Artículo de investigación

Study of the features of the acquisition of civil aircraft by Russian airlines

Исследование особенностей приобретения гражданских самолетов российскими авиакомпаниями

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Abstract

Passenger air transportation is an important component of transport system of the Russian Federation, which has to be provided with effective work of all elements, especially airlines, in order to function in a competitive environment. Aircraft acquisition mechanisms play a very important role in airline's work.

There are some market aspects of different schemes of passenger jet aircraft acquisition by both foreign and domestic airlines considered in this article, and also reflected modern tendencies of aviation leasing in Russia.

Various forms of acquiring passenger aircraft by airlines were considered as a result of the studies, here we can find the most popular of them, their features, advantages, and disadvantages. There is dynamics of changes in the use of aviation leasing in a large historical retrospective, demonstrating the constant growth in the popularity of leasing.

The statistical data of the global aircraft fleet, as well as the fleet of the largest airlines and leasing companies in the world in general and Russia in particular, are presented and analyzed. The share of leasing use by global and Russian companies is shown.

Based on the results of factor analysis, there are the main reasons for using aviation leasing. The influence of the economic and political situation on the decisions of world and Russian airlines when choosing a scheme for acquiring aircraft is reflected.

Here we can find a brief description of the world and Russian aircraft and air transportation market. There are conclusions about the need for a systematic development of the air transport and aircraft building industry in Russia using state support.

The study of the global market for civil aircraft is based both on statistical and factual materials

Аннотация

Пассажирские авиаперевозки являются важной составляющей транспортной системы Российской Федерации, для функционирования которой в условиях современной конкурентной среды необходимо обеспечить эффективную работу всех её элементов, в частности авиакомпаний. Важную роль в работе авиакомпании играют механизмы приобретения авиационной техники.

В данной статье рассмотрены некоторые рыночные аспекты различных схем приобретения пассажирских реактивных самолетов как зарубежными, так и отечественными авиационными компаниями, а также отражены современные тенденции авиационного лизинга в России.

В результате проведенных исследований были рассмотрены различные формы приобретения пассажирских самолетов авиакомпаниями, выделены наиболее популярные, описаны их особенности, преимущества и недостатки. Отражена динамика изменения использования авиационного лизинга в большой исторической ретроспективе, демонстрирующая постоянный рост популярности лизинговых сделок.

Представлены и проанализированы статистические данные мирового парка воздушных судов, а также парка крупнейших авиакомпаний и лизинговых компаний мира в целом и России в частности. Показана доля использования лизинга мировыми и российскими компаниями.

По результатам проведения факторного анализа были представлены основные причины использования авиационного лизинга. Отражено влияние экономико-политической ситуации на решения мировых

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reflected in authoritative foreign sources, as well as on the results of the author's own analysis.
Considered theme is useful and actual for Russian manufacturers of passenger aircraft. Understanding of occurring processes will allow them to have better adapt to market conditions, more effectively communicate with airlines and leasing companies while promoting aircraft on the market, make more precise predictions of market development, taking into account all factors described in this article.

Keywords: Aircraft manufacturing companies, airlines, civil aircraft, leasing companies, leasing, aircraft acquisition.

и российских авиакомпаний при выборе схемы приобретении самолетов.
Дана краткая характеристика мирового и российского рынка авиатехники и авиаперевозок. Сделаны выводы о необходимости планомерного и систематического развития авиатранспортной и авиастроительной отрасли России с использованием поддержки государства.
Исследование мирового рынка гражданской авиатехники базируется как на статистических и фактических материалах, отраженных в авторитетных зарубежных источниках, так и на результатах собственного анализа автора.
Рассматриваемая тема полезна и актуальна для отечественных производителей пассажирских самолетов. Понимание происходящих процессов позволит им лучше адаптироваться к рыночным условиям, более эффективно взаимодействовать с авиационными и лизинговыми компаниями при продвижении авиационной техники на рынок, делать более точные прогнозы развития рынка, принимая во внимание описываемые в статье факторы.

Ключевые слова: авиакомпании, авиапромышленные предприятия, гражданские самолеты, лизинг, лизинговые компании, приобретение самолетов.

Introduction

Passenger air transportation is an important component of transport system of the Russian Federation, which has to be provided with effective work of all elements, especially airlines, in order to function in a competitive environment. Aircraft acquisition mechanisms play a very important role in airline's work.

There are some market aspects of different schemes of passenger jet aircraft acquisition by both foreign and domestic airlines considered This article proposes to consider some market aspects of various schemes for acquiring passenger jets both by foreign and domestic aviation companies, as well as identify factors that influence the market and reflect current trends in aviation leasing in Russia.

Considered theme is useful and actual for Russian manufacturers of passenger aircraft. Understanding of occurring processes will allow them to have better adapt to market conditions, communicate more effectively with airlines and leasing companies while promoting aircraft on the market, make more precise predictions of market development, taking into account all factors described in this article.

Global civil aviation market research is based on both statistic and actual materials, reflected in authoritative foreign sources (International Bureau of Aviation, 2019; RAEX, 2019; Raexpert, 2019), and on the results of author's own research. As an object of study a segment of short-, medium- and long-haul civil passenger jet aircraft was chosen, that relate to regional, narrow-body and wide-body (Riordan, Kundu, Price, 2016) classes of aircraft (Table 1), that are exploited on the global market in 2019.

Table 1. Considered types of aircraft

Regional	Narrow-body	Wide-body
ARJ21 Bae 146 CRJ100/200 CRJ700/900/1000 Dornier 328JET ERJ-135/140/145 E170/175/190/195 Fokker 70/100 RJ Superjet 100 Antonov An-148/158	A220 (CSeries) A318/319/320/321 B717 B737/NG/MAX B757 MD-80 MD-90 Tupolev Tu-154 Tupolev Tu-204 Yakovlev Yak-42	A300 A310 A330 A340 A350 A380 B747 B767 B777 B787 Ilyushin Il-96

There are some main forms of commercial aircraft acquisition, and also different derivatives of financial and organizations schemes that have both common features and their own specific features. The main forms of civil passenger aircraft are:

- Direct purchase is the most popular and makes about 40% (FlightGlobal, 2019) of all volume of transactions in connection to aircraft operated on the global market. Typically, the purchase is attached to direct lending. In this case, the customer (airline) takes a secured or unsecured loan to purchase the aircraft. In most cases, the loan is provided by the purchased property: an airplane;
- Operational (or operative) leasing (Hanley, 2012) is the transaction in which the company, which owns an airplane, provides it to airline for operation on a period up to 10 years. Often, the term of operational leasing is 3-5 years. Ownership of the aircraft remains for the lessor. After the lease expires, the aircraft returns to the leasing company. The volume of transactions using operational leasing is constantly growing and currently has the amount about 20% (FlightGlobal, 2019) of all the global transactions volume.

There are three main forms of operational leasing (Scheinberg, 2017):

- Wet leasing, when the plane is for rent with the crew. The deal is made between two airlines. The lessor lessor airline provides the lessee airline with the aircraft, crew, maintenance and insurance. There is a special term ACMI (Vasigh, 2014), which defines the character and volume of services and that allows to analysis the leasing rate of aircraft wet leasing. The most popular term of wet leasing is from 1 to 24 months. As a lessee can act not only an airline, but also another type of company. A lessorlessor has to be an airline, which has an operator certificate. Wet leasing is used in:
    - The need to organize an air transportations for a short period of time;
    - The organization of charter transportations;
    - The organization of transportations in countries, where a lessee is forbidden to fly, including political reasons. However, in cases of economic embargo, for example the United States of America (USA) in connection with Iran, such variant will not work. This is connected to the fact that if the plane brakes on the territory of Iran, it will be impossible to import spare parts for modern aircraft, made by Airbus or Boeing.

In general, wet leasing rates are much higher, however sometimes this scheme has undeniable advantages.

- Wet leasing. The difference of it is that the lessee provides the flight attendants;
- Dry leasing is the main form of operational leasing. An airline, often a leasing company, gives the aircraft without insurance, crew, maintenance, ground equipment and other to a lessee airline, which makes flights on the aircraft using its operator certificate.

The term of leasing is usually from 2 to 10 years and is related with heavy maintenance performance (C-Check or D(SI)-Check). This is connected to an essential change of aircraft residual value, while carrying out the mentioned maintenance. Depending on the agreement and the lease period the lessee, with monthly lease payments, also pays "maintenance reserve" for heavy maintenance performance (Clark, 2017). In order to fix risks and expenses of the lessee and the lessorlessor, and also for a convenient planning, maintenance reserves payment are clearly defined and tied to the flight hours, flight cycles and calendar. With the dry operational leasing agreement planes are often passed from parent airline to subsidiary one, what is popular in Europe and USA;

- Financial leasing (Scheinberg, 2017), also known as "capital leasing" is a hard deal for purchasing a plane by leasing company with the following returning it to the airline for a long term, which is, as a rule, 10-12 or more years. This is connected with difficult planned forms of maintenance. The plane is given to the airline in temporary ownership until the end of leasing term. The volume of deals using financial leasing reaches about 30% on the world market (FlightGlobal, 2019). There are different individual cases of financial leasing:

  - Equipment trust certificate (Vasigh, Gorjidooz, 2016) (ETC), when an investor buys an aircraft and leases it to the airline, only if the airline receives ownership after the whole fulfillment of the lease agreement. In such case, the boundaries between the purchasing credit and leasing are blurred;
  - Extendible operational lease. The lessee has the opportunity to end the leasing contract under certain conditions in a certain period (after 3 or 5 years). This form is more like for a dry operational leasing. The possibility of ending the contract is sometimes fixed by other terms of the transaction;
  - There are also specific forms of leasing, based on the specifics of the legislation of different countries and providing the reduction or cancellation of taxes, if certain conditions are performed. US leverage lease (Scheinberg, 2017) is common in the USA in transactions with foreign airlines importing aircraft from there in order to get tax exemption. Japanese leverage lease (Spreen, 2016) for the aircraft acquisition provides the establishment of company special-purpose company, 20% of the shares of which should belong to the Japanese. This type of leasing allows getting an exemption from investment taxes. Hong Kong leverage lease (Guzhva, Raghavan, D'Agostino, 2018) allows local lessors to purchase aircraft using credits on terms that are more profitable.

- One of the types of leasing is leaseback (sale and leaseback (SLB)-deal). In this transaction, the airline buys the aircraft from the aircraft manufacturer, sells it to a leasing company with the transfer of ownership. After that, the leasing company provides the airline with on a financial lease basis. As a rule, a deal to purchase an airplane by an airline and a deal of transferring an airplane to a leasing company are concluded long before the airplane delivery. It happens very often in the form of assignment of an aircraft purchase agreement from an aircraft manufacturer to a leasing company or in the form of a tripartite agreement. SLB is used by large companies, as they can get a more attractive price from the aircraft manufacturer and other advantages, compared to small leasing companies. Due to the fact that leasing companies compete with each other in pricing, the second advantage of leaseback is that the airline can choose a leasing company with the most profitable conditions in order to complete the transaction.

The results of the analysis of aircraft acquisition forms allow us to state the following. When comparing leasing schemes with the direct aircraft-purchasing scheme, we can distinguish the following advantages of leasing for the airline: the possibility of more flexible fleet management and minimizing the risks of changes in the macroeconomic situation on the market. The higher cost of ownership is the main disadvantage.

Methodology for analyzing the practice of acquiring civilian aircraft in the world market

The main goal of the study is to highlight the most popular forms of acquisition of aircraft and determine the factors that influence the choice of forms of it.

To conduct a study of development trends in the acquisition of civil aircraft the methodological approach is proposed, consisting of the following stages:

- Quantitative analysis of the global fleet;
- Study of the laws governing the growth of the share of leasing transactions in the acquisition of aircraft in a deep historical retrospective covering a period significantly exceeding the aircraft's life cycle (about 50 years);
- Identification of the largest leasing companies in the world and in Russia and analysis of their portfolio of orders;
- Determination of the largest airlines in the world and Russia, analysis of their aircraft fleets and the main forms of aircraft acquisition, indicating the share;
- Classification of factors affecting the choice of forms of acquisition of aircraft;
- Identification of trends in the acquisition of civil aircraft.

The above-mentioned studies were based on the analysis of statistical information from authoritative sources.

On the basis of factor analysis using the expert assessment method, regularities were identified and the reasons for choosing various ways of acquiring and owning aircraft by both domestic and foreign airlines were determined.

Analysis of the practice of civil aircraft acquisition in the global market

The world fleet of the considered types of planes consists of 26 thousand units (Table 2).

The biggest number of air transportation is carried out in three regions: Asia, North America and Europe. The largest number of aircraft is operated here: 8 thousand (31% of the global fleet), 7.3 thousand (28%), 6.5 thousand (25%), respectively. Overall, there are about thousand airlines in the world (FlightGlobal statistics for 2019).

Only 3.5% of the world's fleet is operated in Russia.

Table 2. Aircraft fleet by regions of the world (FlightGlobal, 2019)

	Africa	**Asia**	**Europe**	**Latin America**	**Near East**	**North America**
Number of aircraft	956	8091	6499	1581	1490	7346
Share	4%	31%	25%	6%	6%	28%

After the World War II, a period of economic growth in the sectors of the national economy and transport was noted. Many countries reoriented the military industry to produce peaceful products. There is the restoration and development of transport links between countries and regions. In the 1950-1970s, both the growth of the civil aviation industry and transport, as well as the development of aviation legal regulation and forms of commercial relations was noted. Since the 1970s, there was an increase in transactions using leasing. According to AirFinance Journal Fleet Tracker (AirFinance Journal, 2019), the share of transactions for Western-made aircraft acquisition with a dimension of more than 19 seats using leasing over the past 50 years is constantly growing and increasing every 10 years by about 2 times (Figure 1).

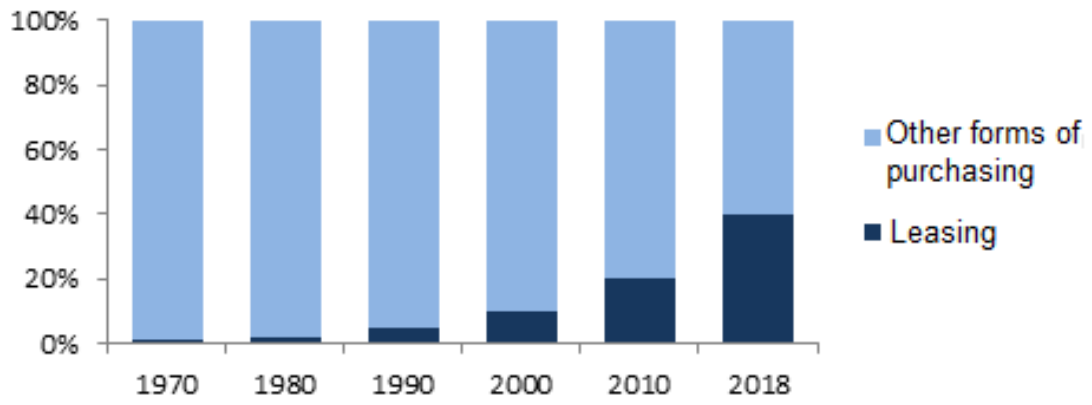

Figure 1. Growth trend in the share of transactions using leasing for the purchasing of aircraft from 1970 to 2018 (AirFinance Journal, 2019)

There a whole layer of financial institutions and companies has appeared, involved in aviation leasing. Over the years, they developed leasing tools, made for market conditions, and increased their portfolios, which allowed reducing their own costs and suggesting more profitable transaction conditions. Nowadays, capitals of leasing companies commensurate with the capital of airlines, and can even surpass some of them. This allows them to make deals that are more profitable with aircraft manufacturers. Table 3 shows the data about the 30 largest leasing companies. Most of them are situated in the USA and Ireland. None of the Russian companies was included in this rating due to the fact that they have more modest indicators. The order book of the best Russian leasing companies is estimated in the dozens of aircraft (Table 4).

Table 3. World's largest leasing companies in the aviation sector (by the aircraft number) (KPMG, 2019)

	Leasing company	Country	Aircraft portfolio	Aircraft order	Approximate cost of the portfolio, million US dollars
1	GECAS	USA	1.229	369	23.602
2	AerCap	Ireland	1.056	362	32.975
3	Avolon	Ireland	521	400	18.725
4	BBAM	USA	498	0	20.499
5	Nordic Aviation Capital	Denmark	471	48	6.285
6	SMBC Aviation Capital	Ireland	422	196	15.723
7	ICBC Leasing	China	377	122	15.448
8	DAE Capital	United Arab Emirates	352	1	10.257
9	Air Lease Corporation	USA	336	382	14.559
10	BOC Aviation	Singapore	331	171	14.051
11	Aviation Capital Group	USA	310	171	8.769
12	Aircastle	USA	246	25	5.533
13	ORIX Aviation	Ireland	236	0	6.922
14	Unconfirmed Operating Lessor		233	0	6.049
15	Apollo Aviation Group	USA	229	0	3.225
16	CDB Aviation Lease Finance	China	214	197	7.164
17	Macquarie Air Finance	Australia	197	60	4.387
18	BoComm Leasing	China	195	34	7.562
19	Boeing Capital Corp	USA	194	105	1.608
20	Castlelake	USA	180	0	2.284
21	Goshawk	Ireland	168	40	6.333

22	Jackson Square Aviation	Ireland	154	30	6.154
23	Avmax Aircraft Leasing	Canada	148	0	402
24	Standard Chartered Aviation Finance		137	0	4.498
25	China Aircraft Leasing Company	China	133	201	4.579
36	Falko	England	119	0	642
26	Deucalion Aviation Funds	Germany	102	0	1.948
27	Regional One	USA	88	0	309
28	ALM – Aircraft Leasing & Management	England	84	0	2.860
29	Cargo Aircraft Management	USA	84	0	1.037
30	Elix Aviation Capital	Ireland	83	0	666
	Grand Total		12.263	3.526	336.886

Table 4. The largest leasing companies in the aviation sector in Russia (by the number of aircraft) (FlightGlobal, 2019; Raex, 2019; Raexpert, 2019)

	Leasing company	**Aircraft portfolio**	**Aircraft order**
1	"State Transport Leasing Company" (STLC)	76	107
2	"VTB Leasing"	50	0
3	"VEB-Leasing"	57	70
4	"Sberbank Leasing", group of leasing companies	52	34

The situation in the Russian aviation segment is approximately the following.

The main form of purchasing of an aircraft is leasing, which makes up about 82% of aircraft. Wherein, 47% of aircraft are in operational leasing, and 34% in financial leasing (FlightGlobal, 2019).

Russian airlines own only 32% of all aircraft. Moreover, every year this share is constantly decreasing.

A unique situation is made from the registration of aircraft of Russian airlines. Most of them have foreign one. Only 21% of aircraft are registered in the Russian Federation. Most Russian airlines register aircraft in the USA (Bermuda) - 74% and in Ireland (Dublin) - 5%. Let's consider the main reasons for this state of affairs.

Firstly, this is a way of acquisition. Russian airlines prefer to use leasing to buy an aircraft. Quite often, they receive the most profitable offers from foreign companies that use credit at a lower interest rate than Russian companies do. Big foreign leasing companies can get a better offer from the aircraft manufacturer by placing large orders for aircraft, which can have an amount up to hundreds. Here Russian leasing companies cannot compete with foreign ones.

Secondly, taxes are the most important reason. A foreign aircraft must be brought to Russia, in order to register it. At the same time, customs payments make up 20%. In addition, it is necessary to pay VAT, which has increased from 18% to 20% since 2019. It can be returned using the law. In practice, it is not carried out immediately and not in all cases, since these procedures are quite complicated. At the same time, the cost of the aircraft increases by 40%, which is very important for the economy of air transportation.

The vast majority by Russian airlines are carried out on foreign aircraft.

Thirdly, for many airlines, the possibility of a simple legal regulation is an important factor in choosing the place of registration of the aircraft. In offshore zones, the aircraft registration process itself is easier in contrast to other countries where registration procedures are becoming more complicated due to the International Civil Aviation Organization (ICAO) requirements. Offshore zones also have more attractive property tax conditions. In addition, there is another tax evasion scheme for the purchasing of foreign aircraft. Russian leasing companies create subsidiaries (or SPC, special purpose company, project company), each for a separate transaction with the airline. Subsidiaries are registered abroad. On their balance sheet the aircraft are registered in offshore zones for tax evasion. These planes are delivered to Russian airlines on leasing terms, which eliminates the need to pay customs duties and VAT.

With such significant advantages of the above schemes and opportunities for Russian aviation and leasing companies, only a few Russian aircraft are registered in the country, but stopping customs barriers do not help Russian aviation manufacturers.

The situation described above is connected with the lack of offers from domestic manufacturers in most segments of the passenger aircraft market, and with the lack of competitiveness of aircraft produced. Currently, Russia produces and supplies only one type of aircraft to commercial airlines, the Sukhoi Superjet 100. The localized production of the Antonov An-148 provides for deliveries to the Russian Air Force. The Irkut MC-21 narrow-body aircraft project is being delayed due to US sanctions on the supply of composite materials. The Russian-Chinese project CR929 is still at the design stage.

As an example, we can cite the 5 largest airlines in Russia by the size of the aircraft fleet and by the number of passengers carried, having half of the domestic fleet of passenger jet aircraft and performing about 65% of the volume of passenger air transportation in Russia:

- Aeroflot has the largest fleet of long-haul aircraft in Russia and accounts for about 30% of the passenger turnover. The aircraft fleet consists of 250 aircraft. Only 50 of them are registered in Russia, these are SSJ100 aircraft, Russian-made. The fleet is based on aircraft manufactured by Airbus and Boeing. All of 200 aircraft were registered abroad, while Russian leasing companies Sberbank Leasing, VTB-Leasing, VEB-Leasing and STLC delivered 76 of them under leasing schemes;
- The fleet of S7 (Siberia) is 78 aircraft. All of them are delivered through foreign leasing companies;
- Rossiya Airlines operates 63 aircraft. 39 of them were delivered through Russian leasing companies Sberbank-Leasing, VTB-Leasing, VEB-Leasing and STLC; The whole fleet is registered abroad.
- UTair Airlines use 55 jets. All of them are registered abroad. 7 of them were delivered through VTB-Leasing and Sberbank Leasing. Until recently, UTair operated a large number of old BoeingB737, bought at a low price. In recent years, the airline updates its fleet and switches to leasing schemes;
- All of 45 aircraft of Ural Airlines were delivered through foreign aircraft.

Now we are going to consider the main advantages of leasing use for an airline when acquire aircraft compared to direct purchase (Guzhva, Raghavan, D'Agostino, 2018):

- Leasing allows to reduce the risks of changes in the marker and microeconomic situation, solvency and preferences of passengers and other market factors. It is easier to refuse an airplane purchased through leasing, as leasing transactions often provide a residual value guarantee or a return option. If the airline's market model changes, it is easier and faster to abandon one type of aircraft in favor of another;
- In the lack of a large fleet of aircraft and, consequently, a large cash flow, it is easier for an airline to pay lease payments, starting with the commissioning of the aircraft. Upon purchase, it is required to make advance payments and pay the full cost of the aircraft before the start of operation. This is less attractive, despite the possibility of obtaining a loan;
- Using leasing is easier and faster to organize a new company due to lower risks for both the airline and the leasing company and the financing bank.

The disadvantages of using leasing for an airline when acquiring aircraft compared to a direct purchase (Guzhva, Raghavan, D'Agostino, 2018):

- Significant overpayment at a high cost of borrowed funds (high percentage of bank credit). For example, borrowed funds are provided abroad at a rate of about 2% in addition to the London Inter-bank Offered Rate (LIBOR) (Wright, 2014), which varies from 2% to 4%. As a result, the cost of borrowed funds is 4-6%. In Russia, the refinancing rate is decreasing by 2019, but there were periods when it exceeded 10-15%. In addition to this rate, banks and leasing companies add their interest. As a result, the cost of borrowed funds can reach 15-20%, and at a refinancing rate of 7% (for 2019) it can rarely be lower than 10%. With such a difference in domestic and foreign borrowed funds, the overpayment for

the entire leasing term when organizing it in Russia can be several times higher.

To compare the largest Russian airlines with the largest world ones, Table 5 was drawn up, in which all airlines are sorted by the size of the fleet. It will help to identify the main patterns in choosing a method of purchasing aircraft, depending on the size of the aircraft fleet. Consider the forms of purchasing of aircraft by the largest airlines currently operating on the world market.

Table 5. The largest airlines in the world and Russia in terms of fleet size and the form aircraft acquisition (FlightGlobal, 2019)

№	Airline	Country	Aircraft fleet	Operational leasing	Financial leasing	Property	Other forms
1	American Airlines	USA	978	14%	26%	54%	6%
2	Delta AirLines	USA	933	2%	18%	78%	2%
3	United Airlines	USA	795	5%	11%	81%	3%
4	Southwest Airlines	USA	754	1%	15%	82%	2%
5	China Southern AL	China	604	23%	42%	35%	1%
6	Sky West Airlines	USA	512	0%	7%	81%	13%
7	AirChina	China	421	15%	40%	44%	1%
8	Ryanair	Ireland	420	2%	4%	94%	0%
9	China Eastern Airlines	China	362	12%	32%	54%	1%
10	Lufthansa	Germany	309	2%	20%	76%	1%
11	Turkish Airlines	Turkey	282	6%	28%	62%	3%
12	British Airways	England	278	13%	45%	40%	2%
13	Emirates Airline	UAE	257	15%	46%	36%	4%
14	JetBlue Airways	USA	254	2%	16%	81%	0%
15	Aeroflot	Russia	250	66%	28%	3%	3%
16	Endeavor Air	USA	243	2%	37%	0%	61%
17	Hainan Airlines	China	236	42%	19%	37%	2%
18	Alaska Airlines	USA	235	3%	23%	66%	9%
19	ANA-AllNippon	Japan	224	4%	16%	7%	73%
20	AirFrance	France	222	1%	53%	39%	7%
21	IndiGo	India	221	43%	43%	7%	7%
22	Qatar Airways	Qatar	197	26%	32%	34%	8%
23	Air Canada	Canada	194	34%	22%	36%	9%
24	Envoy Air	USA	192	0%	2%	1%	97%
25	Republic Airways	USA	191	0%	16%	78%	6%
26	Shenzhen Airlines	China	185	9%	25%	65%	1%
27	Saudia	Saudi Arabia	179	37%	4%	55%	4%
28	Xiamen Airlines	China	172	30%	29%	40%	1%
29	Japan Airlines	Japan	168	3%	15%	82%	0%
30	EasyJet	England	164	12%	26%	62%	1%
	…						
76	S7 (Sibir)	Russia	78	50%	50%	0%	0%
98	Rossiya	Russia	63	38%	60%	2%	0%
117	Utair	Russia	55	7%	60%	29%	4%
138	Ural Airlines	Russia	45	44%	36%	20%	0

As we can see from the table, big major US airlines (American Airlines, Delta AirLines, United Airlines), while taking the opportunities of a highly profitable market and having a very large fleet of aircraft, mainly purchase airplanes through direct purchase. Their fleet can be compared with the portfolio of orders of the largest leasing companies.

There are large regional air transporters in the US market (Cook, Billig, 2017) SkyWest Airlines, Endeavor Air, Envoy Air, which are being subsidiaries to companies American Airlines and Delta AirLines. They mainly get planes from their parent companies, which confirms the general trend again:

- SkyWest Airlines is a regional airline. One part of its fleet is owned by Delta Airlines and consists of Embraer E175 and Bombardier (MHI) CRJ100/200/700/900 aircraft.
- Endeavor Air (in past Pinnacle Airlines or Express Airlines I) is a regional airline. The fleet is owned by Delta Airlines and consists of Bombardier (MHI) CRJ200/700/900.
- EnvoyAir (in past American Eagle Airlines) is a regional airline, which has almost whole fleet owned by American Airlines and mainly consists of Embraer ERJ-140/145, E175 and Bombardier (MHI) CRJ700.

Along with "regular" or main airlines, low-cost airlines stay at the first lines of the rating.

Low-cost (Cook, Billig, 2017) airlines Southwest Airlines, Ryanair, JetBlue Airways, EasyJet, in addition to the size of their fleet, are successfully taking advantage of the one-type fleet.

This allows them to equalize the cash flow from performing air travel and direct it to the uniform purchasing of aircraft to update the fleet:

- Southwest Airlines is the biggest low-cost airline in the USA and in the world by the number of travelled passengers, and also the second among all US airlines and the fourth in the world by its fleet size. The fleet consists of Boeing 737 Max 8, 737-700, 737-800.
- Ryanair is the biggest Irish low-cost airline in Europe. Almost the whole fleet is the same and consists of Boeing 737-800 aircraft.
- JetBlue Airways is a low-cost American airline that is owned by JetBlue Airways Corporation. The fleet mainly consists of narrow-body aircraft Airbus A320 and A321, as well as regional Embraer E190.
- EasyJet Airline Company Limited, more known as easyJet.com is a British low-cost airline. It is a part of Easy Group holding which has EasyJet Europe and EasyJet Switzerland as well. The total fleet of airlines of the holding includes 332 Airbus A319 / A320 / A320neo / A321neo aircraft, the fleet of EasyJet consists of 164 aircraft of the same types.

Majority of large trunk, regional and low-cost companies take advantage of the usage of the one-type fleet or fleet, 2-3 types of aircraft. Very often, these are aircraft of the same family, representing aircraft with different capacity and flight ranges, but at the same time served as one type of the aircraft. Currently, almost all popular types of the aircraft of the world's leading manufacturers (Airbus, Boeing, Embraer, and Bombardier) have families. The advantages and features of operating the family of aircraft by the author were described in details in the article "Marketing Research of Aircraft-Industrial Enterprises in the Formation of a Family of Aircraft" (Kalugina, 2013).

As it was presented above, many large airlines prefer direct purchase of aircraft. It is necessary to consider this issue in details.

The main disadvantage of acquisition the aircraft through direct purchase, without a leasing scheme, is the need to "freeze" funds if they are available or to use borrowed funds at a percentage. As a rule, small commercial airlines do not have money to buy airplanes. However, the situation may change. If with the growth of the airline's fleet, the cash flow on lease payments becomes significantly higher than the market price of one aircraft of the same type, then the airline should consider switching to a direct purchase scheme.

Table 6. Market prices and leasing payments of the most popular types of passenger aircraft (International Bureau of Aviation, 2019; ISTAT, 2019)

Aircraft type	Price of new aircraft, million US dollars	Leasing payment, thousand US dollars	Lease factor	Aircraft price / leasing payment
1	2	3	4	5
CRJ700	22.5	190	0.84%	118
CRJ900	24	200	0.83%	120
EMB175	27	230	0.85%	117

EMB190	31,5	265	0.84%	119
A220	38	310	0.82%	123
A319	37	280	0.76%	132
A320	44.8	330	0.74%	136
A320neo	50	370	0.74%	135
A321	52	385	0.74%	135
A321neo	58	410	0.71%	141
A330-200	82	640	0.78%	128
A330-300	95	750	0.79%	127
A350-900	148	1140	0.77%	130
A380-800	230	1750	0.76%	131
B737-700	38	245	0.64%	155
B737-800	46.5	285	0.61%	163
B737-900ER	48	360	0.75%	133
B777-300ER	155	1350	0.87%	115
B787-8	119	1000	0.84%	119
B787-9	142	1150	0.81%	123
Mean:				130

There is the information about market prices on new aircraft and their leasing rates in 2019 introduced in the Table 6. Column 5 shows conditional indicator of the index of the price of aircraft to the size of the lease payment. This indicator characterizes the size of the airline's fleet, above which the purchase of aircraft using leasing becomes less effective than direct purchasing. Undoubtedly, each airline operates in certain market conditions, which depends on the region, the availability of subsidies from the state or parent companies, market profitability and the possibility of changing market conditions. In fact, under all combined conditions, airlines switch to direct purchase gradually with the growth of the aircraft fleet. Figure 2 shows the scatter plot of the proportions of acquired aircraft under the leasing scheme on the size of the airline fleet. The diagram is based on the statistical data for 233 airlines with the fleet of more than 20 units. Small airlines with 100% of form of aircraft' purchasing are not included in the sample, which usually happens in the case of financing from the countries' budget, parental company or bank. The trend line reflected on the graph really demonstrates a decrease in the share of leasing, depending on the size of the airline fleet.

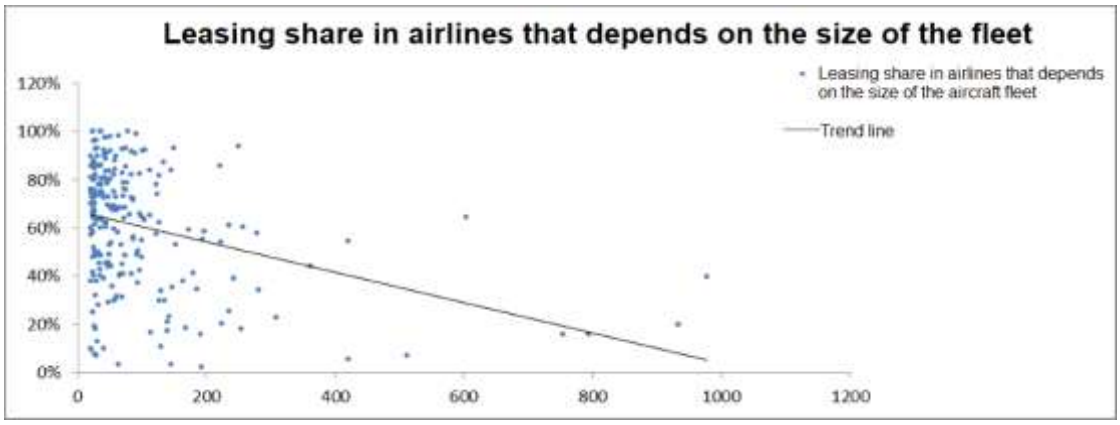

Figure 2. Leasing share in airlines that depends on the size of the fleet (FlightGlobal, 2019)

As the interim summary, we may highlight the main factors that affect the airline's choice on the direct purchasing of an aircraft:

- If the companies' fleet size is less than 150 units of the same type of equipment, the whole amount of lease payments exceeds the aircraft cost. This allows buying equipment through a purchase without "freezing" funds or attracting credits;
- High profits of the market, high loading rates of airline flights, an optimized route network allow the company to receive large revenues and direct funds for the purchase of aircraft;
- Stability of the political and economic situation in the country allows the airline to predict the long-term market situation and purchase the necessary equipment without the risks of its low liquidity or the need to reorient to other market segments and optimize the aircraft fleet in a short time.

According to the results of the analysis, it is clear that only one Russian airline, Aeroflot, meets these conditions; however, it acquire aircraft only through leasing schemes. The remaining Russian operators have significantly smaller fleets of aircraft of various types.

Discussion

Based on previously proposed methods for statistical analysis of deep retrospective data, expert approach, and factor analysis of the reasons for using various forms of aircraft acquisition, airlines received answers to the questions. There are conclusions about the need for state support for airlines and aircraft manufacturers, because the airline and aircraft industry are strategically important areas of the country's economy.

The used statistical data obtained from a number of world reputable sources agree with the results of the author's research, which confirms the reliability of the studies conducted by the author.

Conclusion

In conclusion, it is supposed to summarize all the above-considered practice of aircraft acquisition on the international and Russian markets, to make the outputs and some recommendations:

- Both forms of aircraft acquisition, leasing and direct purchase, have their advantages;
- Type of acquisition depends on the macroeconomic situation a lot and it is like its indicator;
- High proportion of transactions using direct purchase indicates the stability of the air transportation market, positive forecasts and a preferable macroeconomic situation, and the availability of large airlines on the market;
- High proportion of transactions using leasing schemes for the aircraft acquisition indicates periodic changes in the air transportation market, uncertainty and an unwanted situation in the country's economy, insufficient fleet of airlines and their unstable position;
- Tendency of increasing the share of leasing transactions indicates the activity and constant development of the global air transportation market as a whole and about a more flexible approach of airlines in demand.

Russian market can be characterized as follows:

- Insufficiently stable economic situation in Russia, both due to dependence on oil prices and because of sanctions;
- High credit rates compared to developed countries (USA, Europe) lead to high leasing rates of Russian leasing companies and the complexity of business development in general;
- Low solvency and air mobility of people in Russia,, low population density, low profitability of domestic air transportation and volumes of them. All of these factors lead to low income and profit for airlines in Russia as a whole. There are many examples of bankruptcy of not only small, but also large airlines;
- Lag of Russian aircraft manufacturers from world competitors, despite state support through customs regulation and subsidies;
- The country provides support to leasing companies, airlines, aircraft building companies and maintenance centers through subsidies in accordance with government regulations № 1242 (December 25, 2013), № 1073 (October 22, 2012), № 1212 (December 30, 2011), etc. (Consultant Plus, 2019). These measures contribute to the

promotion of Russian aircraft on the market, and the development of regional transportation in the country;
- Russian aircraft manufacturing companies have not yet strengthened their positions in the world market after a 20-year "pause" since the disruption of the Soviet aviation industry, and since they are not able to compete with world industry leaders in full size.

The global market as a whole can be characterized as follows:

- Universal globalization allows large foreign leasing companies and financial institutions to operate successfully on the world market, receive profitable offers from manufacturers, use loans at very low rates, and promote aircraft not only in developed countries, but also in emerging markets, including the market of Russia. World leaders in aviation leasing offer more attractive options for airlines;
- The largest airlines in the leading markets of the USA, Europe, and China have a much larger fleet of aircraft, and greater volumes of transportation than the Russian ones. Effective demand in these markets is higher. This fact allows airlines to optimize costs and have big profits;
- Leading aviation manufacturers, primarily Boeing and Airbus, with huge production volumes and many years of experience in creating aircraft, have a significant advantage over Russian manufacturers, supply more competitive equipment in large volumes.

In connection with the current situation on the world and Russian market of civil aviation equipment, it seems necessary to solve such problems:

- To continue and strengthen support for aircraft manufacturing, aviation and leasing companies through subsidizing mechanisms with close monitoring of the use of funds;
- To intensify the creation of new and improvement of existing types of aircraft for segments of different dimensions, primarily with the goal of providing Russian airlines with modern competitive aircraft;
- To contribute to the enlargement of Russian air and leasing companies while maintaining a competitive environment in order to reduce costs, improve the quality and reliability of air transportation;
- To contribute to strengthening the stability of the economy of the country as a whole in the long term, lowering bets on loans, increasing the welfare of the population to ensure constant solvent demand for air travel.

The results of the study show that only integrated and long-term measures can positively affect the development of the inertial aviation and aircraft building sectors of the country, which in the future will have a positive impact on other sectors of the economy and will bring revenue to the state budget.

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