Assessing Policy Changes on the Cost of Husbanding Services for Navy Ships

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Acknowledgements

- MBA Capstone Project:
  **Husbanding Service Provider Price Analysis Factors** – Graduation June 2021
  LCDR Austin W. Gage, LCDR Luis C. Escobar, and LCDR Bradford R. Sturgis Jr.
  June 2021 (*available at NPS Dudley Know Library*)

- Journal Article:
  **Assessing Policy Changes on the Cost of Husbanding Services for Navy Ships**
  Margaret Hauser, Geraldo Ferrer, and Robert Mortlock
  Defense Acquisition Research Journal (*forthcoming*)
What are the effects of policy changes on the cost of husbanding services?

- **Off-Ship Bill Pay (OSBP)**
  - Formalized a process for **procuring**, **rendering**, and **paying** for husbanding services to increase oversight
  - Effective FY 2016

- **Multiple Award Contracts (MACs)**
  - Multiple vendors are awarded contract over region, **increasing competition** for individual ports
  - Replaces single award contracts – SACs – and single visit contracts – SVCs

*Study period is FY2010 – FY2020, prior to Global MAC awarded by NAVSUP in October 2020 (FY2021).*
HSPortal Data

- Port visits by 5th, 6th, and 7th fleets
- From 1 October 2009 to 11 June 2020
  - Raw data: 14,700+ port visits

- Data base fields:
  - Total Cost
  - Exhibit line-item number (ELIN)
  - Mooring type
  - Ship type
  - Days in Port
  - Dates of Visit
  - Contract

- Filtered for normal visits
  - Exclude: maintenance, transit, brief stop for fuel, cancellations
  - Exclude ship-ports combinations with < 15 visits
  - Filtered data: 8,700+ port visits

- Contract Data
  - Identified MACs with contract numbers in HSPortal

- Historical Crude Oil Prices (Nominal)
  - Price on the date of port visit
Multiple Regression Analyses

(1) Global Cost Model
Objective: Identify general trends in total cost of port visits
- Evaluates entire dataset
- Uses FY as categorical variable
*Assumes fixed factor effects over time horizon

(2) FY Cost Model
Objective: Test assumption in Global Cost Model that explanatory variables have fixed effect over time
- Unique regression model for each FY
- Statistical significance is reduced with reduced

- Models provide a base value for the total cost of a port visit
  - Response Variable: Natural Log of Total Cost
  - Explanatory variables: multipliers to the base cost
  - Unbalanced panel
### Global Cost Model Design

<table>
<thead>
<tr>
<th>Exhibit Line-Item Number (ELIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days in Port</td>
</tr>
<tr>
<td>Fiscal Year</td>
</tr>
<tr>
<td>Crude Oil Price</td>
</tr>
</tbody>
</table>

**Type of mooring**

- Ship Type
- Contract Type

**Benchmarks:**
1) Anchorage
2) DDG
3) SAC
Global Cost Model Results

**Average Cost of 5-day DDG Port Visit**

*Reference Level Used for all Explanatory Variables*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Reference</th>
<th>Total Cost Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC SAC</td>
<td>SAC</td>
<td>- 17%</td>
</tr>
<tr>
<td>SVC SAC</td>
<td>SAC</td>
<td>+ 46%</td>
</tr>
<tr>
<td>Anchorage</td>
<td>Pier side</td>
<td>+ 30%</td>
</tr>
<tr>
<td>Days in Port</td>
<td>5 days</td>
<td>2 days → - 40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 days → + 115%</td>
</tr>
<tr>
<td>ELIN Count</td>
<td>23</td>
<td>70 → + 200%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 → + 570%</td>
</tr>
</tbody>
</table>

- **Ship type and port had statistically significant effects in most instances.**
- **Crude oil price also had a statistically significant effect however, it was very small (> 5% for the full range).**
Global Cost Model Breakdown (I)

Days in Port

Reference number
Global Cost Model Breakdown (II)

Exhibit Line-Item Number

Reference number
Global Cost Model Breakdown (III)

Price of Oil

Reference price

Regression Multiplier vs. Price of Oil [$/bbl]
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Regression Multiplier vs. Ship Tonnage

[Graph showing the relationship between ship tonnage and regression multiplier, with benchmark highlighted.]
Cost of port visit in each FY

FY Cost Model Design

- Exhibit Line-Item Number (ELIN)
- Days in Port
- Fiscal Year
- Crude Oil Price
- Type of mooring
- Ship Type
- Contract Type

Benchmarks:
1) Anchorage
2) DDG
3) SAC
Factor Regression Coefficients in FY Cost Models

(Negative values correspond to decrease in cost)

References
Days: 5
ELIN: 23
Oil: $72/bbls
Mooring: Pier side
Contract: SAC
Conclusions

- Global cost model provides valuable insight on costly aspects of port visits
  - Modeling each FY separately shows:
    - Dynamic impact of contract changes
    - Dynamic cost of anchorage relative to pier side

- Impact of OSBP:
  - Initially => increased cost of port visits
  - Recent years => no significant impact

- Impact of MAC:
  - Cost of husbanding services has decreased since implementation
SUPPLEMENTAL SLIDES
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- **September 2013**: Leonard Francis is arrested
- **December 2013**: Secretary of the Navy orders audit of husbanding processes

**2014**
- **October 2015**: Implementation of OSBP

**2015**
- **June 2016**: First MAC awarded for port visits in various East Asian Countries

**2016**
- **October 2017**: Use of HSPortal mandated
- **September 2016**: Second MAC awarded for port visits in European Command (EUCOM) region

**2017**
- Other MACs awarded during this time

**2018**

**2019**

**2020**
- **October 2020**: NAVSUP awards Global MAC to 32 companies
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FY Cost Model vs Global Cost Model

Total Port Visit Cost over Time

[Graph showing the comparison of Total Port Visit Cost over time between FY Cost Model and Global Cost Model for different years from 2010 to 2020.]