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A Historical Analysis of Past Airline Stock Prices and its Implications on Current Airline Stocks

Paleesha Parwani

Abstract
This document contains a historical analysis of Airlines Stock Prices and how they were affected by pandemics in the twenty-first century. It looks specifically at American Airlines during the Zika and Swine Flu outbreak of 2015-2016 and 2009 respectively, drawing similarities and differences with each other and how those patterns can be used to predict trends given the current corona virus outbreak. A proposed theory of drop – stay – rise is put forward, which describes the patterns of airline stocks during this time, and once again past airline stock data are used to support it. Various factors, such as infectivity and mortality rate of the virus, are discussed and their effects upon the drop, stay and rise is put forward, such as high infectivity keeping the stay duration high, whereas a high mortality rate would mean that the initial drop rate would be exceptionally high. These factors were then applied to the current market and situation regarding airlines and offered the reader an ideal strategy in how to buy and profit from airline stocks the most.

Keywords: *Coronavirus, American Airlines, Delta Airlines, Swine Flu, Zika Virus, Stocks*

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I. INTRODUCTION

The debut of the new decade has taken the entire world by storm - an unforeseen virus has ravaged the entire earth. The virus has left the majority of humanity trapped within the confines of their own home, bringing bustling cities to sudden, startling standstills. Entire industries have been swept into this tornado of unpredictability. The world now relies upon the ingenuity and speed of pharmaceutical companies to find a vaccine for this 21st century plague, and never before have scientists from all around the world collaborated and joined minds to this extent for working towards a common goal.

However, while pharmaceutical companies endeavor to do what has never been done before, the industry hit the hardest by this pandemic are international and national airlines. Since February, stock prices from all airlines all around the world have been stalling at an increasing alarming speed, leading many economists and investors to wonder and speculate whether these clobbered prices will ever rise again to what they were before these testing times. What this report aims to do is scratch the surface and provide evidence from past - albeit milder - pandemics that have struck the world within the last 20 years that despite the plummeting prices, the stocks of these airlines will return to normal and potentially even surpass current prices.

Upon this principle, I will be proposing a model that has been based upon data from 8 of the largest airline companies **(Air France, American Airlines Group, All Nippon Airways, China Southern Airlines, Delta Airlines, IAG, Lufthansa and Southwest Airlines)** stock prices from the last twenty years and how their prices have reacted to the many diseases that have afflicted upon the Earth during that time span.

II. DROP – RISE – STAY MODEL

Due to general fear, hesitation and, as seen in the recent COVID-19 pandemic, a sudden and steep drop in stock prices would be considered as a natural event, and without a doubt investors would lose a substantial amount of money due to the falling prices. However, the prices would never reach 0, as airplanes are now an integral part of life, used extensively in trade and increasingly by online shopping companies who use air transport as one of their methods of delivery. Therefore, as long as this backbone exists, the stock of an airline will never reach 0 (or have any reason to) but rather stabilise and plateau after a period of dropping prices. Furthermore, after the pandemic has passed, travellers would gain confidence back and start to take airline flights again, which would increase the stock price from its plateau.

There are a plethora of factors to consider in the steepness of the drop, or the length of the plateau, which can range from the media attention surrounding the disease, its lethality, its infectiousness, and how widespread the virus is. For example, if we consider the SARS epidemic in 2002-2004, despite its high mortality rate of 9.6% its infectiousness was extremely low, infecting only 8096 people. Therefore, whereas it would make sense that it would influence airlines around the area where SARS was widespread, however, not affect airlines in an unaffected area, keeping airline sales and stocks throughout the world regular whereas affecting

them greatly in China. Therefore, the introduction of one disease in one area of the world does not necessarily imply that other airlines that are based in other areas of the world would be affected. However, assuming that an airline is affected by a pandemic, the general shape that a stock price should take should resemble Figure (1):

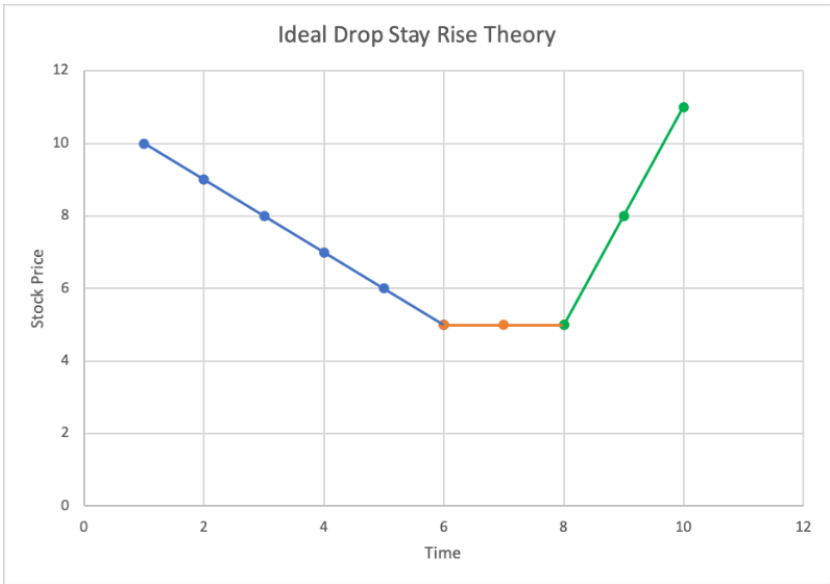

Figure 1– Ideal Drop-Stop-Rise Theory

III. DELTA AIRLINES DURING 2009-2010 SWINE FLU PANDEMIC

The Swine Flu epidemic in 2009-2010 is probably the best approximation that the world has for the current coronavirus pandemic. It adequately mimics the infectiousness of the disease, and although its lethality is much lower than COVID-19, the effects it had upon the Delta Airlines is quite clear.

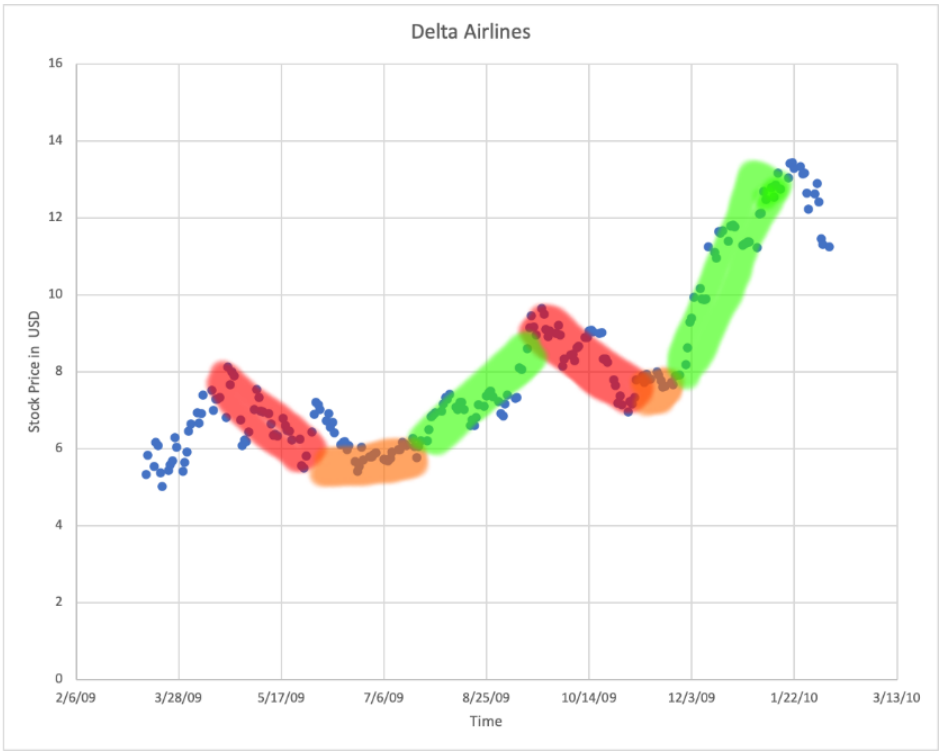

Figure 2– Delta Stock Prices in 2009-2010

Within a span of 2 months (from the 23rd of April to the 23rd of June), the stock fell 32.5% from 8$ a share to 5.4$. This would represent the general drop in the prices of the stock. The reasons of the stock falling are clear. The first reported cases of Swine Flu were in mid-April, and caused mass panic amongst the United States due to its infectivity and general lack of the vaccine. Therefore, the stock continued to plummet for the next two months, finally stabilising at around 5 to 6 USD a share. At that point, either the confidence of the public or the economic strains upon the country forced people to restart using airlines. Furthermore, by mid-July, the majority of H1N1 activity died out in most countries, which meant that confidence could have crept back into passengers. However, this confidence was misguided, as in October the US started to feel the brunt of a second wave, which correlates perfectly to the drop in stock price that started in early October. However, in this particular instant, there was no large stay section, probably attributed to the shortness of the second wave. Shortly thereafter the drop and the pandemic's termination, the prices then again took off, reaching record stock prices much greater than what the initial stock price was before the pandemic, which could be attributed to the sudden influx of passengers or simply lots of people buying stocks as they were cheap at that moment and destined to go up with the pandemic gone.

Delta Airline's stock prices during the Swine Flu Pandemic of 2009 has unequivocally concurred with the proposed model of drop - stay - rise. Dropping when the pandemic was announced, plateauing during the worst months and then rising again when the confidence of the citizens return is model that can be expected of many airline stocks throughout the world during the pandemic. Furthermore, from the nature of the virus we can start to make inferences into what would affect the rate of increase, decrease and the length of the plateau. Compared to COVID-19, H1N1 is not nearly as deadly, but equally infectious. The initial infectivity and its capability to infect many people in a short period of time is most likely contributed to the initial fall in the stock price. The low death rate is what could have contributed to the short plateau period, because confidence of the general public would have been quickly restored. However, looking at American Airlines during the Zika Virus outbreak in 2015-2016, we can begin to see the effects of infectiousness and lethality of the disease affecting the stock price.

IV. AMERICAN AIRLINES FROM 2015-2016

The Zika Crisis of 2015-2016 was another scare that the world has recently experienced and is quite different from the current COVID-19 in terms of infectiousness and lethality. Requiring either vectors such as mosquitos to spread the disease or directly transferred body fluids, its infectiousness as well as its lethality is extremely low. However, the primary danger that it poses is directed towards pregnant women - the virus has the capability to lead to many birth defects amongst unborn babies. Zika first reached international headlines in 2015, when is started to heavily affect south American countries. In 2016, the United States reported many cases and was heavily involved both in the research as well as having a significant amount of cases. Therefore, looking at the American Airlines stock during this time would provide further insight into stock prices and how they get affected if exposed to a global pandemic, albeit this one would provide data for a local epidemic. The stock prices of American Airlines during this time are as follows:

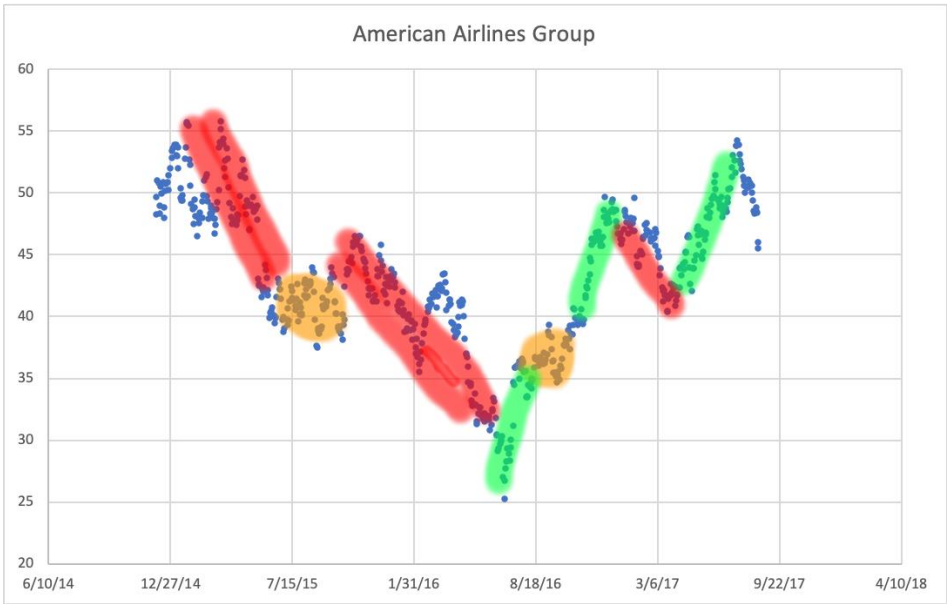

Figure 3– American Airlines Stock Prices in 2015-2016

We can draw immediate similarities and differences between the two graphs. The first point of interest that can be perceived would be the increased steepness of the falls and increase. One potential reason for this phenomenon would be the increased severity of the virus upon the general population. Despite the relatively low mortality rate, the virus had major implications on expecting mothers and their unborn babies. Therefore, flights to South America would have undergone some restrictions as well as decreased passenger numbers. However, this was ready to stabilise at around 40$ a share, however when the first Zika case was announced in the US in January, the cases started to plummet, most likely due to the decrease in domestic passenger flights. However, one interesting figure to note is that there was no plateau when the stock prices reached their minimum. This could possibly be related to the fact that while the virus was a scary ordeal for most expectant families, there was no major risk to the general public. Therefore, after a short period of time where passenger flow decreased and the stock decreased, there was no general fear that was instilled amongst the general public who immediately went back to taking flights. Therefore, we have identified factors that most definitely affect the plateau length. In agreement with the inferences made from Delta Airlines in 2009, the low death rate of this virus contributed to the shortness of the plateau. The low death rate contributed to the fear level of the general public being low, therefore causing the plateaus to be short or not visible. However, one possible reason that there was a period of plateauing in H1N1 case and not this would be because of the fact that H1N1 affected nearly everyone and was much more infectious , therefore the fear level or uncertainty for that time span would have been significantly higher than that of the Zika Virus outbreak, not causing the long plateaus which would have been expected.

The steepness of the drops and rises can be attributed to the seriousness of those who catch the virus; even though for the majority of the population the virus is harmless, for expectant mothers, there are serious consequences. Therefore in the beginning, when much was not known about this virus, the airline stock dipped dramatically as the public did not know the full extent of the virus, but later the lack of consequences for the general public as well as low infectivity of the virus caused the stock prices to return to what they were extremely fast.

V. CONCLUSION AND RELATION TO CURRENT AIRLINE PRICES

This report was a truly short proposal into one of the many ways that the market could move in the event of a global pandemic. We explored the reasoning behind a drop - stay - rise market, followed by giving two examples of two vastly different types of viruses, both with different attributes and symptoms. We established that the plateau duration, and what factors can influence such a plateau (which were identified to be the infectivity and lethality of the virus) as well as the effects that would contribute to different levels of steepness of the drop and rise.

This research has massive implications upon the airline industry of today, given the world's current predicament of COVID-19. The current world situation of COVID-19 has cause airline stocks to plummet, reaching record lows as governments all around the world issue travel restrictions and close their borders. Naturally, this would immediately stop all passenger flights and cause massive losses for airlines. This effect can be seen by looking at American Airlines Stock once again during this pandemic.

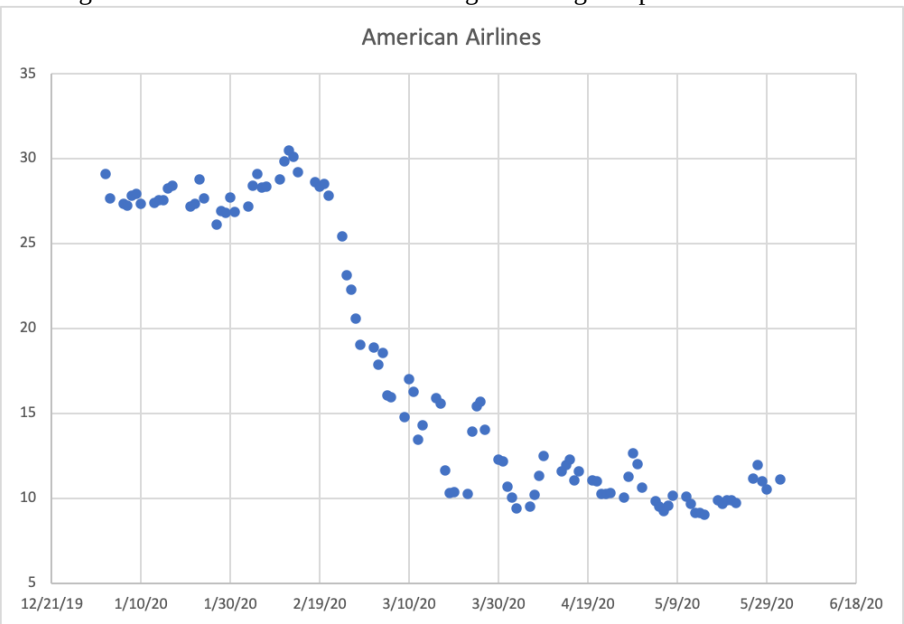

Figure 4 – American Airlines Stock Prices from January 2020 to June 1st

As can be seen, there is a very clear drop and plateau. However, this plateau is much longer and much more drastic (the plateau price as compared to its regular price is much lower) than the regular stock price before the epidemic. Till the early days of June, it seems that the stock price of American Airlines has been following the Drop - Stay - Rise model quite accurately. Furthermore, if considering the series of announcements about the reopening of the US economy, we can again see glimmers of a rise section in the stock prices. All of this evidence suggests that airline stock prices will return to normal, and if considering COVID-19 to the Swine Flu, which it seems to be very similar with regards to effect upon the stock price, the stock prices of airlines would surpass what it originally was. This could provide certain buyers incentive to invest in these stocks currently, when the prices are low, so they could maximize profits after this pandemic has passed.

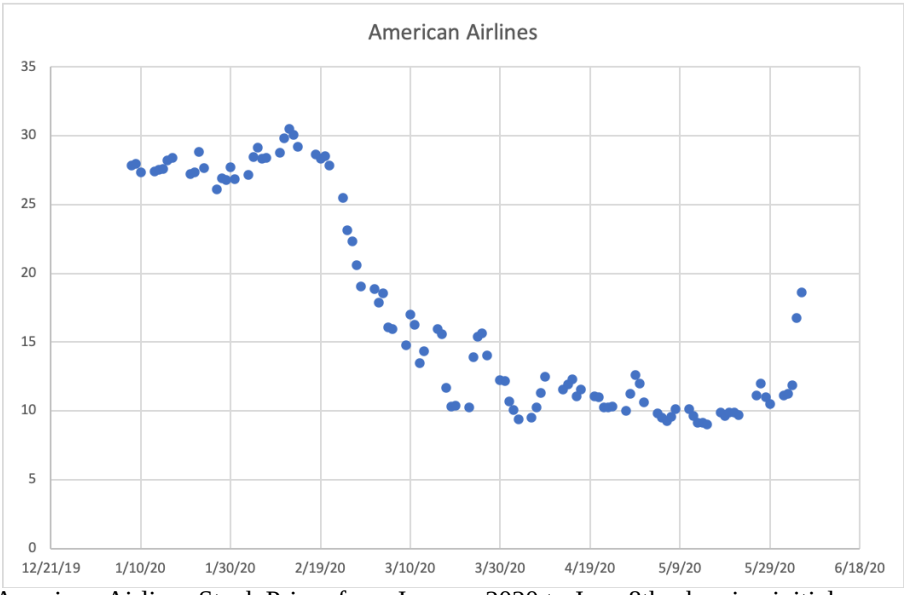

Figure 5– American Airlines Stock Prices from January 2020 to June 8th, showing initial recovery of stock prices

However, there are clear limitations with the use of previous data to suggest possible patterns that might emerge out of new data. Firstly, one of the biggest issues that a potential investor would face is that there has never been a pandemic of this size before that directly affects airlines to this extent. The last time that there was a pandemic of this scale would be in 1918-1919, when commercial airlines were still in their infancy, and no real analysis could be done about their prices and more specifically, their stock prices. Therefore, an investigation based upon past data, although could be beneficial, could be misleading considering that this pandemic, and its effects on the economy, could have never been predicted nor prepared for. Due to the stressing and uncertain times, one must look warily at past data before making predictions about the data. While the data from American Airlines does initially support the suggestion that the stock prices are following the drop – stay – rise theory, many investors and newspapers have made claims that the airline industry will forever be changed due to this virus, such as restrictions on the age groups that can fly for a time period, flight capacity. Furthermore, the sheer number of airplanes that will be able to take to the sky will have diminished as well, due to the fact that so many flight crew and staff have been laid off so that airlines can cope with the lack of revenue generated. According to the drop – stay – rise theory, what this would imply is that there would be an extended period of stay so that the world can get used to the new mode of airline transport. However, whether this theory would hold in these times is certainly a moot point, and a mystery that will only be unveiled as time passes.

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