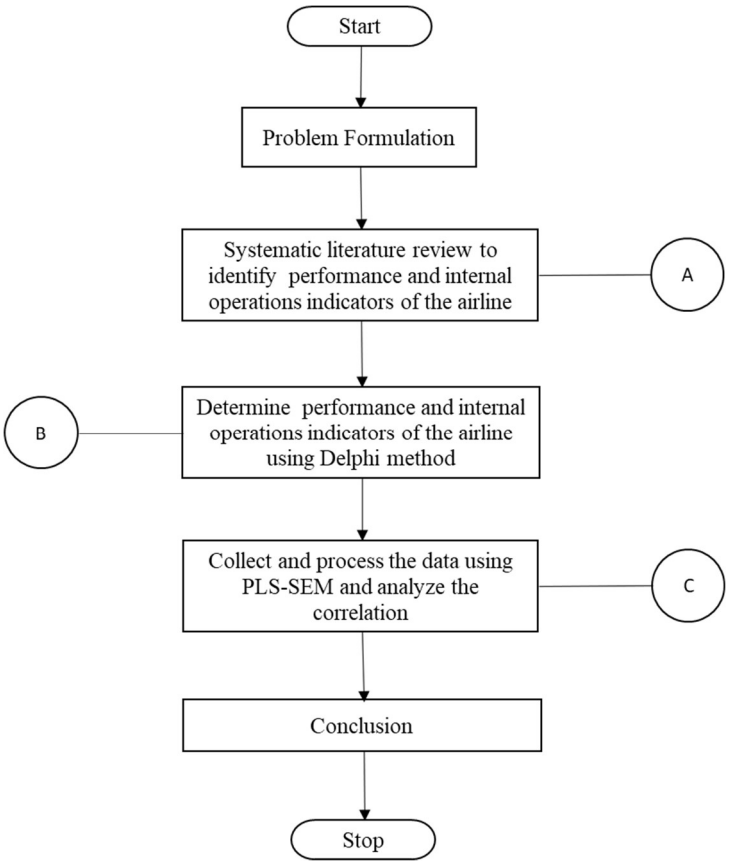

Figure 1.
Research Process

a. As the basis of the research, the formulation of the problem is based on the identification of airline performance indicators and internal operations from several previous research sources. Systematic literature review is conducted with various terms and conditions to produce related research. Review and mapping were obtained to identify airline performance and internal operation indicators used in previous research. A summary of identified airline performance and internal operating indicators as the output of systematic literature review process will serve as the basis for the next process.
b. The list of airline performance indicators and internal operations resulting from review will be selected again by experts using the Delphi method. However, not only choose but experts will also be asked to add indicator of airline performance and internal operations if they have their own opinions. Furthermore, experts will be asked to categorize the airline performance into the category of financial and non-financial performance indicators as well as the internal operations into the category of input and output of internal operation indicators. The suitable financial and non-financial performances as well as input and output internal operation indicators resulting from the Delphi method will be analyzed for correlation between the weekly new case of COVID-19 pandemic.
c. This research focuses on the impact of exploratory signage between variable and complex structural models, so PLS-SEM is chosen for use to analyze the results. In this research, exogenous variables are pandemic COVID-19 and endogenous variables are the performance and internal operations of the airline.

The systematic literature review provides an outline of modern hypothetical and methodological patterns of the previous research (Arviansyah & Tan, 2011) in distinguishing the performance and operations of the air transport carrier. We surveyed the full paper based on the relevant articles and performed a forward and backward search as the figure below:

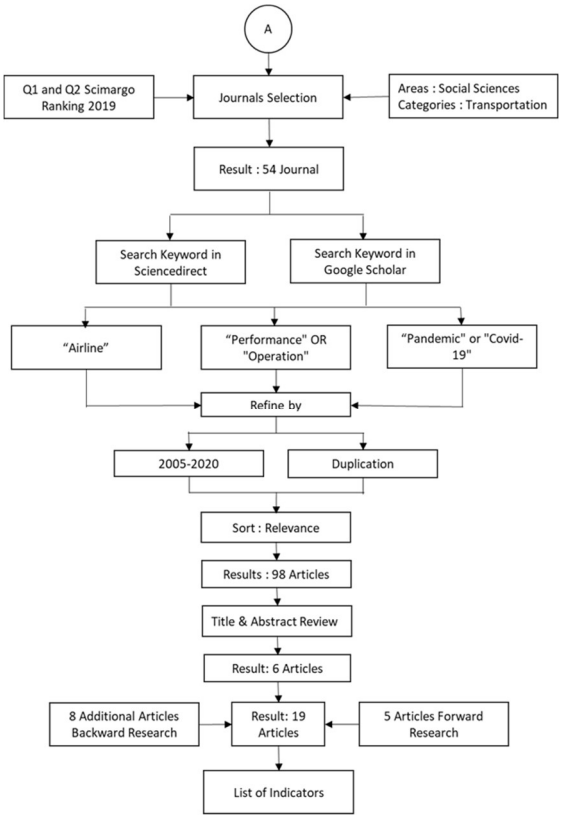

Figure 2.
Indicators Identification Process

Obtained 6 articles that will be used as a reference in this research. The 4 articles are from the Journal of Air Transport Management with four articles and come from Transportation Research Part A: Policy and Practice as many as one article, as well as one article from Sustainable Cities and Society. Furthermore, of the 6 articles obtained, a backward search was carried out by looking at the references used, while forward research was conducted using Google Scholar to identify further research using reference 6 articles. Then, exploration with the same mechanism as before so that obtained 13 additional articles consisting of 8 articles of backward results and 5 articles of forward results. Gotten nineteen articles and twenty indicators of the performance and internal operation included in this research.

The airline performance categories are synthesized from Jenatabadi and Ismail (2014), dividing airline performance into financial and non-financial indicators. The internal operations categories are synthesized from Singh et al. (2019), dividing the internal operation into input internal operation and output internal operation. We ask the experts to select suitable indicators into their categories. To determine the consensus level, we calculated the degree of the consensus by using a cut-off of 60% above will be selected in this study.

Table 5
The Description of Expert Involved

Name	Job Description	Experience
Expert 1	Responsible for strategic investment for business development at Airport Company	More than 5 years
Expert 2	Managing the sales operation of Z Airlines at Ukraine	More than 5 years
Expert 3	Lecturer in Aviation Management of X University at United Kingdom	More than 5 years
Expert 4	Lecturer in Aviation Management of X University at United Kingdom	Less than 3 years
Expert 5	Responsible for corporate strategy for corporate planning at Airport Company	More than 5 years
Expert 6	Aviation consultant for Airline in Uni-Emirates Arab	Less than 3 years
Expert 7	Managing the technical operation of X Airlines in Indonesia	More than 5 years
Expert 8	Managing the corporate strategy of X Airlines in Indonesia	More than 5 years
Expert 9	Responsible for air transport operations and tariffs of scheduled commercial air transportation in DGCA	More than 5 years
Expert 10	Member of International Air Transport Association in Atlanta, Georgia, USA	More than 5 years
Expert 11	Responsible for air transport operations and tariffs of scheduled commercial air transportation in DGCA	More than 5 years
Expert 12	Managing the corporate strategy of Y Airlines in Indonesia	More than 5 years

Thus from the result of systematic literature review obtained research model estimates used to find out the relationship of the COVID-19 pandemic on performance and operations as follows:

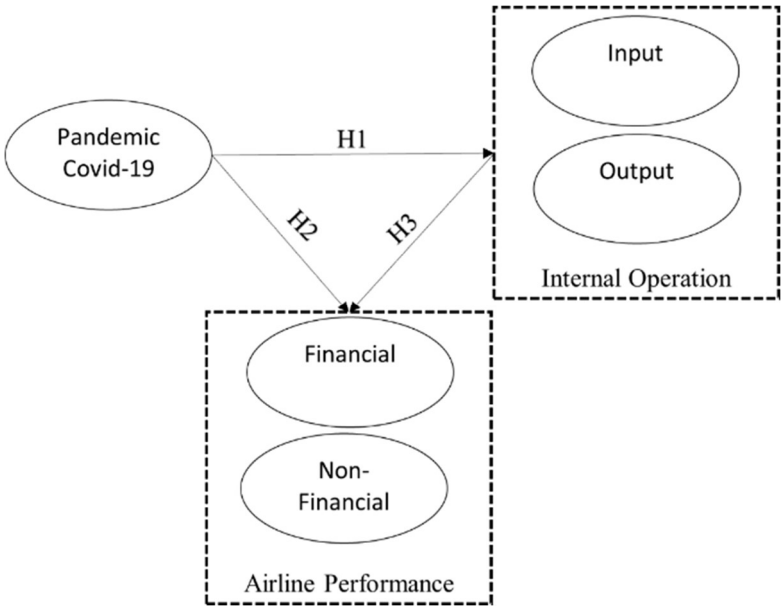

Figure 3.
Estimate Research Model

Furthermore, the indicators and categories collected based on the systematic literature review results, as shown in Figure 2, will be confirmed using the Delphi method. The results of the Delphi method will produce indicators and categories that will be used in the research model in this study. The secondary data is weekly performance and operational report of Garuda Indonesia during 52 weeks started from 08 March 2020 until 28 February 2021 and the weekly new cases of COVID-19 pandemic are obtained from the BNPB Indonesia contained in www.bnpb-inacovid19.hub.arcgis.com.

According to Hair Jr (2020), structural equation modeling is a critical analysis tool because assessing the predicted strength of statistical models is an essential element of almost all social science research. PLS-SEM is the procedure for estimating a set of relationships that have mutual dependence between a group of concepts or constructs represented by various measured variables and integrated into a model (Malhotra & Dash, 2016).

The reflective model measurement consisting of three tests consist of internal consistency reliability by looking at composite reliability should be greater than 0.70. Then the reliability indicator by looking at the loadings. The indicator must be greater than 0.70. Finally, convergent validity by looking at the AVE must be greater than 0.50 (Ghozali & Latan, 2015; Hair, Ringle, & Sarstedt, 2011). The structural model measurement consists of several tests such as multicollinearity by looking at each variance inflation factor must be less than 5, then R^2 must be 0.75, 0.50, or 0.25 for endogenous variables latent in a structured model, and significance testing by looking at the value of Critical t- values for the two-tailed tests are 1.65. The significance level is 10%, 1.96, the significance level is 5%, and 2.58, the significance level is 1% (Ghozali & Latan, 2015; Hair et al., 2011).

4. Finding and Discussion

The systematic literature used in this study compiled the performance and internal operation indicators. Nineteen articles were obtained from the systematic literature review process and generated twenty airline performance indicators and internal operation.

The calculation shows that the experts agree with the categorization result. 87% for airline performance and 83% for the internal operation from the total number of experts involved rate a "strongly agree" of a five-scale Likert. Meanwhile, each region's interquartile range calculation results also meet the terms of Giannarou and Zervas (2014). The below one indicates that experts' opinions do not vary. The standard deviation value for both indicates the consensus of experts with a value below 1.5, which indicates that experts' opinions are somewhat similar. Secondary data obtained from one of the full-service airlines in Indonesia is then tested to determine whether the data is reliable and valid using SmartPLS 3.3.3 version.

In this study, the variables in the measurement model are divided into two categories, namely the reflective measurement model and the formative measurement model. Reflective variables are performance variables that consist of financial and non-financial sub-variables. This variable is evaluated in the measurement model by looking at internal consistency, convergent validity, and discriminant validity values. In comparison, the formative variable is the internal operation variable which consists of input and output sub-variables that will be evaluated by looking at the value of the variance inflation factor and the significance of the outer weight.

SmartPLS calculate the reflective model measurement. Reflective measurement model used to calculate internal consistency reliability and convergent validity. Cronbach's Alpha value must be greater than 0.60 to pass the internal consistency reliability test. In addition, to pass the reliability indicator test,

the loadings indicator must be greater than 0.70. Meanwhile, to pass the convergent validity test, the average variance extracted or AVE value must be greater than 0.50.

Internal consistency testing was conducted to determine the reliability of the measurement model. The results can be seen from the value of Cronbach's alpha and composite reliability on the test results with a minimum value of 0.70 each. Based on the results of the internal consistency testing carried out, it can be seen that the Cronbach's alpha value owned by each variable has met the requirements with the result value above 0.70. Likewise, the composite reliability value possessed by each variable in the research model has met the requirements with a result value above 0.70, as shown in Table 6 below:

Table 6.
Internal Consistency Test Result

Variable	Cronbach's Alpha	Composite Reliability
Financial Performance (FP)	0.971	0.976
Non-Financial Performance	0.861	0.935
Pandemic (CV)	1.000	1.000
Performance (AP)	0.978	0.981

Source: Reproduced from SmartPLS output

Measurement of convergent and discriminant validity was carried out to determine the level of validity of each indicator used in the measurement model for each variable. The measurement of convergent validity is carried out by evaluating the average variance extracted (AVE) value with a limit of more than 0.50. In addition, to evaluate the reliability indicator, it is done by looking at the value of the outer loading that is greater than 0.70. Additionally, discriminant validity is measured by evaluating the outer loading value and the Fornell-Larcker criterion.

Table 7.
Convergent & Discriminant Validity Test Result

	AVE	FP	NF	Pandemic	Performance
CV	1.000	(0.953)	(0.914)	1.000	(0.948)
FP1	0.873	0.967	0.928	(0.980)	0.962
FP2		0.964	0.925	(0.987)	0.959
FP3		0.961	0.947	(0.861)	0.962
FP4		0.954	0.964	(0.938)	0.961
FP6		0.872	0.807	(0.768)	0.859
FP7		0.884	0.879	(0.793)	0.887
NF1	0.878	0.888	0.934	(0.751)	0.904
NF3		0.935	0.940	(0.958)	0.942

Source: Reproduced from SmartPLS output

It can be seen in Table 7 that all variables in the model have met the minimum required AVE value of 0.50. Pandemic (CV) has the highest AVE value of 1.00, then the financial performance (FP) of 0.873, and non-financial variable (Méndez-Suárez & Monfort, 2020) of 0.878. All factor loadings are higher than 0.700, which passes the indicator's reliability

test. There are indicators factor loading values below 0.700, such as FP5 with a value of 0.523, FP8 with a value of 0.022, and FP9 with a value of (0.153). Those indicators are unacceptable, so the authors eliminate the indicator from the financial performance variable (FP). In addition, the NF2 indicator with a value (0.061) in the non-financial performance (Méndez-Suárez & Monfort, 2020) variable having an outer loading value below 0.70 is unacceptable, so the author eliminates the indicator from the non-financial performance (Méndez-Suárez & Monfort, 2020) variable. Table 7 has adjusted the outer loading figure after this indicator is removed. In addition, an evaluation of discriminant validity is also carried out by looking at the outer loading value between an item, and the item itself must have a higher value than the outer loading value with other items so that the cross-loading conditions can be met. From the evaluation of discriminant validity, it was found that all indicators that were not eliminated from each of the variables had met the requirements, with the loading value of each latent construct having the highest value compared to the loading value of other latent constructs. This illustrates that the items used are correct and do not measure other theoretical concepts other than their latent constructs. The Fornell-Larcker criterion test was carried out as the next step. This test aims to determine the level of discriminant validity. Based on the results of data processing, it was found that all variables in this research model were valid because they had the same variance at most with the latent construct itself.

Table 8.
Fornell-Larcker Criterion Test Result

Variables	FP	NF	Pandemic	Performance
FP	1.000			
NF	0.974	1.000		
Pandemic	(0.953)	(0.914)	1.000	
Performance	0.998	0.985	(0.948)	1.000

Source: Reproduced from SmartPLS output

In the formative model measurement, several stages of testing need to be carried out, starting from testing the Variance Inflation Factor (VIF) value, testing the Outer Weight significance value through the bootstrapping process on the SmartPLS 3.3.3 version. Variance Inflation Factor (VIF4 is used to measure the level of collinearity between indicators in a formative measurement model. According to Hair et al. (2017), in the context of PLS-SEM, the Variance Inflation Factor (VIF) with a value of 5 or above indicates a potential collinearity problem. In this study, the VIF value obtained did not exceed the value 5, where the value obtained was in the range of 1.018 to 1.018, as can be seen in table 4.6. From this, it can be confirmed that the latent variables of each category are not indicated to have collinearity problems and can be continued by testing the significance of the weight factor.

Table 9.
Variance Inflation Factor Results

Variable	Indicators	VIF
Internal Operation	IO1	1.377
	IO3	1.377
	OI1	1.018
	OI4	1.018

Source: Reproduced from SmartPLS output

After several indicators have been removed, the model research that will be used to measure the structural model can be seen in the following figure:

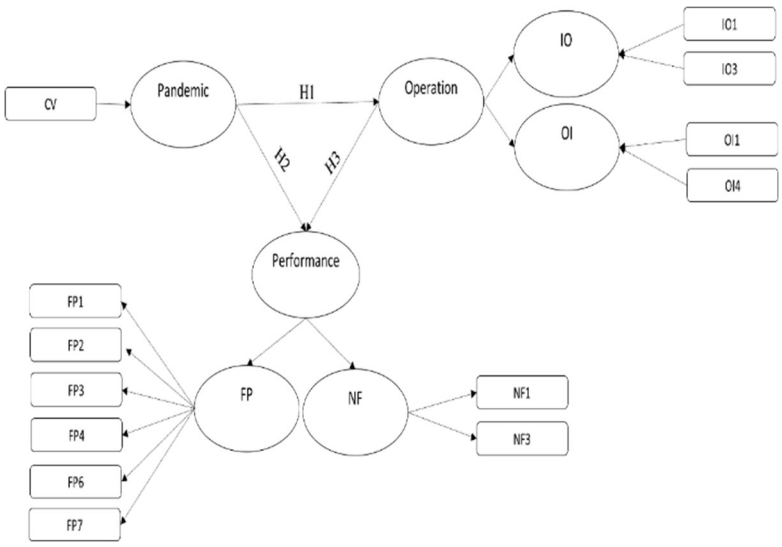

Figure 4.
Research Path Diagram After Removing Indicators

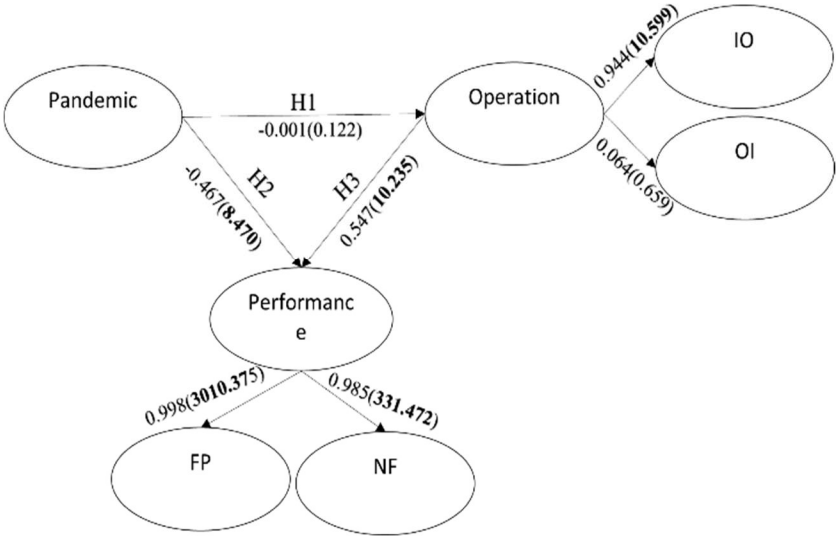

Figure 5.
PLS Path Diagram Result

Measurement of the model structure is used to review the significance of the indicators from the data collected. With a significance level of 5%, the indicator weight or t-value must be more than 1.96 to meet the requirements of a significant indicator. The structural model testing is done using the SmartPLS software with the bootstrapping test function. The results show that t-values for all variables are above 1.960 (5% significance level), except for the COVID-19 Pandemic to Internal Operation with a result value of 0.121. For detailed t-value and p-values can be seen in Table 10 below:

Table 10

T-Values and P-Values Result Relation	Original Values	T Statistics	P Values	Remarks
Internal Operation → Airline Performance	0.547	10.235	0.000	Supported by Data
Pandemic COVID-19 → Airline Performance	-0.467	8.470	0.000	Supported by Data
Pandemic COVID-19 → Internal Operation	-0.001	0.122	0.904	Not Supported by Data

Source: Reproduced from Smartpls Output

These results show the relationship between Internal Operations to Airline Performance and the COVID-19 Pandemic to Airline Performance, except the COVID-19 Pandemic to Internal Operations, are not supported by data. The results of the tests carried out show that H1 regarding the effect of the COVID-19 pandemic on Internal Operations does not have a significant effect and is not supported by data. Meanwhile, H2 regarding the effect of the COVID-19 pandemic on Airline Performance has a significant influence and is supported by data. And H3 regarding the effect of Internal Operations on Airline Performance has a significant influence and is supported by data.

5. Conclusion

This study aimed to distinguish the suitable performance indicators and internal operations during the pandemic and investigate the influence of the COVID-19 pandemic with those indicators. This study synthesizes performance indicators and internal operations during the pandemic from previous studies using a systematic literature review. We also propose categorizing performance indicators and internal operations based on the consensus of experts generated from the Delphi method.

Twenty airline performance and operation indicators were identified from nineteen articles as a result of systematic literature review. The Delphi method has been used to determine airline performance and internal operation indicators and their categorization. There are eight indicators selected as the most important airline performance indicators which are divided into two categories, namely financial performance and non-financial performance obtained from the process with a high consensus score among the twenty-three experts in air transportation involved. The financial performance category consists of profitability, revenue tones kilometers, revenue passengers' kilometers, solvency, and ancillary revenue. Meanwhile, the non-financial performance category consists of load factor, on-time performance, and number of passengers.

Furthermore, there are seven indicators selected as the most important internal operation indicators which are divided into two categories, namely internal operation inputs, and internal operation outputs. The internal operation input category consists of fleet size, network size, and number of employees. Meanwhile, the internal operation output category consists of number of departures, available tones kilometers, fuel burn, available tones kilometers.

We reveal that the profitability and load factor are the most vital indicators for an airline's performance to maintain its business continuity in a pandemic condition. Moreover, the fleet size and the number of departures are the most critical indicators for the airline's internal operation. It can be deduced that the COVID-19 pandemic has a negative influence on airline performance of

the airline. Furthermore, this study contributes to the performance and operations management literature outline by defining categories of performance indicators and internal operations during a pandemic. Finally, this study has an invaluable starting point for examining the aviation industry's dynamic.

The results of this study can help add insight and provide solutions to related companies and the internal operations of an airline during a pandemic. To maximize performance amid the pandemic, the evaluation focus on indicators of financial performance and non-financial performance with the most important order based on the results of the Delphi method, namely their respective profitability and load factors. During the COVID-19 pandemic, the trend of revenue from passenger flows has decreased drastically. However, revenue based on cargo flow tends to increase. Therefore, there is an opportunity for airlines to maintain profitability through revenue sources from tone kilometer revenue and additional revenue. To maximize the revenue of the kilometer tone, the company can convert the income from the flow of people transportation into the flow of freight. In addition, the Load factor indicator which is the level of aircraft content is categorized as the most important non-financial performance during a pandemic. The load factor tends to decrease sharply during the pandemic. Therefore, the load factor must be controlled to maximize efficiency to avoid losses. This can be done by rescheduling the aircraft with a lower seat load factor to avoid losses.

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