Trends in the DoD Industrial Base

Nancy Young Moore, Clifford A. Grammich, and Judith D. Mele

May 5, 2016
Industry Consolidation Has Been a Trend for Many Years

• Industries tend to consolidate over time - faster in recent years¹

• Globally, Merger and Acquisition (M&A) activity reached a volume of $4.3 trillion, barely beating the record set in 2007²

• 2015 M&A driven by²
  – Pressure to become more efficient in a slow-growth economy
  – Increased boardroom confidence
  – Cheap debt
  – Desire to keep up with consolidating rivals


Approved for public release; distribution is unlimited.
Purchases Have Increased while Procurement Funding Has Varied in DoD Budget


Approved for public release; distribution is unlimited.
Procurement Is Projected to Increase, then Decrease, and then Increase Slightly in Future Budgets

Source: OUSD(Comptroller), National Defense Budget Estimates for FY 2017, March 2016, Table 6-1

NOTE: Data in Constant FY2017 Dollars.
## Leading Industries for DoD Procurement Dollars

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Procure $sB</th>
<th>Total DoD $sB</th>
<th>Total Industry $Bs</th>
</tr>
</thead>
<tbody>
<tr>
<td>336411</td>
<td>23.6</td>
<td>20.5</td>
<td>46.7</td>
</tr>
<tr>
<td>336611</td>
<td>11.8</td>
<td>9.3</td>
<td>16.6</td>
</tr>
<tr>
<td>336414</td>
<td>6.1</td>
<td>5.0</td>
<td>10.7</td>
</tr>
<tr>
<td>541330</td>
<td>5.5</td>
<td>3.8</td>
<td>28.8</td>
</tr>
<tr>
<td>336413</td>
<td>4.1</td>
<td>2.9</td>
<td>13.5</td>
</tr>
<tr>
<td>334511</td>
<td>3.9</td>
<td>3.9</td>
<td>9.1</td>
</tr>
<tr>
<td>336992</td>
<td>3.4</td>
<td>1.3</td>
<td>6.5</td>
</tr>
<tr>
<td>541710-2</td>
<td>3.0</td>
<td>2.0</td>
<td>25.4</td>
</tr>
<tr>
<td>332993</td>
<td>2.2</td>
<td>1.5</td>
<td>2.8</td>
</tr>
<tr>
<td>336412</td>
<td>2.1</td>
<td>2.3</td>
<td>5.3</td>
</tr>
<tr>
<td>334220</td>
<td>2.1</td>
<td>0.8</td>
<td>4.9</td>
</tr>
<tr>
<td>332410</td>
<td>1.2</td>
<td>1.6</td>
<td>1.2</td>
</tr>
</tbody>
</table>


Approved for public release; distribution is unlimited.
## Procurement Share of DoD Dollars and DoD Share of Industry Dollars

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>NAICS Name</th>
<th>Procure Share of DoD $s</th>
<th>DoD Share of Industry $s</th>
</tr>
</thead>
<tbody>
<tr>
<td>336411</td>
<td>Aircraft Manufacturing</td>
<td>51</td>
<td>59</td>
</tr>
<tr>
<td>336611</td>
<td>Ship Building and Repairing</td>
<td>71</td>
<td>67</td>
</tr>
<tr>
<td>336414</td>
<td>Missile &amp; Space Veh. Mfg.</td>
<td>58</td>
<td>57</td>
</tr>
<tr>
<td>541330</td>
<td>Engineering Services</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>336413</td>
<td>Other Aircraft Pts./Equip. Mfg.</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>334511</td>
<td>Search Instrument Mfg.</td>
<td>43</td>
<td>45</td>
</tr>
<tr>
<td>336992</td>
<td>Armored Vehicle &amp; Tank Mfg.</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td>541710-2</td>
<td>R&amp;D in Sciences</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>332993</td>
<td>Ammo. (not small-arms) Mfg.</td>
<td>79</td>
<td>77</td>
</tr>
<tr>
<td>336412</td>
<td>Acft. Engines &amp; Engine Pts.</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>334220</td>
<td>Radio/TV Broadcast Equip.</td>
<td>43</td>
<td>36</td>
</tr>
<tr>
<td>332410</td>
<td>Boiler and Heat Exch. Mfg.</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

NAICS Codes Are Often Very Broad — Aircraft Manufacturing Example

• Airplane (military, civilian, general aviation)
  – Manufacturing
  – Conversions
  – Overhauling
  – Rebuilding
  – Prototype development

• Other aircraft mfg.
  – Autogiro
  – Blimp
  – Drone
  – Glider
  – Helicopter
  – Ultralight
Herfindahl-Hirschman Index of Market Concentration by Industry, 1997-2012

Herfindahl-Hirschman Index of Market Concentration by Industry, 1997-2012

Source: Economic Census. Data not available for years not shown.

Approved for public release; distribution is unlimited.
Registered Firms by Industry and Size

NAICS code

336411 - Aircraft Manufacturing
336611 - Ship Building and Repairing
541330 - Engineering Services
336413 - Other Aircraft Pts./Equip. Mfg.
334511 - Search Instrument Mfg.
336992 - Armored Vehicle & Tank Mfg.
541710-2 - R&D in Sciences
332993 - Ammo. (not small-arms) Mfg.
336412 - Acft. Engines & Engine Pts.
334220 - Radio/TV Broadcast Equip.
332410 - Boiler and Heat Exch. Mfg.

Number of firms

Source: System for Award Management 2016

Approved for public release; distribution is unlimited.
Concentration Indexes for Aircraft Manufacturing (NAICS Code 336411)

Source: Economic Census

Approved for public release; distribution is unlimited.
Aircraft Manufacturing (NAICS Code 336411) Firms by Number of Employees

Source: Statistics of U.S. Businesses

SBA size standard = 1,500 employees

Approved for public release; distribution is unlimited.
Concentration Indexes for Ship Building and Repairing (NAICS Code 336611)

Four largest firms  Eight largest firms  20 largest firms  50 largest firms

% of total value of shipments

Source: Economic Census

Approved for public release; distribution is unlimited.
Ship Building and Repairing (NAICS Code 336611) Firms by Number of Employees

Number of Firms

Year

SBA size standard = 1,250 employees

Source: Statistics of U.S. Businesses

Approved for public release; distribution is unlimited.
Concentration Indexes for Guided Missile and Space Vehicle Manufacturing (NAICS Code 336414)

Four largest firms

Eight largest firms

Source: Economic Census. In no year of Economic Census since 1997 has industry had 20 firms.
Approved for public release; distribution is unlimited.
Guided Missile and Space Vehicle Manufacturing (NAICS Code 336414) Firms by Number of Employees

Year

SBA size standard = 1,250 employees

Source: Statistics of U.S. Businesses
Approved for public release; distribution is unlimited.
Findings

- DoD is a dominant or major buyer in some, but not all, top procurement industries
- Because some NAICS codes cover very broad activities; they may need refinement to provide better data
- One top DoD industries by total Procurement dollars is already highly concentrated and several more are close to being so
- Since 1997 industry concentration has improved for a number of top defense industries
- Most industries have many small firms, but these firms may not provide the goods or services DoD needs
Questions?
Concentration Indexes for Engineering Services (NAICS Code 541330)

Source: Economic Census

Approved for public release; distribution is unlimited.
Engineering Services (NAICS Code 541330)
Firms by Number of Employees


Source: Statistics of U.S. Businesses

Approved for public release; distribution is unlimited.
Engineering Services (NAICS Code 541330) Firms by Annual Receipts

Number of firms

Source: Economic Census
Concentration Indexes for Other Aircraft Parts and Auxiliary Equipment Manufacturing (NAICS Code 336413)

Source: Economic Census

Approved for public release; distribution is unlimited.
Other Aircraft Parts and Auxiliary Equipment Manufacturing (NAICS Code 336413) Firms by Number of Employees

SBA size standard = 1,250 employees

Source: Statistics of U.S. Businesses

Approved for public release; distribution is unlimited.
Concentration Indexes for Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing (NAICS Code 334511)

Four largest firms  
Eight largest firms  
20 largest firms  
50 largest firms

Source: Economic Census

Approved for public release; distribution is unlimited.
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing (NAICS Code 334511) Firms by Number of Employees

Source: Statistics of U.S. Businesses. NAICS code 334511 is in concordance with SIC code 3812.

SBA size standard = 1,250 employees

Approved for public release; distribution is unlimited.
Concentration Indexes for Military Armored Vehicle, Tank, and Tank Component Manufacturing (NAICS Code 336992)

Source: Economic Census.
Military Armored Vehicle, Tank, and Tank Component Manufacturing (NAICS Code 336992) Firms by Number of Employees

Number of Firms

Year

SBA size standard = 1,500 employees

Concentration Indexes for Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology) (NAICS Code 541712)

Approved for public release; distribution is unlimited.
Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology) (NAICS Code 541712) Firms by Number of Employees

SBA size standard = 1,000 employees except Aircraft Engine and Engine Parts = 1,500 employees and Other Aircraft Parts and Auxiliary Equipment and Guided Missiles and Space Vehicles, Their Propulsion Units and Propulsion Parts = 1,250 employees


Approved for public release; distribution is unlimited.
Concentration Indexes for Ammunition (except Small Arms) Manufacturing (NAICS Code 332993)

Four largest firms

Eight largest firms

20 largest firms

Source: Economic Census. In no year of Economic Census since 1997 has industry had 20 firms.

Approved for public release; distribution is unlimited.
Ammunition (except Small Arms) Manufacturing (NAICS Code 332993) Firms by Number of Employees

Source: Statistics of U.S. Businesses. NAICS code 332993 is in concordance with SIC code 3483.

Approved for public release; distribution is unlimited.
Concentration Indexes for Aircraft Engine and Engine Parts Manufacturing (NAICS Code 336412)

Source: Economic Census.

Approved for public release; distribution is unlimited.
Aircraft Engine and Engine Parts Manufacturing (NAICS Code 336412) Firms by Number of Employees


SBA size standard = 1,500 employees
Concentration Indexes for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (NAICS Code 334220)


Approved for public release; distribution is unlimited.
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (NAICS Code 334220) Firms by Number of Employees

SBA size standard = 1,250 employees


Approved for public release; distribution is unlimited.
Concentration Indexes for Power Boiler and Heat Exchanger Manufacturing (NAICS Code 332410)

Source: Economic Census.
Power Boiler and Heat Exchanger Manufacturing (NAICS Code 332410) Firms by Number of Employees

Number of Firms

Year


SBA size standard = 750 employees


Approved for public release; distribution is unlimited.
Herfindahl-Hirshman Index (HHI)

- Sum of the squared market shares of all the firms in the industry
- The Federal Trade Commission (FTC) used the following cutoffs for the HHI* in 1997
  - Less than 1,000: unconcentrated
  - 1,000 to 1,800: moderately concentrated
  - Above 1,800: highly concentrated