

**Aerospace Industry Compendium**

**Commercial**

**Boeing 787 Dreamliner** The delivery date target for Boeing's 787 line of aircraft is now projected for summer 2011. Boeing implemented price increases this year for the first time since 2008, including a 5% increase for the 787-8 that brought its price tag to \$185.2 million. In 2010 Boeing made modest progress toward delivery of the 787 with intermittent delays. In November 2010 an electrical fire forced a test flight of a 787 to be cut short, prompting modifications in the design of power distribution panels leading to the seventh delay in the announced delivery date for the aircraft. In September 2010 an in-flight engine surge prompted Boeing to replace one of the Rolls-Royce engines on its first 787 test aircraft. Boeing's 787 can be ordered with one of two engines installed: General Electric's GEnx or the Rolls Royce Trent 1000. GE has 345 orders totaling approximately \$20 billion, while Rolls has 214 orders of approximately \$13 billion.

**Airbus A380** In November 2010 the engine on a Sydney-bound Airbus A380 exploded. The explosion was caused by an oil leak in a pipe in its Trent 900 engine. Later, a secondary leak was found on 16 Trent 900 engines owned by Qantas Airways. As a result, 2010 planned deliveries of the Airbus A380 were cut from 20 to 19. A380s with Rolls engines installed are owned by only three airlines: Deutsche Lufthansa AG, Singapore Airlines Ltd. and Qantas.

**Narrow Body Market** The narrow body jet market segment accounts for about two thirds of output and about 40% of sales. Industry experts expect those numbers to grow over the next 20 years. Expanding demand will be met by an increasingly competitive market for the production of single aisle models. Traditionally, Boeing's 737 and Airbus' A320 have dominated this segment. In late 2010 Airbus announced that it will upgrade its A320 line with more fuel efficient engines. Interest in the A320 NEO has been solidified with a large order from an Indian airline and published reports that Delta and Virgin America will consider this aircraft in its narrow body aircraft strategy. Pressure is mounting on Boeing to announce a re-engine of the 737, but it is not yet clear if it will adopt this strategy or continue to pursue an all new narrow body design for post 2020.

New entrants include the Russian Irkut with its MC-21 aircraft, the Chinese company Comac with its C919 and Mitsubishi Regional Aircraft with its MRJ. Both the MC-21 and the C919 are expected to begin deliveries in 2016, while the MRJ is expected to begin deliveries in 2014. The MC-21, the MRJ and the C919 boast lighter, more fuel efficient operation when compared to current operating versions of the 737 and the A320. The Montreal-based Bombardier is expected to begin offering its 130-seat CSeries in 2013.

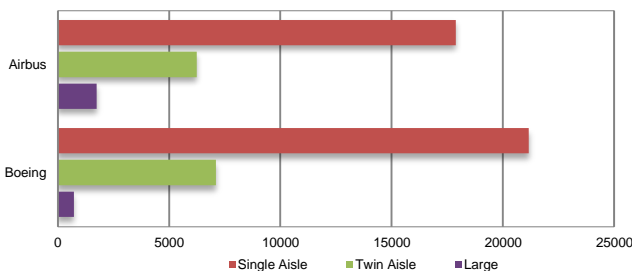
**Defense**

**F-35** Lockheed Martin is developing the F-35 with its principal industrial partners, Northrop Grumman and BAE Systems. The F-35 program has pushed ahead with planned sales amid pressures on government budgets worldwide. The Pentagon is indicating a reduction in total aircraft orders for the F35; however, in 2010 both Canada and Israel signed formal agreements to purchase several F-35 aircraft. After making a formal commitment to purchase F-35Bs, the United Kingdom indicated it would revise its planned acquisitions in favor of a lesser number of F-35C aircraft. Though Japan's weapons export ban prevented the nation from participating in the development and production of the F-35, it took steps toward the purchase of several F-35 fighters in 2010. Development partner nations include Israel, the UK, Canada, Australia, Turkey, Italy, Denmark, Norway and the Netherlands.

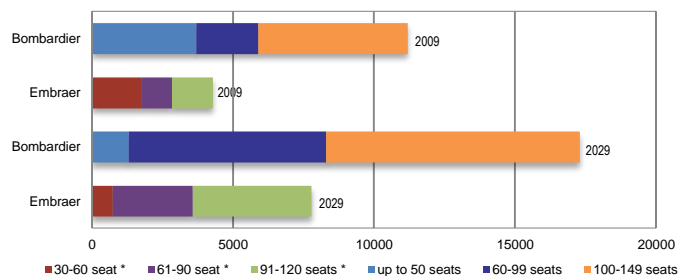
**F-35 Alternate Engine Program** The alternate engine program for the F-35 managed to survive budget cuts in 2010 despite strong opposition from US Defense Secretary Robert Gates, who sees the development of an alternate engine as wasteful and unnecessary. In the face of a presidential veto, Congress intentionally excluded mention of the program in a stripped down defense spending bill passed in late December 2010. As a result of this exclusion, the alternate engine program will continue to be funded at 2010 levels through the first half of 2011. GE Aviation's alternate engine would be produced in partnership with Rolls Royce at facilities in Cincinnati and Evendale, Ohio.

**US Tanker Replacement Program** The approximately \$35 billion US tanker replacement program is one of the largest US defense acquisitions in history. Should they win the contract, both EADS and Boeing are promising to create jobs in competing congressional districts. The US Air Force is expected to pick a winner in January 2011 for the most recent round of bidding for the historically plagued tanker contract. In 2003 the Air Forces' initial attempt to bid the contract ended in scandal. Then in 2008, after a second round of bidding, the Pentagon awarded the 179-plane deal to a Northrop Grumman Corp (NOC.N) and EADS team. The decision was overturned when the US Government Accountability Office declared substantial errors were made in judging the contest. Official bids were submitted for a third time in June 2010 with EADS and Boeing as sole bidders. In November 2010 a clerical error led the Air Force to mistakenly send data about competitor bids to both Boeing and EADS. The year 2010 ended with news that the Armed Services Committee planned to review the procedures used in the most recent round of bidding.

**Chart 1: Industry Aircraft Delivery Forecasts by Carrier 2009-2029**



**Chart 2: Industry Small Aircraft Fleet Size Forecasts by Carrier 2009 and 2029**

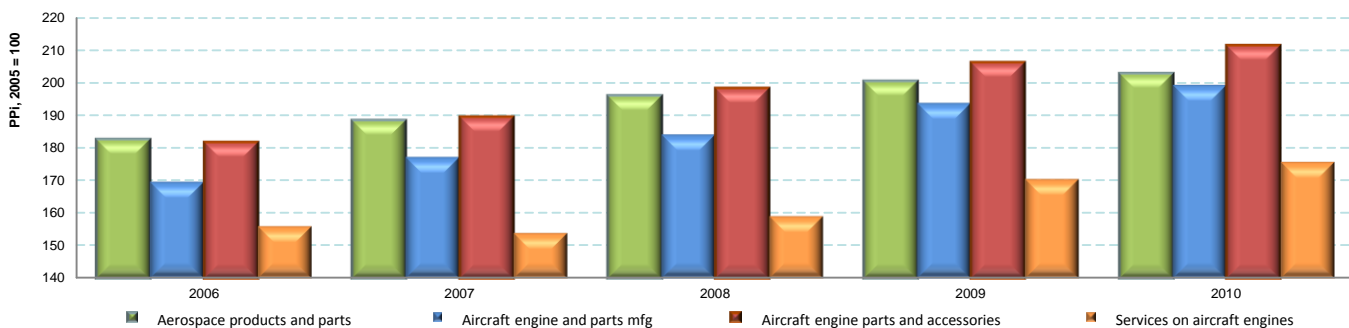


\*Jets only  
 Sources: Market Outlook for Boeing, Airbus, Embraer and Bombardier

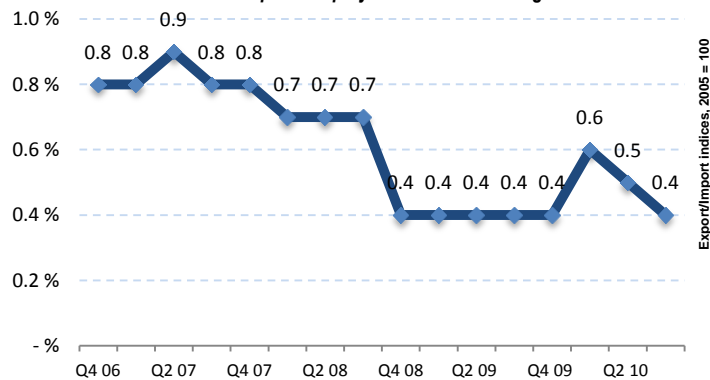
# US Aerospace Sales Price and Employment Cost Growth

A strengthening dollar has contributed to the leveling of prices for imported aerospace goods and the continued growth in prices for exported aerospace goods. Above average domestic sales price increases in 2009 were found across the sector. This rise was especially dramatic for services on equipment. The increase in 2009 was followed by a less dramatic rise in 2010 despite the uptick in employment growth in the first quarter of 2010.

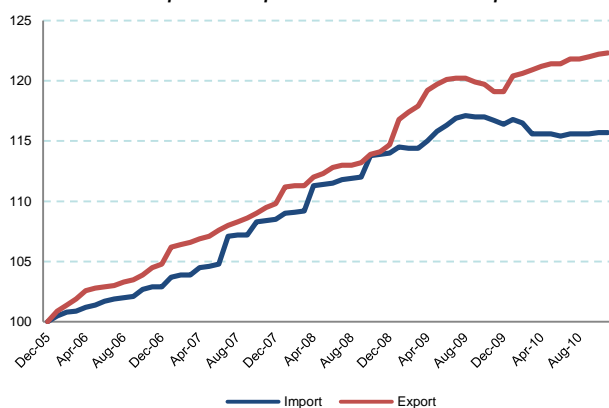
**Chart 3: Sale Price Indices for Aerospace**



**Chart 4: Aerospace Employment Cost Percentage Growth**



**Chart 5: US Import and Export Price Indices for Aerospace**

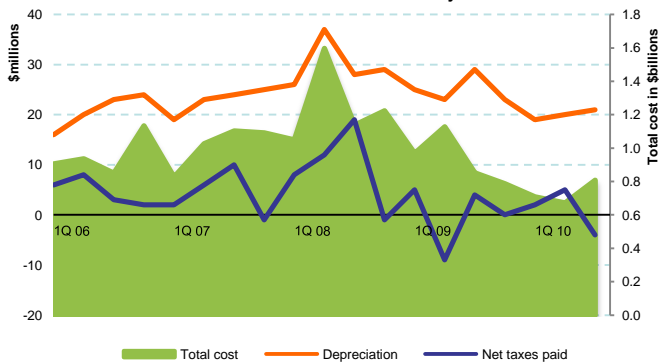


Sources: Bureau of Labor Statistics Export Import Price Indices, BLS Employment Cost Survey, BLS Producer Price Indices

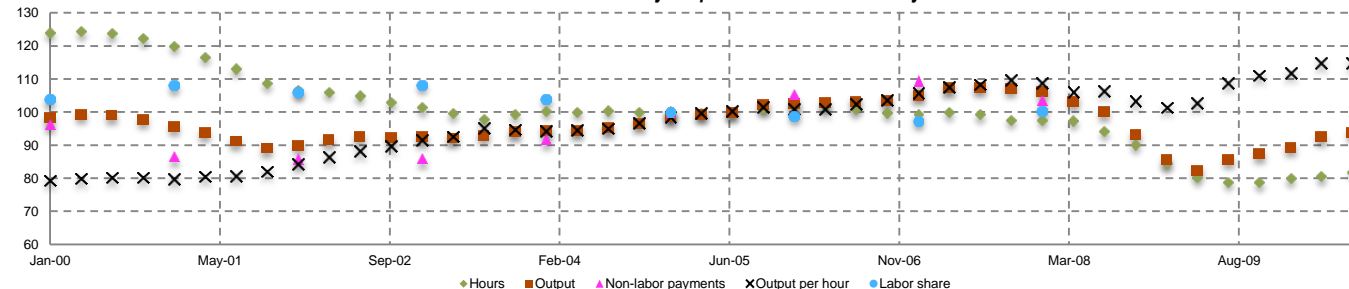
## Industry Input Cost, Productivity and Output Landscape

In recent years, the three large engine manufacturers have taken steps to increase productivity. GE has held leadership training for its top management team and promoted the standardization of procurement procedures with a focus on quality control training in the supply chain through its Six Sigma program. UTC has consolidated its network of branch offices, and in 2010, through programs like ACE, the company has sought to boost productivity through leadership education in all stages of production. This education included a set of tools that promote process improvements and assist with decision making. In addition, UTC has sought to integrate this training up through the supply chain. Rolls-Royce has initiated annual Supplier of the Year Awards. The aggregate figures reflect an industry wide jump in output per hour starting in the beginning of 2009. This may be attributable in part to returns to scale from the increased levels of output.

**Chart 6: Cross Section of Industry Costs**



**Chart 7: Industry Output and Labor Productivity**

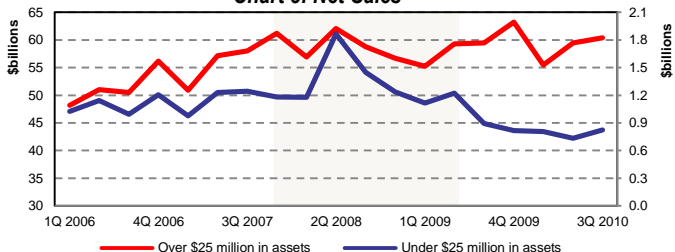


Sources: US Census Quarterly financial report, Bureau of Labor Statistics Labor and Productivity Survey

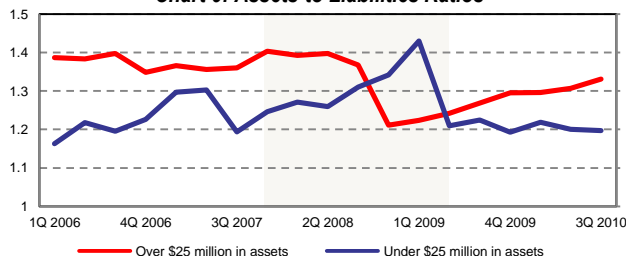
## Industry Financial Health

- Net sales for firms with less than \$25 million in assets continued to experience a downturn following the end of the recession. This downturn showed some signs of reversal leading into the third quarter of 2010. On the other hand, firms generally with at least \$25 million in assets began experiencing growth immediately following the end of the recession.
- In 2010, for the first time since the start of the recession, interest expense for companies with less than \$25 million in assets took a sharp jump. For companies with less than \$25 million in assets, interest expense was steadily increasing leading up to the start of the downturn. These expenses then declined throughout the downturn leveling out at the bottom of the recession in the second quarter of 2009.
- Total assets in the aerospace industry declined for both industry segments for a duration equal in length to the duration of the recession itself. The decline in assets lagged the recession and has shown steady yet modest rates of growth since the fourth quarter of 2009.
- Firms with greater than \$25 million in assets became more leveraged on average leading into 2009 and have been de-leveraging on average since the first quarter of 2009. This may be a result of the strategic restructuring discussed by some of the large firms in their annual reports. Firms with less than \$25 million in assets were on average less leveraged leading up to the peak of the crisis. Their on average re-leveraging lagged that of larger firms.
- Cash on hand has been steadily declining for firms with less than \$25 million in assets. The larger industry segment, however, saw an accumulation of cash on hand through 2009. This trend is in line with statements made in the annual reports of the three big jet engine manufacturers. Through 2010 companies in the large segment appeared to be spending some of their reserves of cash on hand. One could take this to be an indication of an increase in confidence for this industry segment.
- Throughout 2009 the larger industry segment renewed, on average, their long term bank debt obligations. In the smaller industry segment, the third quarter of 2010 showed an upturn in long term bank debt that will come due in the coming year.

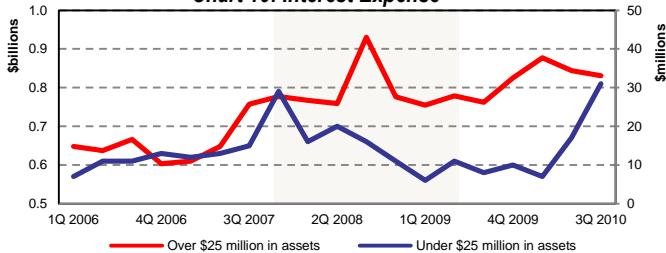
**Chart 8: Net Sales**



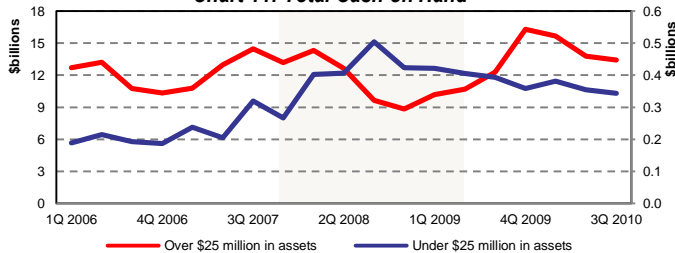
**Chart 9: Assets to Liabilities Ratios**



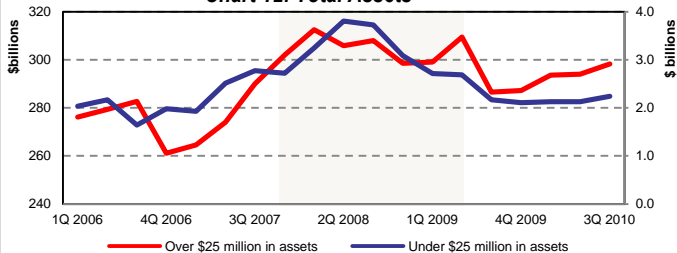
**Chart 10: Interest Expense**



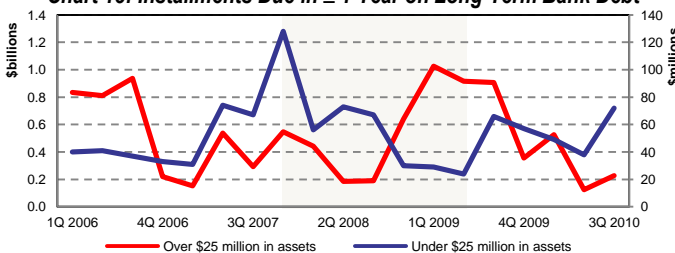
**Chart 11: Total Cash on Hand**



**Chart 12: Total Assets**



**Chart 13: Installments Due in ≤ 1 Year on Long-Term Bank Debt**



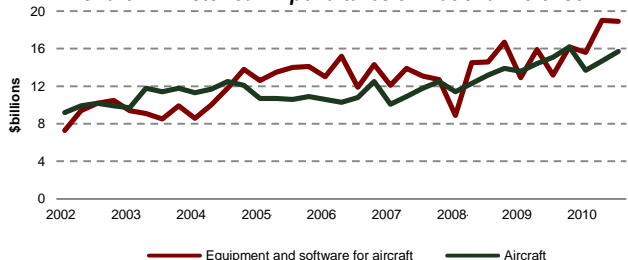
Source: US Census Quarterly Financial Reports; Note: the left margin refers to firms with over \$25 million in assets.

## US Government Expenditures on Aircraft for National Defense

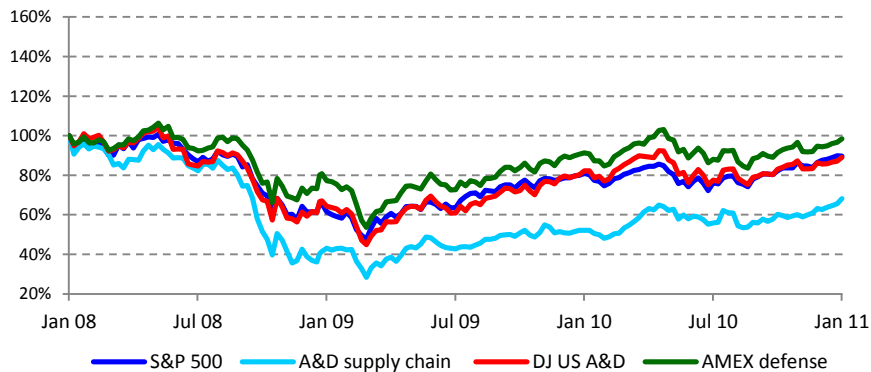
On August 9, 2010 Secretary Robert Gates gave details on the ways in which he plans to save \$101 billion over the next five years. For example, each of the military services is directed to save approximately \$28 billion. Most of the Department of Defense's savings initiatives will begin as part of the fiscal year 2012 budget. Congress has promised to cut of \$7-8 billion from the fiscal year 2011 Pentagon request. While cuts due to increased efficiencies would be ideal, lower priority programs will likely be the focus of cuts. Robert Hale, Under Secretary of Defense, has stated he sees modest increases in the defense budget as long as the war in Afghanistan continues.

Source: National Economic Accounts National Defense Consumption Expenditures Survey

**Chart 14: Historical Expenditures on National Defense**



# Public Market Trading Performance



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## Selected Aerospace and Defense Supply Chain M&A Activity

Date	Target	Buyer	Description
Dec 10	Whitcraft LLC	Linsalata Capital Partners	Linsalata, an Ohio-based private equity firm, invested alongside the founding shareholders and management to recapitalize Whitcraft and now owns a majority stake. Whitcraft, founded in the 1960s and based in Eastford, CT, manufactures precision formed, machines and flight-critical aerospace parts.
Oct 10	Empire Aero Center, Inc.	Premier Aviation Overhaul Center, Inc.	Premier Aviation acquired the assets of Empire Aero from Israel Aerospace Industries Ltd. Empire Aero, incorporated in 1978 and based in Rome, New York, operates maintenance, repair, and overhaul (MRO) facilities in North America.
Sep 10	AvCraft Support Services Inc.	Indaer International Inc.	AvCraft, incorporated in 2003 and based in Myrtle Beach, SC, now operates as AvCraft Technical Services and provides MRO for aircrafts.
Sep 10	JSC PAO Inkar	The United Defense Industry Corporation	The United Defense Industry Corporation "Oboronprom" acquired a further 68.38% stake in JSC PAO Inkar from Saturn NPO for RUB1.1 billion, or 2.72 billion shares at RUB0.4 per share. JSC PAO, based in Perm, Russian Federation, engages in the production and delivery of fuel apparatus for aircraft engines.
Sep 10	Kings Avionics, Inc.	Butler National Corp.	Butler National (OTCBB:BUKS) acquired Kings Avionics from Gary Morris and David B. Hayden for \$1.2 million, plus the guarantee of \$0.63 million in secured bank debt. Kings Avionics, founded in 1969 and based in New Century, Kansas, engages in the sale, installation, service, and repair of aircraft and related components.
Sep 10	Pacific Aero Tech, Inc.	McNally Industries, LLC	Pacific Aero Tech, founded in 1987 and based in Kent, Washington, provides aircraft maintenance services for air and cargo carriers, and airlines in the United States and internationally.
Sep 10	Aerothrust Corporation	Air-Capital Group LLC	Air-Capital Group along with unknown buyers acquired the assets of Aerothrust in bankruptcy auction for \$5 million. Aerothrust, founded in 1946 and headquartered in Miami, Florida, provides MRO and field services for aircraft engines and parts.
Sep 10	Service Centres Aéro	Amari Metals, Inc.	Amari Metals acquired Service Centres Aéro from Rio Tinto Alcan, Inc. Service Centres Aéro, incorporated in 1991 and based in Nantes, France, distributes pre-machined and semi-finished aluminum and light metal alloy products for aeronautics and space industries in Europe
Aug 10	Complete Turbine Services, LLC	Neff Capital Management LLC	Complete Turbine Services, founded in 2002 and based in Fort Lauderdale, Florida, provides MRO services for turbine engines and aircraft to the aviation industry in the United States and internationally.
Aug 10	Superior Air Parts, Inc.	Superior Aviation	Superior Aviation acquired Superior Air Parts from Thielert AG (XTRA: T3C). Superior Air Parts, founded in 1967 and based in Coppell, Texas, manufactures replacement parts for aircraft engines, including engine products, vantage engines, millennium cylinders, and piece parts.
Jun 10	Nampa Valley Helicopters, Inc.	Heili-Welders Canada Ltd.	Heili-Welders Canada acquired substantially all of the assets of Nampa Valley Helicopters for \$6.7 million. Nampa Valley Helicopters, incorporated in 1985 and based in Boise, Idaho, provides MRO services for helicopters in North America.
May 10	Air Transport Components, LLC	Gen Cap America, Inc.	Gen Cap America acquired Air Transport Components in a management buyout. Air Transport Components, founded in 1998 and based in Tempe, Arizona, operates a repair station that provides overhaul and repair services for component parts of commercial narrow and wide body aircraft.
Mar 10	Genesis Lease Limited	AerCap Holdings N.V.	AerCap Holdings (NYSE: AER) entered into a definitive agreement to acquire Genesis Lease (NYSE: GLS) for approximately \$250 million in stock. Genesis Lease, founded in 2006 and headquartered in Shannon, Ireland, engages in the acquisition and leasing of commercial jet aircraft and other aviation assets worldwide.
Mar 10	Northstar Aerospace Inc.	Gordon Investment Partners	Gordon Investment Partners agreed to acquire a 6.5% stake in Northstar Aerospace (TSX: NAS) from Ridge Capital Amalgamated for CAD2.2 million, or 1.95 million shares at CAD1.1 per share. Northstar Aerospace, founded in 1984 and based in Bedford Park, Illinois, manufactures flight-critical parts for military and commercial aircraft applications and non-flight-critical parts for commercial aircraft.

Source: Data obtained from public company filings and Capital IQ

## Public Market Valuation and Performance – Select Cronus A&D Supply Chain Index

(In millions of U.S. dollars, except per share data)

Company Name	Stock Price 1/14/2011	% of 52-week		Market Cap	Enterprise Value	Cash	EV / Revenue				EV / EBITDA				P/E Ratio		
		High	Low				LTM	LQA	CY2010 E	CY2011 E	LTM	LQA	CY2010 E	CY2011 E	LTM	CY2011 E	
Magellan Aerospace Corp.	\$4.74	95.9 %	273.3 %	\$86	\$323	\$14	0.5 x	0.4 x	0.4 x	0.4 x	4.9 x	3.6 x	3.7 x	3.4 x	13.7 x	12.2 x	10.9 x
Hampson Industries plc	0.50	39.4	175.0	140	281	21	1.0	0.9	NM	NM	7.1	12.0	NM	NM	9.8	NM	NM
Ducommun Inc.	21.98	90.5	137.0	231	250	2	0.6	0.6	0.6	0.6	5.9	6.6	5.6	5.3	18.6	11.7	9.9
Heroux-Devtek Inc.	6.46	99.4	130.6	194	268	30	0.8	0.8	0.8	0.7	5.8	6.1	5.5	4.8	14.2	13.5	10.5
LMI Aerospace Inc.	18.28	93.7	166.5	215	215	0	1.0	1.0	1.0	0.8	7.8	9.7	7.7	5.9	19.8	16.2	12.2
Northstar Aerospace Inc.	2.42	80.3	266.7	74	133	0	0.7	0.7	0.7	0.6	4.6	5.2	5.7	5.1	12.5	14.3	9.2
CPI Aerostructures Inc.	14.70	93.6	243.0	98	99	1	2.0	1.9	1.9	1.2	12.2	10.8	12.4	6.6	18.8	20.1	10.9
Sypris Solutions Inc.	5.30	85.4	207.7	104	112	15	0.4	0.4	0.4	0.4	11.0	8.1	12.3	6.7	15.0	NA	80.1
SIFCO Industries Inc.	16.31	94.1	173.5	86	64	22	0.8	0.7	NM	NM	6.6	6.2	NM	NM	16.3	NA	NA
Avcorp Industries Inc.	0.11	50.0	262.5	21	45	0	0.6	0.5	0.5	0.4	NM	8.6	NM	9.6	NM	NM	NM
Edac Technologies Corp.	3.76	55.3	138.7	18	36	1	0.5	0.5	NM	NM	8.9	8.0	NM	NM	21.0	NA	NA
Tel-Instrument Electronics Corp.	8.70	96.7	165.4	23	25	0	2.6	2.0	NM	NM	NM	NM	NM	NM	NA	NA	NA
Mean		81.2 %	195.0 %				0.9 x	0.9 x	0.8 x	0.7 x	7.5 x	7.7 x	7.6 x	5.9 x	16.0 x	14.7 x	20.5 x
Median		92.0	174.3				0.7	0.7	0.6	0.6	6.8	8.0	5.7	5.6	15.7	13.9	10.9

Source: Data obtained from public company filings and Capital IQ as of close on January 14, 2011

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