Strategic Cost Estimation: Understanding Resource Tradeoffs in China's Defense Modernization Efforts

Jack Bianchi
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Project Goals

- Understand at the *strategic level* the feasible range of China’s potential future force structures
- Gain policy-relevant insights into competitive dynamics between U.S. and China and analyze potential interactions
- Aid U.S. competitive strategy development toward China
- Create an extensible methodology that can be applied to other countries/competitions

For this project, the *relative* effort that a country makes to produce systems is essential; the *absolute* cost is important but secondary.
What is the Strategic Choices Tool?

The Strategic Choices Tool (SCT) is an interactive decision making tool in which users can rapidly consider alternative future force structures within a real world budget constraint.
# Strategic Choices Tool Opening Page

## Running Total of Spending

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MOVE 1 2020 - 2024</th>
<th>MOVE 2 2025 - 2029</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running Total</td>
<td>$62.05 B</td>
<td>$28.64 B</td>
</tr>
<tr>
<td>Target</td>
<td>$117 B</td>
<td>$136 B</td>
</tr>
</tbody>
</table>

## Categories of Spending Options

- Air
- Ground
- Logistics & Basing
- Missile Defense
- Munitions
- Nuclear Forces
- Personnel
- R&D
- Readiness
- Sea
- SOF
- Space/Cyber/Communications

## Summary of User Choices

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Reserve BCT</th>
<th>Active Personnel</th>
<th>Reserve Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft</td>
<td>27</td>
<td>1,337,000</td>
<td>816,600</td>
</tr>
<tr>
<td>Munitions</td>
<td>-1</td>
<td>14,450</td>
<td>-24,750</td>
</tr>
<tr>
<td>Ships</td>
<td>31</td>
<td>1,351,450</td>
<td>791,850</td>
</tr>
<tr>
<td>Active BCT</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
The SCT has a wide range of built-in options.
China SCT Project Roadmap

- US system & budget data
- PLA system data
- US Cost Estimating Relationships
- Cost Estimate if PLA systems built in US
- Cost Estimate if PLA systems built in China
- PLA budget estimate
- PLA force structure estimate
- China Strategic Choices Tool
## Cost-informed Force Structure Projection Example: Major PLAN Ships

### 2021-2030: 3% average annual real growth in procurement spending

*Excludes subs; 2000-2019 historic annual tonnage growth: 4.1%; 2020-2030 projected annual tonnage growth: 6.6%
**Impact & Contributions**

**Conference Presentations:**
- International Cost Estimating and Analysis Association 2019 Conference
- MORS 2020 Cost Analysis Workshop

**Publications**
- “Strategic Cost Estimation,” *OR/MS Today*, October 2019
- NPS Acquisition Research Symposium Paper, May 2020

**Project Activities**
- Currently holding workshops and exercises with PLA experts, statisticians, cost analysts, and economists to test and refine the estimates and the tool
- Three Workshops:
  1. October 2019
     - Focus: Air, Sea, and Missiles
  2. December 2019
     - Focus: Ground; O&M costs
  3. Summer 2020
- Three Exercises:
  1. March 2020
  2. Summer 2020
  3. Fall 2020
- **CHINA SCT LAUNCH: FALL 2020**
Summary

• U.S.-based cost estimates are a starting point; Chinese production efficiencies and operating practices can be incorporated over time

• No single approach is likely to yield a definitive answer

• Rough order of magnitude cost estimates are feasible and useful for understanding China’s potential defense modernization trajectories

• Using the U.S. and China Strategic Choices Tools in iterative exercises and wargames will provide insight into U.S.-China competitive dynamics and improve development of U.S. competitive strategies, operational concepts, and modernization plans
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