

Assessing the Reliability of the Future Years Defense Program (FYDP) and Building a Forecast

Panel #12: Following the Money in Defense Acquisition

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Project Director: Andrew Hunter, Director Defense-Industrial Initiative Group (DIIG) and Senior Fellow

Author: Gregory Sanders, John Severini

Address: 1616 Rhode Island Ave., NW, Washington, DC 20036;

Phone: 202-741-3916;

Email: gsanders@csis.org.

Contributing Authors: Chitrakshi Bhardwaj, Gabriel Coll, Cuong Nguyen, Gerhard Ottehenning

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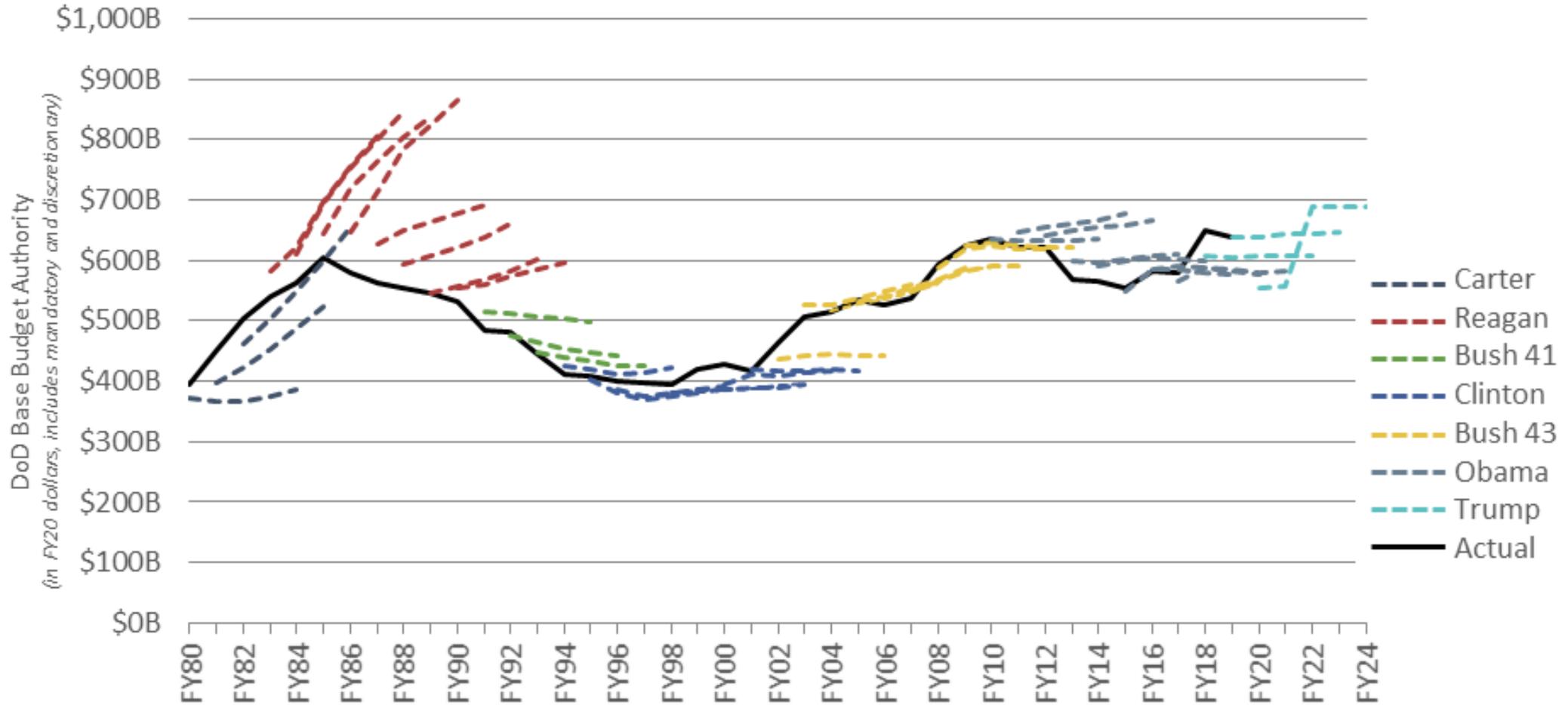
What is the FYDP? Why does it matter?

- Discerning, negotiating, and communicating priorities are necessary tasks for the U.S. defense acquisition system to implement its portion of the National Defense Strategy effectively.
- One of the Department of Defense's (DoD) central tools for doing so is the Future Years Defense Plan (FYDP), a projection of the cost and composition of the force over the next five years.
- Annually updated and submitted as part of the President's Budget (PB), the FYDP, especially for investment accounts, provides insights into DoD's priorities and future expectations.

This presentation answers the following questions:

- How reliable are investment FYDP projections as an indicator for actual spending?
- How does reliability compare across base-budget exclusive and Other Contingency Operation (OCO)-related budget lines?
- How does projection reliability vary across the Military Departments?

Historical Topline FYDP Estimates

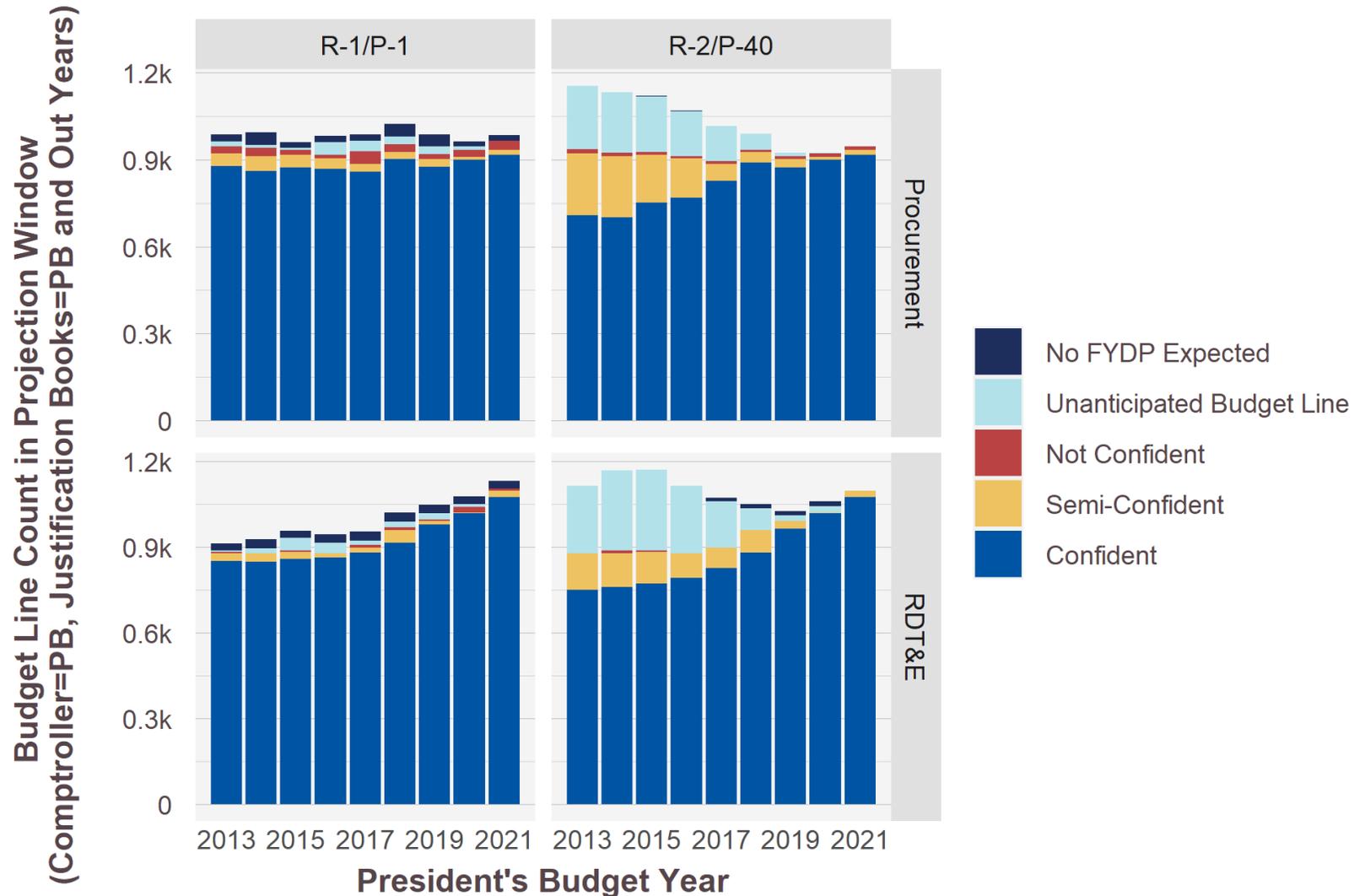


Source: Harrison and Daniels, 2020, pp. 11

How good is the data quality?

Research Development Testing & Evaluation (RDT&E)

- We created a dataset drawing from the justification books (the R-2s and P-40s).
- We cross checked using comptroller documents (R-1, P-1s)
- There were disagreements we were not able to resolve, so we labeled data based on confidence.
- Confusion comes in from dozens of lines starting and ending each year, some of transfers.
- Procurement has more disagreements due to advanced procurement misalignments.



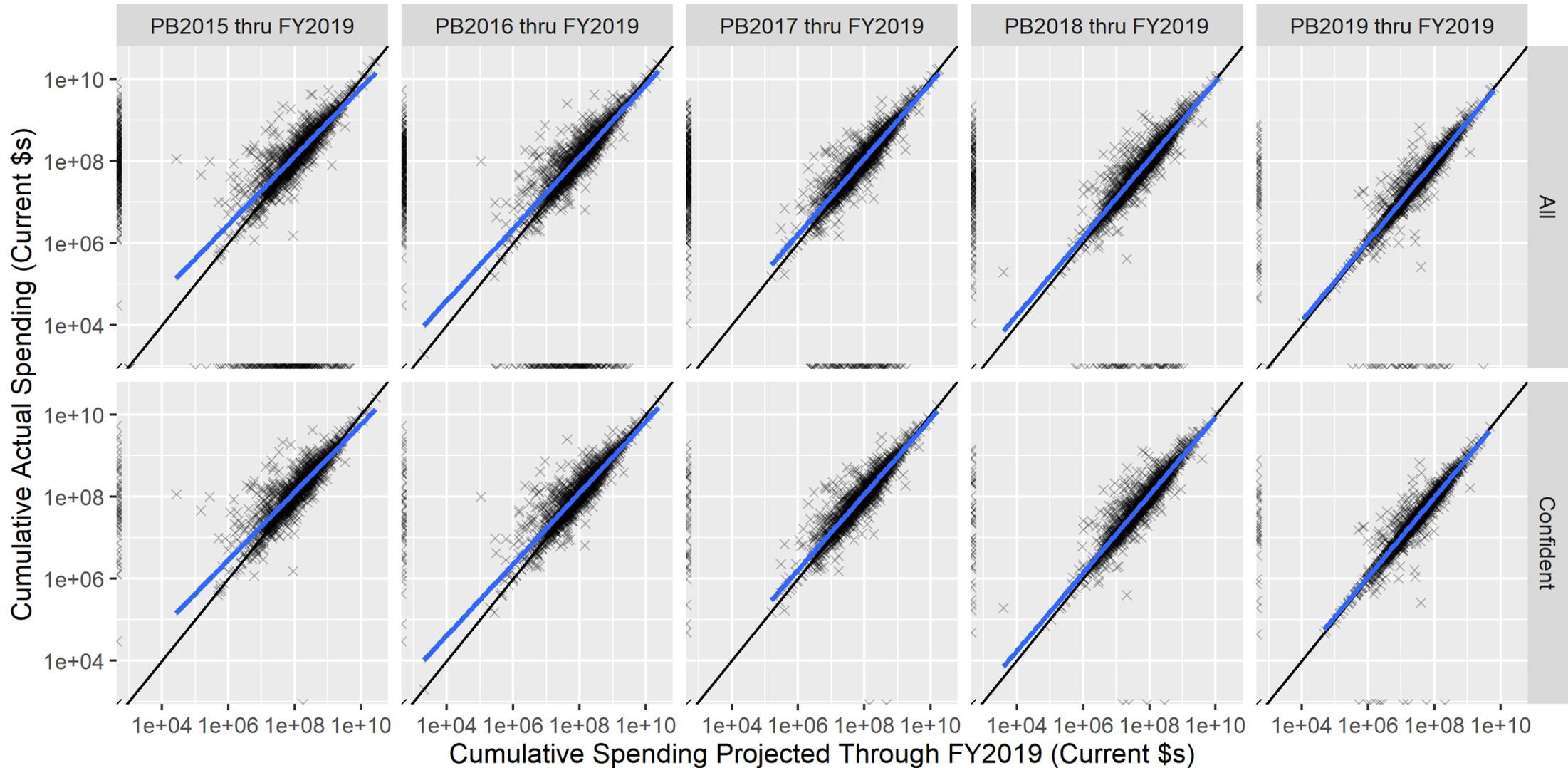
Source: R-1s, R-2s, CSIS Analysis

How we measure reliability

- The FYDP projects five years forward, starting with the President’s Budget (PB), and looks two years back to report actual spending.
- This paper compares cumulative spending, so for example looking at the 2nd year of the FYDP would compare two years of projections from PB2018 to actual spending reported across the PB2020 and PB 2021 budget. We include OCO in the PB projections.

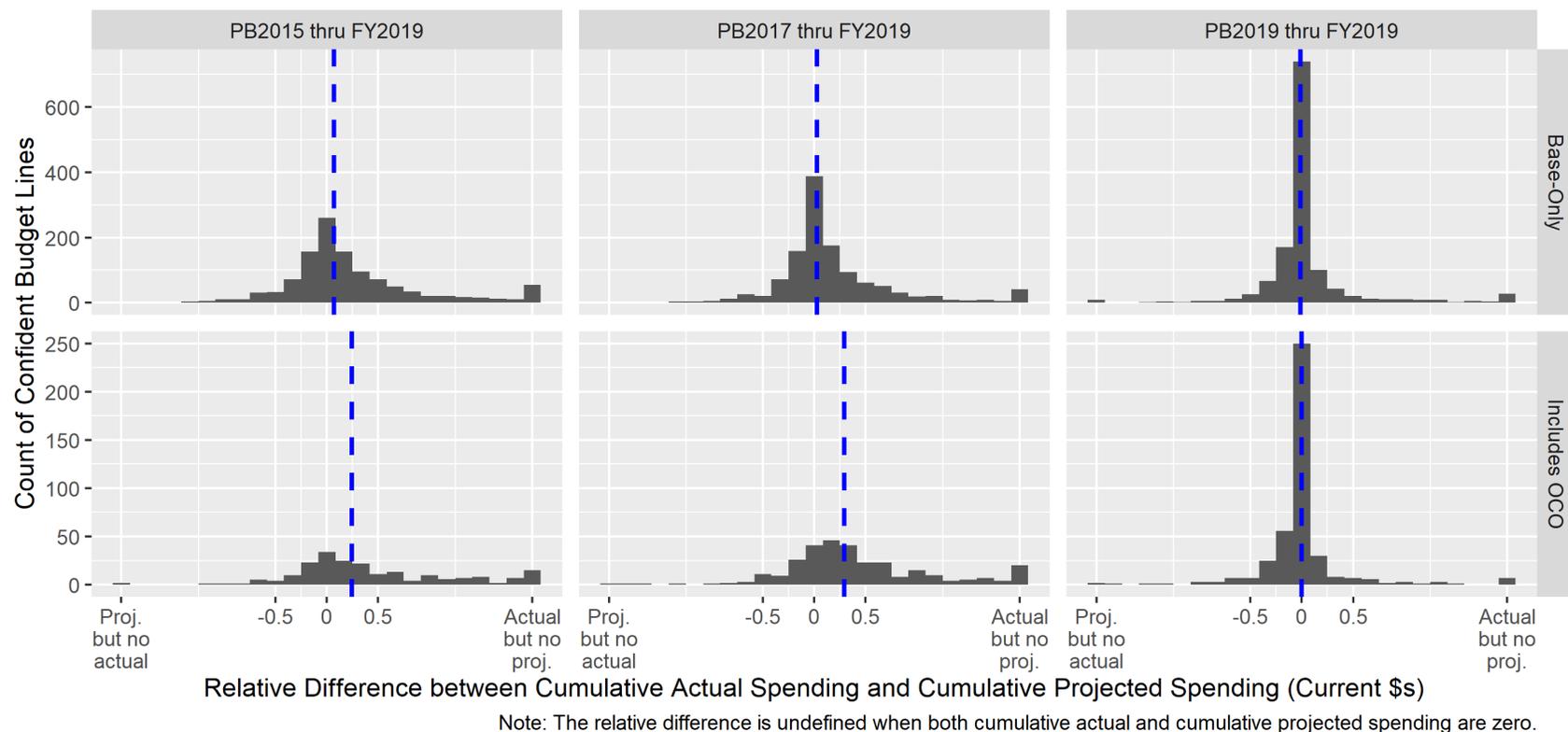
FYDP Reporting Year	Budget Request (Available in P-1s, P-40s, R-1s, and R-2s)			Out Years (FYDP Exclusive, available in P-40s and R-2s)			
	Actual Spending (PB-2)	Enacted Budget (PB-1)	President’s Budget (PB)	2 nd Year of FYDP (PB+1)	3 rd Year of FYDP (PB+2)	4 th Year of FYDP (PB+3)	5 th Year of FYDP (PB+4)
PB18	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
PB19	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	
PB20	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022		
PB21	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025

FYDP Projections strongly correlate with actual spending

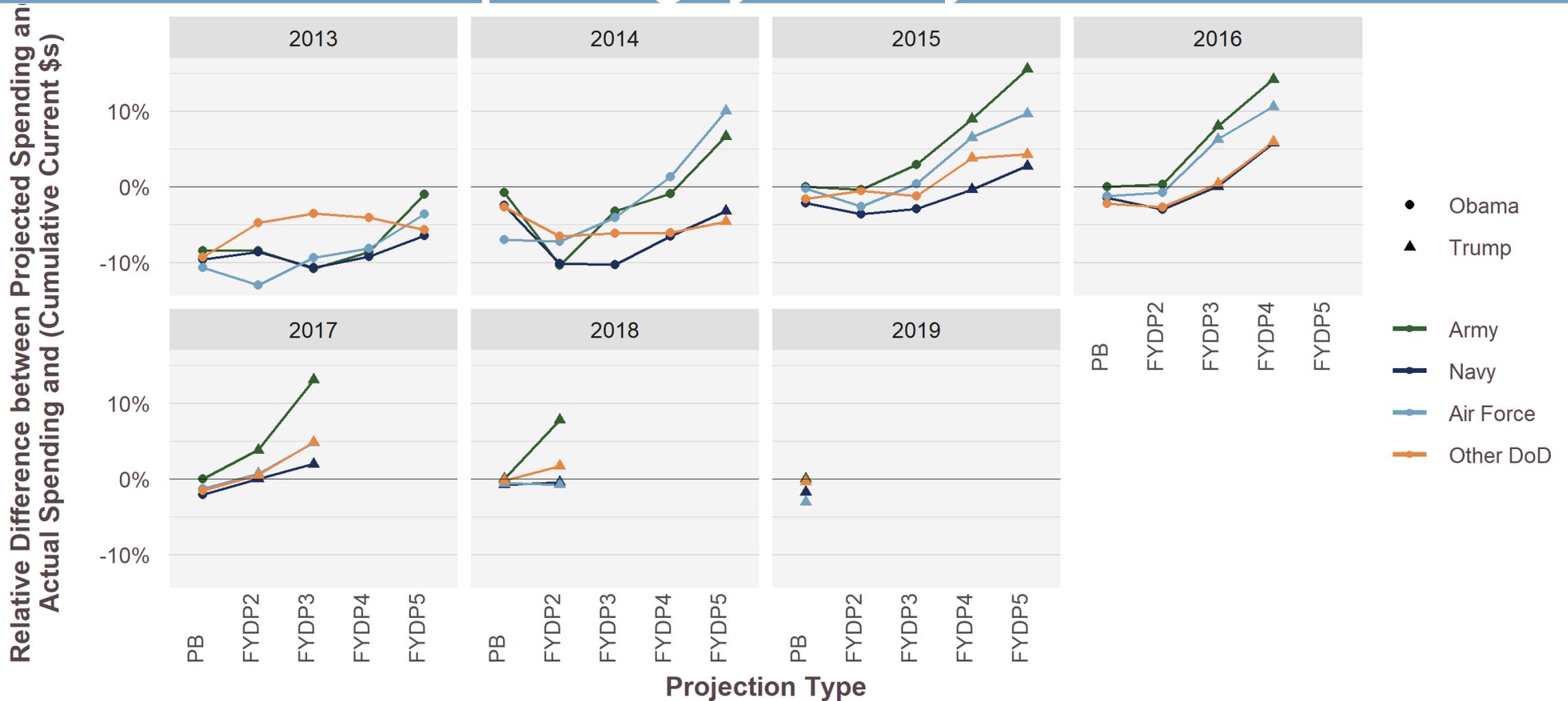


Base versus OCO-related budget lines

- OCO-related budget lines shows wider distributions than base-only lines.
- The dashed blue line shows the median change. We'll compare these medians across different budget categories.



Median relative difference between projections and actual spending by military service



Note: The relative difference is undefined when both cumulative actual and cumulative projected spending are zero.

Multivariate Regression Model

- To examine interaction of multiple factors, we created regression models of two-year FYDP in the very different PB2013 capped and PB2018 growth environment.
- The reliability of projections was dramatically improved by first estimated if a budget line would be funded and separately estimating funded lines with projections of no spending.



John Roth and Gen. Anthony R. Ierardi brief reporters on the PB 2018.
Image Source: Jim Garamone, 2017 May 23. VIRIN: 170523-D-FB314-001

Does the reliability of projection vary systematically between DoD components and between base and OCO lines?

- The Army often has the largest medians, though it is only significantly different from Navy in the PB2018 Base model. Army OCO spending is more prevalent, but less distinct from other services.
- Other DoD was most accurate in the PB2013 2nd outyear median measure and prove significantly different from the Navy in the PB2013 Base model.
- The differences between base and OCO-relevant budget lines are more robust, medians are typically greater magnitude (negative in PB2013) and OCO models are more uncertain.



Image Source: Woodward, F.M. and Arthur, D. (2019 Aug). "Long-Term Implications of the 2020 Future Years Defense Program." CBO: 1.

Conclusions and Recommendations

- For all the flaws, even the outyear FYDP projections highly correlated with actual spending.
- There is significantly greater variation between projections and actual spend for budget lines that include OCO spending.
- Starting and ending budget lines significantly complicate modeling. Better unique identifiers and higher level analysis using public strategically relevant lexicons would aid analysis and debate.
- OCO adds flexibility to the FYDP, but its inherent uncertainty undermines its ability to communicate lasting priorities. Other mechanisms, like portfolio reserve funds, could help.
- Contact us for open access to the underlying unclassified FYDP dataset.

Regression Model

Estimating Actual 2013-2014 and 2018-2019 Spending				
	2013 Base	2018 Base	2013 OCO	2018 OCO
(Intercept)	0.27*	0.44***	0.10	0.32
	(0.10)	(0.09)	(0.33)	(0.27)
log(Cumulative Base + 1)	0.95***	0.94***		
	(0.01)	(0.01)		
log(Cumulative Base + OCO + 1)			0.97***	0.97***
			(0.03)	(0.02)
log(Actual_Total+1)	0.02**	0.02***	0.01	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
No FYDP2 Base	-0.02	0.37***	0.30	0.60***
	(0.08)	(0.09)	(0.17)	(0.12)
Any Enacted OCO			-0.06	0.15
			(0.12)	(0.08)
Military Dept (compared to Navy)				
Army	-0.01	0.14***	-0.05	0.13
	(0.04)	(0.04)	(0.09)	(0.08)
Air Force	-0.08	0.00	-0.03	-0.04
	(0.04)	(0.04)	(0.10)	(0.09)
Other DoD	0.10*	0.08	0.18	0.22
	(0.05)	(0.04)	(0.16)	(0.12)
R²	0.92	0.92	0.85	0.86
Adj. R²	0.92	0.92	0.84	0.86
Num. obs.	997	1222	261	364

*** p < 0.001; ** p < 0.01; * p < 0.05; · p < 0.1.