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Applying Economic Theory to Cost Recovery in DoD Working Capital Funds

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Objective

- Our objective is to recommend a cost recovery structure for Working Capital Funds to incentivize customers to make decisions in peacetime that are consistent with the wartime outcomes that our customer needs to achieve
- Our analysis assumes that this government organization wants to retain a Working Capital fund construct for cost recovery

Today's discussion

1. Supply, demand, and readiness considerations

2. Cost recovery best practices review

3. Analysis of cost recovery

4. Recommendations for cost recovery

Customers face choices, some aim for lowest cost solutions, while others aim for best service

- Short Term
 - How far in advance to request
 - Amount
 - Business system selected to enter the requirement
 - Additional services
 - Can reject the option the government provides and not use the services or try later with different parameters
- Long Term can change what equipment they procure and how it is supported
- Some customers have more elastic demand than others

Customers have only partial control as the government may override their preferences to meet goals, hard to control costs

Cost recovery approach can be designed to support government wartime readiness

- Working capital fund cost recovery can be structured to support readiness demands by driving activities that support readiness into the working capital fund
- This analysis examines cost recovery today, including readiness, and recommends refinements to better align customer decisions with wartime mission
- The government will still need to fully recover costs using rates and other billing mechanisms

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Business literature offers insights on the use of Working Capital Funds (WCF) in the commercial sector

- In the commercial sector, WCF are designed to optimize the allocation of resources within organizations with decentralized decisionmaking
 - Prices are set to provide incentives for internal customers to make decisions that support enterprise objectives
 - Customers are able to make decisions about when, where, and how they meet their requirement
 - WCF organizations do not typically provide service to external organizations and therefore do not fully recover costs through rates
- Two-part cost recovery is a commercial best practice
 - Prices reflect the costs customers impose on the system
 - Other costs are recovered separately from rates through fixed fees

Commercial example of WCF

- An organization has several business units that all use a common internal print shop
 - Rates are designed to incentivize customers to make printing decisions that reduce costs for the organization as a whole
- Business units are charged for what is required to fulfill specific orders (materials, labor hours, etc.)
 - In many cases the print shop would be cheaper than outside commercial options, saving the organization money
 - If the print shop is not cheaper—e.g., for infrequent or specialty tasks—business areas utilize outside printing
- Other costs required to maintain the print shop are recovered separately
 - For example, through a budget for the printing department or fees charged to each business unit based on the prior years usage
 - Cost recovery approach designed to facilitate periodic re-evaluation of the need for an internal capability

The government needs a cost recovery approach that supports readiness but recognizes it differs from a business

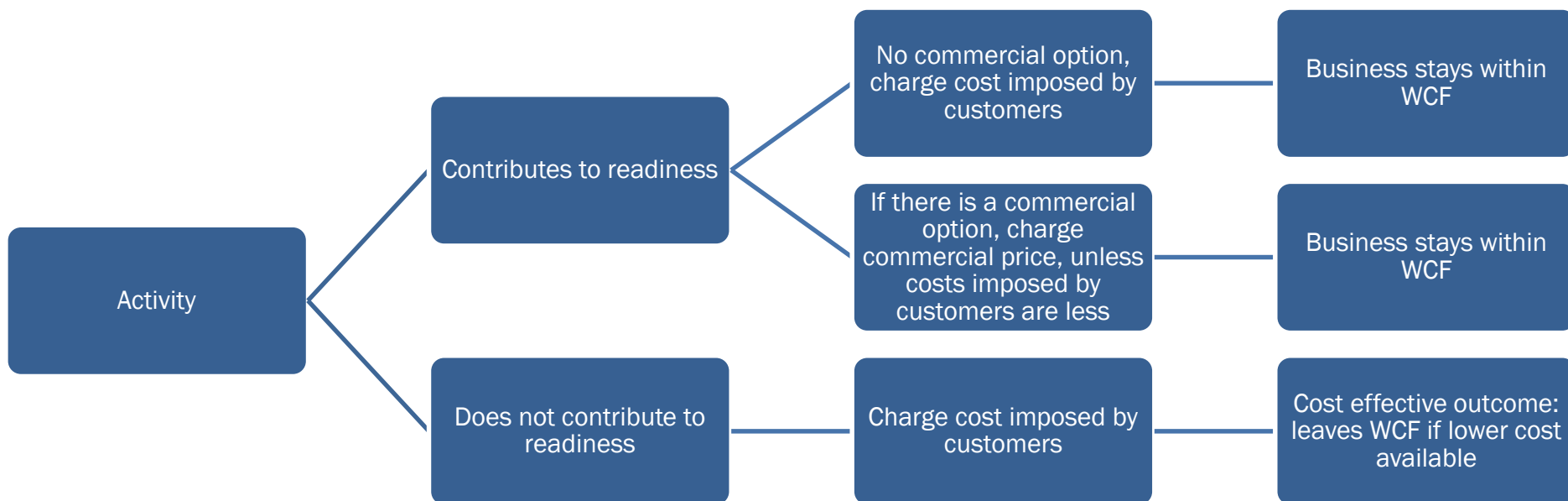
- Rate structure and operational concerns drive customer behavior
- Structure of rates should incentivize customers to make decisions in peacetime that support the wartime mission
- Readiness and other costs will be recovered through a combination of rates and other billing mechanisms (non-rate revenue)

Applying the literature to the government

- When customer demands contribute to achieving readiness, rates should encourage customers to keep these orders in the WCF
- Wartime mission requires some services to stay within government provision in peacetime even if the cost is higher; in these cases rates should lead customers to choose the government service
- When customer demands provide minimal contribution to readiness and may tax the organic capacity, rates should lead customers to make cost effective decisions
- Customers are more likely to see rates as “reasonable” when they understand which costs are included
- Additional costs should be recovered/ subsidized through non-rate mechanisms

Customer decisions drive part of readiness

Recommended cost recovery approach



Fixed costs and shortfalls from commercial pricing are recovered by other mechanisms

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We examine cost recovery today to see how close this is to the recommended approach

1. Identify which WCF costs are recovered through rates vs. non-rate revenue today based on FY16 budget data
2. Assess which cost categories vary with customer activity
3. Assess how well current cost recovery aligns with costs that vary

We examine cost recovery today to see how close this is to the recommended approach

1. Identify which WCF costs are recovered through rates vs. non-rate revenue today based on FY16 budget data
 - Today, overall WCF recovers 81% of costs through rate revenues
 - Percent varies by service area
 - Area A is 82%
 - Area B is 85%
 - Area C is 69%
2. Assess which cost categories vary with customer activity
3. Assess how well current cost recovery aligns with costs that vary

WCF tracks budget and workload in annual financial documents

- There is one for each service area
- Drills down on budgeted and actual cost by business area
- Also breaks down cost by elements including
 - Personnel
 - Fuel
 - Supplies
 - Contract Costs
 - Maintenance
 - Travel
 - Depreciation
 - General and Administrative
 - Information Systems
 - Facilities

We used two complementary approaches to identify which costs vary with customer activity

- **SME input:** Budget and Cost staff categorized each cost category
 - Fixed cost: does not vary with customer demand
 - Variable cost: varies with customer demand
 - Partial variable cost: includes some variable and some fixed costs
 - Focuses on cost categories rather than business area
- **Data Analysis:** Statistical analysis of budget data
 - Historical cost data and measures of workload from FY06–FY17 for service areas
 - A cost category/line of business combination is deemed to vary if the combination is significantly correlated with any of the actual activity measures
 - Limitation: Some fixed costs may be apportioned by workload and thus may appear to vary with activity measures (e.g., civilian personnel costs)

Results of SME Input and data analysis were quite close for most categories

Initial observed variation of cost with workload

Costs	Area 1	Area 2	Area 3	Area 4	Area 5
COMMERCIAL	\$ 216.2	\$ 258.1	\$ 352.0	\$ 30.2	\$ -
CONTRACTOR LOGISTIC SUPPORT	\$ 6.9	\$ 146.9	\$ 452.5	\$ 11.1	\$ 226.4
POL	\$ 0.2	\$ 113.9	\$ 413.8	\$ 8.9	\$ 183.1
MILITARY	\$ -	\$ 281.0	\$ 250.6	\$ 10.8	\$ -
GENERAL & ADMIN	\$ 15.1	\$ 60.9	\$ 127.7	\$ 4.6	\$ 35.5
CIVILIAN PERSONNEL	\$ 17.6	\$ 69.5	\$ 59.9	\$ 1.4	\$ 21.8
OTHER	\$ 27.9	\$ 95.8	\$ 32.6	\$ 0.6	\$ 12.3
ADPE	\$ 9.1	\$ 36.7	\$ 76.9	\$ 2.8	\$ 21.3
DEPOT LEVEL REP	\$ -	\$ 18.0	\$ 67.6	\$ 0.8	\$ 17.7
SUPPLIES/EQUIP	\$ 3.7	\$ 26.1	\$ 54.7	\$ 0.7	\$ 15.1
FACILITY MAINTENANCE/UTILITIES	\$ 7.3	\$ 29.4	\$ 23.9	\$ 0.4	\$ 8.7
DEPRECIATION	\$ 3.9	\$ 15.7	\$ 32.9	\$ 1.2	\$ 9.1
TRAVEL	\$ 3.2	\$ 16.3	\$ 30.3	\$ 0.8	\$ 10.6

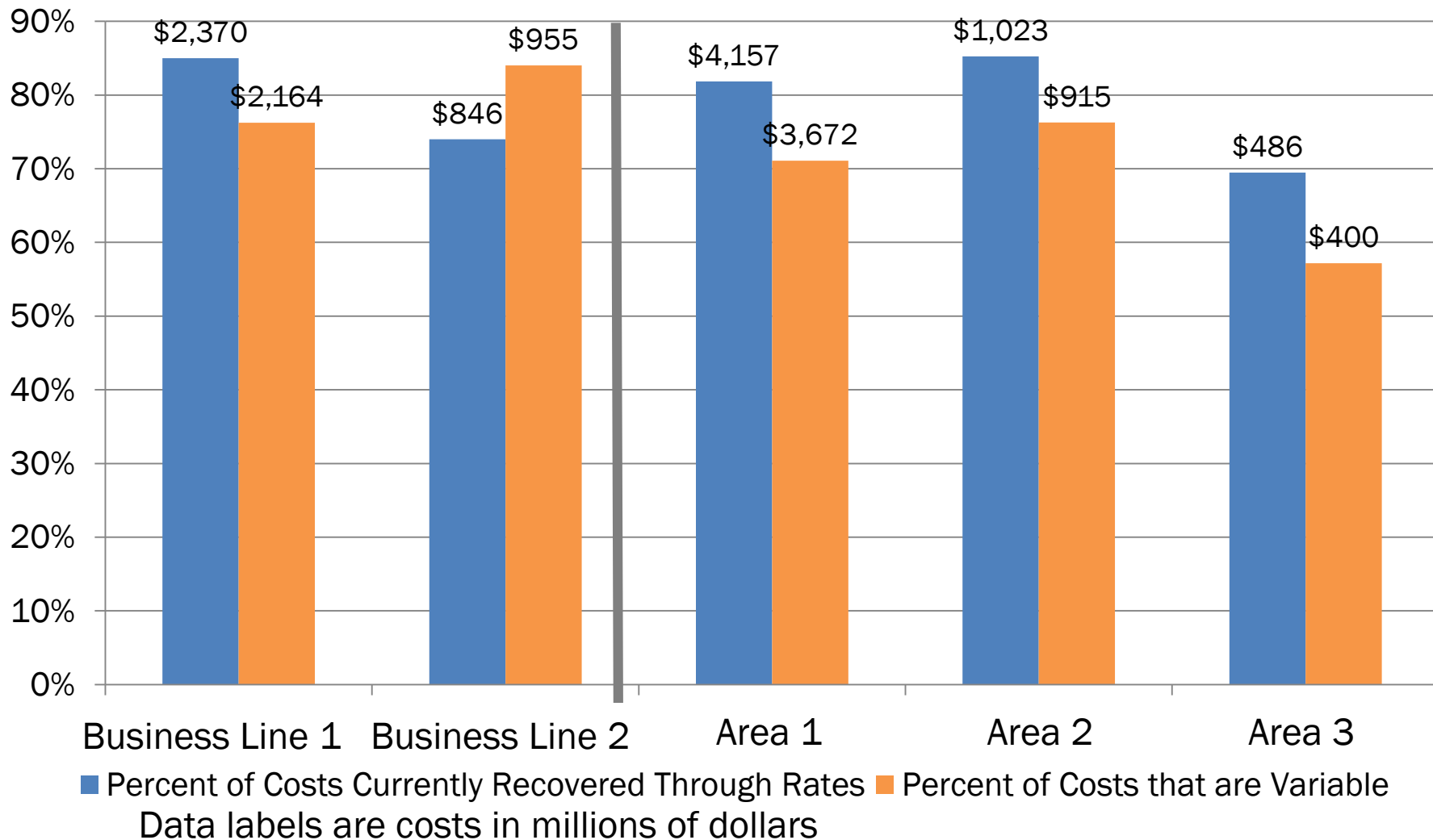
Workload metrics are imperfect
measures of variability
Total Dollars Recovered through
rates shown

Example: SME assessment is similar to results of correlation analysis

Cost Category	SME	Correlation	Difference
CIVILIAN PERSONNEL	Fixed	Variable	Yes because of allocation
COMMERCIAL	Variable	Variable	
CONTRACTOR LOGISTIC SUPPORT	Partial	Fixed	
DEPOT LEVEL REP	Variable	Variable	
DEPOT MAINT	Fixed	Variable	Yes
DEPRECIATION	Fixed	Variable	Yes
FACILITY MAINTENANCE/UTILITIES	Fixed	Variable	Yes, likely because of allocation
GENERAL & ADMIN	Fixed	Variable	Yes, likely because of allocation
MILITARY	Variable	Variable	
OTHER	Partial	Variable	
SUPPLIES/EQUIP	Partial	Variable	
TRAVEL	Partial	Fixed	

Analysis suggests that current revenue from rates tends to exceed the costs that vary with workload

Percentage of Costs Recovered Via Rates



Current Cost Recovery and Data Analysis Provide a Path Forward

- Customers respond to the rates they see; this is the primary cost information they have when making decisions
- The differences between cost recovery from rates today and variable costs indicate it is possible to change rates to better support the wartime mission

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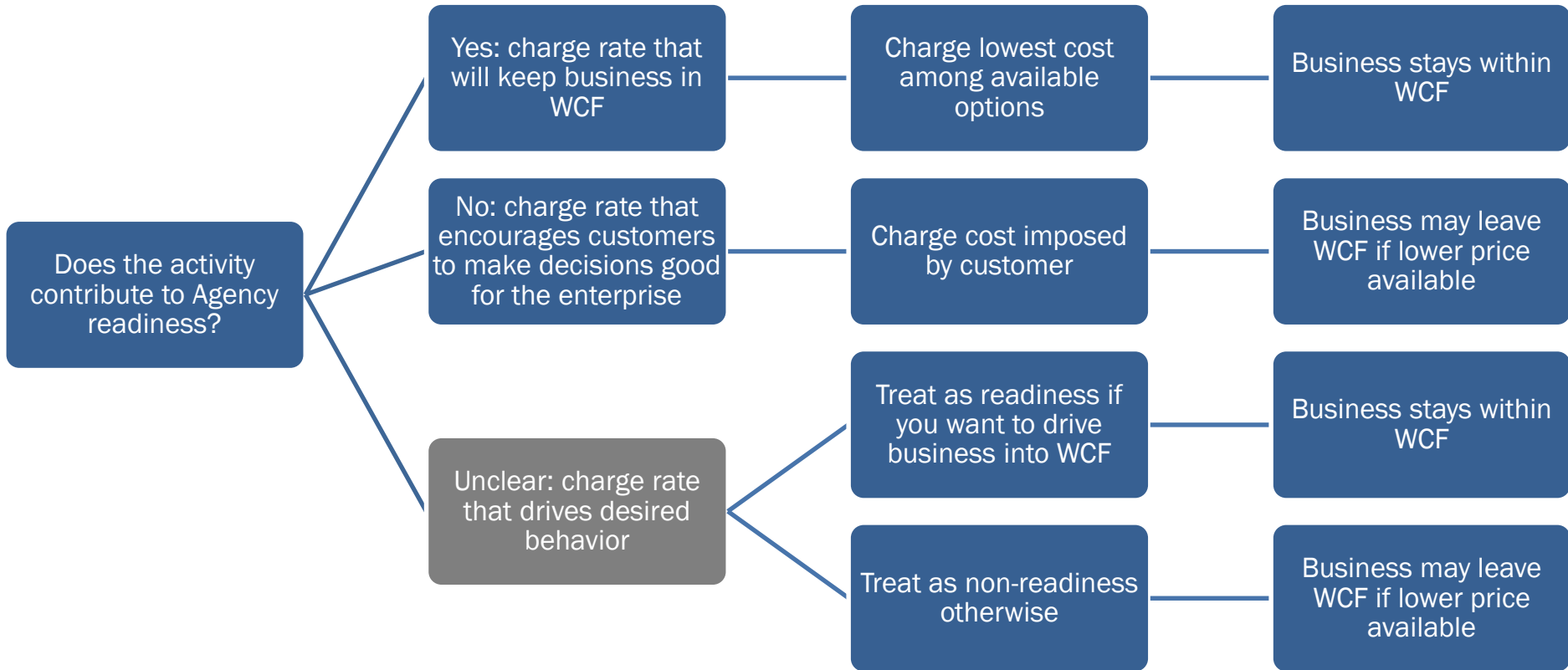
We recommend two actions to tailor WCF cost recovery to better align customer decisions with wartime mission

1. Recover fixed costs through non-rate mechanisms, rather than through rates
2. Construct rates to reflect customer effect on readiness
 - Incentivize customers to keep activities that support readiness in WCF; make cost effective decisions otherwise

Recover fixed costs through non-rate mechanisms

- Some cost categories are fixed, therefore recover through non-rate mechanisms e.g.
 - Business systems
 - Civilian personnel
 - Depreciation
 - G&A
- Partially fixed costs should be partially apportioned to the rates and the remainder recovered through other mechanisms
 - For instance, supplies and equipment
- Finally, variable costs like direct contracts should be recovered solely through the rates
- This approach gives customers more insight into what they are, and are not, paying for in the rates

Where possible, structure rates by contributions to readiness



Example gray area: may want to keep business in WCF to address industrial base concerns

Fixed costs and shortfalls from lowest cost pricing are recovered through non-rate mechanisms

Non-rate cost recovery options have strengths and weaknesses

	Service Level Bills	Readiness Accounts	Appropriations
Predictability	Orange	Red	Green
Flexibility	Orange	Green	Red
Transparency	Green	Red	Orange
Negotiate level of service	Green	Orange	Red
	<ul style="list-style-type: none"> • Gives WCF manager an opportunity to describe what services are being provided to customers • Can facilitate a discussion of the level of service being provided 	<ul style="list-style-type: none"> • Provides flexibility in level of funding from year to year • Service must accept risk given workload uncertainty 	<ul style="list-style-type: none"> • Facilitates advance planning • Difficult to modify on short notice and can be inflexible to changing circumstances

Cost recovery recommendations suggest that G&A costs should be recovered outside of rates

- General and Administrative (G&A) expenses are by definition operating expenses that cannot be directly related to the production of services
 - They typically involve overhead expenses like command staff
- Therefore, we recommend that rates exclude G&A and that these costs be recovered separately
- Likely requires updates to the Financial Management Regulation
 - Title 10 indicates “applicable administrative expenses” should be included in rates, but there is flexibility if attributed to readiness
 - However, FMR is less flexible and indicates rates should include G&A
- Because G&A costs are predictable and do not rely directly on level of service, a direct appropriation to the agency may be preferred

Implementing recommendations will require changes to business processes and regulations

- Need the ability to track more detailed costs and contributions to readiness
 - Ensure rates reflect the costs that customers impose on the system
 - This will require unblending rates
- Assess potential regulatory changes



Discussion

Literature identified to date (1)

- Pricing Theory

- Aktas et al. 2015: “Is working capital management value-enhancing? Evidence from firm performance and investments.” *Journal of Corporate Finance*.
- Bergemann et al. 2014: “The Limits of Price Discrimination” Princeton University- Economic Theory Center
- Che and Schwartz 2015: “Differential pricing when costs differ: a welfare analysis” *RAND Journal of Economics*
- Cooper and Kaplan. 1991: “Profit Priorities from Activity-Based Costing” *Harvard Business Review*
- Eccles and White. 1988 “Price and authority in inter-profit center transactions,” *American Journal of Sociology*
- Hausman, J. and J. Mackie-Mason. 1988. “Price Discrimination and Patent Policy,” *RAND Journal of Economics*
- Hirshleifer 1956. “On the economics of transfer pricing” *The Journal of Business*
- Katz, M. 1983. “Nonuniform Pricing, Output and Welfare under Monopoly,” *Review of Economic Studies*
- Spence A. 1977. “Nonlinear Prices and Welfare,” *Journal of Public Economics*
- Williamson, Oliver E.: 1979 “Transaction-Cost Economics: The Governance of Contractual Relations.” *The Journal of Law and Economics*
- Varian, H. 1985. “Price Discrimination and Social Welfare.” *American Economic Review*

- Transfer Pricing in the DoD

- Byrnes, Patricia E. 1993. “Defense Business Operating Fund: Description and Implementation Issues.” *Public Budgeting & Finance*
- Rogerson, William , P. *On the Use of Transfer Pricing Within DoD*, PA303RD1, Logistics Management Institute, McLean, VA, March 1995
- Thompson, Fred. 1991. *Management Control and the Pentagon: The Organizational Strategy-Structure Mismatch*. *Public Administration Review* 5 1(1): 52-66.

Literature identified to date (2)

- Prior RAND research
 - Laura H. Baldwin and Glenn A. Gotz, *Transfer Pricing for Air Force Depot-Level Repairables*, Santa Monica, Calif.: RAND Corporation, MR-808-AF, 1998
 - Marygail Brauner et al., *Dollars and Sense: A Process Improvement Approach to Logistics Financial Management*, Santa Monica, Calif.: RAND Corporation, MR-1131-A, 2000; Edward G. Keating and Daniel Sommerhauser, *Funding Ammunition Ports*, Santa Monica, Calif.: RAND Corporation, TR-1204-A, 2012
 - Frank Camm and H.L. Shulman, *When Internal Transfer Prices and Costs Differ: How Stock Funding of Depot-Level Repairables Affects Decision Making in the Air Force*, Santa Monica, Calif.: RAND Corporation, MR-307-AF, 1993
 - Edward G. Keating and Susan M. Gates, *Defense Working Capital Fund Pricing Policies: Insights from the Defense Finance and Accounting Service*, Santa Monica, Calif.: RAND Corporation, MR-1066-DFAS, 1999
 - Keating et al., *Improving the Defense Finance and Accounting Service's Interactions with Its Customers*, Santa Monica, Calif.: RAND Corporation, MR-1261-DFAS, 2001
 - Keating et al., *Challenges in Defense Working Capital Fund Pricing: Analysis of the Defense Finance and Accounting Service*, Santa Monica, Calif.: RAND Corporation, MR-1597-DFAS, 2003
 - Keating et al., *Defense Working Capital Fund Pricing in the Defense Finance and Accounting Service: A Useful, but Limited, Tool*, Santa Monica, Calif.: RAND Corporation, RR-866-OSD, 2015