The Economic Crisis and Its Impact on the DIB:
Defense Industrial Base Forecasts 2010-2020

Presented By:

James H Averell
Economist
DCMA Industrial Analysis Center
james.averell@dcma.mil

27 April 2010
Agenda

• BLUF
• Economic crisis history
• Current situation for DIB
  • Military Spending
  • NASA
  • Healthcare
• Economic forecasts and trends
• Additional DIB issues
• Final thoughts
**Demand**

- Recession likely ended Summer 2009
- $1T stimulus for infrastructure, tax cuts, and healthcare reform
- $1.5T budget deficit for FY2010
- US reducing military effort in Iraq
- US surge in Afghanistan
- Healthcare reform
- Decline in Defense budget and contracting until 2020
- Investment and readiness compete for very scarce dollars against healthcare, entitlements, and economic recovery
- Aging DoD procurement workforce
- Aging and worn-out equipment

**Supply**

- Recession hit the Defense and Aerospace industries in 2010
- Defense industry growth will be modest at best for next decade
- Defense industry likely to divest manufacturing capabilities
- Rising energy and raw material prices
- Labor Markets are contracting with a premium on skilled labor
- New round of Defense consolidation possible
- Increasing concentration of the DIB
- Increasing foreign ownership and dependency in lower tier industries
- Increasing spin-offs of manufacturing divisions
## The Great Economic Crisis

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
<th>Key Statistics</th>
</tr>
</thead>
</table>
| 2007 | • US and other housing market crash  
• Declining value of the U.S. dollar  
• Rising energy and materials costs  
• US economy falls into recession  
• Credit markets begin to freeze | • Estimated loses in real estate $150-$400B in the US  
• U.S. Gov’t deficit $162B (1% of GDP)  
• Fed funds at 4.5%  
• Manufacturing Capacity Utilization: 79% |
| 2008 | • Oil and Materials markets peak then crash  
• Major banks in the U.S. and Europe collapse  
• Global stock markets fall by 20-60%  
• Global coordinated reduction in interest rates  
• U.S./Fed implements $750 TARP and other bailouts | • Oil Peaks at $150/Barrel  
• S&P falls 45% between Jun-Nov  
• U.S. Gov’t deficit $455B (3.6% of GDP)  
• U.S. GDP falls 6.2% in real terms in 4th Qtr  
• Fed Funds rate falls to 0.25%  
• Manufacturing Capacity Utilization: 76% |
| 2009 | • Stock markets continue to decline  
• $787B American Reinvestment and Recovery Act (ARRA)  
• Consumers reducing debt and consumption spending  
• GM & Chrysler go bankrupt - $100B+ Bailout  
• Japanese, UK, & European economies in deep recession  
• Propose overhaul of financial regulation & U.S. healthcare | • DJIA closes at 6594; 12yr low 2/2009  
• US Gov’t deficit: $1.8T (13% of GDP)  
• CPI declines first time since the 1950s  
• Unemployment hits 9.5%  
• Manufacturing Capacity Utilization at 65%  
• 140 bank failures; highest since 1992 |
| 2010 | • Weak Recovery begins 2010 through stimulus spending  
• Big Banks have recovered; smaller banks still struggling  
• Sovereign Debt Crisis: | • US Govt Deficit $1.5T (9.8% of GDP)  
• Unemployment hits 10%  
• Manufacturing Capacity Utilization at 69.2%  
• 50 additional bank failures |

Source: WSJ, BLS, OMB, CBO, Federal Reserve, & Value Line – 03/2010
U.S. Federal Budget

Rising Tide Deficits and Debt

- Deficit around $1.4T for 2010 (10% of GDP)
- U.S. publicly held debt is projected to grow from 62% of GDP to 65%-82% range by 2020
- Rising government financing costs
- Falling tax revenue, rising unemployment, and healthcare costs
- Entitlement spending is projected to explode after 2018
- Growing global concerns on U.S. spending
- Healthcare reform: Historic Budget Buster?
- Bush Tax Cuts expire at the end of 2010: What tax cuts will be extended, if any?
- Japan now our largest creditor
- The $64 Trillion Question: How long are investors willing prop up the U.S. by buying U.S. Treasury Securities?

Source: Congressional Budget Office (CBO) 1/2010, WSJ, OMB, NDIA 3/2010, Tech America, & DCMA Analysis
# Healthcare Reform: Hope and Change

## Necessity
- Cost rising far faster than general inflation
- Rising amounts of chronic disease requiring continuing care
- Lack of IT penetration in this industry
- 45+ Million uninsured or under insured Americans
- Health issues leading cause of personal bankruptcy in the U.S.
- Reduces labor market efficiency and mobility
- US manufacturers are constrained by high health insurance costs
- Major factor in GM & Chryslers’ bankruptcies
- American manufacturers must compete against foreign companies that do not have to provide health insurance
- Forces more Automation – Substitution of Labor with Capital

## Costs and Provisions
- Affordability
- Cuts to Medicare by $500B
- Entitlement budget train wreck in 2018-2025
- Rising Medicare & other taxes
- No U.S. Tort Law reform
- Major provisions to date:
  - Full implementation in 2018
  - Requires most Americans and businesses to buy health insurance
  - Subsidizes for small business to provide health insurance to employees
  - Sets up Insurance exchanges
  - Heavily regulates health insurance providers
  - Taxes high end health insurance plans
  - Raise capital gains and taxes on incomes over 250K
  - Covers about 32M uninsured people

Impact on DoD & DIB

- Potential squeeze on DoD spending after 2013
- Health reform could slow the growth of DoD healthcare programs (TRI-Care)
- Could keeps manufacturers in business – reduces cost burden
- Could reduce overhead costs for major prime contractors
- Allows for more responsive labor markets
- Improved healthcare access may keep aging population in the workforce longer
- Higher taxation levels could discourage economic growth
- Possible increase in administrative costs impacting overhead
- Large company write-downs impacting profitability
Sovereign Debt Crisis: Is US Next?

Potential Next Steps

- Greece and European Nations are or near default on debt
- Currently the crisis is helping the US Dollar at the expense of the Euro
- Potential for new conflicts
- European Union debating a rescue package for Greece and other nations

Sovereign Debt’s Hot Spots

In light of the recent focus on sovereign risk and difficulties in the periphery of Europe, economists at RBC Capital Markets assembled a snapshot of economies to distinguish those that appear to be under the most duress. Among the several measures they examined were fiscal deficits, debt loans, growth rates and inflation. The ‘sovereign risk index’ includes those and others. The higher the number the riskier the country. Click on column headers to sort the table.

<table>
<thead>
<tr>
<th>Developed Countries</th>
<th>Fiscal Balance (% of GDP)</th>
<th>Gross Public Debt (% of GDP)</th>
<th>Real GDP Growth %</th>
<th>Inflation</th>
<th>Sovereign Risk Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ireland</td>
<td>Much worse than average</td>
<td>Worse than average</td>
<td>Worst compared with average</td>
<td>Worst compared with average</td>
<td>0.98</td>
</tr>
<tr>
<td>Greece</td>
<td>Worse than average</td>
<td>Much worse than average</td>
<td>Much worse than average</td>
<td>Average</td>
<td>0.90</td>
</tr>
<tr>
<td>Portugal</td>
<td>Worse than average</td>
<td>Worse than average</td>
<td>Worse than average</td>
<td>Worst than average</td>
<td>0.59</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Much worse than average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>0.52</td>
</tr>
<tr>
<td>Italy</td>
<td>Average</td>
<td>Much worse than average</td>
<td>Average</td>
<td>Average</td>
<td>0.43</td>
</tr>
<tr>
<td>France</td>
<td>Worse than average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>0.37</td>
</tr>
<tr>
<td>Spain</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>0.33</td>
</tr>
<tr>
<td>Japan</td>
<td>Worse than average</td>
<td>Worst compared with average</td>
<td>Average</td>
<td>Worst compared with average</td>
<td>0.28</td>
</tr>
<tr>
<td>United States</td>
<td>Much worse than average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>0.21</td>
</tr>
<tr>
<td>Belgium</td>
<td>Average</td>
<td>Worse than average</td>
<td>Worst than average</td>
<td>Average</td>
<td>0.15</td>
</tr>
<tr>
<td>Austria</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>0.14</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>0.00</td>
</tr>
<tr>
<td>Germany</td>
<td>Average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>-0.06</td>
</tr>
<tr>
<td>Canada</td>
<td>Average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Average</td>
<td>-0.19</td>
</tr>
<tr>
<td>Finland</td>
<td>Average</td>
<td>Average</td>
<td>Worst than average</td>
<td>Average</td>
<td>-0.20</td>
</tr>
<tr>
<td>Denmark</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>-0.45</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>-0.49</td>
</tr>
<tr>
<td>Australia</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>-0.62</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>-0.69</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Average</td>
<td>Worse than average</td>
<td>Average</td>
<td>Worse than average</td>
<td>-1.06</td>
</tr>
<tr>
<td>Norway</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
<td>-1.32</td>
</tr>
</tbody>
</table>

Source: Royal Bank of Canada Capital Markets
DoD Top Line Budget: 2000-2020

Source: TechAmerica 10/2009 & CBO 1/2010
Operations & Maintenance Budget

DoD Industry Addressable O&M Base Budget Trends 2000-2020 Forecasts after 2010

Source: TechAmerica10/2009 & CBO 1/2010
DoD Contracting Trends

- Defense Industrial Base expands in terms of contracts and contractors because of the Global War on Terror
- As the wars wind down and the budget declines, the DIB will likely contract as contract awards fall
- The DIB expansion keyed by construction, consulting, and contracting out govt. functions

**The QDR and Defense Budget Issues**

<table>
<thead>
<tr>
<th>Quadrennial Defense Review</th>
<th>Aging and Recapitalization Impacts</th>
<th>Defense Budget Cut?</th>
<th>Perceived Weaknesses in Acquisition Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>• First QDR to fully address wartime priorities</td>
<td>• Aging and war damaged platforms</td>
<td>• High deficits and domestic priorities</td>
<td>• Too many cost overruns</td>
</tr>
<tr>
<td>• Hybrid Warfare: prepare for conventional and unconventional war</td>
<td>• Many systems are at the end of design lifetimes</td>
<td>• Decline in perceived threat</td>
<td>• Hollowed out procurement DoD agencies:</td>
</tr>
<tr>
<td>• Need to take care of “Our People”</td>
<td>• Many vehicles are obsolete and worn out</td>
<td>• Many high-tech systems are behind schedule and over budget</td>
<td>• Increase of 20,000 acquisition workers</td>
</tr>
<tr>
<td>• Cyberspace domination</td>
<td>• Can only reset and reman a vehicle so many times</td>
<td>• Shifting emphasis from high-tech to proven low tech systems</td>
<td>• DCMA declines from 30,000 in 1990 to under 10,000 in 2008</td>
</tr>
<tr>
<td>• Improve long range strike</td>
<td>• High costs and delays in acquiring new systems</td>
<td>• Potential Congressional push back</td>
<td>• DCMA to Hire 3,000?</td>
</tr>
<tr>
<td>• Shift to “Unmanned Systems and Capabilities” especially in aircraft</td>
<td>• About 85% of all Military vehicles need to be recapitalized or replaced</td>
<td>• On-going wars?</td>
<td>• Reliance on contractor personnel</td>
</tr>
<tr>
<td>• New emphasis on cost and schedule over performance</td>
<td></td>
<td>• Last War vs. the Next War?</td>
<td>• Aging workforce in the Federal Government – average age is over 50 for most agencies</td>
</tr>
</tbody>
</table>

Source: DoD QDR 1/2010
### New Defense Build-up
- 20 Year Cycle going back to 1840s
- Entitlement issues will determined DoD’s budget
- New Technologies will require new systems
- 2020’s budget increases not likely to match 2000’s or the 1980’s
- Greater emphasis on investment accounts
- Unmanned Systems (Robotics) could reduce personnel requirements and costs
- Need to maintain near-term Science & Technology (S&T) investment to reduce long-term program risk

### Priority Programs
- Aging Inventories of aircraft, ships, and vehicles
- Aircraft: F-35, UAVs, Strategic Bomber, JTR, and Tankers/Air-lift
- Operationally Responsive Space (ORS) Systems
- Shipbuilding: CGX, DDGX, LCS, SSBNs, & Auxillarily Ships
- Combat Vehicles: JLTV, UGVs, Abrams, and Bradley replacements
- Missiles: Joint Common Missiles, Hypersonics, and Strategic Missiles
- Ammo & Weapons: New Infantry Rifle, Ammo, & Directed Energy
- Other: Chem/Bio Defense, Communications Gear & IT

### Questions
- Are we still in Iraq and Afghanistan?
- How will long-term budget issues be resolved?
- How well will current procurement programs for the 2010’s be funded?
- Peer Competitor vs. Irregular Warfare/Hybrid Warfare
- Can and will the US maintain global military capabilities?
- Will S&T investment be maintained?
- Controlling O&M costs
## Military Technology Trends

### New Technologies: 2010-2015

- IT & Digitalization
  - Mult-Core Processing
  - Terrahertz Computing
  - Cloud Computing
  - IT Security
- Nanotechnology
  - Carbon Nanotube Electronics
  - Photon Electronics
  - Motion Sensing & Simulation
  - Hull Coatings
- Sensors - LADAR/LIDAR

### New Technologies: 2015-2030

- Non-lethal Weapons
- Directed Energy Weapons
- Robotics
  - Unmanned Vehicles
  - Loitering Munitions
- Alternative Power Systems
  - Fuel Cell and Batteries
  - Solar Cells
- Hypersonics
  - Kinetic Munitions
  - Advanced Propulsion – Scram Jet
- Biotechnology

---

[Image: Military Technology Trends]

**DCMA**

**DEFENSE CONTRACT MANAGEMENT AGENCY**

**ACQUISITION INSIGHT | GLOBAL ENGAGEMENT**
Non-Defense Discretionary Budget

Domestic Discretionary Budget Trends
2005-2020 Forecasts after 2009

Source: TechAmerica 10/2009
## Information Technology Budget Trends

### Civil Government rise driven by:
- ARRA investment
- Healthcare reform
- Replacement of retiring workers and automation of services
- IT Security is a top priority

### Defense IT is basically stable
- Army IT declined in 2009 & 2010 as IT investment in support of Overseas Contingencies.
- IT investment need matches inflation over the next five years
- Continuing need to invest in the latest technology

---

Homeland Security Mission

Forecasts after 2010

NASA: Is it Change or the End?

Obama’s Space Policy

- International Space Station (ISS) operates to 2020 and beyond
- Constellation cancelled as recommended by the Augustine Commission
- Focus on new technology development and launch facilities
- Shift in focus from established contractors to new start-ups
- Space contractors are assume greater amounts of program development and operational risk
- Obama’s budget adds $6B over the next 5 years
- Robust Planetary and Earth Observation program

Looming Gap with no U.S. Manned Space Vehicle available for 5+ years:

- NASA to retire the Shuttle in 2010/11
- No true Shuttle replacement vehicle possible before 2020
- Shift ISS supply and personnel ferrying missions to private sector contractors.
- Space Ex – Falcon LV and Dragon Capsule are leading candidates
- Orion continues as a lifeboat for the ISS
- NASA’s Man Rating requirements presents significant technical and cost challenges in developing manned space systems

International Defense Budgets

**Defense Budgets Peaked in 2008**
- Aging equipment
- Interoperability with the U.S.
- Increasing international cooperation on defense programs: F-35 & MEADS
- Global Economic Crisis is reversing the trend

**Defense spending is shifting from Europe to Asia**
- Asian economies will have the money, population, and requirements
- Increasing security risks and threat perceptions in Asia

**U.S. Exports are hampered because of the following:**
- U.S. Systems are often too complex and costly
- Cheaper foreign alternatives
- Offset requirements
- U.S. Export controls are outdated

Crisis Impact on the DIB

Falling Output & Rates of Capacity Utilization
- Total manufacturing rate reached post WWII lows
- Hollowing out of US Industrial Base
- DIB utilization starting to decline
- China could overtake the U.S. in manufacturing by 2020

Frozen Credit Markets
- Small companies having difficulties securing financing for contracts
- Larger companies paying more for financing operations
- Little M&A activity except for small cash deals
- Increases in bankruptcies and liquidations

High Unemployment
- 10M+ jobs lost since Dec 2007
- Migration concerns
- Major Defense firms have started cutting jobs
- Delaying retirements and early retirement
- Rising unemployment and under-employment
- High cost of health insurance

Source: WSJ, Value Line, DCMA, Industrial Analysis Center, Federal Reserve, Census, & DCMA Financial Analysis Group
Commercial Aircraft Production Trends

** Boom times are at an end **
- Global Financial Market Meltdown in 2008
- Delays in deliveries
- Record low order intake in 2009
- Falling demand for business jets and general aviation aircraft
- Significant Supply Chain and Material Cost issues

** Shallow down-turn **
- Market expansion in the Middle East and Asia
- Aging aircraft, high fuel costs, and environmental concerns
- New models (787 & A350) from Boeing and Airbus to address above issues
- After declines in 2009, backlog still provides cushion

** Defense Industrial Base Impact **
- Workload stable for now but will likely decline in 2010
- Employment is likely to fall in 2010 but stable through 2016
- Concerns over sub-tier producers
- Rising overhead cost in the future

Source: Forecasts International 03/2010 & DCMA Analysis
## Defense & Aerospace Market Forecasts

### Forecast International Defined Aerospace and Defense Systems

<table>
<thead>
<tr>
<th>Markets</th>
<th>2010</th>
<th>2019</th>
<th>Total</th>
<th>% Change</th>
<th>CAGR*</th>
<th>US%**</th>
<th>2010</th>
<th>2019</th>
<th>Total</th>
<th>% Change</th>
<th>CAGR*</th>
<th>US%**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Military Markets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Wing Military Aircraft</td>
<td>647</td>
<td>644</td>
<td>6,380</td>
<td>-0.5%</td>
<td>-0.1%</td>
<td>42%</td>
<td>29,538.1</td>
<td>34,777.4</td>
<td>320,252.6</td>
<td>17.5%</td>
<td>1.9%</td>
<td>53.1%</td>
</tr>
<tr>
<td>Military Helicopters</td>
<td>584</td>
<td>558</td>
<td>6,114</td>
<td>-4.5%</td>
<td>-0.5%</td>
<td>44%</td>
<td>10,213.1</td>
<td>9,478.3</td>
<td>111,036.6</td>
<td>-7.2%</td>
<td>-0.8%</td>
<td>62.0%</td>
</tr>
<tr>
<td>Launch Vehicles</td>
<td>40</td>
<td>22</td>
<td>300</td>
<td>-45.6%</td>
<td>-5.0%</td>
<td>36%</td>
<td>2,575.7</td>
<td>1,262.1</td>
<td>18,577.4</td>
<td>-51.0%</td>
<td>-5.7%</td>
<td>61.9%</td>
</tr>
<tr>
<td>Satellites</td>
<td>15</td>
<td>5</td>
<td>90</td>
<td>-66.7%</td>
<td>-7.4%</td>
<td>61%</td>
<td>2,820.5</td>
<td>440.0</td>
<td>21,981.1</td>
<td>-84.4%</td>
<td>-9.4%</td>
<td>72.2%</td>
</tr>
<tr>
<td>Unmanned Systems</td>
<td>9,943</td>
<td>8,255</td>
<td>85,028</td>
<td>-17.6%</td>
<td>-1.9%</td>
<td>39%</td>
<td>3,247.3</td>
<td>3,530.9</td>
<td>34,532.9</td>
<td>8.7%</td>
<td>1.0%</td>
<td>51.2%</td>
</tr>
<tr>
<td>Aircraft Engines - Gas Turbines</td>
<td>3,052</td>
<td>1,650</td>
<td>26,263</td>
<td>-45.9%</td>
<td>-5.1%</td>
<td>59%</td>
<td>5,570.7</td>
<td>5,282.6</td>
<td>56,027.3</td>
<td>-5.2%</td>
<td>-0.6%</td>
<td>56.0%</td>
</tr>
<tr>
<td>Military Vehicles</td>
<td>31,395</td>
<td>9,565</td>
<td>127,413</td>
<td>-69.5%</td>
<td>-7.7%</td>
<td>71%</td>
<td>15,725.5</td>
<td>8,067.2</td>
<td>102,247.5</td>
<td>-48.7%</td>
<td>-5.4%</td>
<td>37.8%</td>
</tr>
<tr>
<td>Warships</td>
<td>24</td>
<td>27</td>
<td>340</td>
<td>12.5%</td>
<td>1.4%</td>
<td>34%</td>
<td>17,146.0</td>
<td>17,530.0</td>
<td>243,526.9</td>
<td>2.2%</td>
<td>0.2%</td>
<td>46.9%</td>
</tr>
<tr>
<td>Missiles</td>
<td>47,328</td>
<td>32,447</td>
<td>368,788</td>
<td>-31.4%</td>
<td>-3.5%</td>
<td>25%</td>
<td>9,092.5</td>
<td>10,673.8</td>
<td>99,615.0</td>
<td>17.4%</td>
<td>1.9%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Munitions &amp; Weapons</td>
<td>652,100</td>
<td>457,461</td>
<td>5,227,804</td>
<td>-30.9%</td>
<td>-3.4%</td>
<td>71%</td>
<td>2,668.4</td>
<td>1,496.9</td>
<td>18,200.4</td>
<td>-43.9%</td>
<td>-4.9%</td>
<td>70.4%</td>
</tr>
<tr>
<td>Naval Systems</td>
<td>65,241</td>
<td>3,113</td>
<td>116,275</td>
<td>-95.2%</td>
<td>-10.6%</td>
<td>79%</td>
<td>1,457.1</td>
<td>782.1</td>
<td>10,454.2</td>
<td>-46.3%</td>
<td>-5.1%</td>
<td>36.4%</td>
</tr>
<tr>
<td><strong>Civil Markets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Wing Aircraft</td>
<td>3,520</td>
<td>5,794</td>
<td>49,930</td>
<td>61.0%</td>
<td>6.8%</td>
<td>50%</td>
<td>108,892.7</td>
<td>174,551.5</td>
<td>1,520,339.7</td>
<td>60.3%</td>
<td>6.7%</td>
<td>48%</td>
</tr>
<tr>
<td>Civil Helicopters</td>
<td>1,559</td>
<td>1,858</td>
<td>16,641</td>
<td>19.2%</td>
<td>2.1%</td>
<td>50%</td>
<td>5,237.8</td>
<td>6,537.2</td>
<td>58,171.7</td>
<td>24.8%</td>
<td>2.8%</td>
<td>27%</td>
</tr>
<tr>
<td>Aircraft Engines - Gas Turbines</td>
<td>8,024</td>
<td>10,555</td>
<td>97,915</td>
<td>31.5%</td>
<td>3.5%</td>
<td>57%</td>
<td>21,110.2</td>
<td>30,050.7</td>
<td>279,728.1</td>
<td>42.4%</td>
<td>4.7%</td>
<td>72%</td>
</tr>
<tr>
<td>Launch Vehicles</td>
<td>54</td>
<td>52</td>
<td>489</td>
<td>-3.7%</td>
<td>-0.4%</td>
<td>18%</td>
<td>3,229.7</td>
<td>4,213.4</td>
<td>47,645.3</td>
<td>30.5%</td>
<td>3.4%</td>
<td>40%</td>
</tr>
<tr>
<td>Satellites</td>
<td>66</td>
<td>18</td>
<td>589</td>
<td>-72.7%</td>
<td>-8.1%</td>
<td>23%</td>
<td>5,997.0</td>
<td>2,242.0</td>
<td>72,296.6</td>
<td>-52.6%</td>
<td>-7.0%</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Combine Markets - Civil + Military</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Wing Aircraft</td>
<td>4,167</td>
<td>6,438</td>
<td>56,310</td>
<td>54.5%</td>
<td>6.1%</td>
<td>49%</td>
<td>138,480.8</td>
<td>209,328.9</td>
<td>1,840,592.2</td>
<td>51.2%</td>
<td>5.7%</td>
<td>49%</td>
</tr>
<tr>
<td>Helicopters</td>
<td>2,143</td>
<td>2,416</td>
<td>22,755</td>
<td>12.7%</td>
<td>1.4%</td>
<td>48%</td>
<td>15,450.9</td>
<td>16,015.5</td>
<td>169,208.3</td>
<td>3.7%</td>
<td>0.4%</td>
<td>50%</td>
</tr>
<tr>
<td>Aircraft Engines - Gas Turbines</td>
<td>8,064</td>
<td>10,577</td>
<td>98,215</td>
<td>31.2%</td>
<td>3.5%</td>
<td>57%</td>
<td>28,059.7</td>
<td>35,179.4</td>
<td>318,393.0</td>
<td>25.4%</td>
<td>2.8%</td>
<td>69%</td>
</tr>
<tr>
<td>Launch Vehicles</td>
<td>94</td>
<td>74</td>
<td>789</td>
<td>-21.3%</td>
<td>-2.4%</td>
<td>24%</td>
<td>5,805</td>
<td>5,476</td>
<td>65,223</td>
<td>-5.7%</td>
<td>-0.6%</td>
<td>46%</td>
</tr>
<tr>
<td>Satellites</td>
<td>81</td>
<td>23</td>
<td>679</td>
<td>-71.6%</td>
<td>-8.0%</td>
<td>28%</td>
<td>8,818</td>
<td>2,682</td>
<td>94,265</td>
<td>-59.6%</td>
<td>-7.7%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Source: Forecast International 2/2010 - www.forecast1.com  Note: *CAGR - Compound Annual Growth Rate, **US% - US Based Producers Market Share
### Other Industrial Base Issues

#### Aging Workforce
- Crisis has delayed retirements and brought people back to the workforce
- Highly skilled workers will be in short supply, especially engineers, scientists, and computer personnel
- Traditional “Defined Benefit” retirement programs are being replaced by 401K “Defined Contribution” programs

#### Labor Migration
- To contain costs, manufacturing work is shifting out of the Midwest, Northeast, and Pacific States to interior South and Southwestern states
- Many Aircraft and Spacecraft production facilities are over 50 years old
- Differences in cost of living and taxation driving worker and company migration trends.

#### Foreign Sourcing and Ownership
- Falling dollar encourages foreign sourcing and mergers with foreign partners
- US DIB is being hollowed out by foreign dependencies for key components
- Industrial “Know How” is moving overseas
- Infrastructure, healthcare issues, lack of skills, tax climate, and regulations hinder competitiveness

#### Energy & Material Costs and Availability
- Plunge in oil prices
- Inflation could return
- Reduction in mining capacity and slowing of the growth of energy production
- China and India are still growing
- Current recession slowing the growth of energy & mining productive capacity
- ARRA has money for Alternative Energy development
## U.S. Defense Consolidation Outlook

<table>
<thead>
<tr>
<th>Thawing merger &amp; acquisition market</th>
<th>Technology &amp; Policy Change Creates Growth</th>
<th>Manufacturing facility consolidation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen credit markets in 2008 are now beginning to thaw</td>
<td>Growth of UAV’s will bring Aircraft players into the market</td>
<td>Prime contractors focusing on design, integration, and service providing at the expense of manufacturing</td>
</tr>
<tr>
<td>Budget uncertainty created by QDR and lack of guidance from DoD</td>
<td>Operationally Responsive Space (ORS) allows for Small Satellites and Launch Vehicle use by DoD</td>
<td>Aging facilities with aging workforces in high cost geographical areas</td>
</tr>
<tr>
<td>Budget cuts could spur a new round of consolidation in the next decade</td>
<td>Foreign competition and penetration in US DIB is possible</td>
<td>Need to maximize shareholder value</td>
</tr>
<tr>
<td>Private Equity Investment companies could dump defense companies</td>
<td></td>
<td>Supply chain issues could mitigate this trend</td>
</tr>
</tbody>
</table>
Final Thoughts

Points to Ponder

• Recession is likely over but the recovery is weak
• Administration fiscal policy along with monetary policy is extremely expansive and will have significant long-term impact on the economy
  • Stimulus in 2009
  • Healthcare Reform
• Defense top line is going to take cuts: How Much and When?
• The QDR repeats many policies and goals expressed over the past 20 years
  • New Urgency on cost containment and schedule
  • Preparation for a multiple types of warfare
  • Emphasis on IT and Cyberwarfare
• DIB is in good shape to weather this down-turn