

Investigation of the Effects of Ukraine - Russia Tension on Turkish Airspace and Istanbul Airport

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Abstract

It is known that the airline industry, which is known to be more dynamic and complex among all sectors in the world, has been affected by many changes and events. Especially the political tensions between the states and the fact that the airline industry creates a large amount of capital make this situation even more complex and unpredictable. In this study, the reflections of the political tension between Ukraine and Russia in Turkey, which has intense commercial relations with both countries, were examined in the context of the airline industry. As a result of the analyzes carried out, it was seen that the tension between Ukraine and Russia is in a positive correlation with the traffic in Turkish airspace and Istanbul Airport, and it was concluded that Istanbul airport effectively increased the aircraft traffic with the airspace occupation. The study is expected to be the basis for future comprehensive studies.

1. Introduction

Since the existence of humanity, transportation activity has presented us many problems and fields of study from the past to the present. As in every business area, it is an important factor to monitor and control the dynamic environment in the airline industry, which is the main way of transferring goods and passengers today. For this reason, optimization studies in the changing and developing environmental conditions in the airline industry have gained an undeniable place in the field of optimization. Under these circumstances, the International Air Transport Association (IATA) guides all these efforts, supporting global standards for aviation, including aviation safety, flight safety, flight efficiency and sustainability, and providing manual data retention to keep dynamic environmental factors in check and provides resources for new studies.

Conditions that vary from country to country have created new and different problems. These problems encouraged creative and innovative ideas and paved the way for platforms to present different ideas in the field of work. With the developments in recent years, Turkey, which is among the top ten countries in the field of air transport, is expected to make even more significant contributions to world air transport in the coming years, both in domestic and international transfer

centers. Since the airline industry is made up of a dynamic environment, it is very sensitive to many changes. This high degree of precision makes managing and operating this industry day-to-day difficult. Especially financial crises or other environmental and political events that may lead to financial crises easily affect the aviation industry. COVID-19, one of the pandemics in history, has caused an unprecedented crisis for the world's airlines (Albers and Rundshagen, 2020). All states in the world have taken measures to cope with this pandemic situation in the aviation sector, as in many other sectors. As a result of these measures, the travel and hospitality industry in general and the airlines in particular have been hit hard and more than 60 percent of the world's commercial aircraft have been grounded (Hollinger, 2020). In addition, many governments have also announced support packages and aid, as the aviation industry is seen as an important source of income for many countries (Rushe, 2020). From this point of view, finding cost sources and taking precautions in the airline industry play a key role in ensuring continuity in the crisis period. However, profitability factors in the airline industry have changed and differentiated in the world over time (Scotti and Volta, 2017). Similar to the differentiation in the sector, it is possible to encounter various business models and cost structures from cost structure to service range. Considering all these situations, the structure of the airline industry, which is

intertwined with other sectors and politics, has caused it to be sufficiently affected not only by financial crises but also by political crises.

On the other hand, it is known that political events lead to investments and new business models in the sector (Atay et al., 2021a). Under these conditions, it is inevitable that a sector that is so affected by current events will have environmental and climatic consequences as well as major economic sanctions and consequences (Atay et al., 2021b). Beyond the environmental and climate effects, when the financial effects and human effects are compared, the resulting grievances and financial losses appear to be an issue that needs to be examined, since they are largely conspicuous. Despite the global crisis experienced in the world in 2003, Turkish Civil Aviation continues its growth that it started in 2002. This growth is expected to continue in the coming years and to reach the 2023 targets in civil aviation.

Having one of the largest airports in the world, especially with its Istanbul Airport infrastructure, Turkey has experienced a significant change in 16 years and has managed to achieve this growth in the sector after liberalization. As people start to prefer air transportation, the number of businesses that will serve in the sector is increasing rapidly, and therefore countries are trying to reach the best standards in transportation. So much so that in many studies carried out during the construction phase, the predicted number of passengers easily reached the estimates and performed above the expected (Atay et al., 2019). However, due to the COVID-19 pandemic that emerged in 2020, its efficiency has decreased due to the closures and reductions in flights, and the aviation industry has suffered a great injury, as is the case all over the world. Since Turkey is a major tourism country and serves as a bridge between Europe and Asia, the disruptions in air transportation caused great damage and pioneered radical changes in the sector. According to the data published by the Ministry of Culture and Tourism, tourism activity increased 4.5 times after COVID-19 compared to the previous year, 2021, and the country with the largest share in this mobility was Russia with a 10% share (KTB, 2022). In terms of total foreign tourist mobility, the ranking by transportation type is shown in Figure 1.

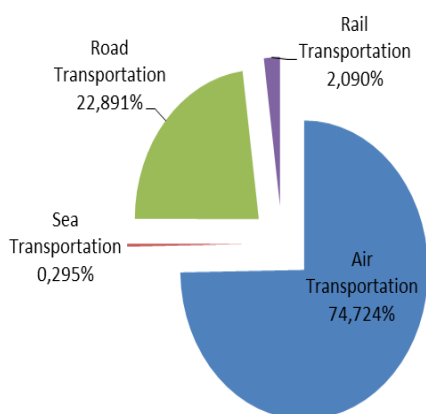


Figure 1: Rates of foreign tourists entering Turkey by transportation type (KTB, 2022)

As can be seen from Figure 1, the majority of tourism mobility uses the airline. This situation is thought to be due to the fact that Turkey is a tourism country and that it offers

advantageous holiday opportunities in the current economic conditions. Although the situation seems to be good, it is possible to deduce that Turkey, which is a country that hosts tourists from many nationalities and shares airlines with almost all countries, will be affected in any political or economic crisis, regardless of its size because Turkey has a role of bridge that links Europe and Asia in terms of aviation. In the light of this information, the aim of this study is listed below as;

- Observe the efficiency changes in Turkish aviation and especially the Istanbul airport, based on the Ukrainian-Russian political tension,
- Reveal the adaptations of aviation operations because of this tension.
- Detect the rapid effects of political crisis on Turkish aviation activity.

The data of the statistics carried out in the study were compiled from official and open sources, and the Turkish Statistical Institute (TUIK), the General Directorate of Civil Aviation (SHGM), the State Airports Authority (DHMI) and the Ministry of Culture and Tourism were used as the main data sources.

2. Literature Review And Conceptual Framework

While the development of transportation activities on a local, regional and global scale plays one of the most important roles in the overall life planning, any disruption in transportation creates extremely comprehensive problems. When we examine some global events affecting air transport, it is seen that there is a mutual interaction between transportation and tensions between countries. This situation shows its effect more significantly in air transportation. When we look at the effect of the Gulf Crisis (1990 – 1991) on air transport; Towards the 1990s, the development of world trade and tourism, the catch of a certain balance in fuel prices, again caught a profitable trend in the civil aviation sector. However, while a sector in the civil aviation sector was expected to revive in this period, the Gulf Crisis that occurred in 1990 brought the airline companies into a new crisis period (75.Year THY 2009:175-176). This crisis had a negative impact on most sectors in the world. However, the biggest impact of this crisis was seen in the World Civil Aviation Sector. IATA airlines, which made a total profit of 2.3 billion dollars in 1989, suffered a loss of almost 2 billion dollars in 1990 due to the effect of the crisis. In this process, while many airline companies in the world and especially in the United States declared bankruptcy, there were airlines that stopped their operations and were on the verge of bankruptcy (75.Year THY 2009:197), (Esin and Denge, 2021: 252). Likewise, when we examine the effects of Terrorist Attacks (9/11) on air transport; It is known that terrorism has a great impact on the international trade and aviation sector. In air transport, company revenues have decreased as terrorist attacks have reduced passenger demand; operating costs have also increased for contributions and incentives (Bükeç and Erdoğan, 2010: 5). While the world aviation industry has progressed positively since 1997, it suffered a loss of 12.6 billion dollars in 2001 as a result of the terrorist attacks in the USA on September 11, 2001. This loss affected all airline companies at approximately the same rate. Compared to the 1991 Gulf Crisis, the September 11 attacks seem to have had far more negative economic consequences; The loss of the Gulf Crisis is approximately 8 billion dollars (Torum, 2002:

9). Terrorist attacks and the psychological effects of these attacks on people have led to a significant decrease in the use of airlines in transportation. Similarly, the air transport sector experienced a sudden decline with the September 11 attacks. In the first four days after the attack, 74% of flight reservations in the USA and 19% of flight reservations outside the USA were canceled (Peter and Fariba: 2002). Some holiday travelers have chosen to cancel their holidays due to fears caused by the September 1 attacks. Some passengers traveling for business, on the other hand, preferred to hold business meetings via teleconference and postponed or canceled their flights (Bükeç and Erdoğan, 2010: 6).

The pandemic has had very sharp effects on air transport. Travel restrictions caused by the pandemic have brought about the cancellation of essential travel, which has led to a significant decline in air transport demand. The Covid-19 Pandemic has caused many airline companies to suffer serious financial losses. Similar to the changes caused by the Covid-19 pandemic around the world, it has also occurred in Turkey. In this process, extraordinary situations related to transportation emerged and some measures were started to be taken gradually since the first detection of the pandemic. The measures taken caused significant decreases in the number of passengers and the amount of cargo compared to previous periods (Bakırcı: 2020: 46). In general, during the Covid-19 Pandemic process, for the first time in a global sense, air transport had almost reached its point. According to the report presented by Global Outlook for Air Transportation, the COVID-19 pandemic is unprecedented, particularly due to the policy response that has included the cessation of many economic activities, including air traffic. The pandemic is the biggest challenge the aviation industry has ever faced. Makes previous shocks such as the 1979 oil price crisis, the Gulf War, and the Global Financial Crisis seem like minor events in comparison (Global Outlook for Air Transportation, Special Edition)

When we try to brought everything together, sustainability of air transport is closely related to operational, economic, social and environmental dimensions (Janic 2004). Similarly, the economic dimension relates to operating revenues, and the social dimension relates to an airline's contributions to the regional and national community as well as contributions to the globalization and internalization of business and leisure activities such as trade, investment and tourism. Likewise, the environmental dimension relates to the physical effects on human health, such as air pollution, airport noise, airplane crashes, and waste generation from airlines. Janic (2004) also reveals that some studies only consider economic, social and environmental dimensions. However, all dimensions are affected by political and legal issues and thus affect an airline's operations and this has a direct impact on an airline's economic and operational performance. Aviation is a highly regulated industry, both nationally and internationally. Therefore, the legal and regulatory environment is an important and complex factor influencing the performance of an airline and airports, as airline operations require strict adherence to relevant civil aviation regulations. Some other legal procedures implemented in a country, although not directly applicable to airlines, greatly affect their operational or economic performance. The airline industry is very susceptible to political situations such as tax and fines, government interference, and trade wars between countries, as there are various laws that indirectly affect airlines and airports. In this study, the effects of the political tension between Ukraine and

Russia on Turkish airspace and Istanbul airport will be tried to be explained with data and statistics from official sources.

3. Crisis and Uncertainty in Aviation

The aviation industry has faced many challenges since deregulation in 1978. Over the past few decades, the aviation industry has faced numerous challenges stemming from oil and energy crises, global market challenges, and unending political tensions. These economic challenges have traditionally focused on key issues where industry has focused its efforts and experts are working relentlessly to find the right strategies. However, our main focus, on which we hope to work, continues to change from day to day. The aviation industry continues to face wider economic challenges that now require its own strategies, experts and solutions. The economic environment that exists today is constantly changing, nationally and globally. This change encompasses not only unexpected events, but also other challenges that add to these deep-rooted economic difficulties. For example, the COVID-19 pandemic, social unrest, global politics and pilot shortage are just some of the new challenges the aviation industry needs to find a solution to right now. The aviation industry and airlines have weathered many storms, from past deregulations to the 9/11 tragedy, but the conditions we are in present complex problems that are very different from what airlines have experienced in the past and need new solutions. This difference is not primarily due to the size of these problems, but to the sheer number of problems that need to be addressed simultaneously. The airline industry faces more challenges today than it did in the past. Discussing and explaining these challenges and how they affect the aviation industry as a whole has the potential to be a resource that can shed light on future uncertain problems.

Considering the global pandemic, for example, it is clear that in early 2020 the global airline industry is about to face a world of challenges that it has never faced before. It was also unclear how exactly airlines would be affected, what these impacts would mean for the industry going forward, or how long that would last. A pandemic of this magnitude had not been seen since 1918, just years before the first aircraft took off. The airline industry has not only had to deal with fundamentally pandemic challenges, but the problem has had to address problems that have had to resolve the constraints placed on it by the states that have intervened. Many governments have intervened and changed the industry with new applications for the entire industry, from personnel to daily operations, with the new requirements of operations and measures taken under the uncertainty of the pandemic. While this intervention caused many airlines to lose money, the industry had to employ different personnel due to government regulations. In addition to these problems, many problems arose for those working outside the sector. Although airlines receiving government funding were not allowed to lay off their employees, this was not a wholly restrictive measure as airlines could still retire early and lay off relevant employees from various positions. Combined with the fact that airlines had to park up to 90% of their planes and cut their operations by the same proportion, there was a significant reduction in revenues.

On the other hand, even before the war in Ukraine, airlines faced serious geopolitical tensions resulting from the various ways in which the world's largest countries competed. In this case, it is clear that the airline's industry is heavily impacted

when countries compete in what are sometimes called trade or currency wars. The airline industry plays a huge role in the escalating world tensions since 2018. Political events like this pose fundamental challenges to the economy. For example, as a result of the tension between Ukraine and Russia, the change in the basic fiscal and monetary policies in the countries where the airlines of the two countries operate has led to the making of parallel arrangements in their neighboring countries. Airlines operating in countries that implement expansionary fiscal and monetary policies are likely to see inflation prices leave their customers out of the market. With the collapse of the global economy as a result of the effects of political events, it becomes more difficult for some customers to risk using airlines and creates a bottleneck. However, it is also possible to observe the positive effects of some political events on the sectors. As can be seen in Figure 2, the tension, which gave its first signals on January 25, had a great impact on airport statistics.



Figure 2: Monthly passenger change at IGA Istanbul airport (EUROCONTROL, 2022)

As can be seen, the effects of a political tension have had an impact on airport statistics. On the other hand, on the days when the tension escalated, Istanbul airport turned into a much more crowded transfer center than usual due to both evacuation flights and the closure of the airspace. In addition, according to the report presented by EUROCONTROL, the effects of the current crisis are obvious, since the most daily flights from Russia and Ukraine, excluding domestic flights, are to Turkey (EUROCONTROL, 2022b). As of March, the closure of the European airspace to Russia, the lack of maintenance and spare parts services for European origin aircraft, etc. Such sanctions also aggravated the effects of the current crisis

4. Purpose and Method

The main purpose of this study is to analyze the effects of the Ukraine - Russia Tension on air transport in Turkey by explaining the effects of the Ukraine - Russia Tension on air transport in a conceptual framework. The study was created within the framework of the evaluation of the data. Correlation analysis was performed in the study. Correlation analysis is an analysis technique that shows the strength and direction of the relationship between dependent and independent variables.

$$Correlation(X,Y) = r_{xy} = \frac{Cov_{xy}}{S_x S_y} = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{(N-1) S_x S_y} = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{S_x S_y} \times \frac{1}{N-1} = \frac{\sum Z_x Z_y}{N-1}$$

Cov_{XY} is called covariance, equal to;

$$\frac{\sum(X - \bar{X})(Y - \bar{Y})}{(N - 1)}$$

Its format is very similar to variance:

$$\frac{\sum(X - \bar{X})(X - \bar{X})}{(N - 1)}$$

It measures how two variables go together, or co-vary. The strength of the relationship between the variables takes values between +1 and -1. A positive value indicates that the relationship between the variables is in the same direction, and a negative value indicates that the relationship is in the opposite direction (İslamoğlu A., 2019: 249).

5. Conclusion

The data used, especially the total flight traffic of IGA Istanbul Airport, and the sanctions against Russia were also used as input data. The main reason for investigating the effects of the sanctions on air traffic is that the closure of the Russian and Ukrainian airspaces as a result of the sanctions will provide information about the effects on the Turkish airspace.

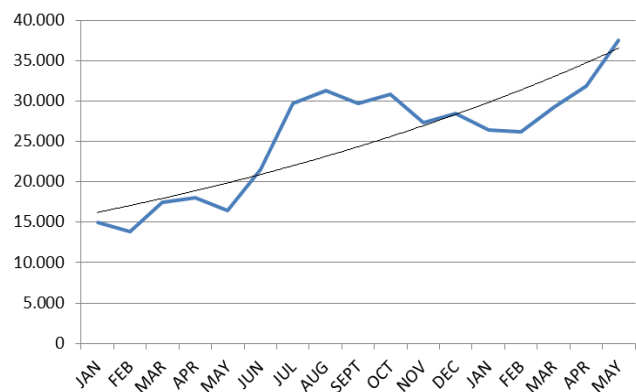


Figure 3: IGA Istanbul Airport Aircraft Traffic between 2021-2022 (DHMI, 2022)

In the graphic above, the previous period aircraft traffic of IGA Istanbul Airport is shown. When the graph is examined, it can be said that while the traffic density of the airport tends to increase from month to month, there is a seasonal increase in demand. However, the relevant graph cannot be considered sufficient to explain any relationship. Therefore, documenting the relevant traffic data simultaneously with the time series of sanctions imposed on Russia by other states as a result of the Russia-Ukraine tension helps to better explain the situation.

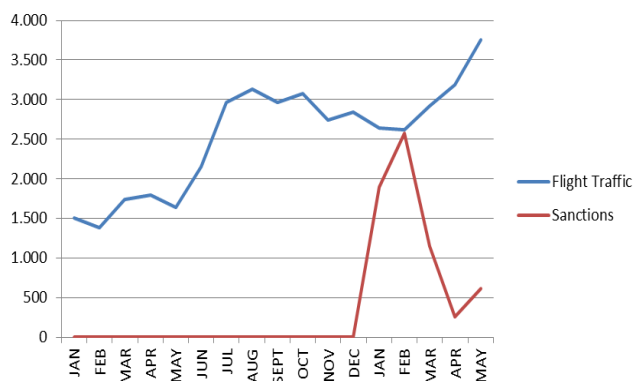


Figure 4: Comparison of Istanbul Airport Traffic with the Amount of Sanctions

As can be seen in Figure 4, when the number of sanctions and traffic data are visualized, the increase in the number of sanctions can also be seen as a trigger for the increase in air traffic. However, it is not possible to say for certain information. For this reason, correlation analysis, which is our most basic analysis used to explain the relationship, has been applied in order to be able to say a certain information. Because correlation is a coefficient that indicates the direction and strength of the relationship between two variables and can offer ideas. Although the data on the amount of sanction from the data of the relevant analysis were tried to be obtained from various sources, the most definitive data was published by statista (Statista, 2022). The data shown in the relevant analysis are presented in the figure below.

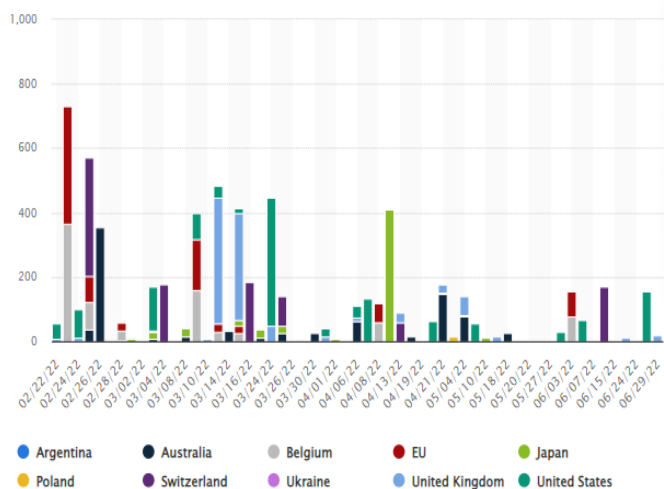


Figure 5: Daily breakdown of sanctions against Russia (Statista, 2022)

Based on the available data, İGA flight traffic data was obtained by the State Airports Authority and was subjected to correlation analysis with the amount of sanctions, which is the other data item obtained. According to the results of the correlation analysis, the correlation coefficient was found to be positive 0.209 at the 95% confidence interval, and thus, it was seen that the effect of the increase in sanctions on air traffic was in the same direction. The relevant correlation graph and confidence interval are shown in the figure below.

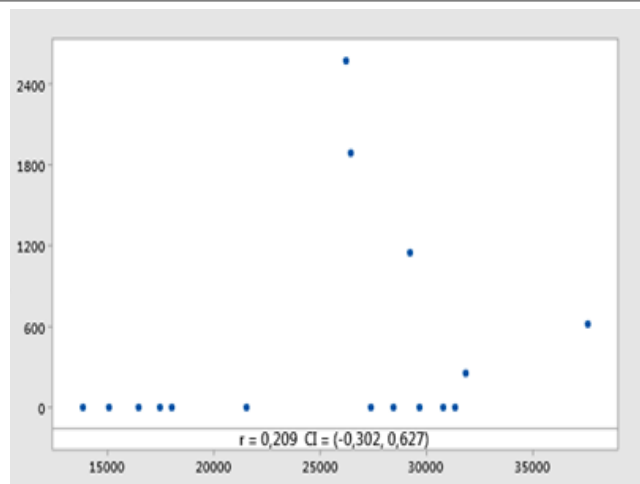


Figure 6: Correlation analysis graph and coefficient

Although the positive determination of the correlation coefficient showed that a political action could have an effect on the Turkish airspace, it is not possible to say that it has fully proven it. Because this effect is very dynamic and it is not healthy to prove with a small amount of data. On the other hand, it can be said that the expectation of a positive effect on its effects is correct.

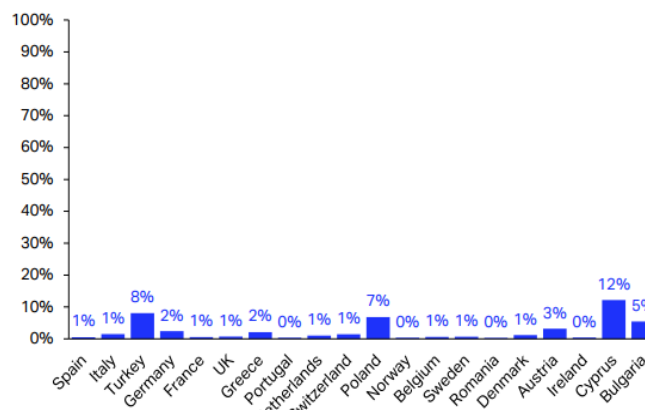


Figure 7: Exposure of European markets to Russia and Ukraine in 2021 (IATA, 2022)

By looking Figure 7, Cyprus, Turkey, Poland and Bulgaria had the highest share of total passenger numbers coming from those two countries in 2021 (5% to 12%). Since Turkey remains open to Russia, it might in fact benefit from its popularity for Russian holidaymakers, as options to travel to other warm countries will be limited. Thus, it can be said that Turkey, which has the highest number of daily flights, is automatically affected by the current situation, valid for both countries that are subject to tension, considering both tourism-oriented and other commercial activities.

6. Discussion and Suggestions

The ongoing socio-economic and political crisis for each nation will surely affect the air transport industry, including both security and operational aspects. The air transport industry and relevant stakeholders must prepare themselves and what measures to take in the face of financial, social and political instability and uncertainty. But unexpected events and political bottlenecks require unprogrammed solutions to this type of problem. From this point of view, several dangers can

be found for airline companies and the entire industry in a crisis environment. These;

- Failure of cooperating states to perform their safety oversight functions in the midst of sudden crisis profits.
- Overloading of the capacity and security infrastructure at airports and within the airspace than planned.
- Economic challenges following the increase in both the human and financial resources required to run safety oversight functions.
- Many risks that increase business complexity, particularly those arising from value-creating activities such as growth and profits.

Apart from the limited measures that can be taken against these risks and dangers, the fact that the location, time or probability of the dangers is not known is another issue that makes it difficult to examine this issue. In addition, the fact that the current political tension has not yet come to an end constitutes an obstacle to making a definitive judgment. From the point of view of analysis, the scarcity of data and information required to measure the environment created by the tension that has just occurred in a qualified and concrete way has made the accuracy of the study questionable. In this case, there is a need to improve the current study and to improve the method and methods used. However, reaching more data on the current tension before the development phase of the study will enable the study to sit on a more solid foundation. This study provides an insight into the impact of the current situation. It is expected that it will provide the basis for future studies at the initial stage and shed light on the future.

Ethical approval

Not applicable.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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