INDUSTRY INSIGHTS

Quarterly Aviation Briefing

Prepared by ICF International for ALTA

SECOND QUARTER **2015**

ALTA

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QUARTERLY AVIATION BRIEFING

SECOND QUARTER 2015

A Revolutionary Development in International Airport Access

Crossing the US-Mexico Border Directly Into and Out of Tijuana International Airport, Without Long Immigration Lines

The border between Tijuana and the United States is the world's busiest crossing – and it can take several hours to get through immigration going into the United States. This is frustrating for passengers who use Tijuana International Airport (TIJ), but are going to the United States, especially since the Tijuana airport is only a few meters from the border.

There are nearly 12 million people of Mexican heritage living in California, many of whom travel to Mexico regularly, primarily from the greater Los Angeles area. Currently, almost 60% of the passengers at TIJ are traveling to or from the United States. Southern California airports (principally LAX) have many flights to Mexico but travelers often choose TIJ due to lower fares on the Mexican carriers at TIJ, the fact that TIJ offers service to places in Mexico that are not served from LAX, and the comfort of the Spanish language and of being "at home."

Tijuana is an industrial Mexican city that is home to nearly 2 million people, and has an economy that is largely based on the manufacture and assembly in the electronics, automotive and aerospace industries. The companies based in Tijuana are primarily from United States, though tourism remains a portion of the economy, especially in nearby Ensenada.

Tijuana International Airport served 4.3 million passengers in the 12 months ending April 2015. The airport is under the management of Grupo Aeroportuario del Pacífico (GAP), a private Mexican airport group, that maintains and operates 12 airports in Northwestern and Central Mexico.

Tijuana Airport Proximity to the U.S. border

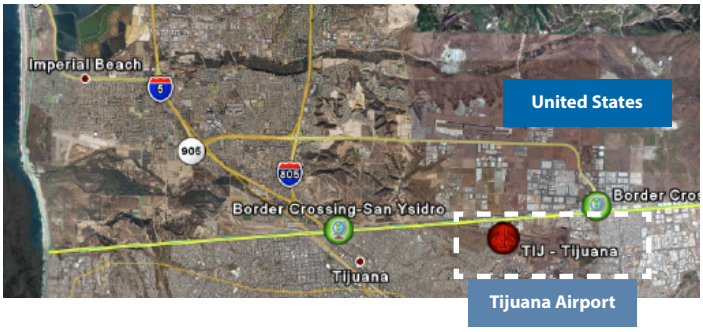
Source: ICF International Analysis; google maps

The Tijuana airport is located on the U.S. border, just 25 miles from San Diego and 126 miles from Los Angeles. It is served by two nearby border crossings to the U.S. — San Ysidro and Otay Mesa, which are located 5 km. and 3.5 km. respectively from Tijuana. These existing San Diego/Tijuana border crossings are extremely congested northbound, making it difficult for passengers to plan their travel to and from the Tijuana airport.

Tijuana Airport Proximity to Los Angeles

On August 2010, a presidential permit was issued authorizing Otay - Tijuana Venture L.L.C. to construct, operate and maintain an international pedestrian bridge, called San Diego – Tijuana Airport Cross-Border Facility (now branded as CBX) The Mexican Civil Aviation Authority has authorized a 180 million pesos investment for airport integration with the CBX.

Location of Tijuana International Airport and the Current U.S.–Mexico Border Crossings



Source: ICF International Analysis; google maps

The investment includes changes and expansion for customs, immigration and the international arrivals area, as well as the bridge and the build up to the airport border.

The cross-border facility would reduce the time for passengers travelling to and from Southern California via Tijuana airport by at least 2-3 hours.

Representative Perspective of the CBX Infrastructure and Tijuana International Airport

Source: Grupo Aeroportuario del Pacifico

The cross-border facility will be a landside "lobby" for the airport on the US side of the border, only for the use of passengers traveling to and from the Tijuana airport. The cross-border facility will contain customs and immigration, with a reasonable fee to use the time-saving facility. Access to the bridge will be granted only for Tijuana airport arrival passengers or passengers departing within the next 24 hours.

The accompanying exhibits show the location of the CBX, the Tijuana Airport and the US-Mexico border, with a representative perspective of the CBX Terminal Building and parking lot.

Representative Perspective of the CBX Terminal Building, Tijuana International Airport and the U.S.-Mexico border

Source: Grupo Aeroportuario del Pacifico

Artists Rendering of the New San Diego – Tijuana Airport Cross Border Facility

Source: GAP, Google Maps, Otay-Tijuana Ventures, ESRI

It is believed that far more passengers from the US will use Tijuana International Airport if they can cross the border more rapidly. This represents a new business opportunity for the Mexican airlines, as they can increase service at Tijuana. According to a projection by ICF International's aviation experts, The Tijuana airport is expected to see an 11 percent growth in passengers in the CBX's first year of operation, and by 2030 the airport expects to serve almost 7 million passengers.

The new cross-border facility, exclusive for Tijuana airport users, is scheduled to open by the end of 2015.

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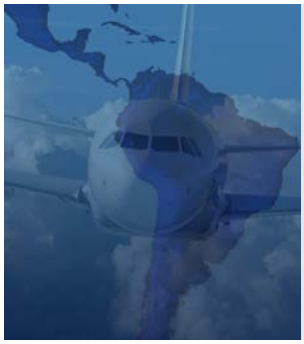
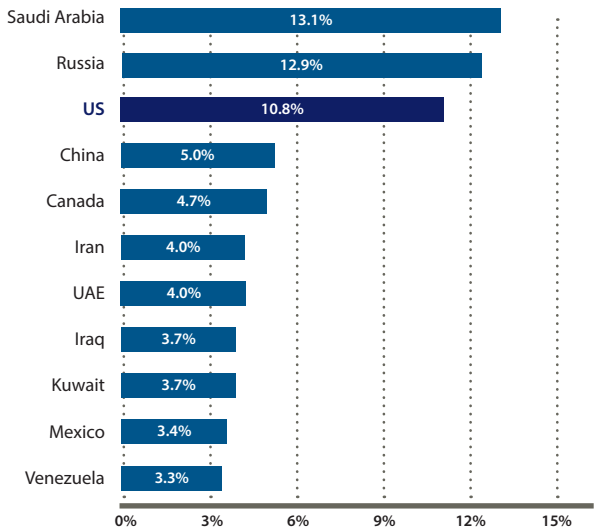


Globalization 2.0: Is Cheap Energy the New Cheap Labor?

Over the past five years, changes in U.S. energy production have been nothing short of revolutionary. As the Energy Information Administration (EIA) recently noted, U.S. oil production increased at its fastest pace in more than 100 years in 2014, and is pumping more than 9 million barrels per day. The U.S recently surpassed Russia as the world's largest natural gas producer, accounting for roughly one-fifth of global production in 2014.

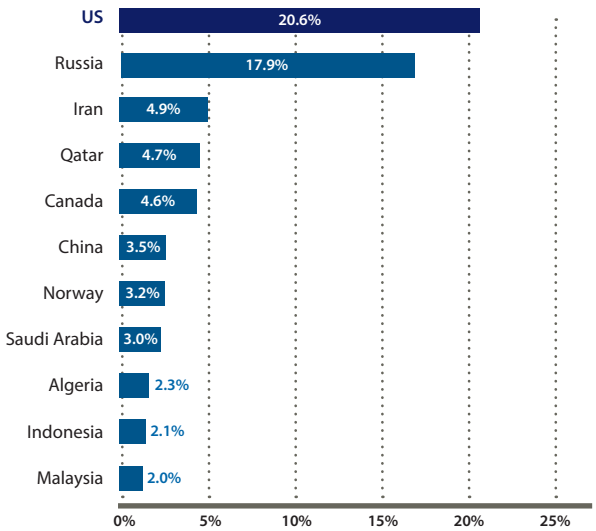
So what caused this American energy revolution? The magic elixir was twofold: first and most importantly, the development of breakthrough technologies such as horizontal drilling

Global Oil Production
2014



Source: BP Energy Outlook 2014

Global Natural Gas Production
2014



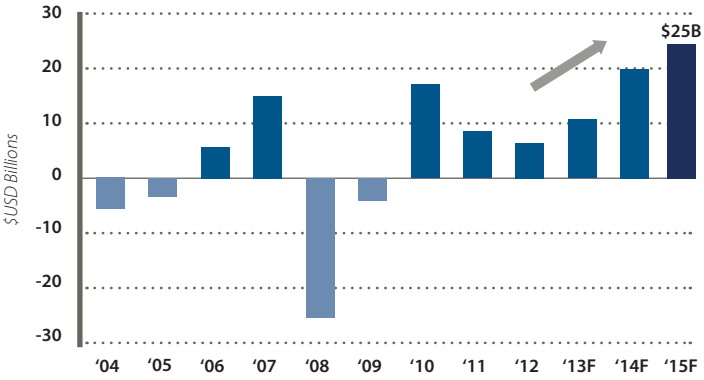
Source: BP Energy Outlook 2014

and hydraulic fracturing (aka fracking); second, a good mix of entrepreneurship, risk-taking, and private sector capital deployment.

The global financial and geopolitical ramifications of America's energy revolution cannot be overstated. In fact, one can argue that we are now entering an entirely new economic cycle. Whereas Globalization 1.0 can be characterized as labor cost arbitrage that induced many industries to shift both manufacturing and aftermarket services to low-cost labor regions, Globalization 2.0 could bring tectonic shifts in where companies choose to locate. This time, however, energy cost arbitrage will be the primary driver.

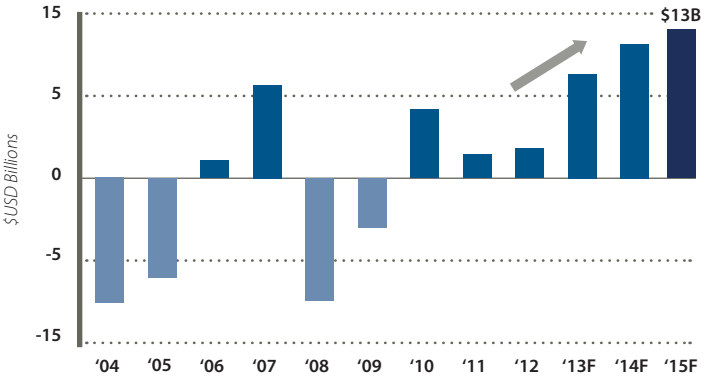
What are the consequences of this new economical world order? The fuel bill for an airline is typically in the range of 30%-40% of total costs. Not surprisingly, with jet fuel prices down over 40% in 2015, North American airlines are reporting record quarterly earnings. And it's not only aircraft operators that are experiencing record profits. Thanks to low-interest rates and the staggering demand growth for air travel in the emerging markets, aircraft OEM order books are at all-time

Global Airline Profitability



Source: IATA Central Forecast Dec 2014

North American Airline Profitability



Source: IATA Central Forecast Dec 2014

highs. This bodes well not only for the large airframe manufacturers, but also for the plethora of tier 1 and 2 aerostructure, engine, systems, and component suppliers.

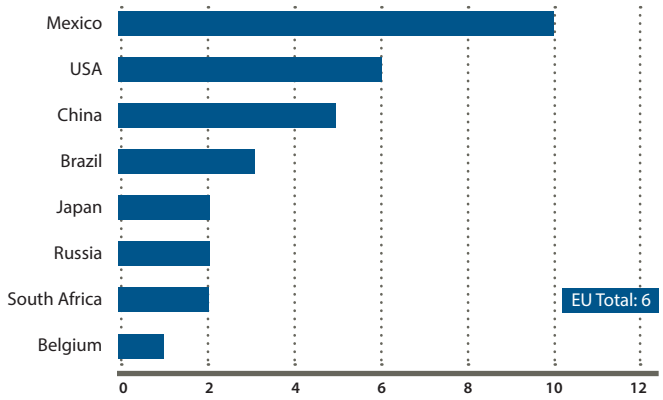
Globalization 1.0

For the past two decades, the driving force behind globalization was the gap in the price of labor between the developed world and the emerging markets. Further enabling this labor cost arbitrage were several significant events: the end of the Cold War, emergence of the internet, proliferation of free trade agreements such as NAFTA, advanced global communication systems, and China's economic boom.

The outcome of Globalization 1.0 was the strategic dismantling of traditional supply chain structures for many large corporations. Labor intensive jobs were outsourced to the lowest cost provider. As Globalization 1.0 played out over the past two decades, specific aviation and aerospace industry clusters developed. For example, India specialized in software testing and development, Russia in design engineering, Mexico in manufacturing, and China created its own aircraft OEM (COMAC) to compete with the mighty Boeing and Airbus duopoly.

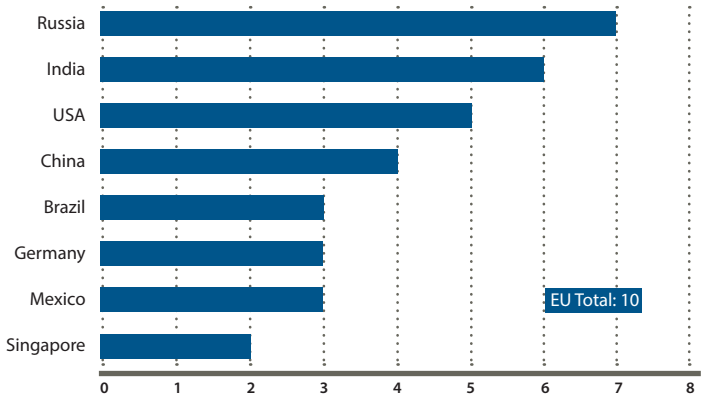
For the last 15 years, ICF International has been closely monitoring aerospace industry investments. Clearly, if one

Major Aerospace Manufacturing Investments*
2000 – 2003



* Includes joint ventures and organic investments for over 180 OEMs and service providers; excludes acquisitions
Source: ICF International

Major Aerospace Engineering Investments*
2004 - 2007



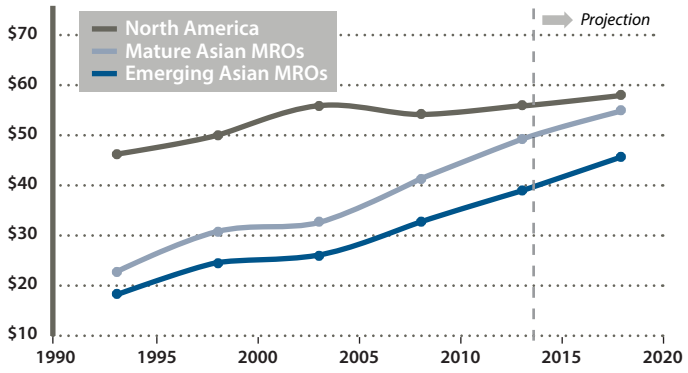
* Includes joint ventures and organic investments for over 180 OEMs and service providers; excludes acquisitions
Source: ICF International

follows the money trail, Globalization 1.0 was a boon for emerging market economies.

Globalization 2.0

However, over time, emerging markets, well…emerge. The comparative labor advantage leveraged so effectively by the "BRIC" nations (i.e. Brazil, Russia, India, and China) has been slowly eroding. Between 2006 and 2011, Asian wages rose 5.7% per year, compared with 0.4% in the developed economies. Moreover, commercial aircraft maintenance labor rates in the U.S. and Asia continue to converge. Compounding this impact, productivity continues to grow rapidly in the developed world as companies deploy new technologies

Average Widebody Airframe Heavy Maintenance Hourly Labor Rates



Source: ICF analysis

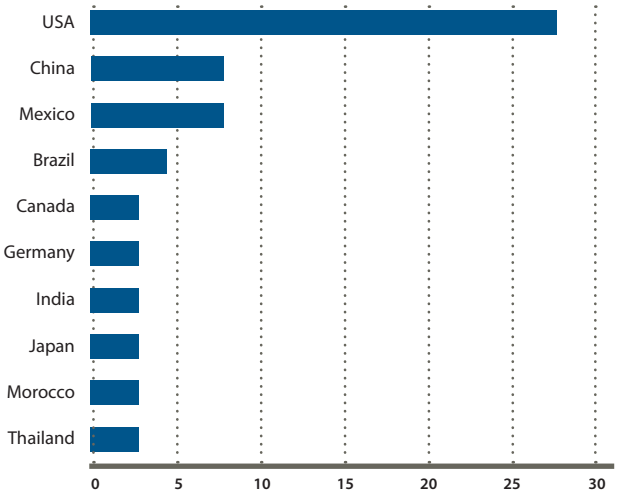
in automation, robotics, and additive manufacturing. This loss of competitive advantage has significantly changed the calculus for how and where capital is being deployed. In fact, the U.S. now enjoys a significant energy cost advantage over its two historic manufacturing competitors – Germany and Japan. Historically, U.S. natural gas prices have tended to be lower than Germany's and Japan's, but the differential has exploded in favor of the U.S. over the past few years – over 40% less than Germany and one-fourth of Japan's.

Consequently, the Southeastern U.S. has emerged as a magnet for aviation-related investments with the big three aircraft manufacturers opening new major final assembly facilities in Charleston (Boeing), Mobile (Airbus) and Florida (Embraer). As ICF International research indicates, the U.S. is clearly the current location of choice for aviation and aerospace capital deployment.

As with Globalization 1.0, there are of course numerous other factors at play helping to fuel Globalization 2.0 other than low energy costs, including state and local tax incentives and Right-to-Work laws that limit/prohibit union security agreements.

Major Aerospace Engineering Investments*

2012 - 2013



* Includes joint ventures and organic investments for over 180 OEMs and service providers; excludes acquisitions

Source: ICF International

No one knows for sure how long energy costs will remain low. Given the recent constitutional amendment in Mexico to allow foreign investment in its stagnant energy sector, as well as the possible lifting of sanctions in Iran, the potential for further over-supply of oil & gas is real. This portends very well for the commercial aviation sector whose business plans assume oil prices at approximately $100 per barrel. And for any energy-intensive business looking for the ideal location to set up shop, the U.S. is well positioned to be the primary beneficiary of Globalization 2.0. Perhaps cheap energy is indeed the new cheap labor.

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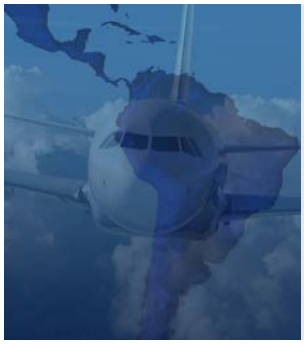

Embraer 190 Review

The opinion expressed here does not constitute a formal appraisal.

Embraer 190 Technical Description

The Embraer E-Jet family is composed of two main commercial sub-families covering the 70 to 120-seat range, and a business jet variant, the Lineage 1000, which is an Embraer 190 derivative. The Embraer 170 and Embraer 190 make up the base model aircraft, with the Embraer 175 and Embraer 195 representing stretched versions.

To better optimize the two sub-families, Embraer opted for two different sets of wings, engines and landing gears. The Embraer 170 and Embraer 175 share 100 percent commonality, as do the Embraer 190 and Embraer 195. The two sub-families share 85 percent commonality, with identical fuselage cross sections and avionics, featuring the Honeywell Primus Epic EFIS suite.

Launched at the same time as the smaller Embraer 170 series, the 98-114 seat Embraer 190 took its initial flight in March 2004 and was first delivered in September 2005 to JetBlue Airways. Compared to the Embraer 170, the 190 has a fuselage stretched by 20 ft. 6 in. and a wingspan increased by 8 ft. 4.75

in. The Embraer 190 model, as with other aircraft models in the Embraer 170 and 190 series, is available in three variants—the Standard (STD), Long-Range (LR) and Advanced-Range (AR), each differing in MTOW and range, and powered by up-rated GE CF34-10E series engines. Additional range is conferred by structural reinforcements in the fuselage, wings, pylons and flight control surfaces to allow higher take-off and landing weights and up to 300nm expanded range.

Like the other members of the Embraer 170/190 family, the Embraer 190 has four main cabin doors and offers airlines fast turn-around times and maximum cabin configuration flexibility for dual class, single class, or high-density seating arrangements. A distinct feature of Embraer 170/190 family is the class-leading cabin comfort and lower lobe baggage hold capacity afforded by its "double bubble" fuselage design.

The aircraft is powered by twin under-wing General Electric CF34-10E engines controlled by a redundant Full Authority Digital Engine Control (FADEC) system. This computerized management system optimizes engine operation during all phases of flight, reducing fuel consumption and maintenance costs. Moreover, cross crew qualification (CCQ) allows better utilization of resources without the restrictions normally associated with mixed-fleet flying. Another important feature of the E-170/190 family is the use of fly-by-wire technology for the flight control systems, similar to those deployed on larger commercial jets.

At the 2013 Paris Air Show, Embraer launched the E-Jet E2 family. These second generation E-Jets will feature a new, high-aspect ratio wing and will be equipped with Pratt and Whitney's Geared Turbofan (GTF) engines. There will be three models in the E2 family, the E175-E2, the E190-E2 and E195-E2 – an E2 version of the Embraer 170 will not be developed. Based on OEM data, the E-Jet E2s will offer a reduction in fuel burn of 16% per seat - compared to current E-Jets – as well as "double-digit" reductions in emissions, noise and maintenance costs.

Embraer 190 Market Overview

The Embraer 190 program has proved successful thus far with 552 deliveries, a user base totaling 67 operators, and a firm order backlog book of 80 aircraft (15 of which are 190 Lineage 1000 corporate models) as of March 2015. Some 200 aircraft are owned by their operators, with 314 on operating lease and eight on financial leases, evidence of strong demand from the operating lessor community.

Embraer EMB190AR Values

Build year	2007	2009	2011	2014
Currrent Market Value (2015 USD $millions)	17.4	20.1	23.5	29.3
Indicative Lease Rates (2015 USD $ thousands/ month)	165 - 175	185 - 195	200 - 210	220 - 230

Assumptions:
Engine CF34-10E2
MTOW(lbs) 114,199

Of the four models in the E-Jet family, the Embraer 190 has broadest geographic distribution. Three quarters of the fleet operates in North America, South/Central America and Europe, with equal numbers—about 130 per region—of aircraft in each of these regions. The remaining aircraft are operating in Asia/Pacific region (21 percent) and Africa/Middle East (7 percent). The Embraer 190 is quite popular in Latin America, with 136 aircraft in active service, the third largest fleet in the region—only the very popular 737 and A320 families have larger active fleets operating in Latin America. As noted previously, the Embraer 190 has a broad operator base, with only one operator, JetBlue, flying more than 10% of the total fleet (10.8 percent). Within South/Central America, the Embraer 190 has somewhat higher concentration with the top three operators - Aeromexico Connect, Austral and Azul – flying about 55 percent (75 aircraft) of the total fleet in the region.

The Embraer 190 is positioned in the 100-seat regional jet market segment, a sector that has exhibited strong growth since the mid-2000s. This is a crowded arena, with competition from both current and future production aircraft. Current production competitors in this sector include the Bombardier CRJ900 and CRJ1000 (337 in active service and 41 in active service/30 firm order backlog respectively) as well as the Sukhoi SSJ100 (47 in active service/110 on firm order backlog). Future competition is expected in the form of the Mitsubishi

MRJ90 (firm order backlog of 223 units), COMAC's ARJ21 (firm order backlog of 155 units, all for the smaller -700 variant) and Embraer's re-engined E190-E2 (firm order backlog of 60 units). Like the E190-E2, the MRJ90 will use a version of the new Pratt & Whitney geared turbofan (GTF), the PW1217G.

Based on the large in service fleet—especially when compared to its competition—the Embraer 190 has proved a successful aircraft as the most popular of the four E-Jets in production, bolstered by a recent mid-life product upgrade package featuring redesigned winglets, longer wingspan and other improvements which reduces fuel burn by up to 5.5%. The large cabin fuselage design and the ability of the aircraft to carry 98 passengers in excess of 2,400 nm has narrowed the distinction between regional and mainline jets as shown by their incorporation in the fleets of carriers such as JetBlue, Air Canada, Azul and Copa.

However, the Embraer 190 is now challenged by competition from 2017-2018 in the form of the completely revamped E190-E2 and new MRJ90, which will likely lead to a gradual reduction in earlier-generation Embraer 190 values and lease rates once these new-technology aircraft enter service in significant numbers given their full fly-by-wire systems, significant fuel burn improvements, and operating cost advantages.

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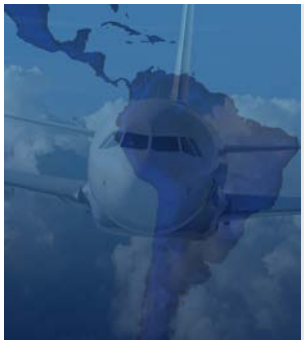


Best Practice in Aircraft Lease Returns

The Second Part of a Four Part Series

Returning aircraft off lease to lessors is not a new process, yet so many established airlines find it difficult to complete scheduled lease returns on time, in compliance with the lease agreement and within budget. The process is simply not a core business for an airline.

In our first article (ALTA Industry Insights Q1, 2015), ICF examined the demographic trends associated with aircraft leasing as an indicator for future lease return activity, and quantified the impact on the airline industry associated with delayed lease returns.

In this article, the second part of a four-part series, ICF will focus on a key consideration that is often overlooked—redelivery preparation actually begins at the point of contract negotiation, not a few months before the lease expires.

Every lease agreement requires varying elements of negotiation, and the approach taken by lessees and lessors also varies from deal to deal. A series of best practices with respect to lease structuring and negotiation are outlined below.

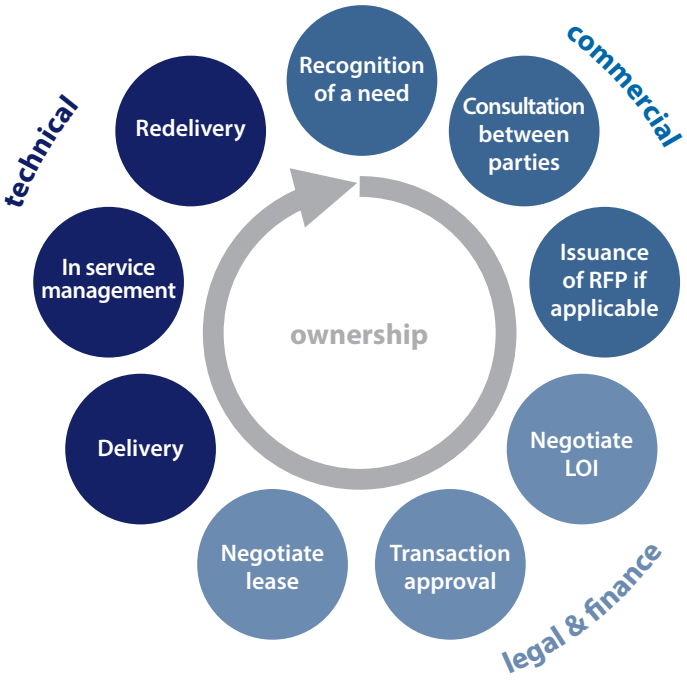
Stakeholder Representation in the Negotiation Team

For the airline, best practice negotiation requires all key stakeholders having a voice in the process, including some, or all, of the following departments, depending on the organization structure:

- Finance
- Commercial
- Engineering & Maintenance
- Legal
- Operations
- Revenue Management

ICF recommends that relevant parts of the transaction documents are shared with all stakeholders affected before execution in order to ensure whatever is in the agreement is practical and capable of being implemented without unanticipated consequences. For example, it is incumbent to ensure that specific clauses relating to obligations do not conflict with other clauses later in the agreement, especially those heavily negotiated clauses which may have altered considerably.

Deal Process – Ownership



Whilst it is not practical to represent every department at the negotiating table, it is recommended to include a minimum quorum consisting of a legal representative, a technical representative, and a finance/commercial manager who hold a level of autonomy to make decisions. More importantly, those individuals should also seek the appropriate advice or input of their colleagues in the decision making process.

The balance between practical, cost and legal implications is often a fine line and experience has shown that a team who regularly work together negotiating deals build up a sense of rapport and understanding that can benefit the business and speed up the process.

However, accountability and responsibility should fall on one person, nominated as the team lead, and who has direct access to the COO or CEO in the event they need to resolve any internal disputes or make a final go/no-go decision on contentious items.

Clear Objectives

Prior to sitting across the table from the lessor, the airline negotiation team must have a clear idea of its objectives, each of which differs from airline to airline and deal to deal. Objectives might include:

- Fixing rent at a pre-determined figure
- Value of security deposits or Letters of Credit
- Paying or not paying reserves
- Delivery configuration
- Use of PBH agreements
- Ability to sub-lease within groups
- Lessor contributions
- Delivery and return conditions

If certain terms or considerations are important to lessee or lessor, it must be brought into the agreement from the beginning, as it will be a lot harder to achieve later in the process. Clarity is critical, and it is often what is not said that causes the most problems as both parties seek to interpret "grey" areas after those involved at the beginning have moved on. Clauses written with all the right intentions and agreed to around a table after hours of negotiation are often found to be lacking in detail once read by another person not involved in the discussion.

Negotiation Process

A series of gates should be considered as part of the approval process and as recognition that each deal is also unique. Determining where and when to put the most appropriate effort needs to be analyzed on a case by case basis. For example, there are two ways to approach the LOI:

1. Get a quick LOI signed and worry about negotiating detail later, or:
2. Get a heavily negotiated, detailed LOI signed and work on the already agreed principles into contract phase?

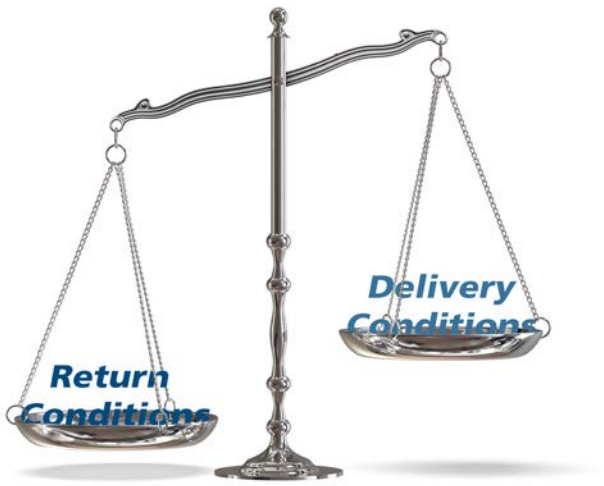
Each have their own merits, but the focus must be on what is negotiable and manageable throughout the term until redelivery.

All too often, certain clauses are washed over or accepted for the greater good of doing the deal, such as lessor defined maintenance providers, full strip and repaint at redelivery or lessor approval for ALL modifications. While that may be the case, it is worth documenting for internal purposes the reasons for giving way on points or accepting something that could be seen as negative, as 10 years later it will be long forgotten.

Lease Terms

Delivery and Return Conditions

One common expectation when negotiating used mid-life and end-of-life aircraft leases is the "same in–same out" principal for both delivery and return conditions. Although this is generally acceptable, equity is not always practical, and return conditions may not always be a mirror of delivery conditions, so it is worth exploring the effect of unbalanced conditions before insisting on equity.



Jurisdiction Implications

Many lease agreements have return conditions requiring specific compliance with certain jurisdictions, such as FAA or EASA, and the lease will contain a statement such as:

> *"At return the Aircraft shall possess a current and valid certificate of airworthiness issued by the Aviation Authority. Furthermore, the Aircraft shall be in the condition required in order to be eligible to receive a certificate of airworthiness pursuant to the rules and regulations of [EASA/FAA] and ready for immediate operation in accordance with [EASA OPS 1/FAR 121]"*

These statements are there to preserve the liquidity of the asset and allow easy transfer to a new operator, but can actually be impossible to comply with if the changes needed invalidate the outgoing Aviation Authority Certificate of Airworthiness. It is important to understand the implications of these and other such potentially conflicting clauses at the time of negotiation rather than at the time of redelivery, as it is in areas such as this where delays and overruns lead to penalty rent situations.

Maintenance Support Agreements

With the increasing number of maintenance support agreements (MSA/PBH/FHA) on offer from OEMs and independent providers alike, it is important to consider the benefits and implications for all sides. While most lessors will demand reserve or supplemental rent payments as the opening position and end-of-lease compensation may be a no-go area for lower-tier credits, the middle ground may be a support agreement provided that the lessor has rights to access certain funds or services.

Maintenance Cash Flows

Another critical point for airlines at contract signing is to assess their anticipated maintenance cash flows throughout the lease, and/or those end of lease compensation requirements.

Numerous tactics may be employed by lessee and lessor alike to drive the balance of maintenance economics to a more favorable level for one party or the other.

Best practice for the airline is therefore to develop a robust forecasting model that may be utilized to project the future condition of the aircraft and associated maintenance-related cash flows pursuant to its preferred lease terms.

The condition of the aircraft will be influenced by a whole host of factors including but not limited to delivery condition, future utilization, maintenance intervals and yields (percent of interval achieved), work scopes and build standards, minimum return conditions, etc.

The cash flows, which would include maintenance reserve payments, reserve reimbursements, lessor contributions, true-ups, and end of lease payments, will be influenced by the condition as well as the lease terms.

Once the baseline scenario is identified, sensitivity analyses should be run to determine the impact of:

- Higher or lower utilization from baseline
- Higher or lower escalation rates from baseline
- Higher or lower engine times on wing
- Higher or lower engine build standards
- Numerous tactics may be employed by both lessee and lessor to drive the maintenance economics more favorable to one party or the other.

Through these sensitivity analyses, risk areas which would change the economics materially for the airline could be identified, and therefore negotiated around initially and/or managed around during the lease term.

Other key lease terms to consider

Although the information in this article is not exhaustive, some other points that should be considered when negotiating the terms of the lease that can affect successful redelivery are:

- Definitions: understanding the consequences of specific defined terms
- Maintenance during the term, including:
  - Standard of repairs
  - Modification rights
  - Configuration control
  - Acceptable MRO's
- Record keeping: obligations in comparison to current procedures
- Compliance with MPD versus AMP
- Maintenance cost escalation terms

An important cost reduction consideration for all airlines

One of the most important aspects of successful redelivery programs is planning and preparation. Airlines who have a volume of fleet exits need to invest in designing and implementing a well-defined process for managing leasing returns. Airlines who have infrequent or low volume fleet exits are often better served by bringing in experts/additional resource to manage the return process.

David Louzado
ICF International
Principal

ICF International Aviation Expertise

For more than 50 years, ICF International (formerly ICF SH&E) has been serving the air transportation industry. ICF provides trusted aviation and aerospace expertise to airlines, airports, governments, international agencies, manufacturers, and financial institutions.

ICF's core aerospace capabilities include strategy and network planning, forecasting, operations, and logistics; revenue management; asset management and appraisals, supply chain and maintenance management, safety, and security and regulatory compliance; financial due diligence; and privatization, alliances, mergers, acquisitions, and alliances. For airports, ICF is a leader in air service development, demand forecasting, commercial planning, system and economic impact studies, sustainability, ground handling, and cargo operations. In addition to aviation, ICF is a leader in the energy, environment and transportation industries, public safety and defense, health, social programs, and consumer and financial business. This breadth of expertise further enhances the wealth of knowledge and experience available to its aviation clientele.

Committed to providing expert and impartial advice, ICF is both results and value driven. By participating directly in many emerging trends, ICF's aviation consulting group is especially well equipped to assist its clients in adapting to a rapidly changing environment.

The firm's staff of nearly 100 professionals dedicated to aviation is based in offices in New York, Boston, Ann Arbor, London, Beijing, Singapore, and Hong Kong. ICF draws from a network of associates worldwide.