



# Aviation Finance Series

**In the news today: on-going significance  
of the COVID-19 impacts on the aviation  
industry**





Overhead panel controls for the left engine (L ENG) and landing gear (LDG GEAR). Includes switches for START, BACK, FUEL, and other engine-related functions.

Overhead panel controls for the right engine (R ENG) and landing gear (LDG GEAR). Includes switches for START, BACK, FUEL, and other engine-related functions.

Overhead panel controls for various aircraft systems including CARGO FIRE, AIR CONDITIONING, FUEL ATTENTION, and WINDOW HEAT. Includes numerous toggle switches and rotary dials.

Primary flight display (PFD) and engine instrument display (EID) area. Shows digital readouts for altitude (4000), speed (300), and heading (175).

Instrument panel displays including the primary flight display (PFD), engine instrument display (EID), and multi-function display (MFD) showing engine parameters and fuel status.

Central console area containing the throttle levers, fuel control panel, and communication controls. Includes a keypad and various indicator lights.

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# In the news today: on-going significance of the COVID-19 impacts on the aviation industry



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Today, the world is in the midst of a vastly different environment than we have known in recent times and it seems every day there is news that has significant impacts on the aviation industry, aircraft values and the global economy. While there are a few exogenous economic shocks to compare against, COVID-19 seems to have even worse effects than the most recent cases of economic shocks including the SARS and great financial crisis.

Initially, at the start of the coronavirus outbreak in January 2020, it was hoped by many that it might be contained within a few months but this has proved to be overly optimistic as it has created even more uncertainty globally. As of this publication, the author continues to be primarily at home indoors in Shanghai, China for over 90+ days since late January 2020 and has been a keen observer and commentator while the entire world has reacted to this ever evolving epidemic.

In the beginning of the viral epidemic in January and early February 2020, before the proliferation of the virus globally, the problem was framed by many as a China or Asia market issue and the direct effects were concentrated in those specific regional markets. To stop the spread of the virus, the Chinese government imposed heavy restrictions on the city of Wuhan on January 23, 2020 and then Hubei Province in its entirety on January 27, 2020. From that point on, many provinces and major cities like Beijing and Shanghai around China declared level 1 health emergencies

and neighborhoods put up restrictions of movement and travel (Caixin, 2020). As of February 12, 2020, there were nearly 45,000 global cases that have been confirmed and global fatalities have reached 1,116, according to Johns Hopkins University CSSE (2020).

The onset of the virus was in the middle of the Chinese New Year's holiday which normally sees a large increase in travel as over 300 million people move around the country and abroad to visit family and for leisure (China Daily, 2020). These quickly implemented restrictions of movement also prevented some people from returning to their normal abode after visiting their familial hometowns or taking vacations during the extended New Year's holiday. In addition, all tourist attractions and many public spaces were shut down to prevent further outbreak and risk of further spreading of COVID-19.

For the economy, and in turn the aviation industry, implications of the outbreak quickly reached far and wide. Businesses and production facilities were shut down due to either preventative measures, lack of workers or disruptions in supply chain inputs. This not only heavily impacted the Chinese economy, but it also affected other countries and the global economy as supply chains are integrated along with the drivers of air travel supply and demand.

The current aviation production manufacturers located in China are the Airbus A320 and A330 completion facilities in Tianjin and the Boeing 737

This is the second article in the KPMG Aviation Finance Thought Leadership Series exploring more in depth analytical aspects of the aviation finance market.

This article is an excerpt of the preface section of David's upcoming book, due to be published by Palgrave Macmillan in October 2020, entitled "Aircraft Valuation and Leasing: Airplane Investments As An Asset Class"

MAX completion facility in Zhoushan in Zhejiang Province. Even during normal times, production is slow in the period during the new year's holiday but the virus has affected the normal ramp up back to full operations afterwards. Airbus' Tianjin completion facilities supplying about 10% of aircraft were temporarily shut down and did not restart until February 11, 2020 (Alcock, 2020) and fully resumed pre-virus production levels on March 25, 2020 (The Paper, 2020). Meanwhile, Boeing's 737 MAX completion Zhoushan facilities were already shut prior to the outbreak due to the grounding of the 737 MAX aircraft production.

### Initial responses to COVID-19 - Phase 1 virus life cycle (impact on China and interlinked countries and industries)

Initially, at the beginning of the response, economists slashed their forecast of China's 2020 GDP growth to as low as 4.5% from the ~6.0% previously. This is despite the People's Bank of China having quickly initiated a large fiscal and monetary stimulus along with other government aid packages to boost the economy. The effects of the virus already rattled investors with China's main stock indexes plunging more than 8% in the initial response on the reopening of the exchange following a 10-day break on February 3, 2020.

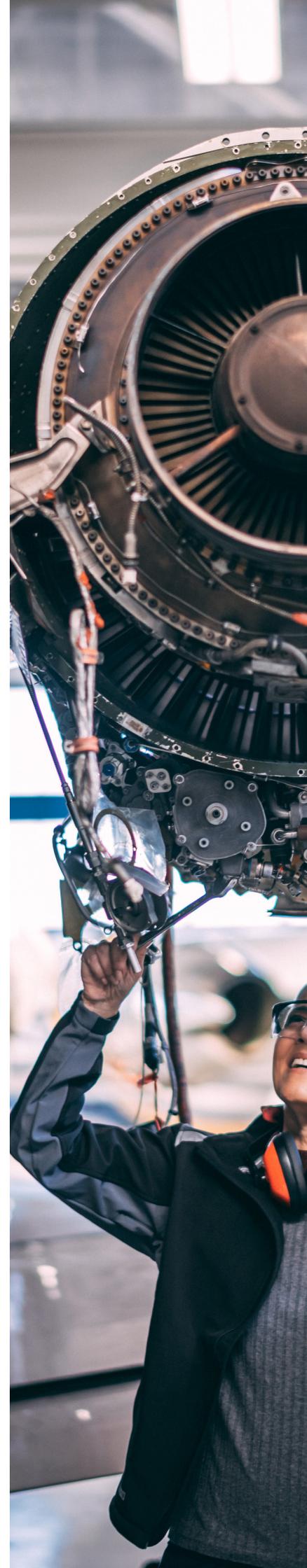
On the demand side, the extent of the virus effects first became apparent in late January when Chinese airlines' domestic traffic fell 6.8% in January, reflecting the impact of flight cancellations and travel restrictions related to COVID-19. On an on-going basis, China's Ministry of Transport reported an 80% annualized fall in volumes in late January and early February. Airlines took out capacity by 0.2% and passenger load factor plunged 5.4 percentage points to 76.7% (International Air Transport Association, 2020a)

International capacity was also initially slashed as the Chinese Big 3 airlines (Air China, China Eastern and China Southern) slashed international capacity between 80% and 90% in mid-February. These figures were also widely reflected by international airlines serving the Chinese market as well. This international squeeze became more acute as the domestic markets fell as well with 60% of Chinese airlines' fleets being grounded in mid-February.

Domestic traffic fell 46.1% in February compared to the previous year (Civil Aviation Administration of China, 2020). The Chinese aviation industry is expected to lose at least US\$12.8 billion in revenue as a result of flight cancellations and weak demand among travelers in February according to the earliest estimates by International Air Transport Association on February 20, 2020 ("IATA") (International Air Transport Association, 2020b).

With losses estimated to be around \$3 billion in February alone, HNA Group was in trouble even before the crisis with Beijing already promising bail-outs to make up for their losses (The Economist, 2020). They subsequently became the second implied airline causality of the virus stricken environment after Flybe of the UK. The control of the firm effectively changed with the newly appointed senior managers by the Hainan Province (HNA, 2020).

The losses of Chinese based traffic reverberated throughout Asia with IATA announcing a potential 13% full-year loss of passenger demand for carriers in the Asia-Pacific region which translates into a \$27.8 billion revenue loss in Asia-Pacific for the full year 2020 (International Air Transport Association, 2020c). Hong Kong's airlines took the brunt of the mainland shutdown which saw a greater than 75% drop in passenger movement. The corresponding figures for South Korea is 46%, Taiwan 38%,





Thailand 33%, and Singapore 32.8% in the month of February (Heng & Yong, 2020).

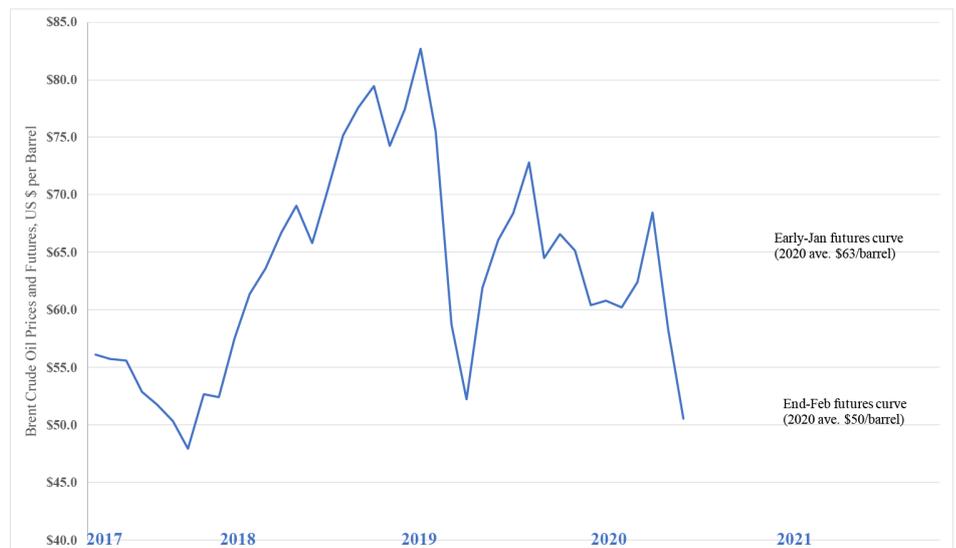
Global airlines that were exposed to routes with China directly or indirectly through transit, tourist or business traffic were also affected but not as severely at first. The earliest estimates by IATA were announced on February 20, 2020, estimating airline revenue losses in China at \$12.8 billion, Asia at \$27.8 billion and globally at

\$29.3 billion. This was the first of four revisions by IATA as the estimates became more direr with the ramifications ever more apparent and global.

A side development which normally has a significant effect on aviation is oil prices. In mid-March, Saudi Arabia, the world's largest oil exporter, announced its intention to significantly raise the production of oil as well as lower the official selling price starting April 2020. This, in turn, caused oil prices to plummet as it foreshadowed the flood of supply coming into the market. Oil prices fell around 24%, the biggest weekly decline since December 2008 and also represented a 48% fall from the peak in early January, the start of the COVID-19 virus effects.

Despite the lower oil costs, virtually no airlines are celebrating these reduced costs. First, lower oil prices are more apparently reflected in the operations when there is higher utilization and oil is consumed. Second, many airlines had oil hedges utilizing instruments such as swaps and options in place, which were meant to lock in the price of the oil for the quantity they expected to be consumed. These airlines had to mark to market the losses on the hedges as the oil prices fell from the referenced price. This also meant that as less oil was consumed, the hedges did not serve its function to counter the price of the oil used but rather became a speculative instrument.

**Figure P-1 - Fall in Oil Prices (Bloomberg, 2020)**



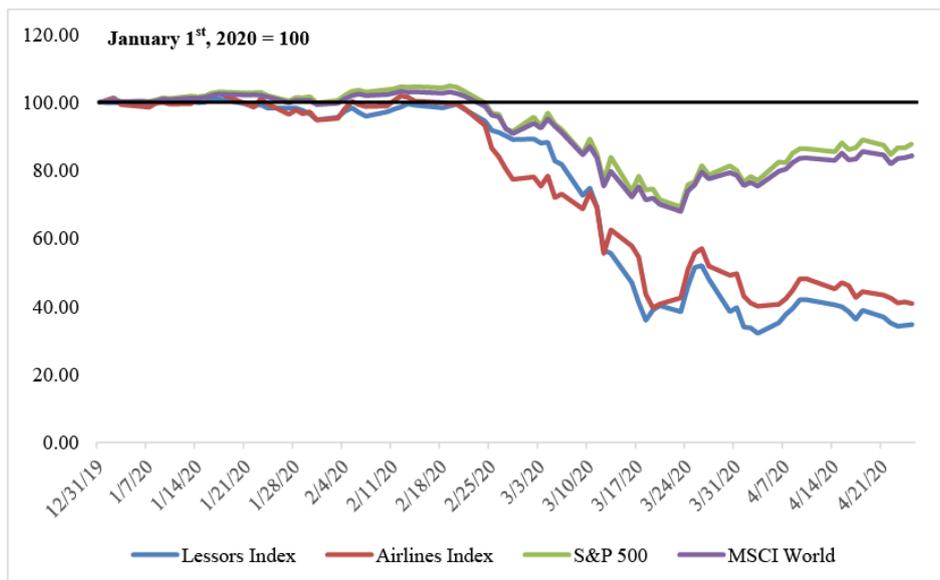
### Current situation - Phase II viruslife cycle (More severe global impact)

After the initial alarm in China and Asia, the infection rates in Europe and then the US reached significant numbers. Many governments have closed borders and restricted movement inside countries by instituting mandatory or recommended social distancing programs and even more stringent lockdown policies to stop the spread of the virus. Where borders are not actually closed, governments have implemented many restrictions for its borders limiting international movement. Even with these measures, the virus infection rates have continued to spread. This has resulted in all airlines grounding a large

portion of their capacity and heavily reducing scheduled flights.

The stock markets responded with aggressively downward movement since the start of the year. The lessor index is down 65.4% and the airline index is down 59.1% while the S&P 500 and MSCI World benchmarks are down 13.9% and 15.7%, respectively, representing the changes from the beginning of the year to April 24th, 2020.

**Figure P-2 - Airlines and Lessors Indexes Stock Performance Compared with MSCI World and S&P 500 Benchmarks Since Jan 1, 2020 (Bloomberg, 2020)**



**Note:** Lessor Index = Average of Amedeo Air Four Plus; Aerocentury Corporation; AerCap; Aircraftle; ALAFCO Aviation; Air Lease Corporation; Avation; AviaAM Leasing; Avolon; BOC Aviation; China Aviation Leasing Group; CDB Leasing; DP Aircraft 1; Doric Nimrod Air One; Doric Nimrod Air Two; Doric Nimrod Air Three; FLY Leasing; Genesis Lease; and Willis Lease Finance Corporation. Airlines Index = S&P 500 Airlines Total Return Index

As the virus became more widespread and the impacts more apparent, IATA issued its second revised loss figures on March 5, 2020, which estimated 2020 global airline revenue losses for the passenger business of between \$63 billion (in a scenario where COVID-19 is contained in current markets with over 100 cases as of March 2) and \$113 billion (in a scenario with a broader spread of COVID-19). Asia Pacific airline revenue losses were increased by 69.1% in the limited spread scenario with additional losses of 21.9% for the more extensive spread scenario (International Air Transport Association, 2020d).

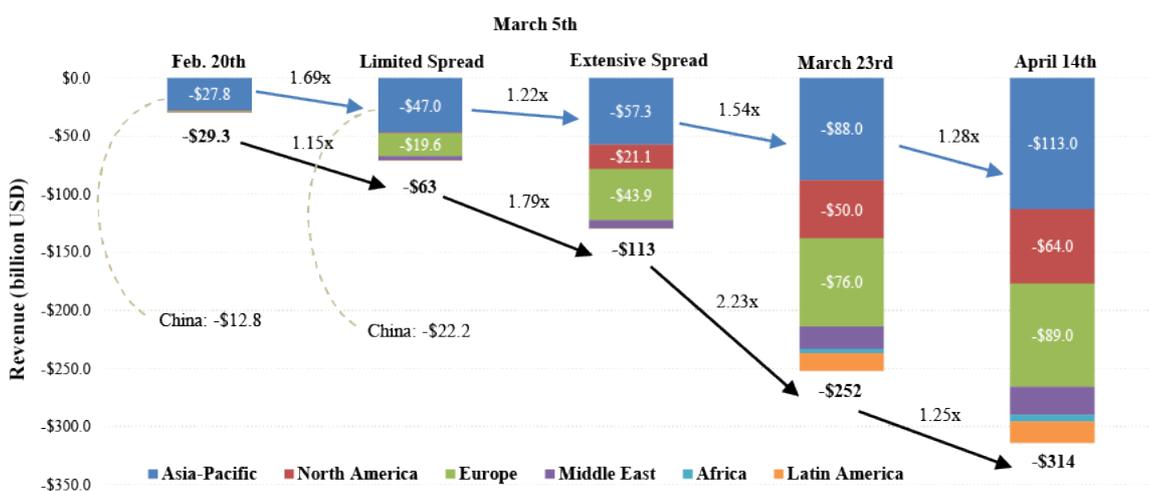
These estimates were subsequently updated on March 23, 2020, when the global revenue losses were estimated at \$252 billion (losses increased by 123.0%) comprising of \$88 billion revenue losses in Asia Pacific, \$76 billion revenue losses in Europe, and \$50 billion revenue losses in North America and the remaining amount from rest of the world. Asia Pacific region losses were further increased by 53.6%.

On April 14, IATA issued the fourth estimates with global airline revenue losses at \$314 billion (losses increased by 24.6%) comprising of \$113 billion revenue losses in Asia



Pacific, \$89 billion revenue losses in Europe, and \$64 billion revenue losses in North America and the remainder from rest of the world. Asia Pacific losses were further increased by 28.4%.

**Figure P-3 - IATA Estimated COVID-19 Impact on 2020 Airline Revenue (International Air Transport Association, 2020c, 2020d, 2020e, 2020f)**



**Note:** Asia-Pacific includes revenue losses from China

Many airlines in the US and Europe also heavily reduced their capacity. American Airlines said it would slash international flying by 70% until May. International Airlines Group, the owner of British Airways and other airlines, said it was cutting capacity by 75% in April and May. Lufthansa subsidiary Austrian Airlines indefinitely halted all flight operations while the overall group reduced long-haul capacity by 90% and on short-haul routes by 80%. With these reductions on a sustained basis, airline businesses are not sustainable. Even in normal times, a rough guide is around 70% load factor per aircraft is required sustain breakeven profitability.

IATA and other industry groups and associations are advocating for country support for the industry. The US airlines received \$58 billion in aid comprising of

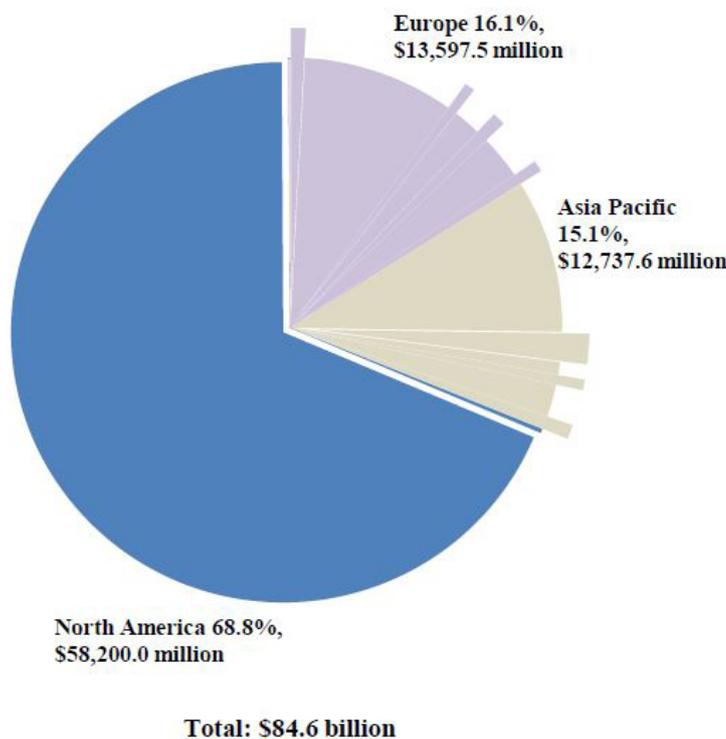
 \$29 billion in payroll grants and \$29 billion in loans from the \$2 trillion stimulus bill, Coronavirus Aid, Relief, and Economic Security Act, which was signed into law on March 27, 2020 (United States Senate, 2020). This economic stimulus bill was more than double the amount of the previous highest stimulus which came during the

financial crisis and is now the largest in the history of the US. It is also the largest percentage of global relief by countries to airlines thus far.

Asia has thus far \$12.7 billion committed state support making up 15.1% of global committed state support totaling \$84.6 billion. On an uncommitted state support basis, Asia has thus far \$2.7 billion committed state support comprising of 10.6% of global uncommitted state support amounting to \$25.4 billion. Combined, both committed and uncommitted support, Asia represents 14.0% or \$15.4 billion of state support based on an overall global state support amounting to \$110.0 billion.

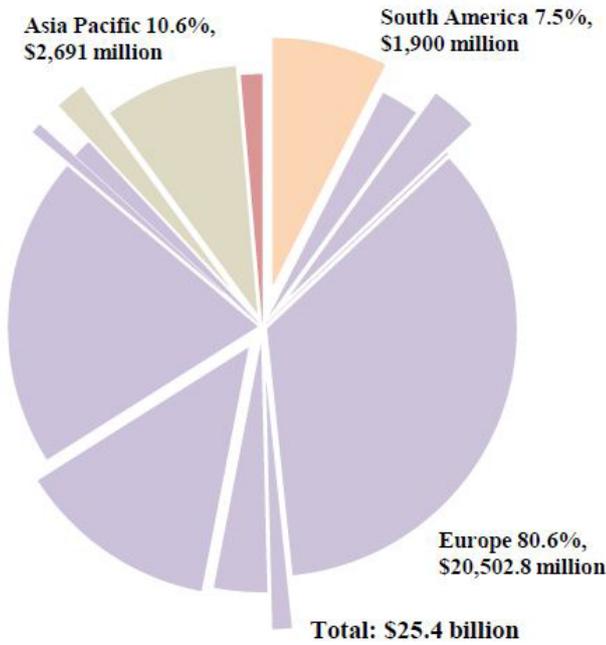
China, early on in March 4, initiated a funding scheme to incentivize the restoration and ongoing performance of flight services, including a CNY0.0176 per seat kilometer reward for flights on routes served by multiple airlines, and a CNY0.0528 per seat kilometer reward for a route served by a sole operator. The incentives are available to both domestic and international airlines serving these routes and given on a cash grant basis through June 30 (Civil Aviation Administration of China & Ministry of Finance of the People’s Republic of China, 2020).

**Figure P-4 - Confirmed State Support For Airlines As Of April 26, 2020**



	(USD Millions)
UK	\$740.0
France	\$7,600.0
Sweden	\$499.0
Denmark	\$170.8
European Air Navigation Service Providers (ANSPs)	\$1,190.0
Finland	\$645.0
Germany	\$2,200.0
Iceland	\$0.7
Norway	\$552.0
Singapore	\$7,747.0
South Korea	\$1,528.0
Hong Kong	\$627.5
New Zealand	\$524.3
Taiwan	\$1,600.0
Somoa	\$0.4
Australia	\$710.5
Canada	\$200.0
US	\$58,000.0
Chile	\$0.0
Senegal	\$74.6
<b>Total</b>	<b>\$84,609.7</b>

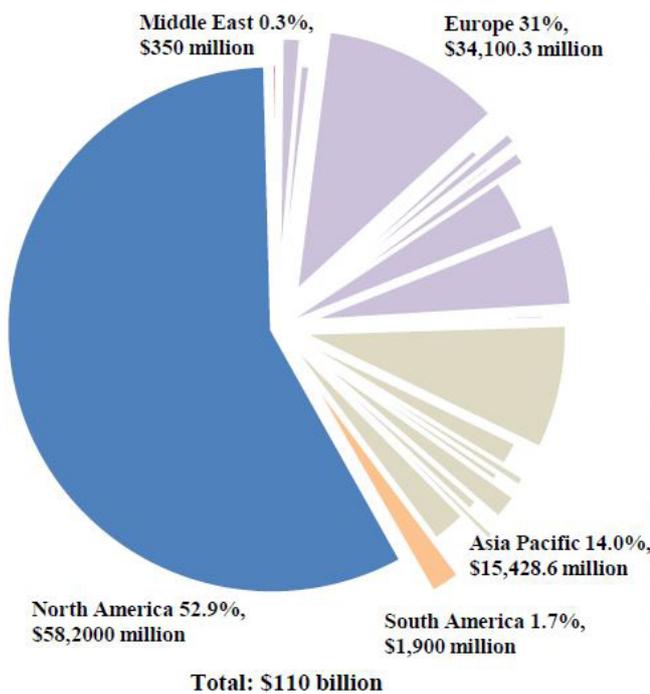
Figure P-5 - Unconfirmed State Support For Airlines As Of April 26, 2020



(USD Millions)

Brazil	\$1,900.0
UK	\$620.0
Italy	\$764.0
Estonia	\$21.5
Germany	\$9,000.0
Belgian	\$315.0
Austria	\$870.0
Netherlands	\$3,300.0
Switzerland	\$5,140.0
Latvia	\$164.3
Russia	\$308.0
Thailand	\$491.0
Malaysia	\$2,200.0
Israel	\$350.0
Total	\$25,443.8

Figure P-6 - Confirmed And Unconfirmed State Support For Airlines As Of April 26, 2020

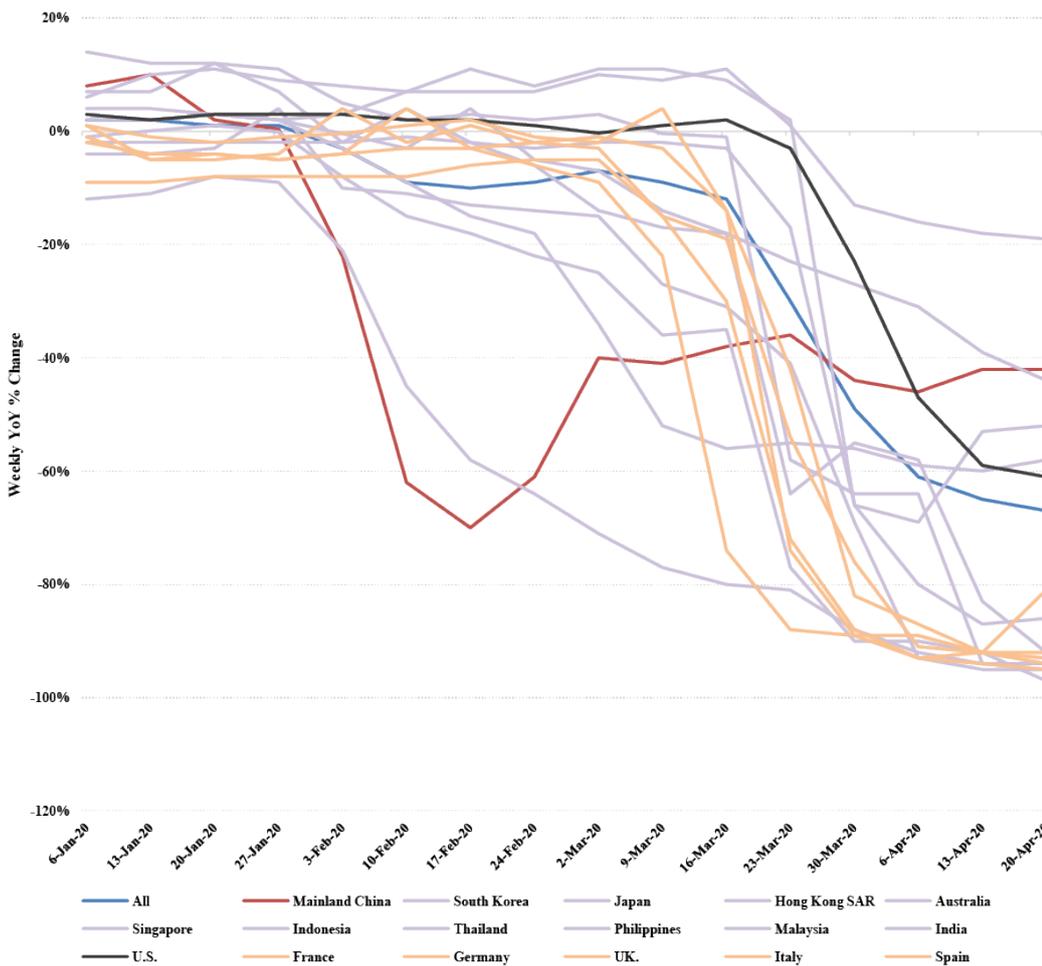


UK	\$1,360.0
France	\$7,600.0
Sweden	\$499.0
Denmark	\$170.8
European Air Navigation Service Providers (ANSPs)	\$1,190.0
Finland	\$645.0
Germany	\$11,200.0
Iceland	\$0.7
Norway	\$552.0
Italy	\$764.0
Estonia	\$21.5
Belgian	\$315.0
Austria	\$870.0
Netherlands	\$3,300.0
Switzerland	\$5,140.0
Latvia	\$164.3
Russia	\$308.0
Singapore	\$7,747.0
South Korea	\$1,628.0
Hong Kong	\$627.5
New Zealand	\$524.3
Taiwan	\$1,600.0
Australia	\$710.5
Thailand	\$491.0
Somoa	\$0.4
Malaysia	\$2,200.0
Chile	\$0.0
Brazil	\$1,900.0
Canada	\$200.0
US	\$58,000.0
Senegal	\$74.6
Israel	\$350.0
Total	\$110,053.5



In China, some initial signs of the air traffic bounce back have already started to occur with strong demand from vacationers and visitors to their ancestral villages who were initially stranded by the restrictions. Following this initial increase, demand has subsequently slightly weakened and changes continue in a yo-yo manner. Domestic and international scheduled flight traffic was off the most at -70% year over year ("YoY") on the week of February 17 and subsequently bounced back with the traffic on the week of March 23 being -36% YoY. From that date, the figures regressed and further weakened with the week of April 20 figures at -42% YoY (OAG, 2020). The trend of global traffic and the other countries specifically has been steadily downward as the crisis has gone on.

**Figure P-7 - International & Domestic Scheduled Flights YoY Changes By Country (OAG, 2020)**

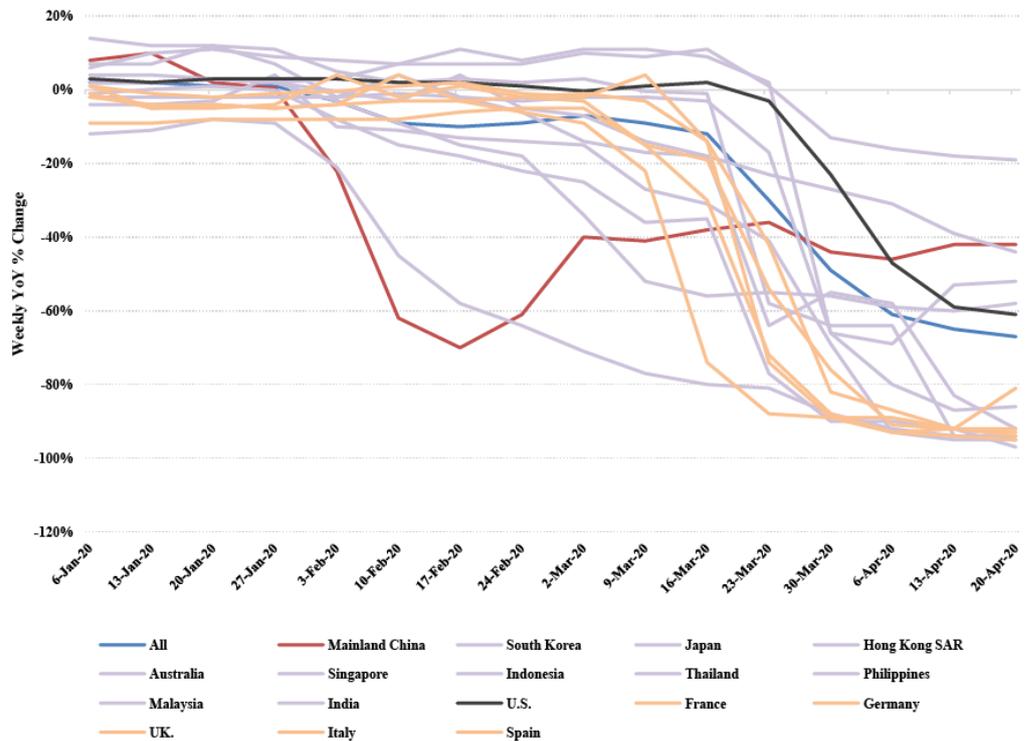


For domestic scheduled flights in China, the market had a low in scheduled flight traffic at -70% YoY on the week of February 17 and subsequent high on the week of March 23 at -31% YoY. The current figures week of April 20 are -36% YoY (OAG, 2020). Volatility in demand is expected to continue as the economy finds its footing and opens up more. Other than South Korea with a current -24% YoY change figure and Malaysia at -46% YoY for the week



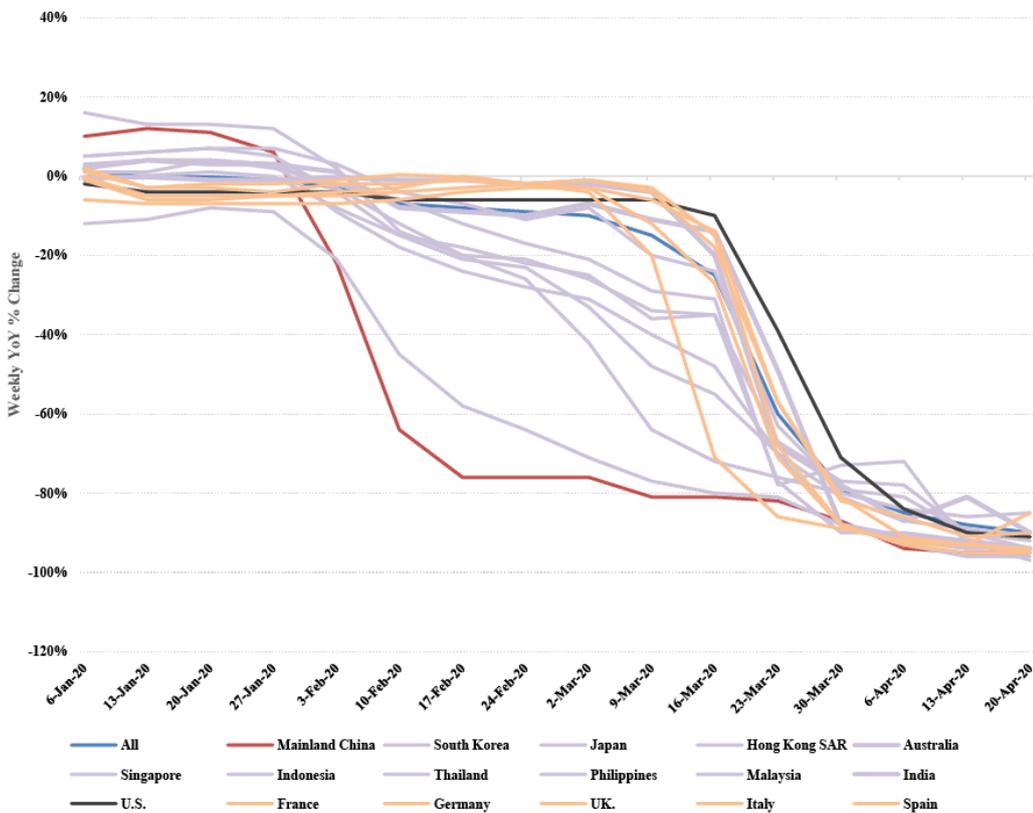
of April 20, the rest of the world and specific countries' domestic scheduled flights are at their lowest point since the beginning of January in terms of YoY change figures.

**Figure P-8 - Domestic Scheduled Flights YoY Changes By Country (OAG, 2020)**



For international scheduled flights in China, the market has steadily worsened with the current -95% YoY on the week of April 20 in scheduled flight traffic. This is the same for other all major countries and globally as well with YoY change figures for the week of April 20 at -90%. These figures are not anticipated to rebound until border restrictions start to get lifted.

**Figure P-9 - International Scheduled Flights YoY Changes By Country (OAG, 2020)**



### Severe acute respiratory syndrome (“SARS”) 2002/2003



Many comparisons have been made to the most recent global outbreak, Severe Acute Respiratory Syndrome (“SARS”). SARS is a coronavirus that first appeared in China and killed nearly 800 people in 2002 and 2003 and this outbreak initially served as a reference point for the economic and cross-border impacts. As the current virus became a global pandemic, this would become weaker as a direct historical case comparison.

SARS contributed to an estimated 3 percentage point decrease in China’s real GDP growth of 5% in its worst-affected quarter. Historically, the Chinese economy was more driven by investment and trade but has gradually rebalanced to a model led by domestic consumption and services. During the 15 years following SARS, the share of the service sector compared to China’s total output rose to 52% from 40%, according to the Asian Development Bank (2020).

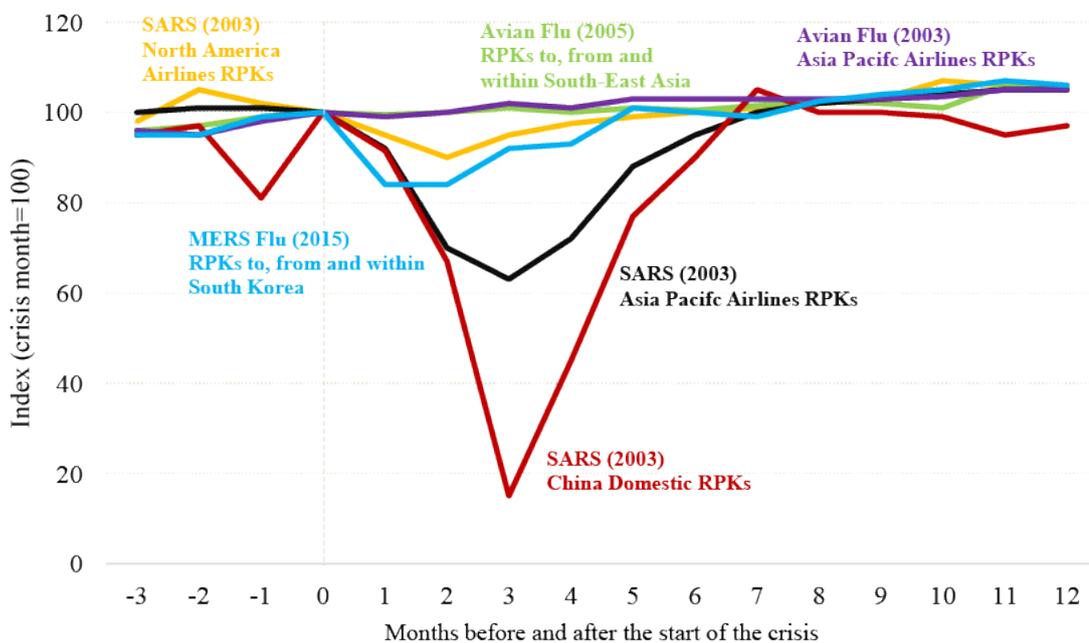
During the SARS outbreak in 2003, foreign direct investment (“FDI”) in China actually rose from March to June, but then dropped 57% to approximately \$32 million in July, the lowest monthly tally for the year. The trend quickly reversed, however, once the outbreak was brought under control. FDI inflows to China gradually picked up from December 2003 and quickly exceeded the pre-outbreak monthly high of \$55 million at the beginning of 2004, according to the Asian Development Bank (2020).

Globally, SARS cost airlines more than \$10 billion in revenue and caused a loss of 39 billion revenue passenger kilometers (“RPK”). In North America, the loss to airlines was around \$1 billion and RPK dropped 12.8 billion, or 3.7% of total international traffic, according to the International Air Transport Association (2003). In May 2003, there was a 21% YoY drop in global passenger traffic and overall capacity, expressed as available seat kilometers (“ASKs”), dropped 12.6% YoY. The global load factor showed signs of improvement rising to 64.6%

from 63.5% recorded one month prior in April. It is interesting to note that North American airlines were also hit hard during SARS but the effects were minimal for European airlines.

In terms of connectivity during SARS, airlines worldwide saw a decline in traffic with those operating out of the Asia-Pacific region losing as much as 8% on an annual basis. In Asia, similar decreased results as in China but not as severe. At the height of the outbreak (May 2003), monthly RPKs of Asia-Pacific airlines were 50.8% lower than their pre-crisis levels (see Table P-1). Overall SARS in 2003 cost Asia-Pacific airlines \$6 billion of revenues and annual RPKs losses of 8% (International Air Transport Association, 2020b). This translates to a 50.8% YoY drop in passenger traffic in RPK terms. June 2003 was the turning point when the YoY decrease reversed (35.8% YoY drop in passenger traffic) and capacity cuts were -27.2% (International Air Transport Association, 2003).

**Figure P-10 - Impact of Past Disease Outbreaks on Aviation (International Air Transport Association, 2020b)**



**Table P-1 - Global Airline Performance by Region (International Air Transport Association, 2003)**

Carriers	May 2003 (Percentage Change over May 2002)				Year to Date Results (Jan-May 2003 over Jan-May 2002)			
	RPK%	ASK%	FTK%	ATK%	RPK%	ASK%	FTK%	ATK%
Europe	-5.5	-4.1	1.4	-2.8	-1.1	2.0	3.3	1.8
North America	-20.6	-19.0	-5.9	-10.7	-10.8	-6.0	11.4	-2.2
South America	2.0	1.9	2.8	1.6	9.1	4.9	12.0	6.4
Asia Pacific	-50.8	-30.7	0.9	-16.0	-11.9	2.3	10.0	6.9
Middle East	-1.6	-11.6	20.9	15.6	4.6	13.4	17.9	15.8
Africa	-0.1	7.7	15.0	8.5	0.2	6.3	11.1	8.4
<b>Overall</b>	<b>-21.0</b>	<b>-12.6</b>	<b>3.0</b>	<b>-7.7</b>	<b>-6.4</b>	<b>1.2</b>	<b>8.7</b>	<b>3.4</b>

**Note:** RPK=Revenue Passenger Kilometers, ASK=Available Seat Kilometers, FTK= Freight Ton Kilometers, ATK= Available Ton Kilometers

In May 2003, passenger traffic in China dropped by 78% YoY while in the second quarter it dropped by 48.9% YoY (Civil Aviation Administration of China, 2004). The Chinese major airlines showed similar changes but recovered from June 2003 onward, which resulted in a 1.9% YoY growth for the entire year (Civil Aviation Administration of China, 2004).

What are the differences between this time and SARS? The current COVID-19 outbreak has occurred in a different environment. China's current highly indebted economy had started to show signs of weakness in 2019, as it marked the slowest GDP expansion in nearly 30 years, standing at 6.1%. These global uncertainties have already dampened Chinese outbound investment by 9.8% to \$118 billion in 2019 (EY, 2020)

Today, the Chinese economy accounts for 15% of global GDP in 2019, compared to 4% in 2003. As the world's largest trading nation, China represents 11.4% of global goods trade. This economic slowdown creates more drag in the face of more uncertain global growth, while the domestic economy continues to be dampened by declining consumer consumption which is now a much higher portion of GDP. China is now the source of 38% of global household consumption growth from 2010 to 2016, according to the World Bank (McKinsey & Company, 2019)

The Chinese economy is also more integrated into the global economy in 2019 than in 2003. Increased global connectivity has made the Chinese tourism industry the main engine of growth for the global travel market in recent years. During SARS, China's tourist volume was merely 7 million, less than 10% compared to 2019 figures (Goldman Sachs, 2015). Meanwhile, the number of inbound visitors from the U.S. was around 160,000, compared to 3 million in 2018 (Statista, 2020). The UN World Tourism Organization estimated that Chinese tourists spent \$277.3 billion overseas in 2018, up from around \$10 billion in 2000 (RTE, 2020) and are spending more on average than any other nationality on their trips, around \$1,850 per person per year (Smith, 2019). China accounts for 12% of total worldwide available seat kilometers versus only 5% 15 years ago (RTE, 2020). International travel in and out of China is now more than 10 times what it was in 2003, with 150 million foreign trips in 2018 (RTE, 2020).

Immigration curbs and flight cancellations from COVID-19 will have a significant impact on global growth. More than 60 countries have some form of restrictions or quarantine protocols. The most exposed regions to China airline

traffic by available seat kilometers are Asia's carriers with 30%, while North America is at 4%.

The SARS epidemic is the latest example of a major health outbreak. While there were more parallels in the beginning to the current COVID-19 outbreak given its similarities in geographies, this is no longer as relevant as a historical data point given the current global effects of the virus. SARS only lasted for about 4 to 6 months. One positive outcome in the aftermath of the SARS epidemic was that it was only a temporary exogenous shock to aviation, the economy and cross-border investments. It did not have long-lasting impacts and the recovery was relatively fast with the total outbound FDI recording a meteoric rise from \$3 billion to \$118 billion between 2002 and 2019.

### Great Financial Crisis ("GFC") 2008/2009

Another historical example of an exogenous shock that is compared with COVID-19 is the Great Financial Crisis ("GFC") in 2008/2009. The GFC had large international economic impacts and was triggered by the collapse of Lehman Brothers investment bank in September 2008. This event reverberated around the world as governments and policymakers raced to secure the confidence in the global financial markets.

By September 2008, passenger travel demand had turned negative and by December, international RPKs were down 4.6% YoY. This decrease in business confidence caused business travel to fall even more and by December 2008, premium traffic was down by 13% YoY. Full-service carriers geared towards premium level customers were hit especially hard and resulted in an overall net loss of \$10.4 billion for the whole year (International Air Transport Association, 2009). From the early 2008 peak to the early 2009 trough, premium travel fell 25% while economy travel fell relatively less at 9% (International Air Transport Association, 2010).

From mid 2009, air travel began to turn upward, boosted by the massive fiscal and monetary stimulus measures taken by governments. By the end of 2009, premium travel had recovered by 11%, while economy travel also rebounded 7%. This was accompanied by a reduction in passenger capacity in international markets of 5% and freight capacity decreasing 10%. For the full year 2009, global airlines' net losses were \$9.9 billion (International Air Transport Association, 2010).

In China, 2008 passenger traffic increased by 3.3% but resulted in net losses of RMB28 billion (Civil Aviation

Administration of China, 2009). Asian airlines had net losses of \$3.9 billion in 2008 and \$2.7 billion in 2009. From Oct. 2019, RPK YoY growth was 0.9% and by September 2019 YoY growth was 2.1% (CAPA, 2009). It is interesting to note that oil prices also suffered a large decrease along with the global economy. The oil bubble burst in late July 2008 and oil had fallen to \$40 a barrel by the end of 2008. This was less than half of the price at the start of the year and represented a decrease of over 70% from the price's July peak.

While this is also one of the most recent global economic shocks, it is not a direct comparison. The causes are man-made, a financial crisis of confidence while the current COVID-19 is a health related shock. While the GFC is more global in effect than during SARS, the global effects are not as significant as COVID-19.

### Preliminary outlook going forward - Virus Lifecycle Phase III (Global peak and virus regression and beyond)



Going back in time, there are not many direct historical cases that relate directly to COVID-19.

The most recent global shock that has the effects that are akin to what is experienced today is the 1973 oil shocks. Like GFC, that was also a manmade event. In that case, OPEC cartel in 1973 embargoed oil sales to US, UK, Canada, and Netherlands which brought life to a

standstill much akin to today. The most recent widespread global health pandemic is the 1918 Flu Pandemic. This lasted more than 2 years and infected an estimated 500 million people of which 50 million were killed (Center for Disease Control and Prevention, 2019). This did not have much of an effect on the budding but nascent aviation industry though as the Wright brothers' first flight was just fifteen years before this time in 1903.

Today, as of April 26, 2020, there are over 2.9 million global cases that have been confirmed and global fatalities have reached more than 200 thousand, according to Johns Hopkins University CSSE (2020). This is clearly a global problem with the acceleration of infection rates in Europe, US and the rest of the world. With the initial outbreak shown in China, today there are signs of early recovery. Many of the restrictions on the hardest hit provinces have been lifted with Hubei Province's restrictions lifted on March 15 while Wuhan lifted its restrictions on April 8, 2020.



This is still an ongoing story that is being played out. There will be long-lasting impacts and the recovery lag period might be longer than other recent economic shocks. As with other health pandemics, the first priority is to control the virus and its spread and then an eye out for recovery. The quicker the virus is controlled, the quicker people can return back to their normal routines and start the recovery process.



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