Determining the Factors affecting Aircraft Lay-up Coverage in Iranian Aviation Industry with the Panel Data Approach

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Submit: 17/08/2024 Accept: 07/09/2024

ABSTRACT

The aviation industry is a new and business industry that is rapidly changing and developing. Hence, its development and changes occur before ratification of relevant laws. For this reason, it is required to identify the relations between the players in the aviation area as best and regulate and codify the air rights related thereto. Therefore, the aim of the present research is to determine the factors affecting aircraft lay-up coverage in Iranian aviation industry with a panel data approach. The present research has analyzed the factors affecting aircraft lay-up coverage using the panel data econometric method, studying on 12 airline companies during 2014 to 2021. Accordingly, the model has been estimated using panel data method in a static mode and the approach of fixed effects in sections and applying the weighted least squares method. In this research, the effect of the number of flights, flight hours, carried passenger, distance traveled, available seat kilometer, passenger capacity factor, weight capacity factor on lay-up coverage in domestic and foreign flights was tested. The results demonstrated that all variables had a significant effect on the lay-up coverage in the domestic flights, but in foreign flights, only the variables of number of flights, flight hours, passenger capacity factor, weight capacity factor had the required significance.

Keywords: Aircraft Insurance Policy Management, Aviation Industry, Iran, Lay-up Approach, Panel Data Method

1. Introduction

The aviation industry has faced various challenges in the past decade, such as Asian financial crisis, September 11, SARS, and high fuel price. These economic, public health and political events have incurred severe financial losses to the industry. New airport security requirements and passenger concerns about flight safety caused a sharp drop in passengers demand. As a result, a lot of airlines and insurance companies have either bankrupted or restructured. Historically, insurance theory was based on the "law of large numbers", which may be defined as a means for risk reduction by combining a sufficient number of homogeneous facing units to predict individual losses collectively. Due to the inherent risk and high premiums paid by airlines, insurance policyholders assume pricing increasingly difficult and fluctuating. Most articles written for and about airlines have focused on industry performance and management, but very few studies have studied on the aviation insurance issue. Most articles focused on the effect of airline insurance on air transport laws and manners (El-Kasaby et al, 2003), post- 9/11 responses (Caplan, 2004), aviation insurance underwriting (Woods, 1993), and pricing issues (Lane, 2005).

By reviewing the insurance industry share in the economy of developed countries, it is concluded that this industry is one of the most important bodies of the economic development of countries. Therefore, the insurance industry has a greater and more significant role and importance compared to other services (Shayestehpour and Fatemi, 2022). The progress and spread of insurance is effective on improvement of industries and economic development status of countries, and if the economy of a country does not rely on the insurance and its security, it will be exposed to numerous threats and risks. From the macro viewpoint, insurance in the economy causes preservation of national wealth, guarantee, development and investments, establishment of credit, development of exchanges and improvement of foreign currency balances, and from micro viewpoint entails increase of the willing for saving, increase of the efficiency of merchants, financial security for commercial activities and effective help in the relative distribution of costs. Today, insurance has reached a position that can play a key role in the economy through creating confidence in the economic activities. Various studies indicate that generally there is a direct relationship between insurance penetration rate and per capita income of countries. Therefore, it can be said that development and insurance are necessary for each other (Central Insurance of the Islamic Republic of Iran, 2021). One of the most important inventions of the 20th century was the invention of airplane, which made a revolution in the transportation industry. Gradually, due to the expansion, growth and advancement of technology in the air transportation industry, this part of transportation acquired a major share of passenger and cargo transport in the world. Increasing the speed of transportation and high technology used in this sector is of the most important reasons for the popularity of air transportation among different transportation methods. This popularity has caused passengers to prefer airplanes to any other form of transportation, especially in the long distances. In addition, merchants inevitably must use this type of transportation to transport perishable cargos to distant regions. Therefore, expansion of air transportation is effective on the economic growth and development of the country. Aviation industry due to the need to advanced technology and high costs in the third world countries has not an appropriate status. In the Islamic Republic of Iran, in addition to the two challenges mentioned above, the aviation industry is also facing other challenges. In this study, we attempted to determine the factors effective on aircraft lay-up coverage on Iranian aviation industry with the panel data approach.

Theoretical Foundations

Aviation insurance is a unique field based on the biasness, legal and supervising perspectives (El Kasaby et al., 2003). After September 11, aviation insurance that is necessary for airlines operation, became a key factor in airline management. Aviation hazards are very complex and costly. Therefore, risks are usually shared by several insurances with a specific aviation insurance market. Each insurer is responsible for a part of the risk it has agreed to cover. Besides, direct insurers put part of their risk in the reinsurance market to distribute the cost of risks arising from the financial responsibility of compensation. Aviation risks assessment is related to the rare events that occur in irregular time intervals (Thomson et al., 2004). Airlines purchase aviation insurance to cover the cost of their daily potential catastrophic risks. Although insurance does not eliminate the risk of accidents, but it helps airlines to avoid financial problems arising from aircraft accidents (Lane, 2005).

Aviation insurance is an ideal risk management instrument from financial perspective of an airline company. Its purpose is to manage net risks to guarantee the financial ability of company at the lowest possible cost (Wells and Chadbourne, 2000). Most importantly, it plays an important role in airlines management. Even though the advanced technology provides incredibly capable machines, plane crashes still happen. Hence, risk transfer through insurance is necessary and risk assessment is necessary as well. For example, traditionally, the fair premium in insurance pricing is equal to the expected loss arising from underwriting risk (Tsanakas & Desli, 2005). Therefore, airlines cannot ignore the importance of risk management to achieve more appropriate insurance premiums.

Based on these arguments, a two-dimensional risk analysis matrix was used to analyze the exposures. The degree of loss is displayed on the vertical axis and the frequency on the horizontal axis. The resulted four quadrants are: Avoided and Controlled Losses, Transferred Risk, Risk Done or Ignored, and Prevented-Mitigated Risk. In the avoided and controlled loss quadrant, the high-frequency and high intensity of exposure means that these items are not probably transferrable. Measures to be taken for prevention of total loss or use crisis management for damage control. Loss characteristics in the transferred risk quadrant are important for airlines with large assets under risk management. Since the companies using company resources must avoid paying such large losses, they must attempt to transfer these items to the others. High accident costs may be reduced through insurance coverage. In the accepted or ignored risk quadrant, the airlines usually manage the adequate funds, use franchises and self-insurance programs, or create a captive insurance company to manage these risks, or in general ignore them, because only results in partial evacuation of company resources. The preventive-mitigated risk quadrant includes exposures of low intensity but relatively high frequency. As discussed above, airlines are currently developing and using new safety management techniques to prevent major disasters associated with human errors.

Aircraft Lay-up Coverage

If an aircraft has been grounded within a year and no lay-up addendum has been issued for it, the agreed number of grounded days in the insurance policy of each aircraft are summed together over year, and lay-up addendum is issued for 75% of the body insurance premium and their franchise. According to the letter of central insurance and Clause AVN26A regarding the aircrafts lay-up is applied only for the body insurance policy and the body franchise. As per letter written by the policyholder to three insurance companies about the inquiry from central insurance and how to calculate the return and lay-up addendum, replies have been sent from different insurers as follows:

According to the letter of the first insurance company, based on the inquiry made from Central Insurance Company, it was agreed to calculate the liability insurance premium and return it to the policyholder. According to the letter of second company, the insurer after inquiry from Central Insurance Co.:

1) At the time of plane grounding, the franchise insurance premium like body coverage is refundable (in the same calculation method), but the war insurance premium is not refundable.
2) At the time of plane grounding and notice to the insurer during the period, a grounding addendum is issued, and in such circumstances, 100% of the insurance premium is laid up to the passengers-crew and third parties for the remaining days. Therefore, according to the agreement made with this company in order to prevent the multiple issuance of addendum during insurance policy period, at the end of period, the lay-up premium will be calculated and returned like as the grounding addendum.

According to the letter of third insurance company:

1) Returning the insurance premium from the lay-up period of the aircrafts inserting the Clause AVN26A is only possible in the body insurance policy, and in regard to the body franchise insurance, since the above clause is not inserted in the relevant insurance policy, it is not possible to calculate lay-up.
2) In regard to the liability insurances, the insurer also shall notify the insurer of the changes on

time and upon plane grounding, to calculate the lay-up premium.

How to calculate the aircraft body and franchise Lay up:

The insurance premium for body of each aircraft (main insurance policy + additional addendums – lay-up addendums) × 75% × number of Lay-up days (15 consecutive days) = Lay-up of the body of each aircraft

The franchise insurance premium for each aircraft (main insurance policy + additional addendums – lay-up addendums) × 75% × number of lay-up days (15 consecutive days) = franchise lay-up of each aircraft (Farokhi, 2024)

Methodology

The characteristic or feature of a person, object or situation is called a variable, which includes a series of values with proportional classifications. In order to test the research hypothesis, regression model is used.

The reason for using the regression model in the present research is that the present research in terms of nature is correlational and intends to measure and express the relationships between variables.

Whereas in this research we intend to investigate the role of insurance premium of navigation, airline share in the airline industry and the available seats with lay-up of Iranian airlines, according to the explained concepts, the regression model of this research is as follows:

$$LAY\ UP_{it}=\alpha_0+\alpha_1\ INSURANCE_{it}+\alpha_2\ SHARE\ AVIATIONSIZE_{it}+\alpha_3\ SEAT\ AVAILABLE_{it}+\alpha_4\ PASSENGER_{it}+\varepsilon_{it}$$

Model elements are as follows:

INSURANCE: insurance premium

SHARE AVIATIONSIZE: Aviation Share

SHARE AVIATION: Aviation Share in industry

SEAT AVAILABLE: Seat available

PASSENGER: Transported passenger

ε: Model error

Panel data estimation method

Panel data is a term for combining cross-sectional observations of countries and households during multi-year periods. In fact, in econometric literature, statistical information related to the pooled data, time and cross-sectional series are called panel data. In better words, there are sections that it is not possible to separate the data in terms of cross-section and time, or their combination provides better results than each one of them.

Estimating the equations in the panel data mode depends on the assumptions that are applied to the coefficients, y-intercept and the error term. However, these assumptions are different from the classic assumptions, because initially it is assumed that $u_{(i,t)} \sim N(0,\sigma^{\wedge 2})$ is random and the rest of the assumptions are running. The new assumptions are in addition to the classic assumptions.

For estimation of panel data, five modes are considered, as follows:

First mode: Y-intercepts and the coefficients between sections and periods are equal, but the error terms are different during the periods and between errors. This is the simplest approach that may be estimated with ordinary OLS. This mode is like the number of sections multiplied by the number of periods, meaning there is N.T observations.

Second mode: The coefficients of slopes are fixed, but the y-intercepts between different sections are different. One way to account for the nature of cross-sectional units is that the y-intercepts to be different, meaning that each section has a y-intercept, but the coefficients are equal, which is known as fixed effect model in econometric literature. This model is also called Least Square Dummy Variable (LSDV).

Third mode: The coefficients of the slopes are fixed, but y-intercepts between sections and periods are different.

Fourth mode: All coefficients between different sections are different. It means each section has its own function and these functions are different from each other. If the fourth mode is confirmed significantly, indicates that the data cannot be pooling.

Fifth mode: y-intercepts and slopes for different sections and periods to be different (Bahifar et al., 2021)

Findings

In this part, to enter the data analysis stage, the descriptive statistics of the data such as mean, median, mode, variance, standard deviation, and Jarque-Bera Test, which examines the normal distribution of the residuals, have been calculated.

Tables 1 and 2 displays the results of descriptive statistics of model variables.

At first, to enter the data analysis stage, the descriptive statistics of the data such as mean, median, mode, variance, standard deviation and also Jarque-Bera Test, which examines the normal distribution of the residuals, have been calculated.

Table 1- Descriptive indicators of domestic flights

Indicator	Number of flight	Flight hour	Carried passenger(O&D)	Distance travelled (thousand kilometers)	seat kilometers offered (thousand)	Passenger capacity factor (%)	Weight capacity factor (%)	Lay-up coverage
Mean	13279.95	19224.43	1625621.	11533.80	1727168.	77.70370	68.60494	-852755.1
Median	12457.00	16398.00	1423173.	10460.00	1431976.	81.00000	71.00000	-703470.0
Maximum	34935.00	73760.00	16443714	90708.00	26323289	97.00000	96.00000	-41690.00
Minimum	537.0000	565.0000	10324.00	265.0000	8212.000	30.00000	34.00000	-2804346.
Standard deviation	7644.161	12714.07	1856034.	10635.93	2889074.	12.68310	16.97622	685608.4
Skewness	0.355408	1.333065	6.352412	5.231151	7.740741	-1.309260	-0.505650	-1.231157
Kurtosis	2.884019	6.198840	51.52055	39.32667	66.51211	5.506674	2.245300	4.004145
Jarque-Bera	1.750650	58.52530	8490.339	4823.167	14422.94	44.34771	5.374006	23.86562
Probability	0.416727	0.000000	0.000000	0.000000	0.000000	0.000000	0.068085	0.000007

Table 2- Descriptive indicators of foreign flights

Indicator	Number of flight	Flight hour	Carried passenger(O&D)	Distance travelled (thousand kilometers)	Seat kilometers offered (thousand)	Passenger capacity factor (%)	Weight capacity factor (%)
Mean	2697.880	7828.470	408476.7	17462.22	1036908.	72.02410	62.25301
Median	1145.000	2677.000	152322.0	1661.000	257150.0	75.00000	63.00000
Maximum	14622.00	50679.00	3269322.	594802.0	9599420.	96.00000	153.0000
Minimum	1.000000	2.000000	127.0000	1.000000	235.0000	33.00000	23.00000
Standard deviation	3632.375	12445.26	611994.2	69631.93	2041797.	16.07981	20.41212
Skewness	1.899005	2.231960	2.405029	7.264689	3.025149	-0.884305	0.827015
Kurtosis	5.751728	7.026664	9.131413	59.07816	11.80507	2.958286	6.018220
Jarque-Bera	76.07258	124.9863	210.0276	11605.69	394.7179	10.82362	40.96558
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.004464	0.000000

If the skewness coefficient is zero, the community is completely symmetrical, and if the coefficient is positive, there will be a skewness to the right, and if it is negative, there will be a skewness to the left. The kurtosis of frequency curve compared to the standard normal curve is called kurtosis or elongation. If the kurtosis is around zero, the frequency curve will be balanced and normal in terms of kurtosis, if this value is positive, the curve is prominent and if it is negative, the curve is wide. The kurtosis of all variables of this model is positive.

Statistical tests required for multivariate regression analysis

In this research, regression analysis and panel data method have been used to test the main hypotheses and lateral models. Prior to model estimation, in order to ensure the research results and the non-fakeness of the relationships in the regression and significance of the variables, stationary test was performed and the unit root of research variables was calculated in the models. The said test was made using Eview s 12 software and Levin, Lin and Chu test (2002), Jm, Pesaran and Sin test (2003), Fisher-Ausmented Dickey-Fuller unit Root (Fisher-ADF) test and Fisher-Phillips-Perron (Fisher-PP) test (1999). In the unit root test, hypothesis zero indicates the existence of unit root, and in case the table probability is lower than 0.05, hypothesis zero is not accepted with a probability of 95%. The results of the unit root test for the variables of the final models are as per Table (1):

According to the significance level value of this test, which equaled 0.0 for all variables and lower than 0.05, it can be said that the research variables values have the required reliability. Therefore, all studied variables are stationary from zero degree I(0) and do not need to be differentiated.

According to the results of table (1), it was specified that all variables are at the stationary level based on the 4 conducted tests. Stationary test is not performed for fictitious variables that get code 0 and 1.

Table 3- Results of research variables stationary test

Levin, Lin &Chu			
Probability	**Statistic**		
0.000	-5.08103	Number of flights	Domestic flights
0.000	-3.90325	Flights hours	
0.000	-3.87757	Carried passenger(O&D)	
0.000	-7.11475	Distance travelled (thousand kilometers)	
0.000	-7.23093	Seat kilometers offered (thousand)	
0.000	-4.00790	Passenger capacity factor (%)	
0.000	-3.65214	Weight capacity factor (%)	
0.000	-2.94073	Number of flights	Foreign flights
0.000	-8.01904	Flights hours	
0.000	-2.50995	Carried passenger(O&D)	
0.000	-2.92299	Distance travelled (thousand kilometers)	
0.000	-3.04370	Seat kilometers offered (thousand)	
0.000	-6.64292	Passenger capacity factor (%)	
0.000	-9.46941	Weight capacity factor (%)	
0.0137	-2.20453	Lay-up coverage	

Variance heterogeneity test

Variance homogeneity is one of the most important assumptions of the linear regression model, so that U_{it} disturbance elements that appear as community in the regression function have the homogenous variance, if this assumption is not satisfied, we will have the variance heterogeneity. Due to the variance heterogeneity, based on the Bartlett and Levin test, the estimated generalized least square (EGLS) is used for its remedy.

Model estimation and final model analysis

In the present research, the said models are estimated using the pooled data model. Accordingly, several companies are examined and analyzed over time. In the panel data analysis, a very rich environment of information is provided for development of estimation techniques and analyzable results. In many cases, the researchers may use pooled data for cases that cannot be examined only as time series or only as cross-section. As mentioned in the third chapter, in the pooled data, at first "Leamer F-test" is used to choose between the panel data and pooled data. If the calculated p-value is more than error level 5%, pooled data will be used, otherwise panel data will be used.

In case the data is in panel form, "Hausman test" is used to investigate whether y-intercept is a fixed effect or acts randomly in the structure of cross-sectional units. If the probability of Hausman test is lower than 5%, hypothesis zero (random effects) is rejected and fixed effects are selected, and if the probability of Hausman test is over 5%, hypothesis zero is not rejected and random effects are selected.

Chow test

Therefore, in order to test the research hypotheses, at first the time fixed effects model is estimated. Then the Chow test was used to check if these y-intercepts statistically have significant difference with each other or not. In continue, to estimate the model, at first, two Chow and Hausman tests were conducted to check if the model was done as a pool or panel, or as fixed or random effects.

Table 4- Results of Chow Test

Test effect	Test statistics	Significance level
Statistic F	21.345519	0.0000
chi-square (χ^2) statistic	136.534402	0.0000

Whereas the test statistic is higher than critical point, as a result, the hypothesis based on the use of Pool is rejected. Thus, the panel data method has been used to estimate the model.

The results of Hausman test:

In order to determine the type of model used in pooled data, Hausman test was used. This test was used to choose between using fixed effects or random effects model. The results of Hausman test are shown in Table 5.

Table 5- Results of Hausman Test

	chi-square (χ^2) statistic	Significance level
Random effect in sections	19.675737	0.0406

Whereas the test statistic is higher than critical point and P-Value value is lower than 0.05, as a result, hypothesis H_0 based on the equal y-intercept was rejected. Therefore, the fixed effects method was used to estimate the model.

Estimation of Model 1 of domestic flights:

In consideration of the models obtained in previous parts, and according to the research hypotheses, using the pooled data method in the static state and the fixed effects approach using weighted least squares (generalized) regression, two models as fixed effects in sections were estimated: The results of model estimation using fixed effects approach in section and applying the weighted least squares method are shown in Tables 6 and 7.

Table 6- The results of model estimation in the mode of fixed effects in sections and applying weighted least squares method

Variables	Coefficients	Standard deviation	T statistic	P-value
Number of flights	28.61430	8.937469	3.201611	0.0021
Flights hours	-9.628166	2.548792	-3.777541	0.0003
Carried passenger(O&D)	-0.026981	0.004456	-6.055110	0.0000
Distance travelled (thousand kilometers)	-4.640423	1.068549	-4.342733	0.0001
Seat kilometers offered (thousand)	-0.015599	0.005031	-3.100324	0.0029
Passenger capacity factor (%)	12433.62	2264.994	5.489472	0.0000
Weight capacity factor (%)	6232.914	3649.477	1.707893	0.0924
C	-2302460.	206620.1	-11.14345	0.0000

Root MSE	255726.2	Coefficient of determination	0.875281
Mean dependent var	-954258.2	Adjusted coefficient of determination	0.840743
S.D. dependent var	706638.5	S.E. of regression	290708.8
Sum squared resid	5.49E+12	F statistic	25.34286
Durbin Watson statistic	1.983424	Significance level of F statistic	0.000000

The results of model estimation in the static state and using the fixed effects approach in sections and applying the weighted least squares method are shown in the above equations. The results of fixed effects demonstrate that the independent variables have a significant effect on the dependent ones. Namely, paying attention to T statistic value, which is higher than critical statistic value of the table, and also according to the probability value of these independent variables is lower than 0.05, it shows that this variable has the required significance at the confidence level95%. Moreover, according to the regression coefficients table, the coefficient of determination (R^2) value in the studied model is equal to 0.88 and the generalized R^2 value is estimated to be equal to 0.84, which shows high explanatoriness of the model. According to F statistic which is equal to 25.34 and the significance level value (P-Value) of this statistic which equaled 0.00, it is to claim that the whole model is statistically significant. Furthermore, Durbin Watson statistic also shows that there is no autocorrelation in the above model.

Estimation of model 2 of foreign flights

The results of model estimation in a static state and using the fixed effects approach in sections and applying the weighted least squares method are shown in the above equations. The results of fixed effects indicate that the independent variables excluding three variables (carried passenger(O&D), distance traveled (thousand kilometers) and seat kilometers offered (thousands)) have a significant effect on the dependent variable. In other words, paying attention to the value of T statistic, which is higher than the critical statistic value of the table, and also according to the probability value of these independent variables lower than 0.05, it shows that this variable has the required significance at the confidence level95%. Besides, according to the regression coefficients table, the coefficient of determination (R^2) value in the studied model is equal to 0.84 and the generalized R^2 is estimated to be equal to 0.79, which shows the high explanatoriness of the model. According to F statistic which is equal to 19.28 and the significance level (P-Value) of this statistic which equaled 0.00, it can be said that the whole model statistically has the required significance. In addition, Durbin Watson statistic also shows that there is no autocorrelation in the above model.

Considering that the data to be studied in regard to the regression assumptions, since if the regression assumptions are not seriously established, the significance levels, confidence intervals and other regression tests are sensitive to these assumptions and the regression may not be interpreted normally. Therefore, the residuals normality test (difference between actual value and the estimated values) has been used to assess the accuracy of the regression model. For this purpose, Jarque-Bera test was used to check the assumption of residual normality in the regression model. As observed in the above table, the results of residual normality test, since the significant level or P-Value statistic is higher than 0.05% in all section, hypothesis zero concerning obedience of residuals distribution of the normal distribution may not be rejected. Consequently, we can claim that the residuals distribution follows the normal distribution and regression assumption is confirmed.

Table 7- The results of model estimation in the mode of fixed effects in sections and applying weighted least squares method

Variables	Coefficients	Standard deviation	T statistic	P-value
Number of flights	96.07986	43.28191	2.219862	0.0299
Flights hours	-17.40528	7.628676	-2.281559	0.0258
Carried passenger(O&D)	-0.011571	0.102503	-0.112888	0.9105
Distance travelled (thousand kilometers)	-0.646637	0.474390	-1.363093	0.1776
Seat kilometers offered (thousand)	-0.029016	0.034653	-0.837329	0.4055
Passenger capacity factor (%)	7488.669	3029.328	2.472056	0.0161
Weight capacity factor (%)	-4704.592	1989.434	-2.364789	0.0210
C	-1151359.	178130.1	-6.463584	0.0000

Root MSE	285583.2	Coefficient of determination	0.842255
Mean dependent var	-903869.5	Adjusted coefficient of determination	0.798572
S.D. dependent var	613359.4	S.E. of regression	324650.2
Sum squared resid	6.85E+12	F statistic	19.28100
Durbin Watson statistic	1.747533	Significance level of F statistic	0.000000

Discussion and Conclusion

Although the international regulations in connection to the exemptions of forwarder have ambiguity and deficiency, nonetheless have passed an appropriate development trend and could guarantee the interests of the parties, in particular the passenger and the cargo owner, but in our local law, the Trade Code in its major part has still reserved its old form, which caused various defects to be observed therein. Accordingly, the lawyers are obliged to refer to the general rules of the civil code to solve the problem. However, in most cases, regulations similar to international regulations may be somehow inferred from local laws, but due to the lack of adequate stipulation, it is difficult to protect the weaker party against the transportation companies who benefit from advantages of monopoly and great power. Therefore, In line with the aviation industry developments like international regulations, it is required to update our local laws to promote the air transportation.

Measures have been taken in this regard and the Trade Code bill has a series of undeniable advantages. For example, transportation of persons is also included in the definition of a carrier (Paragraph 2 of Article 63), which is one of the obvious disadvantages of our current Trade Code; We hope this item to be ratified as soon as possible and fix the defects of the Trade Code. Furthermore, applying Warsaw Convention on the local transportations is one of the admirable actions in this regard, which includes a major part of domestic flights, but as explained it does not include all domestic air transportations and should not be assumed that completion and renewal of the existing laws is not required.

According to the results of the research, taking some measures seems to be necessary. Cooperation and alignment of the goals of relevant bodies towards solving problems ahead, determining a few local airports as air borders for establishing international flights.

It is necessary to calculate the insurance premium of the aircraft body. But not purchasing the body coverage in the insurance policy, in most cases, there is no legal prohibition to purchase the body insurance coverage for the airline. Purchasing the body coverage, this part is added to the insurance policy, and according to the aviation insurance policy, the insurers shall compensate the policyholders in case of incurring loss and damage to the aircraft body, provided that the said damage is included in the risks covered by the insurance policy. The body insurance premium related to the aircraft is determined based on the body value, annual insurance rate, coverage days and the aircraft status (grounding or flying). The rate announced by the Central Insurance Co. or the insurer depends on the aircraft features such as age, previous damages, flight hours, engine working duration, aircraft appearance, its technical specifications, pilot experience, aircraft type etc. This rate in Iran and in the time frame of this research has been varied between half a percent up to five percent. Usually, it is more than 15 days. If the plane is grounded over a definite term under LAY UP clause A26 AVN, then all coverages relating to plane taxiing and flight are suspended during this term and only the body physical damage coverage is due. Accordingly, total insurance premium is sum of insurance premium of flight situation and insurance premium of grounding situation. In the grounding situation, lay-up of body is equal to $1/4^{th}$ of flight situation rate. In other words, the insurance premium on the grounding days is equal to 25% of the same days in the flight situation, the insurance of the aircraft body is usually equal to the agreed value. It is notable that according to the clause, the value is agreed between the insurer and policyholder. One of the main reasons thereof is non-determination of the exact and fair price for the second-hand airplanes in the aviation market, whether at the time of concluding insurance contract or at the time of damage occurrence. In other words, the insurance company agrees to replace the damaged aircraft with an aircraft of the same model and type in case of total damage. In case of inability in replacing the aircraft, to compensate the policyholder based on the agreed value and not the running value. In case of partial damage, a percentage of the compensation will be paid according to the rule of Article 10 of the agreed value.

References

Shayestehpour H. & Fatemi S.M. (2022). Importance and Role of Information Technology in CRM for Insurance Industry. Academic Journal of New Management & Accounting Research Approaches, 6(23), 250-262. Retrieved from https://majournal.ir/index.php/ma/article/view/1729.

Central Insurance Co. of Islamic Republic of Iran, https://www.centinsur.ir/

Behifar Maryam, Rabiei Mahnaz, Azadi Ahmadabadi Ghasem (2021), Analysis of the Effect of Direct Foreign Investment on Economic Growth of Developing Countries, Economics and Business Research Journal, Issue No. 12, No. 22, Oct. 2021, P. 27-40.

El-Kasaby, B. F., Tarry, S. E., & Vlasek, K. K. (2003). Aviation insurance and the implementation of the small aircraft transportation system. Journal of Air Transport Management, 9(5), 299–308.

Caplan, H. (2004). War and terrorism insurance: How to promote long-term international stability and affordability. Air & Space Law, 29(1), 3–28.

Woods, M. (1993). Why aviation insurance underwriting needs to be more specialized. Air finance Journal, 155, 30–31.

Lane, M. N. (2005). Pricing issues in aviation insurance and reinsurance. Journal of Risk Finance, 6(3), 192–206.

Thomson, M. E., O¨ nkal, D., Avciogˇ lu, A., & Goodwin, P. (2004). Aviation risk perception: A comparison between experts and novices. Risk Analysis, 24(6), 1585–1595.

Wells, A. T., & Chadbourne, B. D. (2000). Introduction to Aviation Insurance and Risk Management. FL: Krieger Publishing.

Tsanakas, A., & Desli, E. (2005). Measurement and pricing of risk in insurance markets. Risk Analysis, 25(6), 1653–1668.