AYBU Business Journal

RESEARCH ARTICLE

Evaluation the Regional Effect of Covid-19 on the Stock Price of Airlines

Keziban Seçkin Codal [ID] [a*], Talha Musab Akpınar [ID] [a]

ᵃManagement Information Systems, Ankara Yildirim Beyazit University, Ankara, Turkey

Abstract	*Keyword*
The novel coronavirus – officially named COVID-19 – is rapidly spreading from its epicenter in Wuhan to the rest of China and the world. There have been 5,404,512 confirmed cases of COVID-19, including 343,514 deaths, reported to World Health Organization in 25 May 2020. Business face revenue losses and quarantine policies propagate worldwide and restrict travel, trade and industry. The very crucial negative influences were on the demand side, with national and international civil aviation flights critically affected in the short-term. The aim of study analyzes the changes in the abnormal return of the relevant stocks around the date of COVID-19 to investigate the rebound of the stock market. The transportation economy's stock market value for Asia-Pacific, North America, and Europe weakly impacted the region 's abnormal return that suffered from a global event-based pandemic. As a result, all civil aviation stakeholders should try to get rid of this global crisis with minimal damage, focusing on coordination, transparency and traceability by using information systems and tools.	

1. INTRODUCTION

Air transportation is a major industry in its own right and also provides for well-connected inputs into economic, social and political processes. The aviation industry promotes $2.7 trillion (3.5%) of the world's Gross Domestic Price, therefore; it increasingly deploys strategic position in transportation economy (ACI, C., & IATA, 2019). Demand for air transport is firmly. associated with economic development and mutual air transport is a driver in an economy (Akyildirim et al., 2020). The impact of aviation industry on economy can be monitored by three indicators: the employment and expenditure generated by airline companies and their supply chain, the progressions of exchange, tourism and investment resulting from users of all airlines serving the country, and the city pair connections that allow these flows (Economics, 2018).

To understand the structure of aviation industry, the dominated international region by Asia-Pacific, Europe, Middle East and Africa, North America and Latin America should be individually investigated. From both macro and national perspective, airport hub or airline hubs have important structural advantages for the hinterland economy in each region. These benefits lead to strength in terms of employment and income and, taxation revenue for local government additionally (Song & Ma, 2006). Besides, each hub mutually supports

---

and benefits from their aviation sector and other sector such as robust industrial, trading, maritime and tourism ecosystem (Christidis & Devetsikiotis, 2016).

The European aviation industry has the biggest and busiest airports in the country, which play a leading position as a regional and global network owing to the amount of planned connections to and from foreign flights and the amount of destinations served from the airport. (ACI, C., & IATA, 2019). The aviation markets in the EU Member States have been consolidated into a single EU aviation industry and since 1992 all national carriers are known as EU carriers (Christidis & Devetsikiotis, 2016). This alignment showed benefits by evolving the novel airway business models and integrating recent information technologies resulted in increase in travel demand.

The long-haul transfer passenger traffic in Middle East and Africa region has intensified significantly in recent years. In general, and especially, Gulf carriers have young fleets equipped with the new generation of in-flight products; earned varied award-winning customer service grants; created low unit operating costs; capitalized on their geological position by aggregating traffic bi-directionally from European, North American, and Asia-Pacific hubs (O'Connell & Bueno, 2018). Nevertheless, political tensions in some countries such as Egypt and Syria and ongoing armed conflict in Iraq have both hurt tourism sector in the region and diminished travel demand.

The aviation sector in Latin America region has been growing in recent years despite economic and political difficulties. Latin America and Caribbean aviation sector is a driver force for regional economic growth, generating $156 billion in Gross Domestic Price and sustaining 7.2 million jobs (Rodrigue, 2016). The taxation on air travel purchases and/or use, infrastructure deficiencies have hampered creating jobs and generating economic benefits in the region (ACI, C., & IATA, 2019).

North American region have the largest share of the global market regions expenditure due to status of manufacturing powerhouse (MacDonald, 2017). In North America, largest aviation area on the market, the total number of commercial units in service is higher than in other regions (MacDonald, 2017). As a cornerstone of the aviation industry North American hubs dominate the market.

According to IATA forecast to 2034, the routes to, from, and within Asia-Pacific will carry 42% of all world traffic. The network airlines in Asia have reacted to low-cost carriers (LLCs) in multiple ways, and competition increases depend on the firm's internal resources and external environment (Pearson, O'Connell, Pitfield & Ryley, 2015). Asia-Pacific comprises China and India, emerging markets in global aviation. Airline hubs have contributed greatly to domestic and international markets in these countries. According to IATA (Forecasting, 2005), in total, 0.93 percent of the China's GDP is supported by inputs to the aviation industry and foreign tourists arriving by air.

Unfortunately, the pandemic crisis has caused dramatic improvements in all aviation sector ignoring the regional superiority. This new pandemic has devastated the medical, public health infrastructure, economic in the world. Furthermore, transportation has impacted the contagion of coronavirus; at the same time public health has affected the transportation in many ways.

Highly connected international regions in the world are member of bipartite network that has intense interaction. In fact, the aviation industry already has difficulties as terrorist attack, sabotage, cyber-attack, biological, chemical and radiological attack leading to mass losses, economic or tourism damage, and weak security and security standards. In addition, this industry is severely affected by pandemic, causing subsidiary damage for many sectors in the regions. The literature contains a number of papers which examined the effect of threats on the aviation industry (Ito & Lee, 2005; Blunk, Clark & McGibany, 2006; Chance & Ferris, 1987; Bosch, Eckard & Singal, 1998; Kim & Rhee, 2017) but few of them have focused on whether the stock market-based effect of the pandemic on the aviation industry. The effect of COVID-19 pandemic on the transport economy is discussed in this study that aims to add to research on the pandemic's economic consequences as well as its limited literature on the impact of COVID-19 on transport economy.

2. THE PANDEMIC CRISIS THE AVIATION INDUSTRY FACES

Civil aviation, as one of the world's most competitive sectors, is obviously extremely susceptible to internal and external factors. Learned from numerous crises of the past decades, air traffic has been proven to

be vulnerable to economic crises such as the World Recession and the disease outbreak (ACI, C., & IATA, 2019). While the aviation industry has been exposed to many unique threats over the past decades, the pandemic is a fairly rare occurrence, causing more damage compared to others.

Coronaviruses are a wide family. of viruses that may cause respiratory infections ranging from common cold to more serious illnesses such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The last day of the year 2019, a cluster of pneumonia of unknown etiology was reported in Wuhan City. On 9 January, Chinese authorities reported in the media that the cause of this viral pneumonia was originally identified as a new type of coronavirus, different from other coronavirus found to date.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is type of coronavirus disease that circulates among animals with some of them also known to infect humans. Currently, the COVID-19 outbreak has infected nearly 5,404,512 people and caused 343,514 deaths in the world (on 25 May). The distribution of these cases on the world map is also shown in the Figure 1 below.
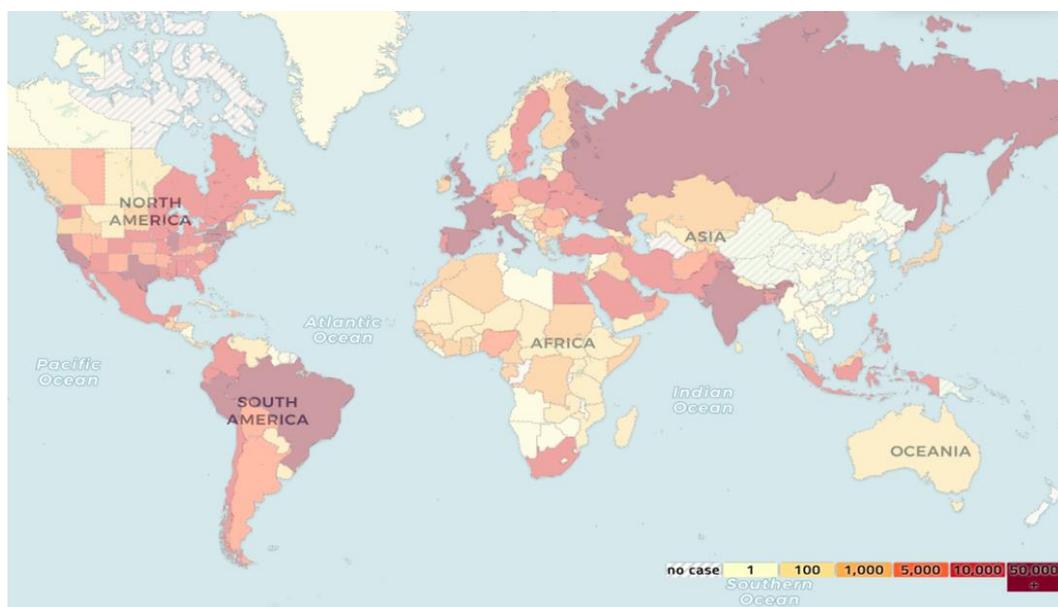

Figure 1. Coronavirus COVID-19 Coronavirus Confirmed Cases (25 May 2020)

The speed and effect of SARS and COVID-19 dispersion is explained in more than one statement. The propagation center is different. A man infected with severe acute respiratory syndrome ion Air China Flight lead to SARS spreading to northern Mongolia and southern Thailand (Twu et al., 2003). Wuhan, the COVID-19 epicenter, incorporates many elements that are difficult to handle. Wuhan is a major hub of transport and an industrial and commercial center. The COVID-19 is rapidly spreading from its epicenter in Wuhan to the rest of China and the world, surpassing the impact of the 2002 SARS-CoV and 2012 MERS-CoV outbreaks (Peng, Ho & Hota, 2020). The time span for COVID-19 outbreak is unique. Isolation was effective for SARS, transmission did not occur from asymptomatic or mildly symptomatic patients. While COVID-19 contagion process appears to contribute to the overall transmission in the early stage of infection (Bastola and et al., 2020). Hence, it is too late to isolate affected patients after infected individuals have reached health care facilities. Contamination of COVID-19 can be greater than SARS (Wilder-Smith, Chiew & Lee, 2020). Temperature monitoring is even less successful when pre-symptomatic exposure exists (Liu, Funk & Flasche, 2020). There is a heterogeneous scientific continuum. Though SARS has become a big epidemic distributed in hospitals, COVID-19 still has widespread contagion. On April 03, 2020, WHO published the data of round 1 million cases with confirmed COVID-19 in 205 countries around the world. Any other projections suggest that there might even be hundreds of thousands of pathogens around the world. Most contaminated people can acquire an infection under close medical care and are not quarantined.

Such individuals would be missing even though there was a more robust monitoring program in effect, so certain patients might secretly transmit the illness, comparable to influenza.

When SARS struck, global passenger traffic dropped by 18.5 per cent in April 2003 compared with the previous year, with Asia-Pacific falling by nearly 45 per cent (Pham & Luengo-Oroz, 2020). There were no travel restrictions at that period but travel advisories were provided by many governments to discourage non-essential travel to countries impacted by SARS (Wilder-Smith, 2006). Throughout 2003, the social impact of SARS, combined with travel bans levied by numerous national and foreign officials, culminated in a major economic decline for the airline sector and the global economy well outside the key areas impacted by SARS. On the other hand, the International Air Transport Association IATA published an initial impact assessment of COVID-19 estimating that total global airline revenue lost could be as high as $29.3 billion, with a potential 13 per cent full-year loss of passenger demand and a $27.8 billion loss of revenue in 2020 for carriers in the Asia-Pacific region (Rodrigue, 2016). The loss of value in the transportation economy will be very strong regard to long-standing travel bans.

3. THE IMPACT OF PANDEMIC ON TRANSPORTATION ECONOMY

Pandemic influenza leads to widespread mortality and morbidity. Traditional economic health practices focus on the specific impact of the health sector, while the general macroeconomic situation goes unnoticed. The decline in labor supply, the avoidance of public places and events, the possible closure of schools will inevitably affect the global economy and so a multidisciplinary approach is needed to capture the real potential impact rather than traditional methods to estimate health costs (Turnbull, Blyton & Harvey, 2004).

Investors fear coronavirus spread will destroy economic growth and government efforts are not enough to halt the decline. Central banks responded by lowering interest rates in many countries, including the United Kingdom and the United States (Hagedorn & Mitman, 2020). It will, hopefully, allow funding easier, and increase investment to improve the economy.

Not only China, but the whole world is suffering the most direct and severe effects from the epidemic. The huge export-led economies are almost paralyzed if not only for production, even consumption and other social activities go into hibernation with no obvious prospect of return (Lucchese & Pianta, 2020). In addition to the human costs, the epidemic has several direct consequences. Commercial losses or loss forecasts have been reported in all sectors: retailers, restaurants, cinemas, transportation companies, hotels, etc (Fernandes, 2020).

The financial impact of the coronavirus COVID-19 should not be measured using the simple billing device. Businesses can use generally accepted accounting principles to "hide" negative information while highlighting cheaper news such as new routes and increased passenger miles. In addition, insurance payments to the company can offset a large part of the loss, and subsequent higher premiums are difficult to record in the income statement. A more accurate measure of an event's financial impact is the response to the price of the company's common stock. In an efficient stock market, stock prices react quickly to new information and fully reflect its economic content. Many previous studies (Zitzewitz, 2003; Chen, Chen & Su, 2001; Kale, Dyer & Singh, 2020; Lee, Jiang, & Indro, 2002) have shown that the stock market is efficient enough to respond to events that are relevant to shareholders' assets.

In economic theory the reason for analyzing the stock market response as a indicator of an event 's financial effect is explained. The share price reflects an estimation by investors of potential discounted cash flows of a business. In other words, it reflects the company's profitability which will be defined by its future capacity to generate cash. The share price therefore represents the shareholders 'properties and indicates the investors' ability to provide the business with cash. If the market price responds adversely to a case, this implies investors anticipate potential lower and/or riskier cash flows. If the stock price does not respond, the incident cannot be deemed to contain any material information about the expected value or the uncertainty of the company's future cash flows (Hammersley, Myers & Shakespeare, 2008).

After the epidemic began on 31 December 2019 (Abodunrin, Oloye & Adesola, 2020), the Financial Times Stock Exchange (FTSE), Dow Jones Industrial Average and the Nikkei have all seen big declines. The Dow and the FTSE have witnessed their highest one-day drop recently since 1987 (Abubakar, 2020). With over a million confirmed cases of COVID-19, companies face revenue losses and disrupt supply chains as business

closures and quarantine measures spread worldwide and restrict movement and business. The travel and tourism industry were affected early by the economic disruption caused by the epidemic. On March 5, before the US travel ban was announced, IATA predicted that the COVID-19 epidemic could cost airlines $ 113 billion in lost business income because fewer people fly (FCE & Welbeck, 2020).

Brian Pearce, chief economist at IATA, told the Associated Press that "There are many airlines with relatively narrow margins and debt, which could put some in a very difficult situation" (Nseobot et al., 2020). In addition to the impact on airlines, the United Nations International Civil Aviation Organization (ICAO) predicts that in the first quarter, Japan could lose $1.29 billion in tourism revenue to Chinese travelers due to the drop-in passenger numbers, while Thailand would lose $1.15 billion (Стежко et al., 2020).

4. METHODOLOGY

According to the United Nations Development Programme (UNDP), "The rising COVID-19 epidemic is starting to affect developed countries heavily, not just as a short-term health problem but also as a crippling social and economic epidemic in the coming months and years.". Given the aforementioned statement, COVID-19 cases selected for the aim of this paper is considered to determine the effect of pandemic on transportation economy, including stock market. The use of civil aviation data is mandatory practice for making real-time decisions involving situation awareness, evaluations of alternatives and risk assessment within a restricted time space (Li et al., 2011).

This paper addresses the following research questions to discuss the effect of COVID-19 on airlines stock market values, as well as their potential effect towards airline hubs in the region.

- Did the number of. COVID-19 cases affect the value of the airlines stock price? Did it have regional effect on aviation industry? (The regions are the Asia-Pacific, North America, . Latin America, and Europe, Middle East and Africa).
- If yes, was the regional effect permanent or transitory? (No, so we cannot predict the outcome of a random experiment)
- Did the response of the stock market to such events change over time or stable? More specifically, .do more vulnerable stock certificate have a minimum number of public listing due to high risk?
- What is the possible effect of COVID-19 on the structure of global aviation? Can the policy towards to COVID-19 outbreak improve by using different argument for airlines, airports managements, aircraft producers and governments?

The research questions in this paper refer to the likely effects COVID-19 has had on the airline's market price endured from the pandemic. To this end, we are analyzing this impact in relation to large foreign airlines and, more precisely, stock market prices for airlines. In this study, each hub with airlines, the most connected airports, around the globe, represents each region for aviation industry due to detection of regional effect. For example, when we examine an event related to COVID-19 in the Asia-Pacific, we look at the impact of this event on the airlines' stock price in this area. Both data were obtained from investing.com and 90 trading days were obtained from 1 January to 1 April.

While determining the airlines in the study, which is a comprehensive and globally valid data set; OAG Megahubs (Regions) report was used. However, in this report, all overtaking airlines are not included in the analysis as they do not comply with certain compliance. For example, airlines that are not listed on the analysis which is not occur world stock markets. Besides, airlines in more than one stock market value only the stock market values of their own countries market are included in the analysis. In addition, the airlines with the highest transaction volume of the stock exchange were used from the airlines that have more than one name and sizes in a stock exchange. Exchange days differ due to the change of holidays in different countries. To overcome this, stock exchange trading days in 2020 were calculated for each country separately.

Examining the financial market 's response to a case, we analyze the changes in the average return of the relevant stocks around the date of the event. The daily return on a stock is defined as the percentage change in price plus the daily dividend yield, or where Rt is the return over the time interval ending at time t, Pt is

the price at time t, Pt-1 is the price at time r-1 (the previous day), and Dt is the dividend paid during the time interval (Brown &. Warner, 1985).

$$Rt = (Pt-Pt\text{-}1+Dt)/Pt\text{-}1 \qquad (1)$$

In an attempt to understand COVID-19 external influences, this paper examines temporal effect of COVID-19 on the airlines stock market and transportation economy. In this study it is offered to evaluate the COVID-19 effects on region event study approach. An event study in the areas of business/finance studies are an analysis to find out whether a statistically significant reaction to past certain type of event has occurred in the financial markets, which should affect the market values of public companies. For instances, some study focusses on event study approach on air transportation such as 9/11 impact of air transportation on economy (Tam & Hansman, 2002), effect of air transport disasters on the air transport sector (Walker, Walker, Thiengtham & Pukthuanthong, 2014) financial crises (Goh & Rasli, 2014; Mwangi, 2013) impact of oil prices fluctuation (Nandha & Faff, 2008; Elyasiani et al., 2011; Tsai, 2015), outbreak (Loh, 2006; Bogoch et al., 2015), terror attacks (Balcilar et al., 2015; Brounen & Derwall, 2010; Kolaric & Schiereck, 2016).

5. RESULTS

The temporal effects of Coronavirus COVID-19 on the stock price of airlines and the differences of pandemic impact within this broad sector are investigated. In particular, COVID-19's impact on the economy can be described as a "depression" in international finance, covering international loans, international capital flows, global financial markets, export finance, and foreign exchange sector determination.
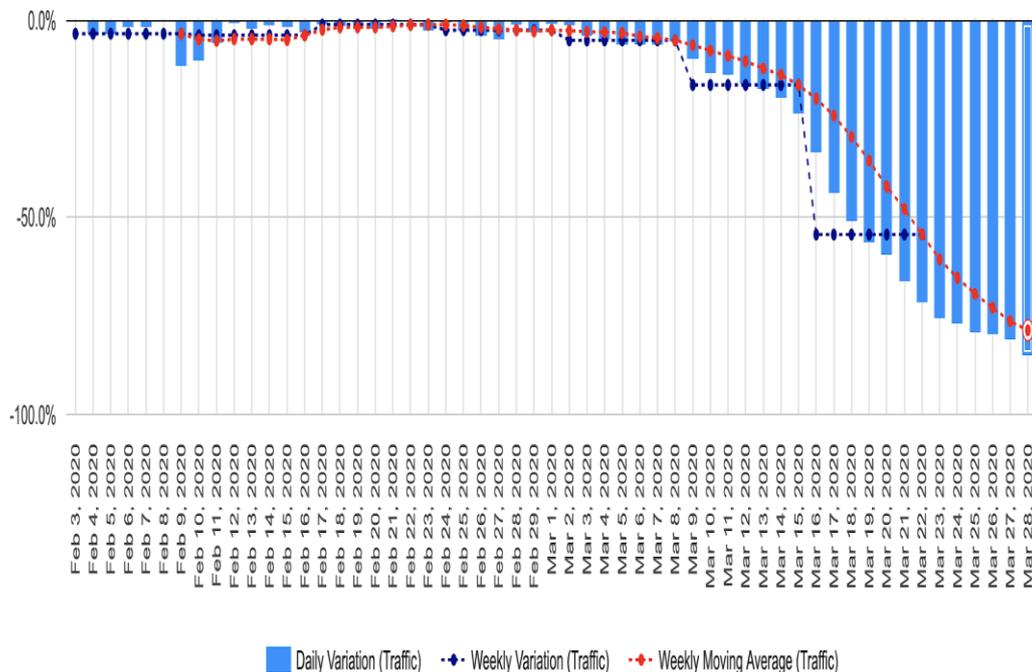

Figure 2. The change of all flight values in Europe

Therefore, the transport economy has a downward trend in the crisis; there is reference to a bigger economy, the economic collapse is quite prominent for smaller trading partners. Reducing the amount of flight by sudden moves like COVID-19 leads to loss of money including implicit and explicit charging.

In this section, we proceed with the presentation of our results that contain the correlation between the total cases of COVID-19, on the day of the pandemic that is identified new case number for country and world,

cumulative case number for country and world, with the abnormal returns (daily change) in trading days consisting of 30, 60, and 90 days. In Table 1, on the day of the pandemic, the relationship exhibited between case numbers with negative abnormal returns. (a) There is no significant correlation on the stock price based on the number of cases per country in the first 30 days and 60 days; (b) in the 90 trading days, the correlations exhibit statistically significant however correlation coefficient is low; (c) beyond the event day, the correlations shows gradually positive relationship between number of case and negative abnormal return though it is weak. The stock market reaction remains in limbo to assess the effects of COVID-19, mostly due to the period following the pandemic. It also analyzes whether this impact is constant or temporary, calculated by variations between recent days of trading and earlier ones. There seems to be an impact based on global events, yet it is not absolutely permanent.

Table 1. The relationship between the numbers of COVID-19 cases with abnormal returns

Correlation coefficient & sig. value	30-days	60-days	90-days
New Case Number for Country	-0.021 (0.614)	0.023 (0.445)	0.060 (0.014)**
Total Case Number for Country	-0.022 (0.597)	0.002 (0.943)	0.030 (0.224)
New Case Number for World	-0.086 (0.037)**	0.056 (0.061)***	0.109 (0.000)*
Total Case Number for World	-0.098 (0.017)**	0.256 (0.000)*	0.059 (0.013)**

Note: *significance at the 1%, **significance at the 5% level and ***significance at the 10% level

The global influence of COVID-19 outbreak on the Asia-Pacific, Middle East, Latin and North America, Africa and Europe financial markets is addressed in Table 2 and its implications are contrasted with those of earlier trading days. (a) National impact indices revealed a statistically important link between irregular returns and certain events on pandemic trading days, but the size of the correlation coefficient was greater than in earlier trading days. (b) The aforementioned weak correlation, the stock market value of transportation economy for the so-called 'birthplace of COVID-19' and Europe impacted against the abnormal return of the country that suffered from pandemic based on global events. (c) As far as the countries events are concerned, there appears the regional effect on North America in the long haul. (d) There is not notable variant between former and latter trading days; the effect inconsiderably appears to persist for at least of some cases in the latter trading days.

Table 2. Multi-dimensional perspective to relationship between the COVID-19 and stock price

Correlation coefficient (sig. Value)		Latin America	Asia Pacific	Europe	Middle East	North America
World new case	**30-days**	0.089 (-0.417)	-0.116 (0.091)**	-0.148 (0.093)**	-0.088 (-0.436)	-0.095 (-0.389)
	60-days	0.072 (-0.361)	0.027 (-0.59)	0.133 (0.036)*	-0.102 (-0.202)	0.077 (-0.33)
	90-days	0.086 (-0.18)	0.132 (0.001)*	0.096 (0.061)**	0.156 (0.014)*	0.104 (-0.103)
World total case	**30-days**	0.065 (-0.554)	-0.108 (-0.118)	-0.165 (0.061)**	-0.154 (-0.17)	-0.104 (-0.344)
	60-days	-0.296 (0.000)*	-0.148 (0.003)	-0.318 (0.000)*	-0.252 (0.001)*	-0.389 (0.000)*
	90-days	0.042 (-0.507)	0.091 (0.022)*	0.045 (-0.382)	0.09	0.038 (-0.556)
County new case	**30-days**	. (.)	-0.11 (-0.888)	0.034 (-0.699)	-0.042 (-0.707)	-0.458 (0.000)*
	60-days	-0.249 (0.006)*	0.05 (-0.312)	-0.205 (0.001)*	-0.045 (-0.578)	-0.404 (0.000)*
	90-days	0.124 (0.089)**	0.04 (-0.32)	0.069 (-0.182)	0.052 (-0.422)	0.113 (0.075)**
Country Total case	**30-days**	. (.)	-0.012 (-0.859)	-0.042 (-0.637)	-0.075 (-0.505)	-0.185 (0.091)*
	60-days	-0.214 (0.018)*	0.018 (-0.72)	-0.203 (0.001)*	-0.138 (-0.085)	-0.488 (0.000)*
	90-days	0.091 (-0.21)	0.019 (-0.639)	0.055 (-0.282)	0.04 (-0.537)	0.067 (-0.296)

Note: *significance at the 1%, **significance at the 5% level and ***significance at the 10% level

In Figure 3, the impact of COVID-19 on transportation economy is considered in terms of variation of response time towards the airlines stock price value. This trend between the abnormal return and volume may signify how important coronavirus news in vulnerable eventual return. The trend is closely dealing with the power network of investor, who have at their disposal a lot of trade volume in the world.
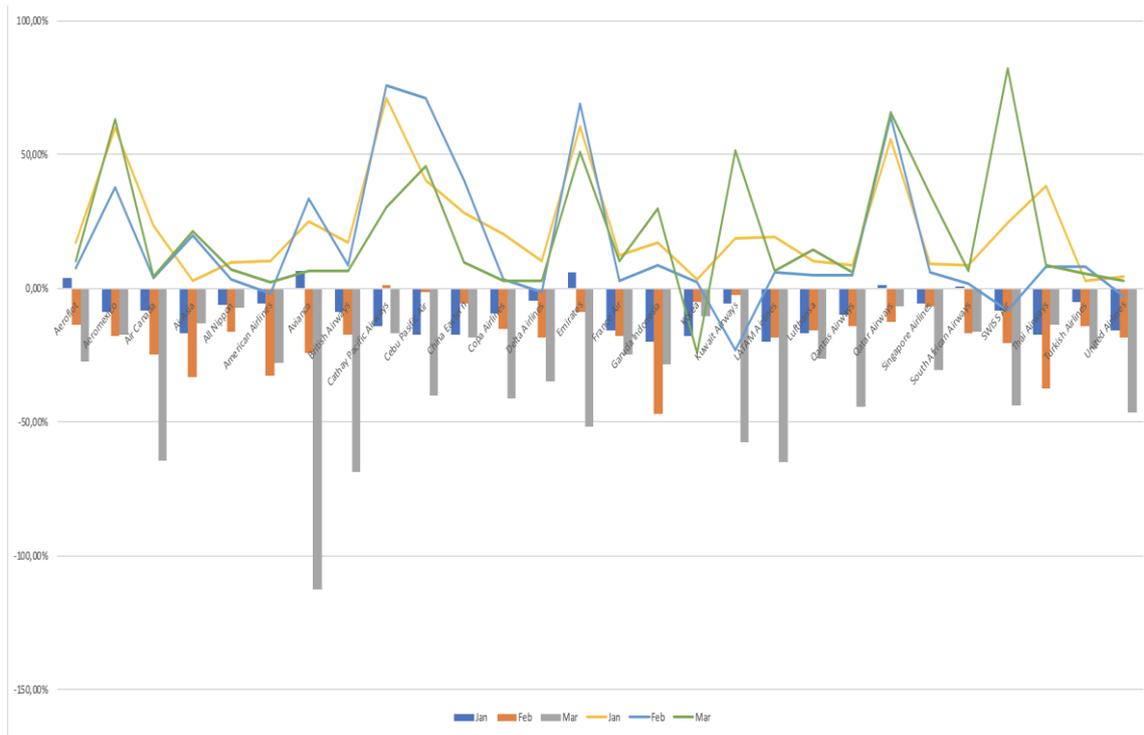
Figure 3.The comparison of the airlines stock price and volume

Figure 3: The comparison of the airlines stock price and volume

In the case of a pandemic, passenger aircraft use decreases, while demands from medical and cleaning supplies for cargo aircrafts may increase. Therefore, cargo operations should be increased, and passenger planes are used in cargo transportation as much as possible. Aviation industry has become fiendishly complex, and the converting their passenger jets into cargo planes to keep business afloat in stock market positively impacted on transportation economy.
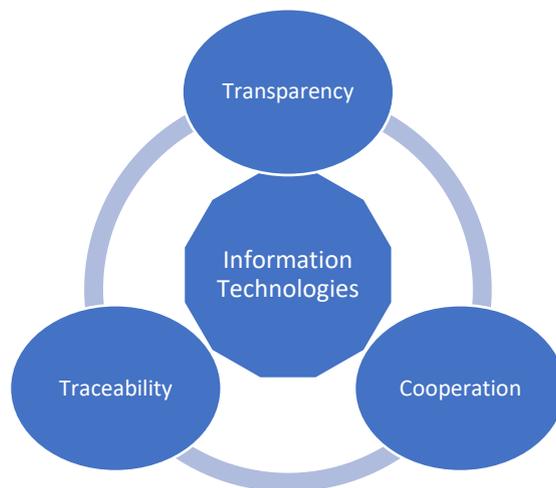

Figure 4.The manageable functions with information technology

In the light of all these results, aviation is a customer-focused economic sector that is affected by the coronavirus pandemic. In order to survive this global crisis with minimal damage, civil aviation sector with all stakeholders should take responsibility as a member of the sectorial team. Fulfilling the roles and responsibilities of team members might be possible with the open communication channel, transparency and

42

traceability for achieving stated objectives as in Figure 4. Major stakeholder groups, including airlines, airports, governments, employees and passengers can realize the importance of a combination of three key factors, thanks to information systems technologies.

6. CONCLUSION

Coronavirus drive stocks down especially in civil aviation markets. COVID-19, which spread to 148 countries (31 March), has put pressure on businesses and supply chains around the world. This global health crisis threatens to overwhelm global supply chains in China. In customer-focused economic sector, consumers change their behavior such as delaying or cancelling flights.

The pandemic often alleviates market demand because of travel bans or staying at home, also without a policy directive to do so. As the impact of coronavirus and multiple government travel reactions was caused into technical bankruptcy or in breach of debt covenants. Cash reserves are running down quickly since demand is drying up in ways that are completely unprecedented.

Airlines companies closed sharply lower and their stock prices tumbled at the start of trading. The airlines particularly Asia-Pacific airways flight and their load factor fall down therefore their stock prices collapsed. The share price of airlines not only in Asia-Pacific region but also more active carriers in North America and Europe have sharply fallen since outbreak began. Stock market manages the uncertainty through alliance with government and industry (airports, airlines and also manufacturer)

In short, the coronavirus outbreak environment has made a geopolitical standoff. However, the aero-political conflict along nationalistic lines would have colossal implications for the entire industry. The adjustment progress in close global collaboration can manage with open communication channel, transparency and traceability using by information technologies.

REFERENCES

Abodunrin, O., Oloye, G., & Adesola, B. (2020). Coronavirus pandemic and its implication on global economy. *International journal of arts, languages and business studies*, 4.

Abubakar, A. (2020). Coronavirus (COVID-19): Effect and Survival Strategy for Businesses. *Journal of Economics and Business*, 3(2).

ACI, C., & IATA, I. ICCAIA, Aviation Benefits Report, 19, 2019. Retrieved from https://www.icao.int/sustainability/Documents/AVIATION-BENEFITS-2019-web.pdf

Akyildirim, E., Corbet, S., Efthymiou, M., Guiomard, C., O'Connell, J. F., & Sensoy, A. (2020). The financial market effects of international aviation disasters. *International Review of Financial Analysis,* 69, 101468.

Balcilar, M., Gupta, R., Pierdzioch, C., & Wohar, M. E. (2018). Terror attacks and stock-market fluctuations: Evidence based on a nonparametric causality-in-quantiles test for the G7 countries. *The European Journal of Finance*, 24(4), 333-346.

Bastola, A., Sah, R., Rodriguez-Morales, A. J., Lal, B. K., Jha, R., Ojha, H. C., ... & Pandey, B. D. (2020). The first 2019 novel coronavirus case in Nepal. *The Lancet Infectious Diseases*, *20*(3), 279-280.

Blalock, G., Kadiyali, V., & Simon, D. H. (2007). The impact of post-9/11 airport security measures on the demand for air travel. *The Journal of Law and Economics*, 50(4), 731-755.

Blunk, S. S., Clark, D. E., & McGibany, J. M. (2006). Evaluating the long-run impacts of the 9/11 terrorist attacks on US domestic airline travel. *Applied economics*, 38(4), 363-370.

Bogoch, I. I., Creatore, M. I., Cetron, M. S., Brownstein, J. S., Pesik, N., Miniota, J., ... & Yoon, J. W. (2015). Assessment of the potential for international dissemination of Ebola virus via commercial air travel during the 2014 west African outbreak. *The Lancet*, 385(9962), 29-35.

Borenstein, S., & Zimmerman, M. B. (1988). Market incentives for safe commercial airline operation. *The American Economic Review*, 913-935.

Bosch, J. C., Eckard, E. W., & Singal, V. (1998). The competitive impact of air crashes: Stock market evidence. *The Journal of Law and Economics*, 41(2), 503-519.

Brounen, D., & Derwall, J. (2010). The impact of terrorist attacks on international stock markets. *European Financial Management*, 16(4), 585-598.

Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of financial economics*, 14(1), 3-31.

Chance, D. M., & Ferris, S. P. (1987). The effect of aviation disasters on the air transport industry: a financial market perspective. *Journal of Transport Economics and Policy*, 151-165.

Chen, C. J., Chen, S., & Su, X. (2001). Is accounting information value-relevant in the emerging Chinese stock market?. *Journal of International Accounting, Auditing and Taxation*, 10(1), 1-22.

Christidis, K., & Devetsikiotis, M. (2016). Blockchains and smart contracts for the internet of things. *Ieee Access*, 4, 2292-2303.

Economics, I. A. T. A. (2018). Economic Performance of the Airline Industry.

Elyasiani, E., Mansur, I., & Odusami, B. (2011). Oil price shocks and industry stock returns. *Energy Economics*, 33(5), 966-974.

FCE, J. K. K., & Welbeck, B. A. The Coronavirus Pandemic and Its Impact On Economies And Employment. Retrieved from

https://www.academia.edu/42784671/THE_CORONAVIRUS_PANDEMIC_AND_ITS_IMPACT_ON_EC ONOMIES_AND_EMPLOYMENT

Fernandes, N. (2020). Economic effects of coronavirus outbreak (COVID-19) on the world economy. *Available at SSRN 3557504*.

Forecasting, O. E. (2005). The economic and social benefits of air transport. Geneva, switzerland, air transport action group.

Goh, C. F., & Rasli, A. (2014). Stock Investors' Confidence on Low-cost and Traditional Airlines in Asia during Financial Crisis of 2007–2009. *Procedia-Social and Behavioral Sciences*, 129, 31-38.

Hagedorn, M., & Mitman, K. (2020). Corona Policy According to HANK.

Hammersley, J. S., Myers, L. A., & Shakespeare, C. (2008). Market reactions to the disclosure of internal control weaknesses and to the characteristics of those weaknesses under Section 302 of the Sarbanes Oxley Act of 2002. *Review of Accounting Studies*, 13(1), 141-165.

Henderson, V. (2003). The urbanization process and economic growth: The so-what question. *Journal of Economic growth*, 8(1), 47-71.

Ito, H., & Lee, D. (2005). Assessing the impact of the September 11 terrorist attacks on US airline demand. *Journal of Economics and Business*, 57(1), 75-95.

Kale, P., Dyer, J. H., & Singh, H. (2002). Alliance capability, stock market response, and long-term alliance success: the role of the alliance function. *Strategic management journal*, 23(8), 747-767.

Kaplanski, G., & Levy, H. (2010). Sentiment and stock prices: The case of aviation disasters. *Journal of Financial Economics*, 95(2), 174-201.

Kim, E., & Rhee, M. (2017). How airlines learn from airline accidents: An empirical study of how attributed errors and performance feedback affect learning from failure. *Journal of Air Transport Management*, 58, 135-143.

Kim, H., & Gu, Z. (2004). Impact of the 9/11 terrorist attacks on the return and risk of airline stocks. *Tourism and Hospitality Research*, 5(2), 150-163.

Kolaric, S., & Schiereck, D. (2016). Are stock markets efficient in the face of fear? Evidence from the terrorist attacks in Paris and Brussels. *Finance Research Letters*, 18, 306-310.

Lee, W. Y., Jiang, C. X., & Indro, D. C. (2002). Stock market volatility, excess returns, and the role of investor sentiment. *Journal of banking & Finance*, 26(12), 2277-2299.

Li, W. C., Harris, D., Hsu, Y. L., & Wang, T. (2011). Understanding pilots' cognitive processes for making in-flight decisions under stress.

Liu, Y., Funk, S., & Flasche, S. (2020). The contribution of pre-symptomatic infection to the transmission dynamics of COVID-2019. *Wellcome Open Research*, 5(58), 58.

Loh, E. (2006). The Impact of SARS on the Performance and Risk Profile of Airline Stocks. *The Impact of SARS on the Performance and Risk Profile of Airline Stocks.*, 1000-1022.

Lucchese, M., & Pianta, M. (2020). The Coming Coronavirus Crisis: What Can We Learn?. *Intereconomics*, 55, 98-104.

MacDonald, M. (2017, March). Annual Analyses of the EU Air Transport Market 2016. Retrieved May 10, 2020, from

https://ec.europa.eu/transport/sites/transport/files/2016_eu_air_transport_industry_analyses_report.pdfv

Mwangi, F. K. (2013). The effect of macroeconomic variables on financial performance of aviation industry in Kenya (Doctoral dissertation), University of Nairobi.

Nandha, M., & Faff, R. (2008). Does oil move equity prices? A global view. *Energy economics*, 30(3), 986-997.

Nseobot, I. R., Ahmed Soomro, M., Effiong, A. I., Muhiyuddin Solangi, G., Idongesit, M., & Ali Soomro, F. (2020). COVID-19: A Situation Analysis of Nigeria's Economy. Abere, OJ, Survival Analysis of Novel Corona Virus (2019-Ncov) Using Nelson Aalen Survival Estimate. International *Journal of Business Education and Management Studies*, 3(1), P30-40.

O'Connell, J. F., & Bueno, O. E. (2018). A study into the hub performance Emirates, Etihad Airways and Qatar Airways and their competitive position against the major European hubbing airlines. *Journal of Air Transport Management*, 69, 257-268.

Pearson, J., O'Connell, J. F., Pitfield, D. E., & Ryley, T. (2015). Competition between Asian Network Airlines and Low-Cost Carriers: Strategic Analysis. *Transportation Research Record*, *2501*(1), 56-65.

Peng, P. W., Ho, P. L., & Hota, S. S. (2020). Outbreak of a new coronavirus: what anaesthetists should know. *British journal of anaesthesia*, *124*(5), 497-501.

Pham, K. H., & Luengo-Oroz, M. (2020). From plague to coronavirus: On the value of ship traffic data for epidemic modeling. *arXiv preprint arXiv:2003.02253*.

Rodrigue, J. P. (2016). The geography of transport systems. Taylor & Francis. [Pearce, B. (2020, March 5). *IATA Economics*. Retrieved March 19, 2020, from https://www.iata.org/en/publications/economics/

Song, W., & Ma, Y. (2006). Hub-and-spoke system in air transportation and its implications to regional economic development. *Chinese Geographical Science*, 16(3), 211-216.

Tam, R., & Hansman, R. J. (2002). Impact of air transportation on regional economic and social connectivity in the United States.

The economic & social benefits of air transport, Air Transportation Action Group, 2005 http://www.iata.org/NR/rdonlyres/5C57FE77-67FF-499C-A071-4E5E2216D728/0/ - ATAG_EconomicSocial_Benefits_Air_Transport.pdf

Topham, G. (2015). Malaysia Airlines 'technically bankrupt'as New Chief Seeks to Shed 6,000 Jobs, Christoph Mueller Remains Optimistic Carrier Can Regain Leading Regional Role Despite Financial Troubles and Legacy of MH370 and MH17 Disasters'. *The Guardian*.

Tsai, C. L. (2015). How do US stock returns respond differently to oil price shocks pre-crisis, within the financial crisis, and post-crisis?. *Energy Economics*, 50, 47-62.

Turnbull, P., Blyton, P., & Harvey, G. (2004). Cleared for take-off? Management-labour partnership in the European civil aviation industry. *European Journal of Industrial Relations*, 10(3), 287-307.

Twu, S. J., Chen, T. J., Chen, C. J., Olsen, S. J., Lee, L. T., Fisk, T., ... & Wu, Y. C. (2003). Control measures for severe acute respiratory syndrome (SARS) in Taiwan. *Emerging infectious diseases*, 9(6), 718.

UNDP, Retrieved from

https://www.undp.org/content/undp/en/home/newscentre/news/2020/COVID19_Crisis_in_developing_count ries_threatens_devastate_economies.html

Walker, T. J., Walker, M. G., Thiengtham, D. N., & Pukthuanthong, K. (2014). The role of aviation laws and legal liability in aviation disasters: A financial market perspective. *International Review of Law and Economics*, 37, 51-65.

Wilder-Smith, A. (2006). The severe acute respiratory syndrome: impact on travel and tourism. *Travel medicine and infectious disease*, 4(2), 53-60.

Wilder-Smith, A., Chiew, C. J., & Lee, V. J. (2020). Can we contain the COVID-19 outbreak with the same measures as for SARS?. *The lancet infectious diseases*, 20(5), e102-e107.

Zitzewitz, E. (2003). Who cares about shareholders? Arbitrage-proofing mutual funds. Journal of Law, *Economics, and Organization*, 19(2), 245-280.

Стежко, Н. В., Олійник, Ю., Поліщук, Л., Тищук, І., Парфіненко, А., & Мархонос, С. (2020). Міжнародний туризм в системі сучасних глобалізаційних процесів.