

AEROSPACE/AVIATION INDUSTRY OPPORTUNITIES IN JAPAN & CHINA



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MAINE INTERNATIONAL TRADE CENTER
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JAPAN

I. Japan: Summary of Opportunities

Japan continues to offer a lucrative market for imported aircraft, aircraft parts, and engines. U.S. firms have an overwhelming presence in the market due to long-standing relationships, some spanning over 50 years, with domestic manufacturers and trading firms. U.S. firms are presented with opportunities in the market as the domestic industry undertakes international projects, develops transport and patrol aircraft for defense, and develops small jets and small jet engines for civil aviation.

II. Japan: Industry Prospects

Opportunities

Japan continues to offer a lucrative market for imported aircraft, aircraft parts, and engines. U.S. firms have an overwhelming presence in the market due to long-standing relationships, some spanning over 50 years, with domestic manufacturers and trading firms. U.S. firms are presented with opportunities in the market as the domestic industry undertakes international projects, develops transport and patrol aircraft for defense, and develops small jets and small jet engines for civil aviation.

In the civil aircraft market, Japanese manufacturers such as Mitsubishi Heavy Industries, Kawasaki Heavy Industries, and Fuji Heavy Industries, supply about 35 percent of the content for the Boeing 787. It was announced in April 2014 that Japan will supply about 20 percent of the content for the Boeing 777X. Although the size of investment is yet to be determined, the Japanese firms are planning to expand their facilities in order to meet this new demand.

Mitsubishi Heavy Industries established Mitsubishi Aircraft Corporation (MJET) in April 2008 to undertake the design, type certification, procurement, sales and marketing and customer support of Mitsubishi Regional Jet (MRJ). MJET announced in October 2007 that it selected Pratt & Whitney to supply Geared Turbofan engines for the aircraft. This next-generation engine will make the planes 20-30 percent more efficient and about 15 percent cheaper to operate than conventional regional jets. Other U.S. manufacturers such as Parker Aerospace (hydraulic systems), Hamilton Sundstrand Corporation (electrical power system), and Rockwell Collins (flight control system) are also suppliers of MRJ. The first MRJ flight is scheduled in early- to mid-2015.

In terms of engines, the Japan Aero Engines Corporation (JAEC) is participating in the international joint development of the PW1100G-JM, a next-generation engine for the A320neo, a single-aisle aircraft which Airbus is developing with the aim of entering into service in 2015. The agreement between JAEC, Pratt & Whitney and MTU Aero Engines Holding AG (MTU) of Germany, was signed in September 16, 2011.

In the defense sector, Japan adopted new principles and guidelines on arms exports, the first major overhaul in nearly half a century of its arms embargo policy. Japan will now allow arms exports but only

if they serve the purpose of contributing to international cooperation and its security interests. Japan is seeking ways to commercialize C-2, a small transport aircraft. In addition, Japan is working with India to sell their US-2 amphibious patrol aircraft.

Sub-Sector Best Prospects

- Commercial aircraft and aircraft engines
- Helicopters
- Aircraft parts and supplies
- Avionics¹

Japanese Aircraft and Aerospace Production

Airplanes:

For a certain period after the end of the war, Japan was forbidden from any activities related to the development and production of aircraft, and its aerospace industry thus fell behind those of the US and Europe. Starting with the licensed production of defense aircraft, national development and production systems have grown. The development and manufacture of defense aircraft was the base of the Japanese aerospace industry, and in recent years the F-2 fighter (a joint Japan-US project), the OH-1 observation helicopter, the T-7 trainer US-2 amphibious search & rescue flying boat have been successfully developed and produced in this country. The P-1 Fixed-Wing Maritime Patrol Aircraft is being delivered.

Delivery of the C-2 Transport Aircraft will start in 2014. With a steady increase in passenger transportation, Japanese producers are further developing and manufacturing civil aircraft, and the importance of this industry has thus risen. In the 1960s, Japan focused on the YS-11 transport aircraft and other similar projects. More recently, international joint development has become main stream due to the enlargement of the airline industry in general, which has gone global, and thus the risks have increased as well. Currently, Japan is participating in the development of aircraft such as the B767, B777 and B787, and engines such as the V2500, TRENT1000, GEnx, PW1100G-JM, etc.

Spacecraft:

Japanese space-related projects are comparable to the world standard. Japan has successfully developed launch vehicles such as the M-V and H-IIA, and also in the satellite field, Japan has contributed to the development of various engineering test satellites, observation satellites, global navigation satellites, etc. The development technologies of H-IIA were transferred to a private sector. The company received a commercial order to launch South Korean satellite on an H-IIA Rocket. This launch was executed successfully in May 2012. The H-IIB rocket, which is an upgrade model of H-IIA was also developed. This was mounted with the unmanned H-II Transfer Vehicle (HTV) to carry supplies to the International Space Station, and its inaugural launch in September 2009, second launch in January 2011, third launch in July 2012, and fourth launch in August 2013 were all successful.

Japan has achieved a 96.3% launch success rate with the launch of H-IIA launch vehicle No. 23 in February 2014. Progress into the global market has also been made. For example, a Turkish government-run communications company ordered two satellites in 2011 and procurement of two observations satellites from Japan were included in a yen-loan grant agreement with the Vietnam government. Japanese companies are striving to build their reputation and reduce costs in order to compete further internationally.

Aerospace Sales:

The aerospace industry in Japan has steadily increased to a total of 1,483 billion yen (with aircraft-related activities accounting for 1,167 billion yen and space-related activities accounting for 316 billion yen). As of 2012, a total of 35,411 persons were employed in this industry, with 27,230 and 8,181 persons involved in aircraft-related and space-related activities respectively. The proportion of defense aircraft stood at one time between 80% and 90% of total sales, and export components of civil aircraft have increased since the late 1990s along with the promotion of multinational development projects. Consequently, defense-related products currently are 50% or less of total sales. The United States is overwhelmingly large, and various EU countries, Canada and Japan follow.

When compared with the automobile, home electric, computer and other industries in Japan, the aerospace industry is still relatively small. The trade balance was in pronounced deficit because of the large volume of aircraft procurements by airlines, but the deficit is gradually narrowing with growing demand for aircraft exports in the private sector.

Aircraft Development:

Japan Ministry of Defense is currently developing, and delivering following types of aircraft.

- **Search & Rescue Flying Boat** In 1996, development of a successor to the US-1A was started, and its first flight was successfully completed in December 2003. US-2 (former US-1A kai) delivery to the base started in March 2007.
- **Fixed-wing Maritime Patrol Aircraft and Transport Aircraft** to be used as successor models for the P-3C and the C-1, and simultaneous development activities began in 2001. By making use of multi-utilization to the utmost, it is expected that there will be a reduction in the overall development cost. Fixed-Wing Maritime Patrol Aircraft succeeded in the first flight in September 2007 and started delivering to the base from 2012. Transport Aircraft successfully completed its first flight in January 2010 and delivery to the base will start in 2014.
- **Unmanned Aerial Vehicles** The Ministry of Defense is currently developing unmanned aerial vehicles. Studies to evaluate conversion of the F-104 Fighter for pilotless operation are had been done. The ministry is also developing an unmanned aircraft research system whose autonomous flight function enables automatic landing.
- **Trainers** The Ministry of Defense is designing and developing trainers such as the T-4 and T-7 indigenously in Japan. Both the airframe and engine of the T-4 intermediate trainer are fully developed and produced in Japan. Making the most of its excellent agility, the aerial combat research aircraft (nicknamed “Blue Impulse”) appeals to people with flying displays held at various air bases throughout

Japan. Furthermore, the outspread applications of such technical advances not only contributes to the design and manufacture of civil aircraft, but it also has helped to form strong technical foundation in other industries.

- **Advanced Technology Demonstrator (ATD)** In the ATD program, high maneuvering stealth prototype will be made with advanced technologies such as stealth form, high maneuvering flight control and advanced composite material. It will be used to verify the stealth technology in actual flight environment and establish the performance needed for the future fighter jet.

Helicopters:

As one of the largest user of helicopters, Japan develops and manufactures fuselages, engines and all other helicopter components. The technologies used in fuselage and transmission production in this country have an excellent reputation throughout the world. The rotor system is the most important part of these components, and Japan has successfully developed and produced a composite-material, bearing-less version of this system that makes full use of cutting-edge technologies. The Japanese aerospace industry is also proactively participating in multinational development projects.²

5 of A&D’s Top 100 Companies are in Japan (from PricewaterhouseCoopers):

- Rank #30: Mitsubishi Aerospace
- Rank #41: IHI Aero Engines and Space Operations
- Rank #51: Kawasaki Aerospace
- Rank #86: Fuji Aerospace
- Rank #100: Jamco Corp³

Exports of Aircraft, Spacecraft, and Parts Thereof (HS 88) from the US to Japan (in US\$)

Rank	Code	Description	ANNUAL 2012	ANNUAL 2013	ANNUAL 2014
		TOTAL SELECTED COMMODITIES	8,285,891,445	7,056,626,830	7,302,818,779
1	8800	Civilian Aircraft, Engines, And Parts	7,168,071,140	6,155,100,044	6,508,086,205
2	8803	Parts Of Balloons Etc, Aircraft, Spacecraft Etc	778,452,486	862,226,257	770,545,538
3	8805	Aircraft Launch Gear; Deck-Arrest; Gr FI Train; Pt	15,663,396	22,689,043	16,870,430
4	8802	Aircraft, Powered; Spacecraft & Launch Vehicles	322,057,262	12,666,842	4,703,671
5	8804	Parachutes (Including Dirigible Parachutes) Rotoch	1,489,963	3,470,660	2,485,753
6	8801	Balloons & Dirigibles; Gliders Etc	157,198	473,984	127,182

Source: WiserTrade

III. Japan Market Overview

As the world's fourth-largest buyer of American products and the world's third-largest economy, Japan, among the most dynamic and advanced countries in the world, is a market that should be considered by all American exporters. Japan is a technology powerhouse, a proving ground for consumer goods and services, and in the social and commercial vanguard of developed market demographics.

Further, Japanese companies are also major investors in the United States, and as a result Japan sees dozens of visits by senior U.S. state and city officials annually.

While the reasons U.S. firms engage with Japan are diverse, the strategic and tactical importance of the Japanese market is critical not only for their business in Japan, but in the United States and third-country markets as well.

Japan continues to enjoy attention in the business news this year owing to a variety of factors, including the strong performance of the Japanese stock market in 2013, continued brighter business and consumer sentiment, a yen that has seemingly stabilized at a level sharply lower than that of recent years, and the

apparent end of stubborn deflation. The new economic policies linked to these developments are known collectively as "Abenomics"-- a three pronged strategy of bold monetary loosening, fiscal stimulus centered on infrastructure spending, and growth-oriented structural reform. While the implications and ultimate success of this strategy in reigniting long-term growth in Japan are uncertain, it has drawn considerable attention from U.S. businesses.

The U.S., Japan and ten other countries are negotiating the Trans-Pacific Partnership (TPP). With Japan's participation, its members would account for nearly 40 percent of World GDP. Moreover, the liberalization expected to be required of TPP member countries may play an important role in promoting the domestic economic reforms likely to be called for under "Abenomics." As of May 2014, the U.S.-Japan TPP talks have been proceeding vigorously, with most topics already or nearly agreed upon.

While Japan has made significant steps toward economic healing following the tragic combined earthquake, tsunami, and nuclear incident of March 2011, lasting changes on various levels remain noticeable, including idled nuclear power plants. In particular, greater levels of manufacturing by Japanese companies outside of Japan, increased fuel imports and a weakening yen have turned Japan's multi-decade trade surplus into a trade deficit.

Country Profile

- **Full name:** Japan
- **Population:** 127,103,388 (July 2014 est.)
- **Median Age:** 46.1 years
- **Largest District:** Tokyo
- **Area:** 377,915 sq km
- **GDP:** USD \$4.77 trillion (2014 est.)
- **GDP per capita:** USD \$37,800 (2014)
- **Unemployment rate:** 3.6% (2014)
- **Monetary unit:** Yen (JPY)
- **Main exports:** motor vehicles; semiconductors; iron and steel products; auto parts; plastic materials; power generating machinery
- **Investment in fixed capital:** 22.2% of GDP (2014)
- **Inflation rate:** 2.8% (2014)

Source: CIA World Factbook

Japan remains the world's third-largest economy, after the United States and China, with a GDP of almost \$6 trillion. Japan is the fourth-largest export market for U.S. goods and services, and our fourth-largest trading partner overall. In 2013 the U.S. exported \$65 billion in goods to Japan. The United States runs a persistent trade deficit with Japan in merchandise, and a surplus in services.

Japan is the second-largest foreign investor in the United States, with a cumulative investment of approximately \$310 billion. During 2013 the Japanese yen weakened appreciably and is currently near 5-year lows against the dollar. Even so, U.S. products remain competitive in Japan.

Japan's large government debt, which totals over 200 percent of GDP, and an aging and shrinking population are major challenges confronting the economy, but the latter can also present opportunities for U.S. companies.

In 2013 the top exporters to Japan were China, the United States, Australia, Saudi Arabia, South Korea, the UAE, and Indonesia. The top importers from Japan were China, the United States, South Korea, Taiwan, and Hong Kong.

The United States-Japan alliance is a cornerstone of U.S. security interests in Asia and is fundamental to regional stability and prosperity. The U.S.-Japan alliance continues to be based on shared vital interests and values. These include stability in the Asia-Pacific region, the preservation and promotion of political and economic freedoms, support for human rights and democratic institutions, and securing of prosperity for the people of both countries and the international community as a whole. Japan is one of the world's most prosperous and stable democracies.

Market Challenges

The degree of difficulty in penetrating the Japanese market depends on the product or service involved. Key variables include the degree of local or third-country competition, the number of regulatory hurdles to be overcome, and cultural factors such as language (both spoken and written), service and quality expectations, and business practices. Tariffs on most imported goods into Japan are low. However, cultural, regulatory, or other non-tariff barriers exist that can make market entry difficult. These can include Japanese import license requirements, restricted or prohibited imports, temporary entry of goods, certifications, standards, labeling requirements, etc.

Market Opportunities

U.S. companies wishing to enter the Japanese market should consider hiring a reputable, well-connected agent or distributor, and cultivating business contacts through frequent personal visits. Japan's business culture attaches a high degree of importance to personal relationships, and these take time to establish and nurture. Patience and repeated follow-up are typically required to clinch a deal. The nature and pace of dealmaking in Japan are quite different from those in the United States. U.S. business executives are advised to retain a professional interpreter, as many Japanese executives and decision-makers do not speak English or prefer to speak Japanese.⁴

CHINA

IV. Summary of Opportunities

Commercial opportunities in the civil aviation market include:

- Final assembly and tier-one suppliers
- Small niche parts manufacturers
- Airport design and construction companies
- General aviation⁵

V. Industry Prospects

China is already the second largest air travel market in the world, leading to considerable opportunities for foreign investment in the country's aerospace and aviation industry. Over the next five to ten years, China will increase the size of its general aviation fleet by roughly 30 percent annually, a total value of \$159 billion, according to PIM Ltd. **From 2012-2032, Chinese enterprises and individuals are expected to purchase 5,357 aircraft of at least 50 seats apiece, at a net worth of US\$647 billion; the number of single-aisle jet airliners will account for 75 percent of this total.**

The Civil Aviation Administration of China mandates that foreign investors may not produce planes in China except through co-ventures with **AVIC (Aviation Industry Corporation of China, owner of the XAC/Xi'an Aircraft Corporation)** and **COMAC (Commercial Aircraft Corporation of China)**. China currently assembles final-stage versions of the Airbus A320 and produces the Embraer ERJ-145 regional jet under license.

Additionally, plans are in the works for the manufacture of two medium-size domestic planes: AVIC/XAC's MA60 turboprop and COMAC's 90-seat ARJ21 regional jet. COMAC is also developing a 190-seat passenger aircraft, the C919, with the goal of completely displacing the market share of the aging Boeing 737 and Airbus 320 in China.

While all wide-body aircraft will be imported through 2020, AVIC SAC Commercial Aircraft Co., Ltd. (SACC) continues to produce the front edge of the vertical tail of the B787 aircraft, serving as the sole Tier 1 supplier since 2007. As for the A330/340, since 2004-2005, SACC has been making forward & aft cargo doors, currently at a rate of eight and six per month, respectively.

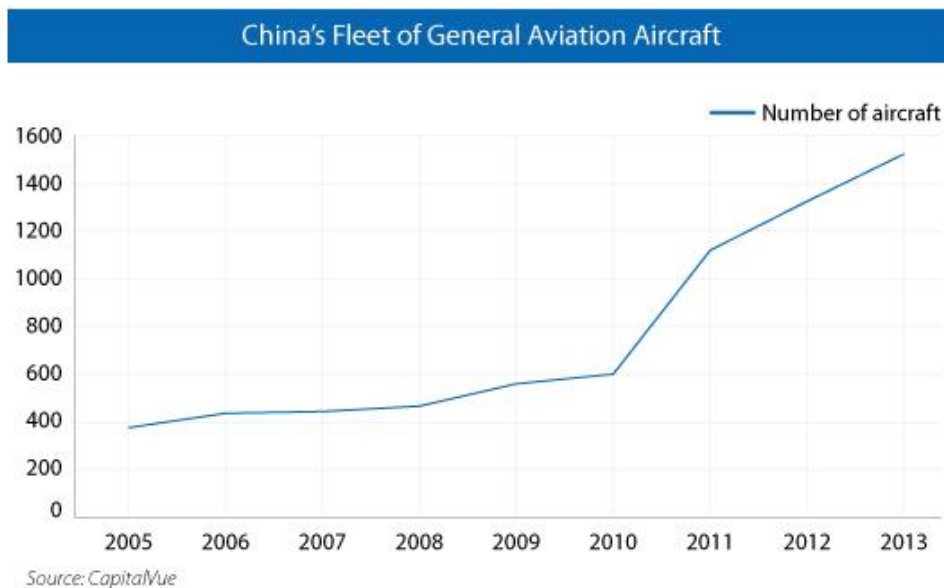
Foreign investors are more likely to find opportunities in China's aerospace and aviation industry through component systems (engines, hydraulics and electronics) and services (design engineering, precision machining and training), which will be worth at least \$8 billion over the next five to ten years, or more than \$32 billion over the next 20 years.

This is despite the fact that global aerospace component sales fell below \$400 million in the most recent fiscal year (2013), mainly due to a \$100 million drop off in business with the U.S. Rising costs in China require a commensurate rise in quality – an ongoing challenge to prospective investors.

Within China however, with AVIC and COMAC setting the priorities for the market, demand may increase in areas of engine design and development, as evidenced by GE Aviation, Pratt & Whitney, Rolls-Royce and MTU Aero Engines GmbH having committed to participate in upcoming forums with AVIC and COMAC.

Led by companies such as PPG, Huntsman and Japan’s Toyo and Mitsubishi Rayon, composite materials (e.g. carbon fiber) might also become a topical and accessible industry – especially in light of the Chinese government’s recent decision to expand its aerospace force and the rising demand for new technologies carried onboard projects such as the Gaofen high-resolution satellites.

But given China’s record with intellectual property rights protection, some firms with a competitive edge may be cautious about transferring first generation technologies into the country. While some degree of reverse engineering is unavoidable, investors whose operations combine both innovation and superior services will lead the way to safer, cheaper and more convenient travel for all.⁶



Current Commercial Aircraft Production

Essentially, all aircraft manufactured in China were produced by the Aviation Industry Corporation of China (AVIC) and COMAC and their subsidiaries, however, some major components, such as engines, hydraulic systems and other critical parts are mainly either being produced abroad or by foreign OEM’s in China . **There are two domestically designed commercial passenger aircrafts in the market China produced: the MA60-series turboprop and the ARJ21 regional jet.** The MA60 is a 60-seat turboprop

airliner manufactured by the Xi'an Aircraft Corporation (XAC), an AVIC subsidiary. The ARJ21, manufactured by COMAC, is a 90-seat regional jet that has been in testing since November 2008, and six ARJ21-700 have been built so far, with expected entry into service in 2015. COMAC is also developing a 190-seats passenger aircraft named C919 with the goal of initial production in 2014, and by the end of February 2012, the order has reached 235 aircrafts. It aims to be customers' another competitive choice besides Boeing 737 and Airbus A320. China also performs final assembly on Airbus A320-series narrow-body airliners and produces the Embraer ERJ-145 regional jet under license. All wide-body aircraft will be imported at least through 2020.

Competitive Landscape

Although most of the aircraft related companies are SOEs, the government has issued policies to encourage Chinese private capital or foreign investment to invest this industry. Up until now, foreign involvement in China's civil aerospace sector has unquestionably contributed to its development. Several foreign companies, such as Honeywell Suzhou Aero-engine Co., Ltd, GE, Pratt & Whitney, Boeing Tianjin Composites Co., Ltd, Harbin Embraer Aircraft Industry Co., Ltd, SAM (Suzhou) Co., Ltd, have already been active in China.

The domestic listed companies in this industry:

- AVIC Xi'an Aircraft Industry (Group) Company Ltd
- AVIC Jiangxi HongDu Aviation Industry Co., Ltd
- AVIC AERO-ENGINE CONTROLS CO., LTD.
- AVIC HaiG
- Sichuan Chengfa Aero Science & Technology Co., Ltd
- AVIC Heavy Machinery Co., Ltd
- AVI China Industry & Technology Co Ltd
- Hunan Boyun New Materials Co., Ltd
- AVIC Xi'an Aero-Engine (Group) Ltd
- China AVIC Avionics Equipment Co., Ltd⁷

Opportunities

Commercial opportunities in the civil aviation market include:

- Final assembly and tier-one suppliers
- Small niche parts manufacturers
- Airport design and construction companies
- General aviation

As stated in China's 12th Five Year Plan, China plans to build 56 new airports, re-locate 16 airports, and renovate/expand 91 airports with investment totaling \$68.5 billion during the 2011 – 2015 period. At the end of 2013, the total number of civil airports in China was 193. China will have more than 230

airports by 2015, accessible by 83% of the population, including 3 national hubs, 5 regional hubs, and 24 medium hubs. The commercial air fleet will grow along with the number of airports, up from 2,888 aircraft in 2011 to an estimated 4,500 by 2020. China's top three airlines, i.e., Air China, China Southern, and China Eastern, are now among the world's top 10 carriers. Boeing's "Current Market Outlook" forecasts that China's airlines will add over 5,580 new transport airplanes valued at \$780 billion (RMB 4.72 trillion) during the next 20 years. <http://www.boeing.com/boeing/commercial/cmo/> China has become an integral and growing part of the global aviation supply chain for a wide variety of aviation products and services and is making progress on its plans to enter the large commercial airplane manufacturing market. The increase in the number of airports and aircraft will require new infrastructure, aircraft engines and parts, pilots, controllers, communication/navigation/surveillance systems and other equipment presents significant business opportunities for U.S. exporters.

In July 2012, China's "State Council Opinions on Promoting Civil Aviation Development" set several key development targets for the industry including a transport growth rate of 12.2 percent for 2011- 2020, an improved safety record, general aviation growth of 19 percent, and increased access to air services for more of the population. China's civil aviation system is forecasted to be as large as the U.S. system in approximately two decades.

Meaningful cooperation between the United States and Chinese governments on aviation is essential to realizing these business opportunities. The U.S. Federal Aviation Administration (FAA) and the Civil Aviation Administration of China (CAAC) continue to enjoy a close partnership that has benefited both sides for many years. The U.S.-China Aviation Cooperation Program (ACP) brings together U.S. industry and government agencies from both countries - CAAC, FAA, the U.S. Trade and Development Agency (TDA), and the U.S. Transportation Security Administration (TSA) in a unique and active forum for bilateral cooperation.

Sub-Sector Best Prospects: Aircraft Parts Manufacture and Repair China's import market for aircraft parts and components exceeded \$2 billion in 2013, an increase of around 20% compared with year 2012. China's demand for aircraft parts can be attributed to a number of factors including an increasing capacity utilization rate, the age and expansion of China's aircraft fleet, and the domestic production and assembly of aircraft.

As of 2011, China had a civil aviation fleet of 2888 aircrafts with an average age of 6.35 years, and as the fleet continues to age, it will require parts and equipment for routine maintenance and repair. Though there are a number of major domestic aircraft and parts manufacturers scattered throughout China, the sector is still underdeveloped, creating a strong demand for reliable imported products and technologies to ensure quality standards.

China's domestic aircraft part and assembly manufacturing sector is also growing. In addition to approximately 200 small aircraft parts manufacturers, there are also a number of regionally-based major manufacturers concentrated in Shanghai, Chengdu, Xi'an, Jiangxi and Shenyang. China's domestic manufacturing base is developing, as reflected by the commitments of large aircraft and engine

manufactures to expand procurement in China over the long term. However, most highly technical and sophisticated parts and assemblies will continue to be imported until production quality meets international standards. At the present time, domestic manufacturers do not have the ability to produce all of the qualified materials and parts.

Commercial Aircraft Corporation of China (COMAC) has launched its C919 aircraft and expects to sell more than 2,000 planes, capturing about 7 percent of market share. In addition, Irkut of Russia has launched a narrow-body aircraft and Bombardier is marketing its CSeries. Embraer launched its next-generation E-Jet in 2013.⁸

Sub-Sector Best Prospects: Airports China currently has 193 civil aviation airports, including the world's second busiest in Beijing, with plans to expand aggressively to more than 230 by 2015. The expansion will place 83% of China's population and 96% of its GDP within 100 kilometres (roughly 60 miles) of the nearest airport, greatly enhancing the potential for aviation growth.

The airport system at present is highly concentrated, with top airports suffering from major congestion. The top three airports, Beijing, Shanghai and Guangzhou, account for 1/3 of all traffic, while the top 14 airports handle 2/3 of total traffic nationwide. Local industry estimates indicate that 40 of China's airports are already at or near capacity, with another 29 expected to reach this limit within the next two years. To relieve congestion, China opened 19 new airports over two years from 2009–2011.

International companies will have opportunities to participate in both the airport design and in the infrastructure construction. Qualified companies can bid for design, consultation, surveillance, management, and construction of designated civil airport projects. However, the chances for international leading design and construction companies to win the bid are limited, unless partnering with qualified Chinese domestic design and construction companies. So far, the Beijing Capital Airport, Shanghai Pudong Airport, Shanghai Hongqiao Airport, Shenzhen Huangtian Airport, and Guangzhou's new Baiyun Airport are all designed by international companies with local Chinese partners.

Ground service is another area in which foreign companies can actively participate. Beijing Capital Airport, Guangzhou Baiyun Airport, and Chengdu Shuangliu Airport have all established joint ventures with foreign partners (Singapore, Indonesia and UK) in ground services. Shanghai Airport Ground cooperated with Cargo Warehouse and Lufthansa set up a joint venture. China Air Oil Supply Corporation (CAOSC) has established many joint ventures with foreign companies to provide airport oil supply services.

Sub-Sector Best Prospects: General Aviation (GA) In China, the airspace is tightly controlled by the Chinese military and the airspace class system does not segment out its GA air activities. Strict military control over roughly 70% of all Chinese airspace is the largest single factor limiting growth of this industry. GA is still underdeveloped in China in terms of GA aircraft numbers, GA professionals and GA facilities.

However, a welcome change came in November 2010 when civilian and military authorities issued a joint reform document calling for liberalization of low altitude airspace under 4,000 meters (13,000 feet), setting the goal of opening up airspace below 1,000 meters by 2015 and airspace below 3,000 meters by 2020. Implementation of the reform will roll out in three stages, starting with an Experimental Phase in Guangzhou and Shenyang. The policy outlines a national rollout by 2015, and a final deepening and consolidation by 2020.

Since then, GA has been developing at a fast pace with new players coming to this market and the more involvement of local governments. GA has big potential market driven by the state and local economy development plan, the public demand for business jet, and the need for public services and individual recreations.

China currently has 123 operators registered with the Civil Aviation Administration of China (CAAC), the main stakeholder formulating policies and regulations concerning the safety and economics of GA in China. However, about 80% of Chinese operators have only 2 or 3 aircraft thus struggle to achieve operating scale and profitability. In addition, GA aircrafts are very costly to use in China due to airspace access, flight approval procedures, and operation charges such as airport charges, plus maintenance services. All of these factors contribute to low profitability for Chinese operators.

Sub-Sector Best Prospects: Helicopters China will further open up its low-altitude airspace (below 1,000 meters) across the board by 2015 to unleash a vastly untapped general aviation market, valued at trillions of RMB. With the rise of the General Aviation market here, China could become the fastest-growing helicopter market in the world. It is both exciting and challenging. In China, two-thirds of the country is covered by hard to reach mountains and high plateaus.

In 2008, an earthquake in the Sichuan region of China resulted in many casualties, and Chinese officials cite the failure of emergency teams to reach inaccessible areas as the reason. This has convinced China's leaders that they must dramatically increase their helicopter fleet.

For a country similar in geographical size to the United States, China operates comparatively few helicopters, most of which are built abroad, with the rest built locally under license. But with demands growing in both military and civil sectors, change is on the horizon for China's relatively small helicopter industry. The main civil helicopters are supplied by Airbus Helicopters, Sikorsky Aircraft Corporation, Bell Helicopters, AgustaWestland Helicopters, Russian Helicopters and Robinson Helicopter Co. The local suppliers are Changhe Aircraft Industry Corporation and Harbin Aircraft Manufacturing Corporation. In 2013, Chongqing Helicopter Investment Co. Ltd acquired Enstrom Helicopter Corporation and entered into China market.

As of October 2013, there were 381 civil helicopters in China. Over the next ten years, China's civil helicopter needs are expected to rise up to about 1,500 helicopters. China has realized the importance of helicopters for disaster relief work and medical rescues, and the country has become a bright spot in the struggling helicopter industry. The Chinese government has also loosened its control on helicopter

manufacturing to allow local private firms and foreign companies to co-operate in developing and manufacturing civil helicopters. The growing Chinese economy provides a huge potential market for helicopters of all classes.

1 of A&D's Top 100 Companies is in China (from PricewaterhouseCoopers):

#47: AVIC Aircraft Company

Exports of Aircraft, Spacecraft, and Parts Thereof (HS 88) from the US to China (in US\$)

Rank	Code	Description	ANNUAL 2012	ANNUAL 2013	ANNUAL 2014
		TOTAL SELECTED COMMODITIES	8,364,119,504	12,587,421,001	13,923,738,378
1	8800	Civilian Aircraft, Engines, And Parts	8,355,571,005	12,586,747,406	13,922,913,688
2	8804	Parachutes (Including Dirigible Parachutes) Rotoch	424,659	435,842	497,941
3	8805	Aircraft Launch Gear; Deck-Arrest; Gr Fl Train; Pt	245,733	199,107	277,533
4	8803	Parts Of Balloons Etc, Aircraft, Spacecraft Etc	7,821,371	29,819	42,339
5	8801	Balloons & Dirigibles; Gliders Etc	56,736	8,827	6,877
6	8802	Aircraft, Powered; Spacecraft & Launch Vehicles	0	0	0

Source: Wisertrade

VI. Shanghai Aircraft and Aerospace

Shanghai serves as the hub for much of domestic China and intra-Asia cargo transportation. Shanghai is poised to overtake Beijing as China's largest aviation hub. Passenger numbers at Shanghai's two airports in 2014 rose 8.25 percent to 89.62 million, including 51.66 million for Pudong Airport (PVG) and 37.96 million for Hongqiao Airport (SHA), according to statistics released by Shanghai Airport Authority.⁹ DHL Express has already opened a \$175m air hub at Shanghai Pudong International Airport in July 2012, and recently in April 2015, Delta announced plans to open a future hub in Shanghai as well.¹⁰ As Delta spokesman Trevor Banstetter said, "China is a market that will become increasingly important to global aviation in the coming years and we're fortunate that we've got relationships that we're building and that are already pretty strong with China Eastern and China Southern that are going to help us serve that market really well."¹¹

With extraordinary government support, Shanghai built a massive airport terminal in 32 months as part of a \$9 billion transportation hub that connects the air terminal with the city's buses, subway platforms and a new high-speed railway network.

In Shanghai, Pudong Airport — which operates 25 miles east of Hongqiao as the city's international gateway — has so many flights it plans to add a fourth and fifth runway, something few other airports in the world possess.

In Shanghai, the city's airport authority helped set up Shanghai Rainbow Investments to develop the new transportation hub and revitalize the area around it. The plan includes a new central business district with towers, five-star hotels and a vast mixed-use commercial project created by the Hong Kong developer Shui On Land. The developer hired the American architect Ben Wood, who designed Shanghai's popular Xintiandi commercial and entertainment district.¹²

Major Shanghai Commercial Airlines

China Eastern Airlines

Established: 1988

Aircraft in service: 352

Aircraft on order: 83

Shanghai Airlines

Established: 1985

Aircraft in service: 70

Aircraft on order: 5

Juneyao Airlines

Established: 2005

Aircraft in service: 36

Aircraft on order: 4

Spring Airlines

Established: 2005

Aircraft in service: 43

Aircraft on order: 5¹³

VII. China Market Overview

In November 2013, following the Third Plenum of the 18th Chinese Communist Party Congress, President Xi Jinping rolled out an ambitious agenda to re-shape the Chinese economy and fully embrace the market as the “decisive force” in shaping the country's economic future. In order to continue China's labor force evolution and to supplement the strong manufacturing exports that have fueled its unprecedented growth, Xi directed his administration to implement policy changes that increase domestic consumption, stimulate domestic innovation, and develop a world-class services sector – all the while expanding China's middle class and moving millions of rural Chinese citizens to urban centers.

Market Challenges

The depth and complexity of China's proposed macroeconomic reforms bring with them significant challenges and pitfalls that will require skillful policy making and implementation. Problem areas to look out for include rising local debt, potential property bubbles, outflows of capital, shadow banking, excess capacity in industry sectors, and endemic corruption across industry sectors. China continues to make steady progress on the world stage as an emerging market in which to do business. The World Bank recently ranked China 96th (out of 189) in its Ease of Doing Business Report. However, China's explosive economic growth of the last several decades is beginning to slow. In 2013, real GDP grew 7.7 percent

(down from 10.4 percent in as recently as 2010). While the government has set a 7.5 percent growth target, some economists predict that China's GDP growth will slow to 7.3 or 7.4 percent in 2014, which would represent China's slowest economic expansion since 1990. U.S. companies doing business in China remain concerned about rising costs for labor, enforcing intellectual property rights, competition with Chinese state-owned or state-supported companies, lack of transparency, burdensome bureaucracy, and protectionism in the business licensing and approval process.

Market Opportunities

Despite these and other longstanding concerns, China remains an extremely attractive market for many U.S. companies. In fact, ninety percent of U.S.-China Business Council member companies responding to a USCBC survey report that their China operations are profitable, the highest percentage reported since 2006. Foreign direct investment into China saw modest growth in 2013, rising 5.3% year-on-year compared with a 3.7% drop in 2012. Furthermore, many of the economic reforms called for as part of the Third Plenum, particularly those related to foreign investment, are starting to take shape.

Some highlights so far include:

- Revising the three basic laws that govern foreign investment in China.
- Slashing the number of business or administrative approvals needed while delegating much of the approval responsibility to provincial or local government.
- Relaxing "paid in" and minimum registered capital requirements for foreign-invested enterprises, and replacing the annual government inspection procedure with an online filing system.
- Undertaking efforts to improve the legal and enforcement regime for intellectual property (IP) rights, and amending the trademark law to provide stronger protection and enforcement tools for all trademark owners.
- Liberalizing financial controls, including interest rates and limits on foreign exchange.

In a move that garnered significant attention, China established the Shanghai Pilot Free Trade Zone (SFTZ) in September 2013. Covering approximately 29 square kilometers in Shanghai's Pudong district, the SFTZ was envisioned as a venue for China's leaders to experiment with market-based reforms, such as relaxed controls on foreign investment, increased market access in industry sections not on a "negative list," streamlined administrative procedures, and financial and foreign exchange reforms, but regulatory details are still slowly trickling out.¹⁴

Country Profile

- **Full name:** People's Republic of China
- **Population:** 1,355,692,576 (July 2014 est.)
- **Median Age:** 36.7 years (2014 est.)
- **Largest District:** Beijing
- **Area:** 9,596,960 sq km
- **GDP:** \$17.63 trillion (2014 est.)
- **GDP per capita:** USD \$12,900 (2014 est.)
- **Unemployment rate:** 4.1% (2014 est.)
- **Monetary unit:** 1 Renminbi yuan (RMB) (Y) = 10 jiao = 100 fen
- **Main exports:** Manufactured goods, including textiles, garments, electronics, arms
- **Investment in fixed capital:** 46%
- **Inflation rate:** 2.1% (2014 est.)

Source: CIA World Factbook

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- ¹ [Doing Business in Japan: 2014 Country Commercial Guide for U.S. Companies](#)
 - ² http://www.sjac.or.jp/common/pdf/sjac_gaiyo/info/habataku2014E.pdf
 - ³ http://www.pwc.com/en_US/us/industrial-products/assets/pwc-aerospace-defense-2013-year-in-review-and-2014-forecast.pdf
 - ⁴ [Doing Business in Japan: 2014 Country Commercial Guide for U.S. Companies](#)
 - ⁵ [Doing Business in China: 2014 Country Commercial Guide for U.S. Companies](#)
 - ⁶ <http://www.china-briefing.com/news/2014/09/24/investing-chinas-aerospace-aviation-industry.html>
 - ⁷ <http://www.pimchina.com/index.php/industrial-market-insights/chinas-aerospace-industry/>
 - ⁸ http://www.pwc.com/en_US/us/industrial-products/assets/pwc-aerospace-defense-2013-year-in-review-and-2014-forecast.pdf
 - ⁹ <http://www.wcarn.com/news/40/40535.html>
 - ¹⁰ <http://postandparcel.info/49041/news/companies/dhl-express-opens-175m-air-hub-in-shanghai/>
 - ¹¹ <http://www.freep.com/story/money/business/michigan/2015/04/06/delta-air-lines-shanghai-hub-richard-anderson/25373169/>
 - ¹² [NY Times Article](#)
 - ¹³ [Flight Global](#)
 - ¹⁴ [Doing Business in China: 2014 Country Commercial Guide for U.S. Companies](#)