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# An analysis of Russian international air traffic in times of war: What structural changes have emerged and who benefits from Western sanctions?

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## Abstract

We examine key air transport developments caused by Russia's ongoing war against Ukraine and subsequent sanctions on the civil aviation sector. Western countries imposed flight bans and visa restrictions on Russian airlines and individuals in early 2022, while Russia retaliated by restricting its airspace to airlines from 36 countries. We use origin-destination (booking) and flight supply (schedule) data to assess shifts in traffic volumes, destination countries, and airline nationalities and revenues. Our analysis reveals a sharp decline in international origin-destination traffic from Russia, from 27.4 million passengers in 2019 to 14.5 million in 2023. (Now fully indirect) travel to Western Europe and North America has decreased by 94% and 86%, respectively, while traffic to non-sanctioning countries in Central Asia, the Gulf or Türkiye has increased considerably, leading to strong revenue growth for airlines from these countries. The findings give some evidence to the wider economic and political complexities of sanctions, raising questions about their effectiveness and the unintended economic consequences for both the imposing and the sanctioned countries.

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## 1. Introduction

On February 24, 2022, Russia launched a full-scale military invasion of Ukraine. This move was the culmination of an escalation of Russian aggression against the country that began in 2014 with the annexation of Crimea and the occupation of eastern Ukraine by Russian-backed paramilitary forces. In addition to the human tragedy, the Russian

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invasion also has a significant economic impact, including on civil aviation. Passenger flights to and from Ukraine came to a complete halt, but domestic and international air traffic in Russia has also been affected.

On February 28, 2022, the European Union (EU) issued a Council Regulation banning all Russian air carriers from flying into, over or out of the territories of EU member states (Council of the European Union, 2022). Several countries followed the EU's lead, including Iceland, Norway, Switzerland, the United Kingdom, Albania, Kosovo, Moldova, North Macedonia, Montenegro, Canada and the United States. Other measures with direct and indirect effects on aviation include trade restrictions on aircraft spare parts and other support for the civil aircraft fleet of Russian operators. Also, even without a formal ban, airlines from other countries (e.g. Japan, South Korea) are avoiding Russia due to security concerns (Lee, 2022). In addition, travel between Russia and many countries has become more difficult due to visa restrictions. For example, the EU suspended its visa facilitation agreement with Russia (Gesley, 2022).

Russia retaliated by banning airlines from 36 countries from using its airspace in March 2022 (Reuters, 2022). This move has a significant impact, as Western airlines, especially those from the European Union, have made a significant contribution to Russia's international connectivity. However, airlines from countries not supporting the sanctions against Russia are not banned from continuing to provide international services to and from Russia. As Western airlines have ceased operations and Russian citizens' travel to Europe and North America has been severely restricted by visa policies, airlines from non-sanctioning countries appear to be actively benefiting from Western sanctions.

Thus, the sanctions described above have a wide range of potential effects. These include competitive imbalances in international traffic to and from Russia, a potential change in the international destinations of Russian and, more generally, supply-side reactions by airlines. These issues are analyzed in this paper. The main research questions to be addressed in this paper and the corresponding areas of analysis are as follows:

- Flight schedule analysis: Which airlines are still serving Russia and to what extent in terms of seat volumes and available seat kilometers (ASK)?
- Demand analysis: What has changed with regards to origin-destination demand flows from Russia?
- Airline revenue analysis: Which airlines are benefiting from the withdrawal of Western airlines?

Our paper adds empirical evidence to the emerging, so far mainly legal literature on impact analysis of the Russian invasion of Ukraine, with a focus on the understudied issue of the impact on passenger traffic flows. Section 2 provides a literature review on the impacts of sanctions in general and in this particular case. Section 3 describes our data and methodology, followed by a presentation of the results and a discussion in Section 4. Section 5 concludes.

## 2. Literature Review

Firstly, we summarize the literature on the general effectiveness of sanctions. Secondly, we look more closely at the existing nascent literature in the aeropolitical domain on the impact of the Russian invasion of Ukraine.

A broad literature in political sciences and economics discusses the effectiveness of sanctions (e.g., Peksen, 2019; Pala, 2021). Most authors find that sanctions usually fail to achieve high-level political objectives, such as regime change. For example, sanctions imposed by Western countries on countries such as Iran, Cuba or North Korea, which have been in place for decades, have not led to significant changes in the governance of the affected countries (e.g., Hufbauer et al, 2007). Caetano, Gallego and Caleiro (2023) find in their econometric analysis that sanctions imposed by the UN or the US in particular have a relatively low probability of "sender capitulation", i.e. the termination of sanctions without the originally intended success. As a result, sanctions remain in place for a long time, even if they do not seem to achieve the objectives originally intended at the time of their imposition. At the same time, sanctions compliance by the target country is lower in countries with a low level of democracy, among other factors. They also find that sanction compliance is higher for financial and military sanctions and for democracy promotion and lower for regime change or terrorism objectives. Sender capitulation is higher for travel and trade sanctions and sanctions addressing human rights. Pala (2021) argues that due to the complexity of international relations, it is relatively difficult to measure the effectiveness of economic sanctions.

The emerging literature on the aero-political implications of the ongoing Russo-Ukrainian war has so far focused to a large extent on the legal implications. An important issue in the early days of the invasion was the impact of the sanctions on leasing contracts of aircraft owned by Western lessors. Russian operators refused to release aircraft whose

leases had been terminated (Wedenig and Hanley, 2022 / Yu and Tasos, 2022). This resulted in severe financial write-offs for the lessors, while some claims were settled in the meantime.

Another issue discussed in the literature is the impact of airspace closures on overflight movements. Not only Ukrainian airspace was closed for arrivals, departures and overflights, but also the agreements in place with Russia on Siberian overflights for European airlines for their traffic to Far East Asia. The unavailability of Ukrainian and Russian airspace has a particularly high impact on neighboring countries: On the one hand, passenger traffic to and from Ukraine and/or Russia, which was important for countries such as Finland, the Baltic States or Türkiye, has come to full or partial standstill (Çıkmaz, Atay, and Keskin, 2022). On the other hand, countries located south of the Ukraine and Russia, such as Türkiye, Armenia, Azerbaijan and Georgia benefit from diversion effects for overflights in terms of en-route air traffic control revenues, but this may also result in congestion issues, as overflights over Georgia increased by +76% and over Armenia by +97% (EUROCONTROL, 2022).

Akbarlı et al. (2022) point to negative effects on passengers due to longer flight times between Europe and Asia. Ennen and Wozny (2024) have conducted a detailed analysis of the impacts on airfares of the unavailability of Russian airspace for flights between Europe and Far East Asia. They conclude that Northeast-European airlines are particularly affected, due to longer detours and associated higher operating costs, resulting in an average increase in airfares of 43 USD. Pandey and Kumar (2023) applied the event study methodology to analyze impacts on the stock returns of global tourism companies. Their results show a significant level of uncertainty in the markets with fluctuating positive and negative abnormal returns after the invasion date, but also a difference in reactions based on the geographical markets in which the companies operate. Firms in Europe, the Middle East and Africa were more affected than firms in North America, suggesting that financial markets initially viewed the conflict as more regional in nature. Prakasa et al. (2022) paint a broader picture with an analysis of the impact on traffic, pointing out the high dependence of Eastern European and Central Asian countries on traffic to/from Russia and Ukraine. The authors also discuss the impact of airspace restrictions on air cargo flows and trade between Europe and Asia and the negative external effects of rising oil prices and general market uncertainty on global air traffic.

To the best of our knowledge, research on the impact of the recently introduced sanctions on air traffic to and from Russia is scarce, leaving room for this paper which aims at adding empirical observations on impacts of sanctions in the air transport sector to the literature body.

### 3. Methodology & Data

To analyze the impact of the sanctions on air traffic, we use air transport supply and demand data, provided on a monthly level by Sabre Market Intelligence (Sabre MI), an online database based on real airline booking data:

- Flight schedule (supply) data, included in the Sabre MI database but originally sourced from Official Airline Guide (OAG), can be used to generate and analyze traffic indicators at the direct flight segment (route) level, like the number of seats or flights, or available seat kilometers (ASK) offered by an airline. Queries can also be made at airport or country level, for example.
- Sabre Market Intelligence also provides monthly origin-destination (OD) demand data, up to a very high granularity of actual passenger itineraries by origin, destination and transfer airports, again including marketing and operating airlines. Whilst leg data takes into consideration all passengers flying on that leg, OD data only looks for passengers with the given origin and destination (e.g., a passenger on BHX-JFK with legs BHX-LHR and LHR-JFK would not be considered if OD LHR-JFK is analyzed even though they fly on LHR-JFK; this is because their origin is BHX and not LHR).
- The dataset also includes information on travel and booking classes, including fare and revenue estimates, both at the segment (flight) and OD levels.

The data itself covers nearly the entire airline passenger market and is derived from Market Information Data Tapes (MIDT), which represent actual bookings through global reservation systems. Sabre MI applies special modeling to correct for internet sales, e.g., through direct data exchange agreements with airlines and by calibrating the data with other, e.g. public sources, such as air transport statistics. As such, the data allows for a broad descriptive analysis. The dataset's market size information can be considered reliable at least for markets that are not dominated by LCCs with their high shares of direct sales (Maertens, 2018). However, it is unclear if passenger bookings made through Russian

distribution systems are still fully covered. To our best knowledge, there are few other providers of similar, worldwide air transport supply and demand datasets are IATA (MarketIS) and Amadeus (Amadeus Market Data).

## 4. Results and Discussion

### 4.1. Supply

International air traffic from Russia had shown a dynamic growth path in the past. According to Sabre MI segment (direct flight) data, available seat kilometers increased fivefold from 20 billion ASKs in the year 2000 to 100 billion ASKs in 2019. Figure 1 shows this development split by airline nationality. Western European airlines have traditionally had a very strong position in international air traffic from Russia. Their market share (Fig. 2) peaked in 2007 at 20.3 % of international ASKs from Russia.

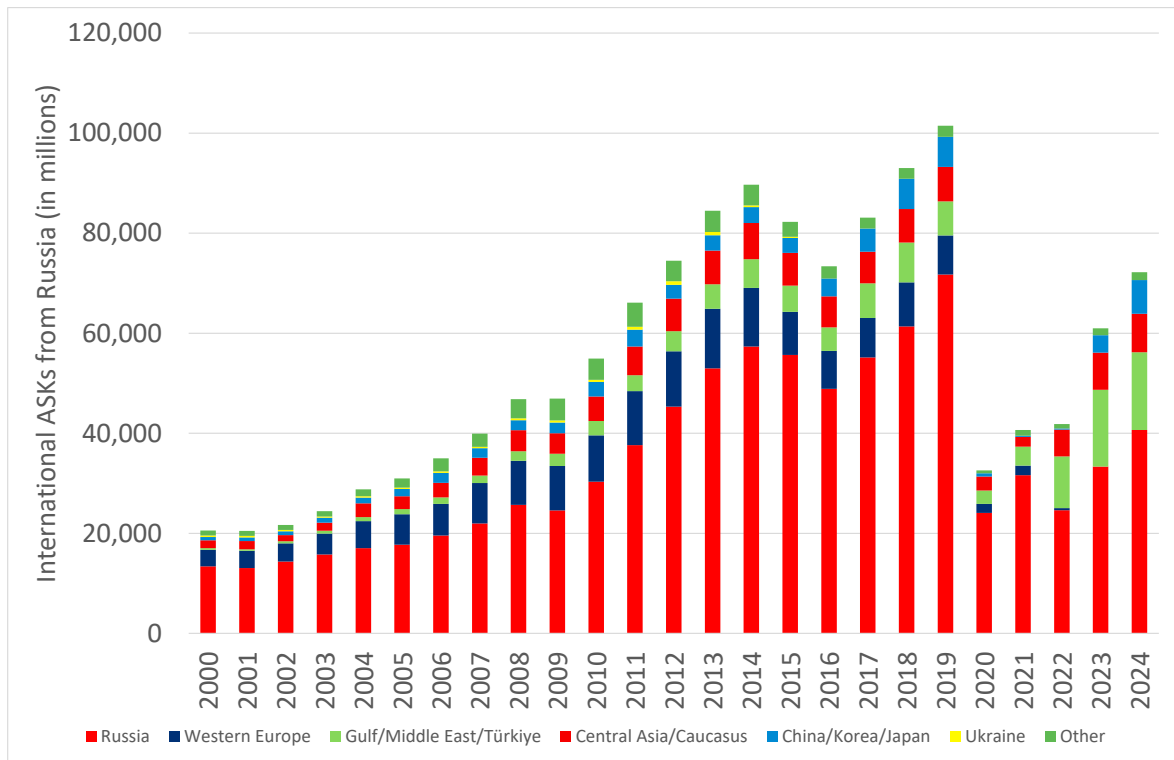


Fig. 1. Development in international ASKs from Russia by airline nationality 2000-2024.

Source: Own analysis based on data provided by Sabre Market Intelligence.

Absolute growth continued until 2014, when Russia annexed Crimea and first sanctions were imposed. Since the start of the current, full-scale phase of the Russo-Ukrainian war, airlines from the Gulf/Middle East and Türkiye have significantly increased their presence in the Russian market, reaching a market share of more than 25 % of ASKs in 2023, while the Western airlines are now entirely out of the direct flight market.

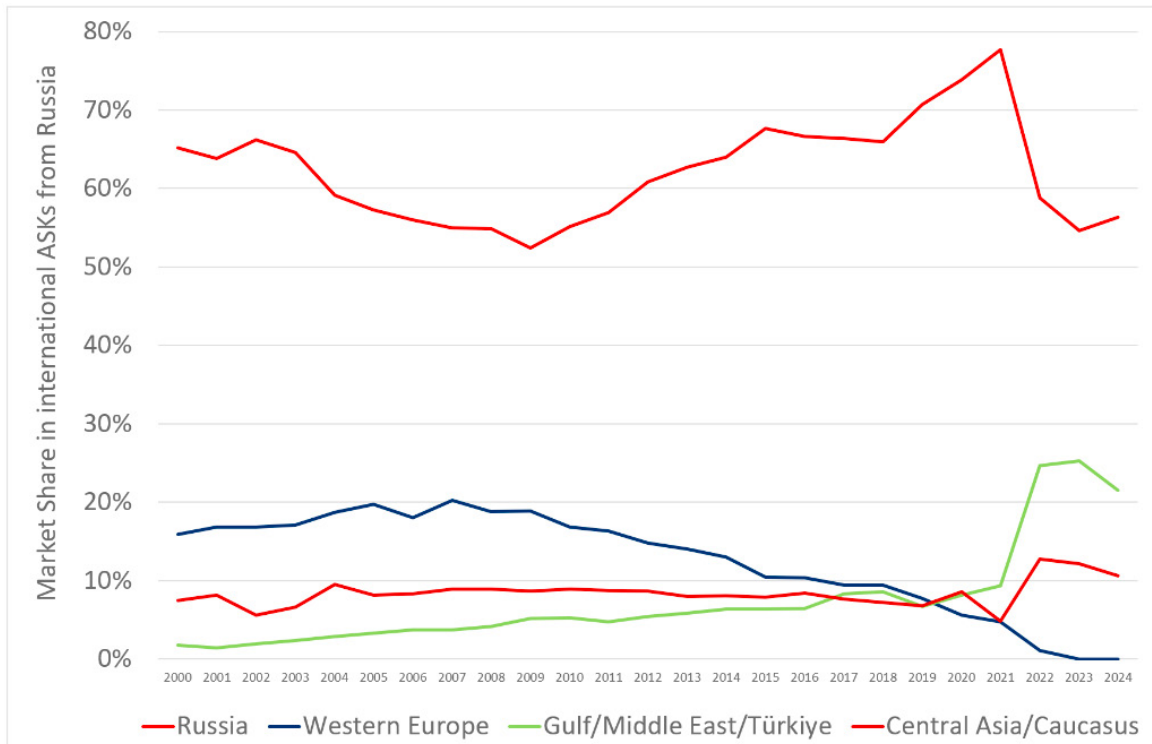


Fig. 2. Development in market share in international ASKs from Russia by airline nationality 2000-2024.  
Source: Own analysis based on data provided by Sabre Market Intelligence.

Figure 3 shows the change in the total number of seats offered on international routes by airline, comparing 2024 with 2019. Airlines from Türkiye are the main beneficiaries of the traffic shift:

- Southwind, a holiday airline, increased the number of seats offered on international routes from Russia by more than 900,000. In the meantime, the Turkish-registered airline, has had its EU entry permit revoked as the authorities believe that the airline's effective ownership and control are in the hands of Russian nationals (Needham, 2024).
- Turkish Airlines has had the second highest increase in the number of seats offered on international flights from Russia with an increase of more than 700,000, followed by low-cost carrier Pegasus with more than 288,000 additional seats.

Other carriers that significantly increased their supply to Russia are mainly from the Gulf region (flydubai, Air Arabia, Emirates) and Central Asia / Caucasus (Uzbekistan Airways, Armenian Airlines, SCAT) mainly. In contrast, Western carriers have lost all their supply to Russia, with Lufthansa having the strongest decline of almost 700,000 seats.

Interestingly, although Belarus is a close ally of Russia, Belavia reports a sharp decline of around 400,000 annual seats to Russia (one-way). The Belarusian aviation sector was more or less a collateral damage of Russia's invasion of Ukraine. Previously, the national carrier Belavia and Minsk airport had capitalized on the absence of direct flights between Ukraine and Russia since 2014 after the annexation of Crimea, with more than 380,000 transfer passengers (both ways) between the countries in 2019, which disappeared completely in 2023. Moreover, Minsk's function as hub between the West and Russia has collapsed, as Western aviation sanctions also apply to Belarus. In 2019, Minsk had a total of more than 738,000 transfer passengers, of which more than 539,000 had Russia as their origin or destination. In 2023, the total number of transfer passengers declined to less than 90,000 passengers, of which less than 80,000 traveled to or from Russia.

The loss of Belavia’s landing rights in the EU and other European countries, as well as the discontinuation of services to Ukraine, severely affects the Belarusian national carrier’s business model, with a decline from 3.3 million passengers in 2019 to 1.4 million passengers in 2023.

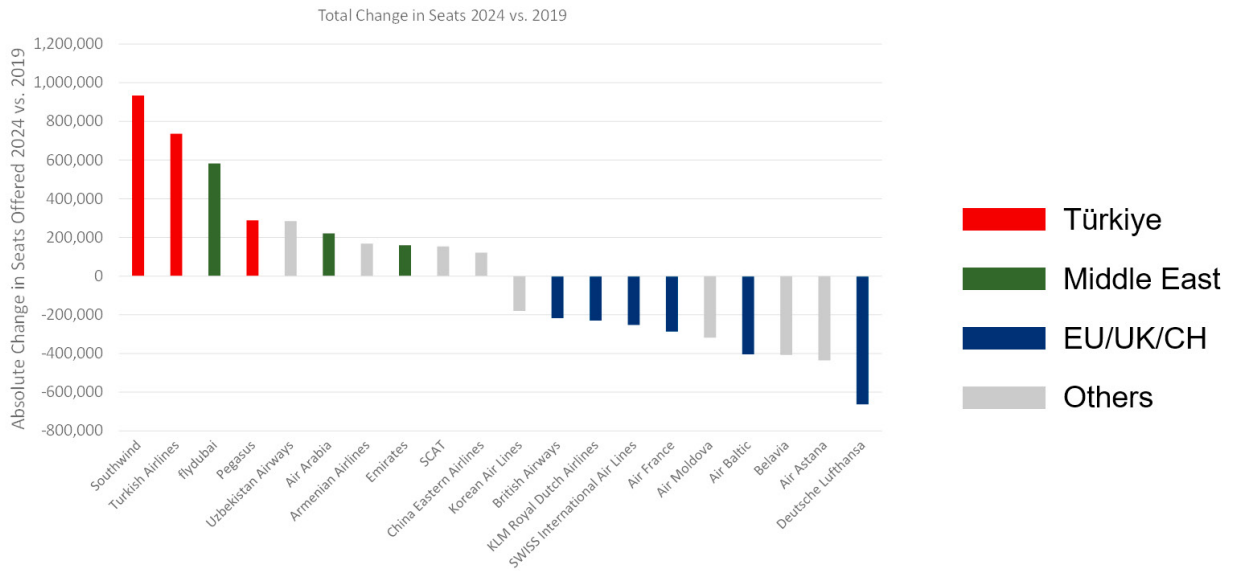


Fig. 3. Change in total number of seats on international routes from Russia 2024 vs. 2019 by airline / airline nationality. Source: Own analysis based on data provided by Sabre Market Intelligence.

#### 4.2. Origin-Destination Demand

Figure 4 shows the long-term evolution of international origin-destination passengers from Russia between 2010 and 2023, disaggregated by destination regions. The EU/Western Europe accounted for about one third of Russia’s international origin-destination passengers. In 2019, 10 million passengers traveled between Russia and EU/Western Europe out of a total of 27.5 million. In 2023, the number of passengers to the EU/Western Europe decreased to 622,000, which, under the absence of direct services, now have to use transfer connections, e.g., via Serbia, Türkiye or the UAE. At the same time, the number of travelers to the Gulf/Middle East/Türkiye has increased from 4.1 million (2019) to 4.9 million (2023). Traffic to Central Asia & Caucasus has increased, too, from 4.3 million to 4.9 million.

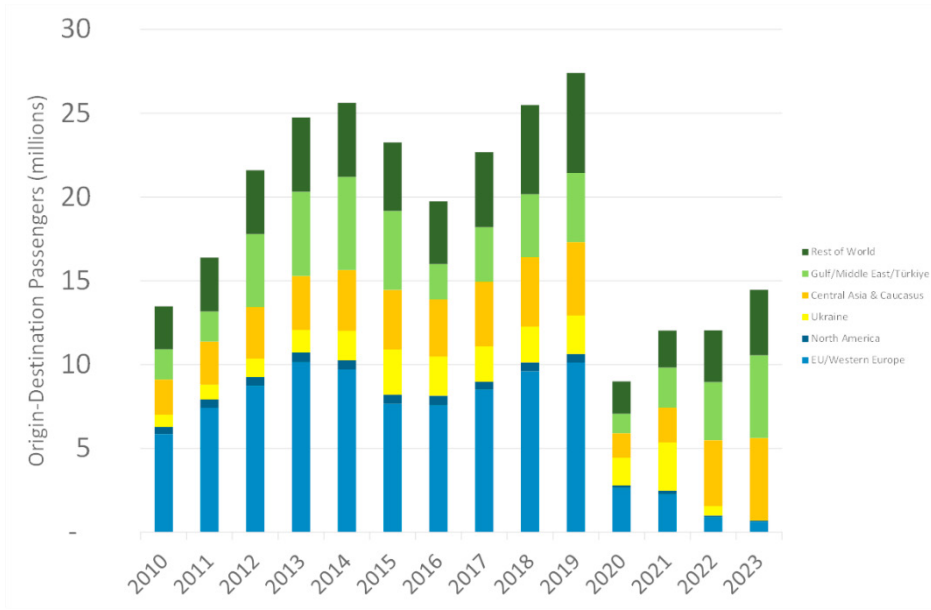


Fig. 4. Evolution in destination regions of origin-destination passengers from Russia 2010-2023. Source: Own analysis based on data provided by Sabre Market Intelligence.

The “beneficiaries” of the change in destinations by Russian travelers are particularly evident in the case of mainly touristic destinations. Figure 5 shows the change in demand at the country level for touristic destination countries. Türkiye has traditionally been the most preferred foreign vacation destination in the Russian market, but still accounts 8.2% growth between 2019 and 2023.

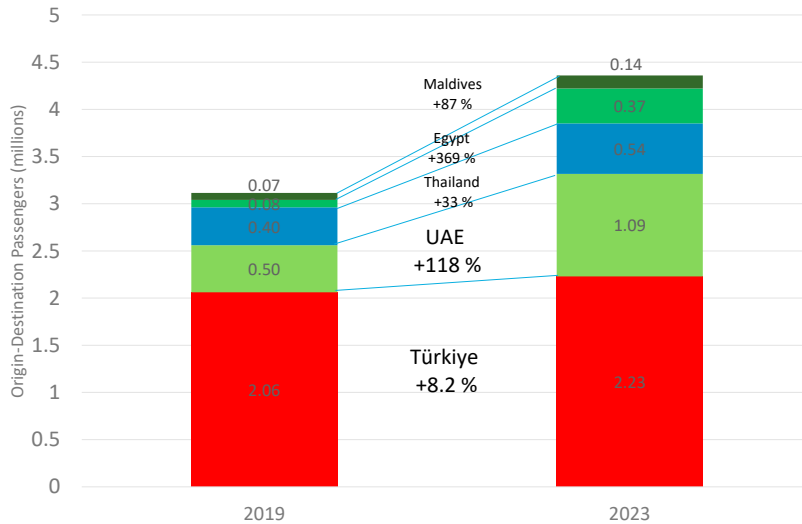


Fig. 5. Comparison of demand for touristic destination countries from Russia 2019/2023. Source: Own analysis based on data provided by Sabre Market Intelligence.

OD passenger traffic from Russia to the UAE more than doubled from 0.5 to 1.1 million passengers and also Thailand, Egypt and the Maldives have shown growth rates of 33%, 369% and 87%, respectively, albeit at

considerably smaller absolute levels of between 0.14 and 0.57 million passengers per year in 2023. It can be assumed that these destinations are used to replace former holiday destinations in the EU, such as Cyprus, Greece, Italy or Spain.

Finally, it is worth considering the commercial implications of the change in traffic flows are worthwhile to consider. Table 1 shows the change in gross revenue (including taxes and charges) of international traffic to/from Russia by airline, comparing 2019 and 2023. Based on the data provided by Sabre Market Intelligence, Turkish Airlines has become the largest provider of international traffic in Russia by revenue, followed by Emirates, Aeroflot and flydubai. The increases in revenue are substantial, with Turkish Airlines increasing revenues by more than 900 million USD, Emirates by more than 800 million USD and flydubai by almost 700 million USD. Aeroflot has lost 2.7 billion USD in annual revenues. However, the figures for Russian airlines should be viewed with caution, as Sabre may no longer be able to accurately report revenue figures due to sanctions and the use of other distribution channels. Nevertheless, it is obvious that Russian airlines that previously had a substantial share of traffic to the West are heavily exposed to sanctions.

Table 1. Evolution of international traffic gross revenues to/from Russia by airline 2019/2023. Source: Own analysis based on data provided by Sabre Market Intelligence.

Rank	Airline	Airline Nationality	Gross Revenues 2019 (million USD)	Gross Revenues 2023 (million USD)	Change 2019/2023 in %
1	Turkish Airlines	Türkiye	327.1	1273.7	+289%
2	Emirates	UAE	313.5	1156.8	+269%
3	Aeroflot	Russia	3732.1	1010.5	-73%
4	flydubai	UAE	81.3	763.7	+839%
5	AZUR Air	Russia	223.4	715.5	+220%
6	Ural Airlines	Russia	672.1	701.1	+4%
7	Uzbekistan Airways	Uzbekistan	246.2	410.5	+67%
8	Siberia Airlines	Russia	808.1	335.9	-58%
9	UTair Aviation	Russia	160.7	280.9	+75%
10	Nord Wind	Russia	231.1	276.5	+20%
11	Red Wing	Russia	68.7	256.3	+273%
12	Pegasus	Türkiye	72.2	239.5	+232%
13	Air Arabia	UAE	25.9	203.4	+686%
14	Qatar Airways	Qatar	152.6	167.3	+10%
15	Azerbaijan Hava Yollary	Azerbaijan	99.4	154.2	+55%
16	Air Serbia	Serbia	19.8	149.4	+655%
17	Southwind Airlines	Türkiye	0.0	146.7	n.a.
18	Etihad Airways	UAE	44.1	138.9	+215%
19	Corendon Airlines	Türkiye	6.2	135.9	+2082%
20	China Eastern Airlines	China	68.4	125.2	+83%

On the other hand, Russian carriers that focus on holiday traffic, e.g. to Türkiye, even benefit from the political developments and the resulting shift in traffic flows. Severely affected among the European airlines is the Lufthansa Group, which generated more than 416 million USD in revenues from traffic to and from Russia in 2019. In addition to the aforementioned direct shifts in sales from Western airlines to those from the Gulf States or Türkiye, additional adverse cost and demand effects can be seen, for example as a result of flight time extensions due to the avoidance of Russian airspace and payload restrictions due to flight distances closer to the maximum range of long-haul aircraft. Finnair, whose long-haul business model in the past was based on flights to Asia via Russia, is particularly affected.



These competitive disadvantages come at a time when European airlines are already burdened with high costs for air traffic control, security, air passenger duties and environmental regulations.

## 5. Summary and Conclusions

The descriptive analysis of air transport supply and demand data leads to the following conclusions: Firstly, the flight bans and visa restrictions imposed by Western countries (and, on the basis of reciprocity, by Russia) resulted in a significant decrease in total international traffic to and from Russia. While 27.4 million origin-destination passengers traveled from a Russian point of origin to an international destination in 2019, this figure fell to only 14.5 million passengers in 2023. Secondly, there is a significant geographical shift in traffic flows from (and to) Russia. Origin-destination traffic to Western Europe decreased by 94% and to North America by 86%. At the same time, passenger numbers to Central Asia & Caucasus increased by +12% and to the Gulf/Middle East/Türkiye by +19%.

The analysis of the development of international traffic revenues to and from Russia provides an additional perspective on the “winners” and “losers” of the current political developments in the aviation sector. In particular airlines from the Gulf region and Türkiye are taking advantage of the commercial options available to them because their national governments do not support sanctions against Russia. One of the aims of this article was to make this information transparent. This may also be an additional consideration for passengers in their individual decision-making when choosing an airline for their next flight.

This analysis of the development of international traffic to and from Russia in the light of the invasion of Ukraine illustrates the general problems with economic sanctions. As in other sectors, sanctions come at a cost for stakeholders both the imposing and the sanctioned country/countries. Traffic to and from Russia has been an important segment for several Western European airlines in recent years. This has completely disappeared due to political realities. In the overall political context, the “costs” for the countries imposing sanctions and their (corporate) citizens must be considered in the political decision-making process and should be made transparent. In the end, it is a question of whether the (perceived) benefits of political and economic pressure exerted on the target country outweigh the economic costs for the imposing country. At least to a certain extent, travelers from Russia can evade the sanctions by choosing other destinations, especially for their vacations. Among the major winners are Türkiye, the United Arab Emirates, Thailand, Egypt and the Maldives, which have not imposed sanctions – their aviation and tourism sectors are benefiting.

This illustrates the general moral, political and economic dilemma of imposing sanctions. Doing nothing is not a political option because of public pressure. But when sanctions are imposed, their effectiveness in actually hurting the target country economically is rather limited. This is especially the case when the international community is divided over the sanctions to be imposed.

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