## Airlines DA Internal Link

### Airline Industry K2 Aerospace

#### Airline Industry is key to Aerospace development

Conway 6 (Richard S., Douglas H. Pedersen, “The Washington Aerospace Industry,” January 2006, <http://afa-wa.com/Aerospace_Industry.pdf>)

Air transportation is a vital function of a modern economy. It entails a variety of activities: aerospace manufacturing, air passenger and freight service, airport operations, air traffic control, air transportation arrangement, and other air support services. Today, including the suppliers of these activities, air transportation employs more than 100,000 people in Washington. This study focuses on the aerospace industry, which accounts for more than one-half of the employment in air transportation: • The Washington aerospace industry primarily manufactures aircraft and parts. • Led by The Boeing Company, the aerospace industry employed 65,400 people in 2005. • With an average annual wage of $83,370, more than double the average for all industries, the aerospace industry paid $5.4 billion in wages and salaries. • Taking into consideration the direct and indirect impact on the economy, the aerospace industry accounted for an estimated 209,300 jobs or 7.5 percent of total state employment. • More than nine out of every ten aerospace employees worked in King County (38,800) and Snohomish County (23,700) in 2005. • The total impact of the industry amounted to 116,400 jobs or 10.1 percent of total employment in King County and 52,100 jobs or 22.9 percent of total employment in Snohomish County. • The aerospace industry also accounted for 40,800 jobs or 2.9 percent of total employment in the rest of the state. 2. BRIEF HISTORY The history of the aerospace industry in Washington is almost as long as the history of the airplane. In 1916, just thirteen years after the Wright brothers took their first heavier-than-air flight at Kitty Hawk, William Boeing founded the Pacific Aero Products Company and soon renamed it the Boeing Airplane Company. Initially, Pacific Aero Products employed 16 workers earning 14 to 40 cents per hour. Selling bi-planes (Model Cs) to the navy and army during World War I, the Seattle company emerged from the conflict as a major aircraft manufacturer. After the war, Boeing devoted much of its effort to developing aircraft for a promising commercial market. The airline industry began in 1925 when Congress turned over the job of flying mail to private contractors. Boeing formed a subsidiary called Boeing Air Transport, the forerunner to United Airlines, and successfully bid on a federal contract to fly mail between San Francisco and Chicago. In 1927, the 23-hour inaugural flight in a Model 40A carried mail as well as two-paying passengers.

#### Domestic airline industry strength is key to the aerospace industry

Conway 6 (Richard S., Douglas H. Pedersen, “The Washington Aerospace Industry,” January 2006, <http://afa-wa.com/Aerospace_Industry.pdf>)

Volatile demand. The demand for aircraft, whether stemming from the military or the world airline industry, is highly volatile. Given that Boeing is a major employer, the fluctuations in aircraft demand have often sent ripples throughout the state economy. The ramp-up in Boeing production during World War II, which led to 40,000 new jobs, helped pull the Seattle area out of the Great Depression. The subsequent lay-offs at the conclusion of the war precipitated a recession. Despite a declining employment share, the aerospace industry can still impart significant fluctuations to the Washington economy (Figure 4). Surging aerospace employment coupled with a strong national economy triggered state economic booms in the late 1970s, 1980s, and 1990s. Spurred by 48,000 new hires in the aerospace industry, the 1983-90 expansion created fully one-fifth of the jobs in the state economy today. Back-to-back aerospace slumps contributed substantially to the last recession.

**Aerospace dependent on Airline Industry**

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[Ben Hur Gomez, John Simon, Alan Ibrahim, “Dependence on key customers”, http://www.wikinvest.com/stock/Precision\_Castparts\_(PCP)]

PCP’s commercial sales depend substantially on the production rates of both Boeing Company (BA) and Airbus , which in turn depend upon deliveries of new aircraft. The ultimate drivers of orders and deliveries of aircraft are underlying air travel demand, financial health of airlines, growth prospects for airline capacity, and overall economic growth. The current increase in aerospace demand is dependent on increased spending by foreign carriers and domestic airlines who must upgrade aging fleets. PCP stands to benefit from expected aircraft deliveries by Boeing and Airbus, and from the replacement cycle of aging turbines and aircraft that will be upgraded or overhauled. Any factor that adversely affects the aerospace industry (similar to the tragic events of 9/11 or the SARS travel scare) would likely pressure PCP’s operations and profitability. Bankruptcy of another airline, continued high oil prices, or the possibility of a major terrorist attack threaten to change the course of the recovery in the aerospace cycle and likely impact PCP.

**Airline Industry key to aerospace industry. 9/11 proves.**

**Lloyd 01** (Caroline , “Job cuts hit aviation and aerospace industry,” May 11, 2001, [http://www.eurofound.europa.eu/eiro/2001/10/feature/uk0110114f.htm) Senior](http://www.eurofound.europa.eu/eiro/2001/10/feature/uk0110114f.htm%29Senior) Research Fellow and professor at the School of Social Sciences, Cardiff University.

**The attacks on the USA on 11 September 2001 have had a dramatic impact on airline passenger numbers** and have heightened fears of a major recession in the USA. The immediate consequences were felt across the world's airline industry as aircraft were grounded, routes cut and large-scale job losses announced. This sudden drop in business comes on top of a slowdown in the industry, leading many companies to react quickly by cutting capacity. The knock-on effects are now being felt in other sectors, in particular **the aerospace industry**, with the **US-owned Boeing making 30,000 job cuts worldwide**. The response in the UK has been almost as rapid, with a number of airline and aerospace companies announcing substantial redundancies.

Aerospace

The crisis in the airline industry has had an immediate knock-on effect on the aerospace industry, ie the manufacturers of aircraft, which includes the major UK employers BAE Systems and Rolls Royce. The UK aerospace industry is the largest in Europe and has been described by theDepartment of Trade and Industry as 'the country's most globally successful manufacturing industry'. It is one of the few growth areas in manufacturing in the UK, with employment increasing from 110,000 in the mid-1990s to over 150,000 in 2000. However, with the threat of orders being cancelled and airline carriers looking to renegotiate existing contracts, aerospace companies have started to reassess their position**.**

Shorts Aerospace, a subsidiary of the Canadian Bombardier, announced in late September plans to cut 2,000 jobs in Northern Ireland. In October, the US-owned TRW Aeronautical Systems (formerlyLucas Aerospace), based in Solihull near Birmingham, disclosed that it will lose more than 1,000 jobs, including 670 across nine sites in the UK. Rolls Royce, which is the world's second-largest supplier of civil aircraft engines, has also announced that 5,000 jobs will be cut from its worldwide workforce of 43,000, with 3,800 to go in the UK. GKN, the UK-based engineering company, also plans to cut 1,250 jobs, with 70% of job losses taking place in its aerospace business. All these companies have linked the proposed redundancies to the aftermath of 11 September.

Although aerospace companies have strong order books, there has been concern for some time that the stagnation in passenger numbers and the squeeze on airlines would lead to a short-term downswing in demand. Reduction in capacity had already been planned at Rolls Royce, which announced job losses earlier in the year, and BAE Systems, which has seen 5,300 jobs lost over the past year. Nevertheless, commentators remain optimistic that the worldwide civil aerospace industry will continue to expand over the longer term.

Planes DA Internal Link

**Aviation Sector Key to Aerospace**

AIA 2011 (Aerospace Industries Association- **Aerospace and Defense: The strength to lift America**, What is the Aerospace Industry?, Launch Into Aerospace, http://www.launchintoaerospace.org/inside/what\_is.cfm)

**The term aerospace is often misunderstood**. Some think it is an area where spacecraft orbit. **Aerospace is actually a compression of aeronautics** (the science of flight within Earth's atmosphere) **and space flight** (the movement of a vehicle beyond the atmosphere). Aerospace embraces the full spectrum of flight, and the **aerospace industry manufactures the components and equipment for things that fly.** No single company builds a complete flight vehicle. A production program is organized as a team of specialized manufacturers that each contribute individual parts, components, systems and subsystems. These eventually come together at the plant of the team leader, known as the prime contractor or systems integrator, **to be assembled into an end product - aircraft, missiles, or spacecraft** - that has hundreds of assemblies and products.

**Air Transportation is one of the key components of Aerospace**

Penn & Price 1999 ( David A., Michael F., Associate Director

**Center for Economic and Management Research, College of Business**

**The University of Oklahoma, Economic Impact of Aviation and the Aerospace Industry in Oklahoma**

**Final Report, Oklahoma Aeronautics and Space Commission**

**Oklahoma Department of Transportation, http://www.ok.gov/OAC/documents/Economic%20Impact%20of%20Aviation%20and%20Aerospace%20Industry%20in%20OK.pdf)**

**The economic impact of aviation and aerospace can be divided into three major sectors**: **Air transportation – including civilian airports, airlines, airline aircraft maintenance centers, air freight and air cargo, airline reservation centers, and local spending by commercial airline passengers. Aircraft manufacturing – including private sector manufacturing of aircraft, aircraft engines, and aircraft parts. Federal Government and Military Aviation – including civilian, military, and federal government employment at** Tinker Air Force Base, Altus Air Force **Base**, Vance Air Force Base, Henry Post Field at Ft. Sill, Air National Guard **facilities and the** Mike Monroney **Aeronautical Center**.

**Aerospace Dependent on Airline Industries**

Shikani, Shyr, & Bhattacharjee 6/18/12 (Will, Thomas, Anshuman, Sr. Director from Yale University-BA, Economics, Director from University of Pennsylvania '11, Finance, Entrepreurship, Director, *Teleflex (TFX),* WikiInvest, http://www.wikinvest.com/stock/Teleflex\_(TFX))

Teleflex is a manufacturing conglomerate that earns most of its money making disposable medical supplies like catheters and oxygen masks. Although medical devices made up 77% of 2009 revenue of $1.89 billion,[1] the company makes a host of other industrial products, from jet engine blades and airline baggage systems, to boat and commercial truck engine parts**. Revenue from** Teleflex's **aerospace products is dependent on the commercial airline industry** demand for aircraft parts. The FAA predicts new commercial aircraft construction will slow in the future[2] because of weakness in the overall economy and among passenger airlines specifically. However, the Aerospace segment only made up 10% of Teleflex's 2009 revenues.[1] Business Financials The company's revenue decreased from $2.1 billion in 2008 to $1.89 billion in 2009.[3] However, its operating profit remained relatively flat, as its operating revenue in 2009 was $336 million in 2009, compared to $340 million in 2008. Medical (77%% of 2009 Revenue) Teleflex’s Medical segment businesses produce devices used in surgeries, critical care, and cardiac care, as well as parts and instruments for other companies’ medical devices. The largest revenue source in this segment is Critical Care Products, which sells under the names Arrow, Rüsch, HudsonRCI, Gibeck and Sheridan. The next largest revenue source in this segment is Surgical Products, which sells under the names Deknatel, Pleur-evac, Pilling, Taut and Weck. The third revenue source in this segment is Devices for Original Equipment Manufacturers, which sells under the names TFX OEM, Beere, Deknatel, KMedic, and SMD. Contents 1 Business Financials 1.1 Medical (77%% of 2009 Revenue) 1.2 Aerospace (10% of 2009 Revenue) 1.3 Commercial (13% of 2009 Revenue) 2 Key Trends and Forces 2.1 Aerospace 2.1.1 Revenue in the Aerospace Segment is Highly Dependent on the Aerospace Industry, Particularly the Commercial Airline Industry 2.1.2 Interest Rates impact Teleflex’s ability to pay off its substantial debt load 3 Competition 3.1 Medical 3.2 Aerospace 3.3 Commercial 4 References The products in the Medical segment are manufactured in the Czech Republic, Germany, Malaysia, Mexico and the United States and sold to hospitals and healthcare providers all over the world. Aerospace (10% of 2009 Revenue) **Revenue in the Aerospace segment comes from engine repair products and cargo handling systemst for commercial aviation**. Engine Repair produces parts and services for flight turbines through a majority-owned venture with GE Aircraft Engines called AirFoil Technologies International (ATI). Cargo Handling Systems and Equipment acquired Nordisk Aviation Products in November 2007 to improve global market presence and produces cargo systems and spare parts under both the names Nordisk and Telair. Major sites for the Aerospace segment are in England, Germany, Norway, Singapore and the United States. Commercial (13% of 2009 Revenue) The Commercial segment produces driver controls and engine and drive assemblies for boats, as well as fuel management systems for automotive, rail, and industrial vehicles, and rigging products. Manufacturing sites are in Canada, Europe, Singapore, and the United States. The Marine part of this segment sells products under the names Teleflex Marine, SeaStar, BayStar, and Sierra. Fuel Management systems are sold under the names ComfortPro, Proheat, and Teleflex GFI. Rigging systems produces cables and other rigging equipment for applications such as oil drilling and marine transportation. Key Trends and Forces. **Aerospace Revenue in the Aerospace Segment is Highly Dependent on the Aerospace Industry, Particularly the Commercial Airline Industry** New construction of aircraft from companies like Boeing and Airbus are important sources of revenue for Teleflex because as demand for more aircraft rises, so does demand for more parts. On the other hand, **rising costs in the commercial airline industry, driven largely by increases in the price of oil,** and the 2007-2008 **slowdown of the US economy**, led the FAA to predict flat operations growth by airlines for the forseeable future. **Such weakness** in both operations and consumer demand **leads to reduced spending on everything from airplanes and parts to expenditures on airport improvements. This cyclicality of the Aerospace industry affects demand for everything related to the industry,** including Teleflex’s airline engine repair parts and cargo handling systems.

**The Aerospace Industry Consists of Commercial Airlines**

**AIA 2012** (Aerospace Industries Association- Aerospace and Defense: The strength to lift America, About AIA, http://www.aia-aerospace.org/about\_aia/aia\_at\_a\_glance/)

**The Aerospace Industries Association, founded in 1919 only a few years after the birth of flight, is the premier trade association representing the nation's major aerospace and defense manufacturers**. Based in Arlington, Va., AIA is led by a Board of Governors that meets twice a year and consists of senior representatives (generally chief executive officers) of member companies, and an Executive Committee that meets more frequently. A hallmark of **AIA** is that it receives its policy guidance from the direct involvement of CEO-level officers of the country's major aerospace companies. The government frequently seeks advice from AIA on issues, and AIA provides a forum for government and industry representatives to exchange views and resolve problems on non-competitive matters related to the aerospace industry. Today, more than 300 major aerospace and defense companies and their suppliers are members of the association, **embodying every high-technology manufacturing segment of the U.S. aerospace and defense industry from commercial aviation and avionics, to manned and unmanned defense systems, to space technologies and satellite communications**. Marion C. Blakey is the association's chief executive officer and president. AIA member company representatives sit on various councils and committees in these areas and, supported by AIA staff, formulate industry positions on specific issues for approval by the Executive Committee and the Board of Governors. **The association concentrates on issues covering civil aviation etc., space, national security, international and procurement & finance**. In addition the association has offices for Communications, Legislative Affairs, and Membership Services, the Supplier Management Council, the Team America Rocketry Challenge and the Aerospace Research Center.

**Aerospace Industry K2 Airline Industry**

**El-Tahch & Range 11** (Gregory and Aziz, Stout Risius Ross, Fall 2011 “Aerospace Industry Overview and Update”, http://www.srr.com/article/aerospace-industry-overview-and-update)

Industry Overview: The global aerospace industry can broadly be categorized into two sectors. The commercial aerospace sector consists of companies that produce large commercial aircraft, regional aircraft, light aircraft (such as helicopters and business jets), aircraft engines, parts and auxiliary equipment, and commercial satellites. Dominated by Boeing in the United States and Airbus in Europe, the primary end customer is the global airline industry. As such, demand is generally correlated with global economic activity, which drives spending on air travel. Fuel prices also play a substantial role, as the airline industry is forecasted to spend $176 billion on fuel in 2011, representing 30% of global airline operating costs. The defense aerospace sector is comprised of companies that produce aircraft, engines, parts, equipment, weapons systems, and military satellites. Major companies in the sector include Lockheed Martin, Northrop Grumman, Raytheon, Boeing, General Dynamics, and BAE Systems. Demand is driven by defense spending, led globally by the United States with spending of approximately $700 billion in 2010, more than five times that of the second largest spender, China. Recent Trends: The two sectors of the aerospace industry were moving in opposite directions during the first half of 2011. In commercial aerospace, after suffering significant contraction in passenger volumes and massive losses in the economic meltdown of 2008 and 2009, the industry rebounded significantly in 2010 and is generating strong top-line growth in 2011. In the first half of the year, record passenger volumes were on pace to generate record revenues on a global basis for the airline industry. At the same time, high fuel prices are negatively impacting airline profitability. In June 2011, the International Air Transportation Association (IATA) downgraded its 2011 airline industry profit forecast to $4.0 billion, which represents a 54% decline from the $8.6 billion profit forecast in March 2011 and a 78% decline from the $18 billion net profit recorded in 2010.1 The reasons for this downward revision include the lingering impact of the earthquake in Japan, continued unrest in the Middle East and North Africa, and recent increases in fuel prices. By June 2011, the average oil price for 2011 had been revised upward to $110 per barrel, a 15% increase over the previous forecast of $96 per barrel.2 Nonetheless, the expectation of continued high volume of passenger travel is creating strong demand for new aircraft production, resulting in high order volumes, especially for fuel-efficient aircraft, and increased build rates for aircraft. Between the two global titans, Boeing and Airbus, Airbus is currently winning the battle, with almost four times Boeing’s order base for the first half of 2011. Increasing backlog and build rates are benefitting the supply chain, with manufacturers experiencing extended lead times and firming prices. Suppliers of aerostructures, electronics, engines, and components are all benefitting from this dynamic. Global airline industry revenues and passengers for 2011 are forecasted to be $598 billion in revenues and 2.8 billion passengers, both representing record levels exceeding the prior highs of 2008. Overall passenger volume as measured by RPKs (revenue passenger kilometers) is forecasted to increase at a 5% annual rate through 2014. In the defense aerospace subsector, overall pressure on government spending and budgetary concerns have cast a pall over the industry as spending is “reprioritized.” Major (and costly) programs are being cut or deferred, while more cost-efficient programs are enjoying increased spending. In January 2011, U.S. Secretary of Defense Robert Gates announced proposed cuts in U.S. defense spending of $178 billion between fiscal 2012 and fiscal 2016, including a two year delay in the Marine Corps version of the F-35 “Joint Strike Fighter” jet produced by Lockheed Martin.3 In April 2011, just hours before a government shutdown, the U.S. Congress passed the 7th continuing resolution – a type of appropriations legislation used to fund government agencies in the absence of a formal appropriations bill – for fiscal 2011. As a result of the continuing resolution, the U.S. Department of Defense (DoD) must maintain existing funding levels for all programs and may not make any new program awards. Also in April 2011, Secretary Gates announced a comprehensive review to identify $400 billion of cuts in defense spending by fiscal 2023.4 While many representatives of the defense aerospace industry believe that funding should be stable over the next two to three years (especially during the transition to new U.S. Secretary of Defense Leon Panetta), significant uncertainty and risk clouds the outlook.5

## Aerospace K2 Heg

**1. US aerospace industry is key to hegemony, innovation in private sector is dual use**

**Erickson 4’, (**PhD Candidate at Princeton, Andrew, “Seizing the Highest Ground”, East-West Institute, http://www.eastwestcenter.org/fileadmin/stored/pdfs/IGSCwp003.pdf)

Technological advance imposes increasing reliance on specific software, satellites, and systems, offering aspiring great powers unprecedented opportunities to leapfrog technologies and narrow the gap vis-à-vis established competitors by asymmetrically challenging and even attacking ‘linchpin’ systems. Wireless technology offers China comprehensive telecommunications coverage of mountainous territory without prior landline investment. Increasing reliance on communications satellites makes America “more dependent on space than any other nation.”25 This creates concentrated targets for foreign espionage, and even weapons in wartime. ‘Satellite killers’ need not be advanced lasers: pebbles released in enemy orbit would likely destroy satellites before they effected countermeasures. So vast are asymmetric attack options that a U.S. government space commission concluded that “The U.S. is an attractive candidate for a ‘Space Pearl Harbor’.”26 Aerospace is even more important to great power status than developing nuclear weapons per se. Nuclear weapons lie at the mercy of aerospace capabilities—they cannot provide credible deterrence without effective missile- or aircraft-based delivery systems. American development of new-generation anti-aircraft weapons and even missile defense could make nuclear delivery’s aerospace backbone even more important. (That is why Russia and China strongly oppose American missile defense and are developing penetration aids [PENAIDS] to limit its potential effectiveness). Moreover, aerospace development offers larger economic and technological benefits that narrow nuclear development does not. Nuclear technology transfer cannot serve as a major source of economic development because robust international regimes regulate its weapons component, and environmental concerns limit civilian nuclear power in many developed nations. In sharp contrast, aircraft technology transfer is not directly regulated by international regimes 27 (though China advocates such limitations to ameliorate its comparative long-range bomber deficiency), and missile technology transfer is limited with only partial effectiveness. This disparity in international restrictions exists not because nations capable of coordinating and enforcing international regimes (e.g., America) value nuclear over aerospace technology, but rather because nuclear technology can be specifically defined and thus systematically controlled. By contrast, aerospace technology is so versatile in application that it is difficult to isolate: “95 percent of space technologies are dual use in nature.”28 This versatility thwarts the formulation of specific regulations. Not surprisingly, some potential great powers (e.g. Brazil and Japan) have decided not to develop nuclear weapons (at least for now), but still do develop aerospace capabilities. To the extent that all-out aerospace competition does not currently characterize the international system, it is because no great power is currently capable of directly challenging America. As Vally Koubi explains, for the development of critical, non- preemptive weapons (such as the majority of those in the aerospace field), the typical pattern of competition “involves a great effort to close a technological gap, relative complacency when one has the lead, and an intense race in conditions of parity when the nations are close to developing the weapon.”29 Thus, aerospace competition intensifies when the relative capabilities of major powers come closer together, bringing the hierarchy of the international system into question. Given the stakes involved, a rapid change in one power’s relative capabilities will attract the attention of its competitors even if the difference in capabilities is still large.

**2. Aerospace Industry investments spills over to other industries, key to hegemony**

**Jessa 9’**, (Tega Jessa, writer for Universe today specializing in SEO, August 24, 2009. “Aerospace”.

http://www.universetoday.com/38075/aerospace/)

An interesting fact is that due to its capital intensive nature, the major consumers of goods produced in the aerospace industry are governments. This has produced interesting relationships where key private companies procure government contracts to produce vehicles and proponents for military and scientific use. In the United States the two main Aerospace companies are Boeing and Lockheed Martin. In Europe the equation is slightly altered with some of the companies being owned by the government. A current example is AirBus, the commercial plane manufacturer that is owned by France. The two biggest government consumers of Aerospace goods is the United States Military and the National Aeronautics and Space Administration. The military mostly order fighter jets, carrier craft, missiles, and their supporting components. NASA is more directly involved with space exploration and scientific research. The interesting side effect of this arrangement is that **many technologies flow freely from** the government into **the private sector. This is what created the modern commercial airline industry**. In the case of NASA**, many key technologies are appropriated for use in the private sector.** As mentioned before the private sector also play a role in aerospace. It builds the craft and components and many of the technologies used in the manufacturing process are used in other industries. However, new player are now emerging in the private market with the promise of the commercialization of space travel. Companies like Virgin Galactica are now investing in producing the apparatus in infrastructure to launch vehicles on their own. This would be a huge step since only governments have had the resources to so for the past 40 years. One of the benefits is that the private sector will be able to **spur innovations in cost reduction and manufacturing that will help make more advanced projects possible** in the future.

**3. U.S Commercial Aerospace Industry key to hegemony and Aerospace dominance**

**Cutcher-Gershenfeld 04’**, (Joel, a senior research scientist in MIT’s Sloan School of Management, and executive director of MIT’s Engineering Systems Learning Center. He is co-lead for the Labor Aerospace Research Agenda, which conducts research on issues including industry knowledge, instability, and global employment, Instability in the Aerospace Industry, http://leraweb.org/sites/leraweb.org/files/publications/perspectives/PoW7.2TOC%26Pg1-48.pdf)

The U.S. aerospace industry of the 21st century bears little resemblance to the strong, dependable industry that armed the allies in World War II and then drove the growth of commercial aircraft design and the very frontiers of space exploration. While science and technology have continued to advance in this industry in important ways, the social institutions have not kept pace. The end of the Cold War has been followed by almost two decades of instability in government funding and capital markets, combined with numerous waves of organizational consolidation and re-engineering, demographic shifts, and other changes. As was noted in Aviation Week and Space Technology, “A management and Wall Street preoccupation with cost-cutting, accelerated by the Cold War’s demise, has forced large layoffs of experienced aerospace employees. In their zeal for saving money, corporations have sacriﬁced some of their core capabilities—and many don’t even know it.” Together, these forces have undermined the very resolve and commitment that drove decades of success for this industry. Support for the historic mantra of always going higher, faster and farther has eroded—but what will be the new rallying cry? Can a once proud industry be revitalized or must the aerospace industry choose between some degree of stability and continued deterioration? Serving the Public Interest In the book Lean Enterprise Value, the authors examined these questions by ﬁrst highlighting four core missions in which aerospace serves the public interest: • enabling the global movement of people and goods; • enabling the global acquisition and dissemination of information and data; • advancing national security interests; and • providing a source of inspiration by pushing the boundaries of exploration and innovation. The ﬁrst mission—the global movement of people and goods—includes the commercial aircraft sector, as well as the vast array of airlines, maintenance, airports, and related services. Even before September 11, 2001, the industry was changing due to the rise of global competition, increased air-trafﬁc congestion, the emergence of new business models for engine maintenance (sometimes termed “power by the hour” leasing of engines by manufacturers), and the growing use of regional jets. Now we also see airlines teetering on the brink of collapse, labor relations deteriorating at an alarming pace, and the evaporation of orders for commercial aircraft. There are some pockets of growth, including employment in Brazil and Canada for the production of regional jets (though this too is shifting; see the accompanying article by Barrett, et al.), and expansion by some low-cost airlines such as Southwest and JetBlue. But the challenges experienced by most of the commercial aircraft and airlines sector cannot be adequately addressed by the industry’s traditional institutional responses. For example, employers can no longer assume that laid-off manufacturing workers will be available for rehiring in an upturn (and workers cannot assume that such jobs will remain in their community). Airline negotiation procedures cannot continue to involve delays of over two years past the contract expiration date. And companies cannot assume that existing apprenticeship enrollments will sufﬁciently prepare them for the industry’s impending wave of retirements (the approaching “demographic cliff,” discussed in more detail in the article by Sleigh, et al.). The industry’s second mission—the global acquisition and dissemination of information and data—involves a combination of space-based and land-based mechanisms for the movement of in for Instability in the Aerospace Industry. Can this once proud industry be revitalized by information and data. This domain continues to evolve in unpredictable ways. Not only is there uncertainty about the demand and supply of the professional and technical workforce needed for the space sector, but it is not clear how this workforce will be linked to land-based aspects of the telecommunications industry. In ﬁeld research on workforce matters, we continually hear employers reporting shifts in their business strategies to focus more fully on the space sector—raising the risk of a “herd” effect. The space sector is also the prestige sector of an industry that is a priority in China, the European Union, and potentially in other parts of the world. In the United States, meanwhile, NASA is facing the same “demographic cliff” as the commercial aircraft sector, a challenge exacerbated by limited NASA hiring over the past two decades. The end of the Cold War, longer product lifecycles, growing technological complexity, and mounting budgetary pressures have all affected the mission of furthering national security interests. These developments are driving a fundamental re-thinking of defense acquisition policies, product development and manufacturing processes, supply-chain integration, and life-cycle sustainability. The additional imperative to ﬁght global terrorism has scientists, engineers, managers, production workers, and countless others uncertain about job security, appropriate skills and capabilities, and career prospects. A major question is whether there are favorable long-term prospects for those wanting to pursue a career in the industry. In the 1950s, there were forty-six new military platforms that offered opportunities for an engineer or production worker, including such fabled platforms as the X15 and the U2. The 1970s, however, saw just twelve new platforms. Only six new platforms were introduced in the 1990s, and today there are just two on the table. There has been an upturn in this sector with the current war, but that does not reverse the longterm trends. Finally, the fourth mission—pushing the boundaries of exploration and innovation—has too often been victim to the resource constraints associated with uncertainty and decline in the other three missions. Simply put, the best and the brightest are not choosing aerospace in the same numbers and with the same intensity as they have in the past. As was noted in the recent report of the Commission on the Future of the United States Aerospace Industry (CFUSAI), pushing the frontiers of aerospace is seen as mundane by many in our society. Infrastructure, Institutions, and Capabilities Looking to the future, it is clear that the aerospace industry needs to rebuild what might be termed its institutional infrastructure. Some key gaps deserve particular attention. For example, it is hard to ﬁnd the appropriate forums to engage issues that bridge multiple employers and unions or multiple government agencies. In its recommendations to the President and Congress, the CFUSAI recommended an inter-agency task force linking the U.S. Departments of Defense, Labor, NASA is facing the same “demographic cliff” as the commercial