

China's Skies Are Booming, But Who Will Shape It? A Comprehensive Look At China's  
Commercial Aviation Market

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China is already the fastest growing and is quickly becoming the largest commercial aviation market in the world. Boeing and Airbus are working to stake their claim in the market as the manufacturer of these aircraft but China is also expected to provide most of the passenger growth in the commercial aviation industry. Given this projection, many of the major U.S. based airlines are attempting to corner this emerging passenger market; however, as they clamor to get on the leading edge of this passenger growth, they are running into more issues than anticipated due to Chinese protectionist air policies. For manufacturers and airlines alike, it is a race against each other and time to come up with the best strategy and financial plan to capitalize on this opportunity. There are many aspects to this situation, and different companies are in place to capture success in the short or long term. This is a difficult market to analyze due to the wide range of factors involved and the seemingly infinite amount of information; however, a comprehensive view of the market can allow a perspective to be formed. Overall, there will be plenty of market share for all of the companies involved to benefit as long as the Chinese economy continues to advance, route freedom is increased, and aviation infrastructure evolves to meet demand. In the long term, Boeing has the potential for the most success in the commercial aircraft manufacturing industry, whereas the Chinese-run state airlines stand to gain the most in the long run for the commercial airline industry.

Aviation has a long-standing history in Asia, especially China, and the role it plays has only been growing in recent years. There is definitely an aviation boom, perhaps even a second “Golden Age” of aviation occurring across the world. China is without-a-doubt the catalyst for this boom. China has long been a quickly growing country; however, the economic state of their citizens kept down the expansion of widespread air travel in the country. That is now changing

as China transitions to an advanced economy. This transition yields opportunity for China and the rest of the world.

The potential is high and there are countless companies and firms looking to capitalize. The opportunity posed by this transition is highlighted by the McKinsey Global Institute (MGI) in a growth model where they noted that household incomes could increase by over \$5 trillion by 2030, with labor productivity increasing by 1 to 8 percent per year and GDP increases of 5.6 percent per year. MGI also labelled “China’s working-age consumers (15-59 year-olds) as one of three groups” that are going to push “approximately half of the increase in global consumption between now and 2030.”<sup>1</sup> This is where the sentiment of China leading the commercial aviation growth comes from. It is rooted in the massive potential of China’s economy and the upcoming contributions of Chinese citizens looking to take advantage of their new opportunities.

This has already become visible in the commercial aviation industry, where China has been leading passenger demand. As reported by the International Air Transport Association (IATA), China added 59 million passenger trips over their previous year’s numbers in 2017.<sup>2</sup> China has already had their welcoming party and now its people are getting ready to run the show. According to Boeing’s Commercial Market outlook, China is expected to represent approximately 20% of global air traffic by 2037.<sup>3</sup> This is an impressive share of the traffic for one single country to hold and it goes to show just how important China will be to the future of commercial aviation.

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<sup>1</sup> “The CEO Guide to China’s Future.” 2016. *McKinsey Quarterly*, no. 4 (October): 54–64.

<sup>2</sup> "IATA Annual Review." IATA. June 3, 2018.

<sup>3</sup>"Boeing: Commercial Market Outlook." Boeing.

As is natural for people coming into a new economic standing, the Chinese are looking to spend more of the economic wealth they are coming into as the middle class grows. According to MGI in their global sentiment survey, China’s working class is the most likely group to start spending instead of saving.<sup>1</sup> This spending includes travelling, as many throughout the country are looking to experience new locations. The main cause for this increase in air travel is founded in economic opportunity as the people of China come into better financial standing and it is evident that the rest of the world has taken notice.

As can be seen in Figure 1, China’s origin-destination (O-D) market is increasing much more than the other top markets in the world. This trend will undoubtedly continue as long as steps are taken to properly support this rising passenger group and air travel demand.

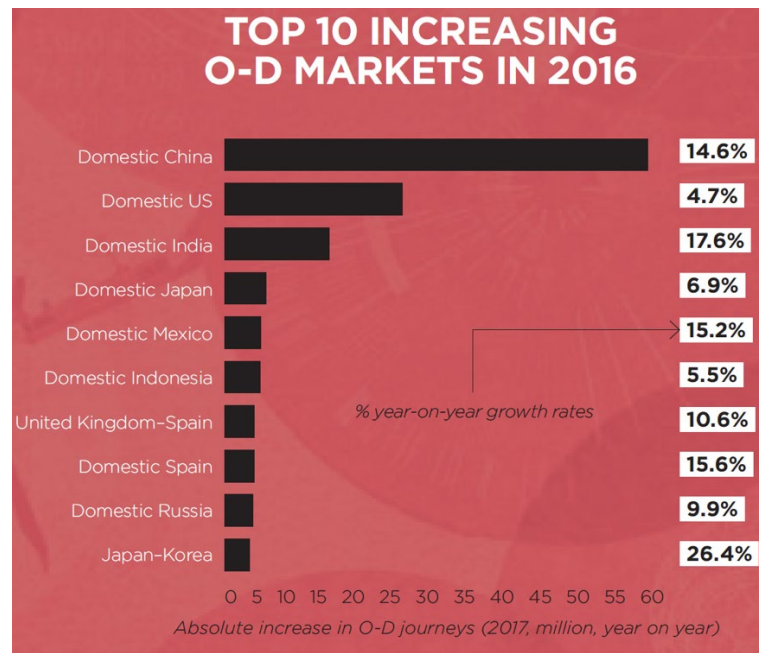


Figure 1- IATA Annual Review

<sup>1</sup> “The CEO Guide to China’s Future.” 2016. *McKinsey Quarterly*, no. 4 (October): 54–64.

These factors of economic growth and commercial aviation growth can be tied together in Figure 2. This shows the forecasted growth of China's urban population, income, and passenger growth.

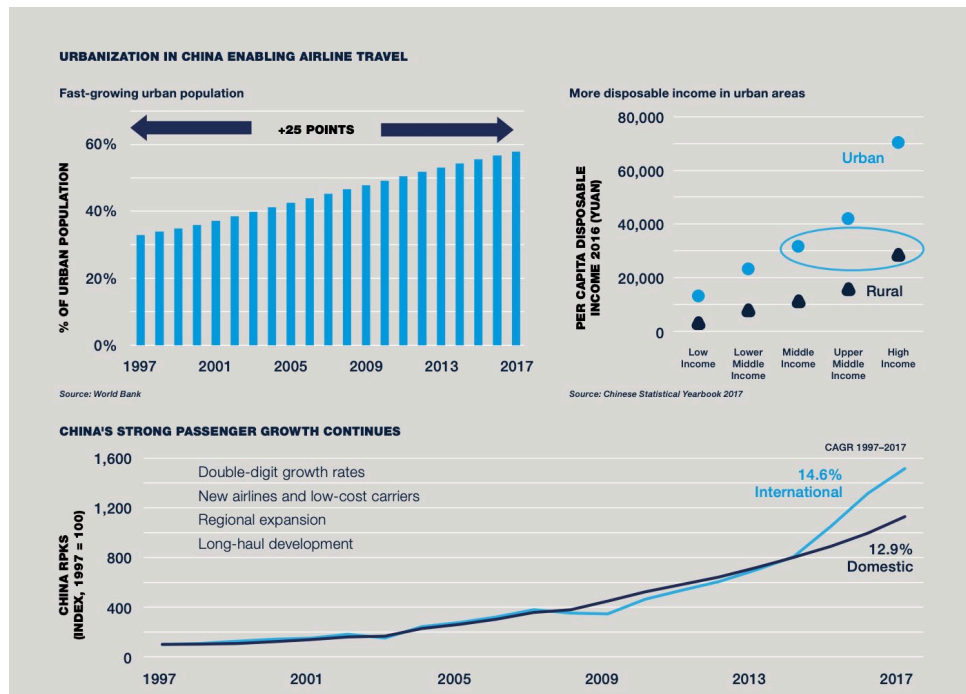


Figure 2- Boeing Commercial Market Outlook

Boeing points out in their Commercial Market Outlook that China will represent nearly 20% of global air traffic by 2037. They point to the increased urbanization and income as accelerators of commercial air traffic due to the fact that urban areas have higher disposable incomes and readily available access to aviation.<sup>3</sup> These statements tie in with many of the economic points made earlier. China's economic growth correlates well with their increase in commercial air traffic, giving the country a strong foundation for their future continued growth.

Companies such as airlines and aircraft manufacturers are chomping at the bit to take advantage of this situation in their own ways. Airlines are looking for an increase in travelers and

<sup>3</sup> "Boeing: Commercial Market Outlook." Boeing.

profits as well as expanded route networks, and aircraft manufacturers for increased demand and new markets for production. MGI understands this, as they pointed out that global companies will have to increase the role they play in China and how much they utilize China's workforce.<sup>1</sup> Increasing investment in China will yield better results in the long run for any company looking to take advantage of this emerging global leader.

In order for this increase in air travel to occur, the aircraft necessary for this boom in aviation must be provided to the airlines. There is a tremendous upcoming demand for aircraft throughout the world, with the main driver being China. There are three potential manufacturers for these aircraft. They are Boeing, Airbus, and more local Chinese manufacturers. Boeing is an American based company with a long-standing history of building aircraft on the leading edge of technology. Airbus is a French aircraft manufacturer that also has a high reputation for producing quality aircraft for airlines and nations around the world. Recently, Chinese manufacturers have been increasing their research and development in an attempt to gain their footing on the global stage of aircraft manufacturing. These Chinese manufacturers recognize the potential and have the advantage of being right in the middle of this emerging market. The main Chinese manufacturer that will be discussed is the Commercial Aircraft Corporation of China, which is commonly referred to as COMAC.

Boeing, Airbus, and COMAC all have large amounts of capital at their disposal to help them take risks, invest in new technologies, and develop capable aircraft for airlines around the world. All three stand to gain enormous profit if they can properly take advantage of the rising Chinese market. Each company will most likely take different approaches, and the outcomes will

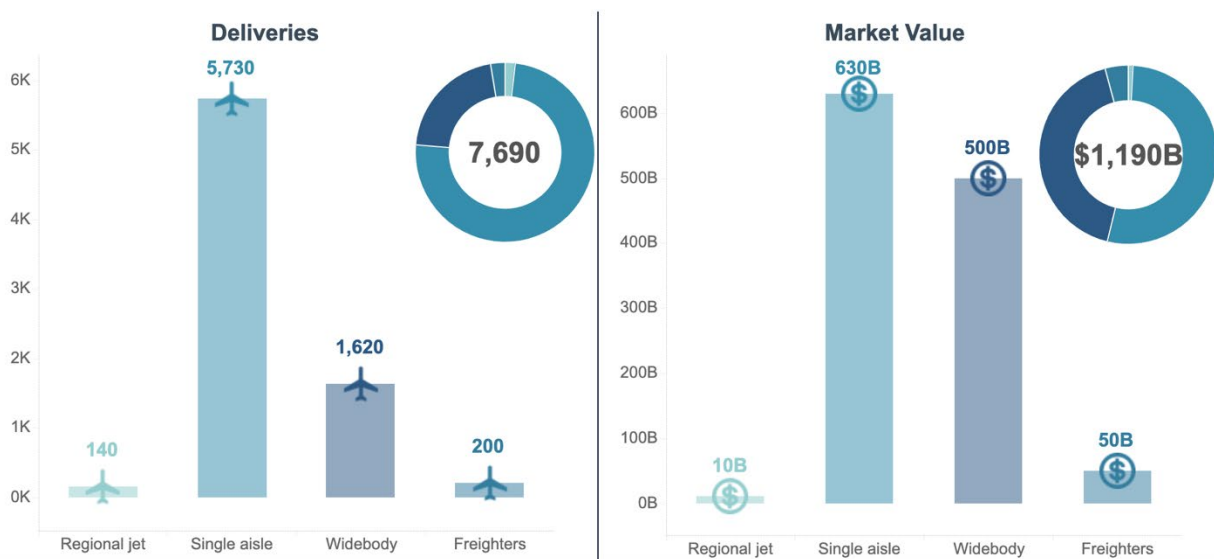
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<sup>1</sup> "The CEO Guide to China's Future." 2016. *McKinsey Quarterly*, no. 4 (October): 54–64.

determine who is ultimately the most successful in the short and long term. From aircraft that are designed and marketed towards Chinese customers to facilities built within China to establish a more solid footing, these companies are taking serious steps to meet demand and capture as much of the manufacturing market as possible.

Boeing has forecasted that China will demand a massive amount of new aircraft over the next 20 years. Deliveries are projected at 7,690 new aircraft and a market value of \$1.19 trillion.<sup>3</sup>

Figure 3 provides a breakdown for these aircraft and their market value.



*Figure 3- Boeing Commercial Market Outlook*

To help satisfy these market needs, Boeing recently completed and began operating their new 737 completion and delivery center in Zhoushan, China. This facility is designed to initially complete certain interior installments of 737 MAX aircraft after they are flown over from the assembly factory located in Renton, Washington. The Zhoushan facility is expected to soon take on painting duties as well sometime in the future. The 100-acre completion and delivery center is actually a joint project between Boeing and COMAC. After the first 737 delivery from the

<sup>3</sup> "Boeing: Commercial Market Outlook." Boeing.

center, COMAC President Zhao Yuerang stated that “This is a significant milestone of Boeing’s efforts to deepen its footprint in China, as well as to support the growth of China’s airline industry, opening an era of the collaboration between the two airplane manufacturers of us.”<sup>4</sup> This is an important ally for Boeing to have moving forward, as COMAC can help them get in more with customers and grow their market influence in China. This will also allow for a healthy cooperative competition between the two manufacturers. This bodes extremely well for Boeing’s short and long term standing in the Chinese commercial aviation manufacturing industry. The facility allows for Boeing to put more investment into utilizing the growing and developing labor force of China. Doing this satisfies the requirement laid out by MGI for sustained success in China’s emerging markets.

One issue Boeing is currently running into is the grounding of their 737 MAX aircraft. While they continue to produce them, the manufacturing and delivery process for the aircraft is without a doubt affected. This could have a negative impact on the growth of the Zhoushan center; however, that remains to be seen. It will be imperative for Boeing to resolve the issue in a timely manner so that they can resume normal business processes with the 737 MAX family of aircraft and continue to develop their presence in China. Another issue is the ongoing trade strain between the United States and China. As an American company, Boeing is exposed to the risks presented by the standoff. A quick end and a favorable new trade deal would go a long way to changing Boeing’s short-term risk to a long-term benefit. However, a drawn-out process or an

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<sup>4</sup> "Boeing Delivers First Airplane From New 737 Completion and Delivery Center in Zhoushan, China." Boeing MediaRoom. December 15, 2018.



escalating trade war would bring both short-term and long-term difficulties for Boeing. Both the 737 MAX debacle and the trade tensions will have an effect on Boeing's future success in China.

In a similar forecast to Boeing's, Airbus projects in their Global Market Forecast that China will require over 7,400 new aircraft at a value of \$1.06 trillion over the next 20 years. The company believes that there will be demand for 6,180 single-aisle aircraft, 870 medium segment aircraft, 240 large segment aircraft, and 130 in the extra-large aircraft segment.<sup>5</sup> These forecast numbers are very close to the numbers that Boeing came up with, as both companies are highly skilled at forecasting the future demand and direction of their markets. With Airbus and Boeing having similar expectations in China, it will take some unique strategies in order for one of the manufacturers to differentiate themselves.

Boeing and Airbus actually have quite similar foundations in China. This is evident in the fact that Airbus has had a facility in China just as Boeing does. The main difference is that Airbus's facility has been around longer than Boeing's and has had more time to develop. This gives them a stronger foundation and allows for reaching its potential sooner rather than later. Airbus describes the facility as the Final Assembly Line in Tianjin, China, which is a joint venture between Airbus and China Aviation Industry Corporation. It is used to produce aircraft of the A320 family and was expanded to now include production for the A330 family.<sup>6</sup> This is a similar strategy to Boeing once again, as both manufacturers use their facilities to produce their

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<sup>5</sup> "China Will Need More than 7,400 New Aircraft in the next 20 Years." Airbus Newsroom. November 7, 2018.

<sup>6</sup> "Airbus' China Assembly Facility Marks 10 Years of Quality Manufacturing for A320 Family Jetliners." Airbus Newsroom. September 28, 2018.

highest demanded aircraft while joining forces with Chinese manufactures for cooperative competition.

Airbus has a number of challenges facing them as well. Airbus planned on continued use of their super-jumbo jet, the A380, as China became more globally connected. Recently, Airbus had to make the decision to stop producing the A380 due to the airline industry trending away from the jumbo jets and instead opting for smaller and more efficient aircraft. They are also running into problems filling orders for their new A330 derivative, the A330 neo. The aircraft has lost out on a number of competitions to its Boeing counterpart, and Airbus must find some orders to justify the continued production of the A330 neo. Just like Boeing, these challenges pose potential dangers to Airbus's ability to lock down short- and long-term success in the market.

The local option for aircraft manufacturing in China is COMAC. Trying to gain a seat at the table, they have developed the first commercial aircraft to be designed and built in China. The jet has been named the C919 and it made its first public test flight in 2017. This is a big step for Chinese manufacturing, as the aircraft is the product of many years of research, development, and learning from being a supplier for many aircraft parts used by Boeing and Airbus.<sup>7</sup> The development of the C919 by COMAC represents the opportunity to compete with Boeing and Airbus in the future. If they are able to continue to improve their aircraft and bring them to the level of their rival products being sold by Boeing and Airbus, they could capture a share of the market later on down the road. Currently, the C919 is lagging behind the 737 and A320 jets it is designed to compete with; although, as of the summer of 2017, they had 570 orders for the plane

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<sup>7</sup> "China's Civil Challenge." *Factiva*, August 2, 2017.

with most of them being from Chinese carriers. While this aircraft may not have all the capabilities of its rivals, many are confident in COMAC's ability to build passenger aircraft. There is also the likelihood that state-run Chinese airlines will buy the aircraft, helping boost their ability to continue improving their aircraft as they look to develop larger wide-body aircraft in the near future. Boeing and Airbus have both congratulated COMAC on their successful addition to the single-aisle market and say that they look forward to the new competition.<sup>7</sup> Boeing and Airbus most likely welcome the added competition because it is not a threat to their current business model. Lighter competition that does not cause any noticeable damage can be a welcome sight at times because it inspires growth and development.

Looking at these three manufacturers and their current situations, Airbus has the best chance to succeed in the short-term. This is due to the fact that their facility in China is better established than Boeing's. Also, Boeing's current challenges pose a higher threat than those facing Airbus. Due to these factors, Airbus will most likely gain a slight early advantage in Chinese commercial aviation manufacturing over their counterparts. In the long-term, however, it is Boeing who stands to gain the most. Boeing may struggle for now with these obstacles, but they have set themselves up for long-term success. The 737 is the most popular aircraft platform in the world and they will fix their 737 MAX problems. Once the airplane is up and running again, they will continue to sell them to Chinese airlines at the incredible rate they had been accomplishing before the grounding. Boeing has delivered over 1,000 aircraft to China in the last five years and Boeing sells one in four of every jet they produce to one of more than 30 Chinese

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<sup>7</sup> "China's Civil Challenge." *Factiva*, August 2, 2017.

customers.<sup>8</sup> This is an impressive growth rate for Boeing's development in China and it would appear that they have even more to come. Once these manufacturers build the aircraft, it then is on the hands of the airlines to use these aircraft and attempt to capture the business of the flying public.

The United States boasts some of the largest and most-successful airlines in the world. They have been around for years and have been able to work themselves into global companies with reach and influence in hundreds of countries. While they have been flying to China already, the growth and rise of the Chinese airline industry is providing new opportunity for U.S. airlines. This opportunity is not so easy to obtain. While trying to establish a foothold on the market, these airlines are realizing that China has some major roadblocks. The U.S. based airlines are struggling to keep up with the growing demand of the Chinese market due to Chinese protectionist policies, customer loyalty, and efficiency of aircraft. In spite of this, the airlines are doing what they can to gain the upper hand. At the same time, Chinese airlines are taking advantage of the opportunity to expand themselves and corner their domestic market. There is no clear winner here, as pitfalls loom for every airline involved.

One of the most significant problems facing the U.S. airlines are the protectionist policies that the Chinese government has put in place to help their state-run airlines avoid foreign competition that they may not be able to keep up with. These policies restrict the ability of the U.S. airlines to fly routes that match the potential of their aircraft and to use origin cities in the United States that work the best for the destinations they fly to. This can have a negative effect

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<sup>8</sup> The Boeing Company. Media. "Boeing Delivers Its 2,000th Airplane to China." News release, November 30, 2018.

on the efficiency of the aircraft that they use. These aircraft are built for efficiency and productivity but they can be severely limited by these Chinese policies that restrict where U.S. airlines can fly to. An example to highlight this is a flight between Seattle, Washington and Beijing, China. The distance between the two cities is 8,680 kilometers.<sup>9</sup> The Boeing 787 Dreamliner is a popular choice amongst airlines due to its impressive range. Many U.S. airlines hope to use it as they expand throughout China. The range of the 787-8 is 13,620 kilometers.<sup>10</sup> The discrepancy between these two distances keeps the 787 from being able to reach its maximum efficiency, therefore limiting its profitability. If airlines could gain access to more Chinese cities, they could in turn begin to utilize aircraft such as the 787 to their true potential.

To combat this, Delta, American Airlines, and United have established codesharing agreements with Chinese airlines. These agreements allow for the airlines to gain access to the other's cities. Delta and China Eastern reached their agreement in 2014, United and Air China in 2016, and American and China Southern most recently in 2017. In the case of American Airlines and China Southern, the codeshare agreement opened up approximately 70 destinations for American beyond Beijing and Shanghai.<sup>11</sup> American had been lagging behind the other major U.S. carriers as shown in Figure 4. This will go a long way to helping American Airlines be more competitive in the future of China's commercial aviation market.

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<sup>9</sup> "Flight Time from Beijing to Seattle, WA." Beijing - Seattle, WA Flight Time | Flight Duration Beijing to Seattle, WA (PEK to SEA).

<sup>10</sup> "Boeing 787 Dreamliner." Boeing.

<sup>11</sup> Waldron, Greg. 2017. "US-China Tie-Up Underpins Growth." *Airline Business* 33 (4) (05): 6.

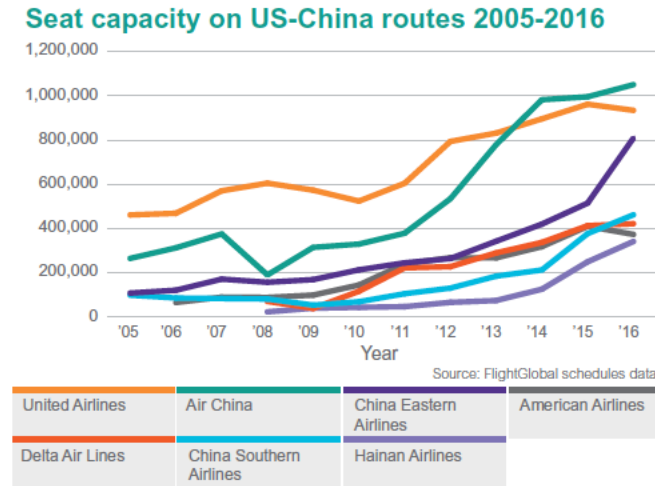


Figure 4- Waldron

Figure 4 also shows the positive impact these codesharing agreements have had on the airlines. Delta Airlines has also taken a recent step to put themselves ahead by putting their new Airbus A330-900 neo's on new routes to Asia, which includes a route to Shanghai.<sup>11</sup> These are decent options but there are better ways to open up China's commercial airline market.

Another point of conflict involves United and American Airlines in a direct dispute with each other. American Airlines' Chicago to Shanghai and Beijing routes are being suspended by the airline due to rising fuel costs rendering the routes unprofitable (previously mentioned lack of aircraft performance efficiency another reason). American would like the possibility to restart the routes in the future; however, United Airlines wants American to be forced to give them up since they are not being currently operated so that United and Delta can open new routes without bumping up the flight cap on the cities.<sup>12</sup> These flight caps are another form of Chinese

<sup>11</sup> Waldron, Greg. 2017. "US-China Tie-Up Underpins Growth." *Airline Business* 33 (4) (05): 6.

<sup>12</sup> "United Airlines Wants American to Free Up China Routes -- Market Talk." 2018. *Dow Jones*

protectionist policy that limit the ability of foreign airlines to operate successfully in China.

Airlines like American, Delta, and United are already straining hard to make routes work around the protectionist policies and their ability to corner the Chinese market will only continue to deteriorate if they continue to attack each other over the routes they currently have.

On the surface, it may seem that China's policies put the Chinese airlines at a strong advantage. After all, they have certain protections over their current market share and are allowed to go about their business with minimal interference from foreign competition. This is not the case. In a research paper that explores air policy liberalization of China, the argument is made that China must reach Open Skies Agreements (OSAs) with the United States in order to ensure the growth and prosperity of Chinese airlines. In an OSA, airlines of the two participating nations are allowed to enter any markets that link the two, and have the freedom to set the details of their air services. These arrangements reduce prices, expand the market size, and allow airlines to become more efficient, effective, and productive due to the enhanced competition. This in turn stimulates the international balance of trade between the two countries which produces positive results in much more than just aviation.<sup>13</sup> This would be tremendous for Chinese airlines especially. It would introduce healthy and robust competition that would ultimately allow for them to improve and grow at the proper pace to meet the natural growth in passenger demand.

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<sup>13</sup> Liu, Shaoxuan, and Tae Hoon Oum. 2018. "Prospects for Air Policy Liberalization in China as a Result of China-ASEAN Open Skies: Changing Role of Chinese Mega Carriers in Global Scene and Anticipated Low Cost Carrier Competition." *Transport Policy* 72 (December): A1-9.

According to the authors, OSAs with countries such as the United States would allow for Chinese carriers to not only grow and develop, but to actually become the world's super carriers in the next 10 years.<sup>13</sup> Figure 5 shows that Chinese airlines are already leading in Asia. If OSAs were to be introduced, it would only be natural for the resulting increase in competition make stronger and healthier Chinese carriers on the global stage.

Table 2  
Performance of Chinese network carriers: 2016 vs. 2006.  
Source: Fu et al. (2015a).

2016	China Southern	China Eastern	Air China	Korean Air	Japan Air	ANA
Revenue (million USD)	17310	14838	17151	10382	12889	15890
Passengers (1,000)	114614	101741	96593	26840	40190	50410
# Aircrafts	702	581	623	161	227	257
2006*	China Southern	China Eastern	Air China	Korean Air	Japan Air	ANA
Revenue (million USD)	5797	4842	5636	8455	19499	11769
Passengers (1,000)	49206	35040	33971	22353	57452	49609
# Aircrafts	309	205	225	116	NA	NA

*Figure 5-Liu and Tae*

The best example to look to in this situation is the OSA that was signed with South Korea in 2006. This agreement was not taken well by Chinese carriers at first. After the OSA was in place, flights per week on the Incheon to Qingdao route increased from 4 to 134 in only six months. Before the OSA, Korean airlines had control of the market but within two years of the agreement, the Chinese airlines had taken the majority of the market. The same thing happened with an OSA with China and Japan, where China now holds 70% of the market share.<sup>13</sup> The improvements in these situations are incredible, and China would be smart to take this action with more countries in order to make sure that they can grow with their own population of air travelers. If they do, then they can introduce more flights and routes across the country which will have a positive effect on GDP and the economy while having a great chance of ruling the

<sup>13</sup> Liu, Shaoxuan, and Tae Hoon Oum. 2018. "Prospects for Air Policy Liberalization in China as a result of China-ASEAN Open Skies: Changing the Role of Chinese Mega Carriers in Global Scene and Anticipated Low Cost Carrier Competition." *Transport Policy*. 72 (December) A1-9.



market in the long-run as well. Without them, China runs the risk of not keeping up with demand and stalling the growth of what could have been one of the largest and most lucrative markets in the world.

The other important move that must be taken with the Chinese airlines is the encouragement of expanded Low Cost Carriers (LCCs). Figure 6 displays the recent loss of seats in the China-ASEAN market over the last five years. This is because China restricts its own LCCs while the ASEAN nations allow their LCCs to enter the market. Due to this, the Chinese carriers cannot keep up and end up losing out.

Share of scheduled seats in China-ASEAN market over 2014-2018 period (excluding routes to/from top 10 Chinese airports).

Source: OAG

year	Chinese LCC	Chinese FSC	ASEAN LCC	ASEAN FSC	Other airlines
2014	0.2%	45.9%	36.5%	17.3%	0.1%
2015	2.5%	51.7%	29.0%	15.8%	0.9%
2016	6.3%	38.0%	40.2%	15.1%	0.3%
2017	4.4%	31.8%	40.1%	22.9%	0.9%
2018	4.6%	31.7%	44.9%	18.1%	0.7%

Note: the top 10 Chinese airports are Beijing Capital, Shanghai Pudong, Shanghai Hongqiao, Guangzhou, Chengdu, Shenzhen, Kunming, Xi'an, Chongqing, Hangzhou. The top 10 refers to total passenger throughput.

*Figure 6- Liu and Tae*

If this is allowed to continue, this situation would likely continue at an exponential rate until the Chinese mega carriers completely lost out on the market.<sup>13</sup> This would deal a devastating blow to the ability of Chinese airlines to corner their own market. Therefore, China must also allow for the development of their own LCCs to increase the connectivity of the country and protect their share of the market from foreign LCCs. If this is done, then the potential for Chinese carriers is

<sup>13</sup> Liu, Shaoxuan, and Tae Hoon Oum. 2018. "Prospects for Air Policy Liberalization in China as a result of China-ASEAN Open Skies: Changing the Role of Chinese Mega Carriers in Global Scene and Anticipated Low Cost Carrier Competition." *Transport Policy*. 72 (December) A1-9.

astronomical in the long-term. A short-term investment is most definitely worth the long-term returns.

The biggest issue facing the Chinese carriers outside of the regulation put in place by the government is the struggle to find enough pilots to sustain the forecasted growth. This problem could single handedly bring Chinese commercial aviation growth to a standstill. The Asia-Pacific region is expected to need 253,000 new pilots between now and 2036 according to Boeing forecasts, with the majority no doubt coming from China. While fears of an actual shortage are decreasing thanks to the opening of flight academies in the region the risk still remains as demand continues to increase at such an accelerated rate. One of the issues the industry is facing is that current generations would rather work for tech companies instead of becoming pilots.<sup>14</sup> The key to avoiding a pilot shortage is putting programs into place that help bring new generations of professionals into the aviation industry. Whatever it may be, such as social media campaigns, shake ups of industry culture, etc., if younger people can see the impact commercial aviation is going to have on the future of the global economy they may be more inclined to enter the industry. As this is worked on, airlines and private companies must continue to expand and build more pilot training schools and programs in order to prepare the next generation of pilots for the new age of commercial aviation.

The future of commercial aviation in China hinges primarily on the ability to find pilots to meet demand and the potential for new OSAs that allow for airlines to improve and expand at a rate that satisfies the exploding air traffic population. If this can occur, then the full potential of this market can be realized. Under these circumstances, U.S. airlines would be open to better profit margins by being able to use their aircraft more effectively and open new routes. Chinese

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<sup>14</sup> "Glamour of Cockpit Fades for Millennials." *Factiva*, July 30, 2018.

airlines would be able to take over as the new global leaders and emerge as the model airlines of the future. This would give U.S. airlines the short-term advantage and a decent long-term market share. On the other side, Chinese carriers would become the titans of the commercial aviation industry with a tremendous long-term gain.

In order for the rising Chinese commercial aviation market to reach its full potential, there are a number of things that must fall in place, as well as certain steps that companies can take to place them in a better position for long term success. Market expansion is one of the keys, which can be achieved for the airline industry through previously-discussed OSAs. U.S. based airlines can expand through the increase of codesharing agreements and adding routes that allow them to utilize their aircraft to their full capabilities. For Boeing, they can expand their market through the development and release of the anticipated New Midmarket Aircraft (NMA), which has been dubbed the “797” by many. They can leverage this aircraft into even more success if they build another finishing center in China to further invest in China’s labor force. Finally, improvements of airport infrastructure will open up the possibilities for China to comfortably handle their increasing air traffic.

For Boeing, the key to long-term success in China may be the NMA. The company has continuously pushed back the decision date for when they will decide whether to pursue the project, as they are attempting to ensure that they make the best business decision. As they discuss their options, there have been many airlines that have expressed interest in the aircraft. Boeing has suggested that the aircraft would have two models: one with a range of 5,000 nautical miles and another with a range of 4,500 nm.<sup>15</sup> Boeing must be enticed by the level of interest that

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<sup>15</sup> “Boeing Still Working NMA Business Case as Airlines Indicate Strong Interest.” 2018.

airlines have for the aircraft. It seems to be a niche style aircraft that fits in the gap that has been left by current Airbus aircraft and aging Boeing 757 and 767s. This style may end up being the ace up the sleeve for Boeing, as this aircraft would be perfect for a Chinese market that opens up its skies.

The other possibility provided by the NMA is the potential to develop a plane in the future to replace the 737 that is an extension of manufacturing improvements used on the NMA. Boeing has mentioned that the NMA would not be a technological revolution, but that instead they would use the aircraft to change the way they manufacture aircraft into a more efficient and productive process.<sup>16</sup> This would be a huge opportunity for Boeing. They could take the opportunity to build an aircraft that fits perfectly into plans for China's growing market and to integrate production of the aircraft into China itself. This would go a long way to securing what could even end up being a majority of the Chinese market. With this project, Boeing could jump on the chance to further push vertical integration, which has been a trend for the company in recent years as they move away from having so much done by suppliers. Boeing has become strong enough to exert power over their suppliers, and the NMA will be the next step in them changing the landscape of aircraft manufacturing.<sup>15</sup>

For this NMA production site in China, the place that would make the most sense for Boeing as a potential location is Ningbo. It is a city in northeastern Zhejiang Sheng province and a busy port for the province. It is well connected to Shanghai via the Hangzhou Bay Bridge and

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<sup>16</sup> Hemmerdinger, Jon. 2019. "NMA may Offer Path to 737 Successor." *Flight International*, Feb

<sup>15</sup> "Boeing Still Working NMA Business Case as Airlines Indicate Strong Interest." 2018. *Air Transport World* 55 (3): 9.

has been designated as an “open” city since 1984. It already supports a number of manufacturing industries as well.<sup>17</sup> This would be a fantastic location for Boeing to incorporate aspects of the NMA production. Ningbo is also relatively close to Zhoushan, where Boeing’s existing completion and delivery center is located. This makes sense for the company and would make coordinating between the two locations much easier. The connection to Shanghai would allow for Boeing to bring in even more highly-skilled workers and the fact that Ningbo is an open city gives Boeing an easier way to invest in China. Between the development of the NMA and a new facility in Ningbo, Boeing has the opportunity to align the life of the aircraft with the growth of the Chinese aviation market.

A commonly-agreed-on point is that airport infrastructure must improve in order for China to support the demand that is coming in the near future. This is a hurdle that the country faces and they must continue to act in order to keep this from developing into a larger problem. IATA outlined in their most recent annual report that infrastructure is not currently keeping up with passenger demand. Due to this, a crisis is upcoming if steps are not taken. Airport infrastructure projects must become common in any country that is a part of the increase in air traffic.<sup>2</sup> This is an issue China is more than capable of solving. With government support, improvements can be made at airports all across the country to ensure that passenger demand is met. This is evident at Hong Kong International Airport, where a third runway is due to be completed in 2023. It is expected to increase aircraft movement by 33 per hour which, when paired with the new terminal, will allow the airport to handle 30 million more passengers every year.<sup>2</sup> This improvement would go a long way to improving capacity at one of the world’s

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<sup>17</sup> The Editors of Encyclopaedia Britannica. "Ningbo." Encyclopaedia Britannica. October 21, 2010.

<sup>2</sup> "IATA Annual Review." IATA. June 3, 2018.

largest airports. It would take a lot of stress off of trying to ensure that future passengers can flow through the airport. Increasing the capacity and efficiency will open up the doors to better profits for the airport and airlines as well.

Another infrastructure project that is nearing completion is the Daxing International Airport south of Beijing. According to China Daily in an article provided by DOW Jones on Factiva, this huge project is expected to be completed by June 30<sup>th</sup> and open to passengers on September 30<sup>th</sup>. When it is completed, it will be the world's largest airport by passenger capacity. It will be the first airport to have high-speed rails, subway, and express trains going underneath the airport. This will allow access to the airport by the 200 million people in 28 cities that are now within a 3-hour journey by the rail network. The airport is expected to have annual passengers of 72 million by 2025 and has the capability to take on more than 100 million.<sup>18</sup> This is another huge undertaking that will help China take on the new passengers anticipated in the next 20 years. This airport is on the leading edge of technology and could end up being China's crown jewel in the aviation industry. The world needs improvements in aviation infrastructure, and China is taking the right steps to ensuring that it happens. This will help the industry keep up with demand and open up more profitability for all the airlines involved. Daxing is leading the way for China and should be a shining example of what this emerging market is capable of.

China is the perfect economic situation for expansion, and the horizon of the commercial aviation market there is possibly one of the greatest business opportunities in history. This is a chance that cannot be passed up on. The economic implications reach far beyond the aviation industry. Capturing the future air travel demand of China represents the ability to provide a monumental boost to the world GDP. In order to capture shares of the market, manufacturers and

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<sup>18</sup> Ruowei, Yin. "Beijing's New Airport Ready for Take off." *Factiva*, March 14, 2019.

airlines alike have attempted to place themselves in advantageous positions. In manufacturing, Boeing sits in the best position due to their close relationship with COMAC, their rapid expansion of sales to China, and the potential of developing a new aircraft that is suited for Chinese airlines needs more than any other aircraft currently in service. The possible expansion of Boeing production in China also represents a healthy boost of investment in Chinese industry. In the airline industry, Chinese airlines currently have the best position if OSAs are able to be enacted. It has been shown that freeing up the skies of China provides a great benefit to the airlines. The main question remains if China is willing to lift some of the regulations that they have in place and welcome in foreign companies. The U.S. airlines will have their fair share, but if Chinese airlines respond properly to new competition, they will come out on top. China must also encourage the development of LCCs to protect their market share and expand their route networks to meet future demand. This will give more people access to the larger cities in China and then to the rest of the world. To secure this economic future, new airports must be added and infrastructure projects must continue. China is the future of aviation and that future seems very bright. The companies looking to capitalize have taken major steps towards building the possibility of that future and are now ready to help it take off.

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