



Measuring Service Contract Performance
Panel #20 - Contract Management Challenges
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Research Question

The research project seeks to answer the following questions:

- Under what circumstances are services contracts likely to succeed or fail, as measured by terminations, cost ceiling breaches, and the exercising of options?
- What services contracting policy choices influence these outcomes, for better or worse?

Output Measures:

- Contract Terminations (Yes/No)
- Ceiling Breaches (Yes/No)
- Growth due to exercised options (base value = 100)

Hypotheses

H₁: As service complexity increases (decreases), the likelihood of cost ceiling breaches and terminations increases (decreases) and the likelihood of exercised options decreases (increases)

H₂: As a contracting office's contract management capacity increases (decreases), the likelihood of cost ceiling breaches and terminations decreases (increases)

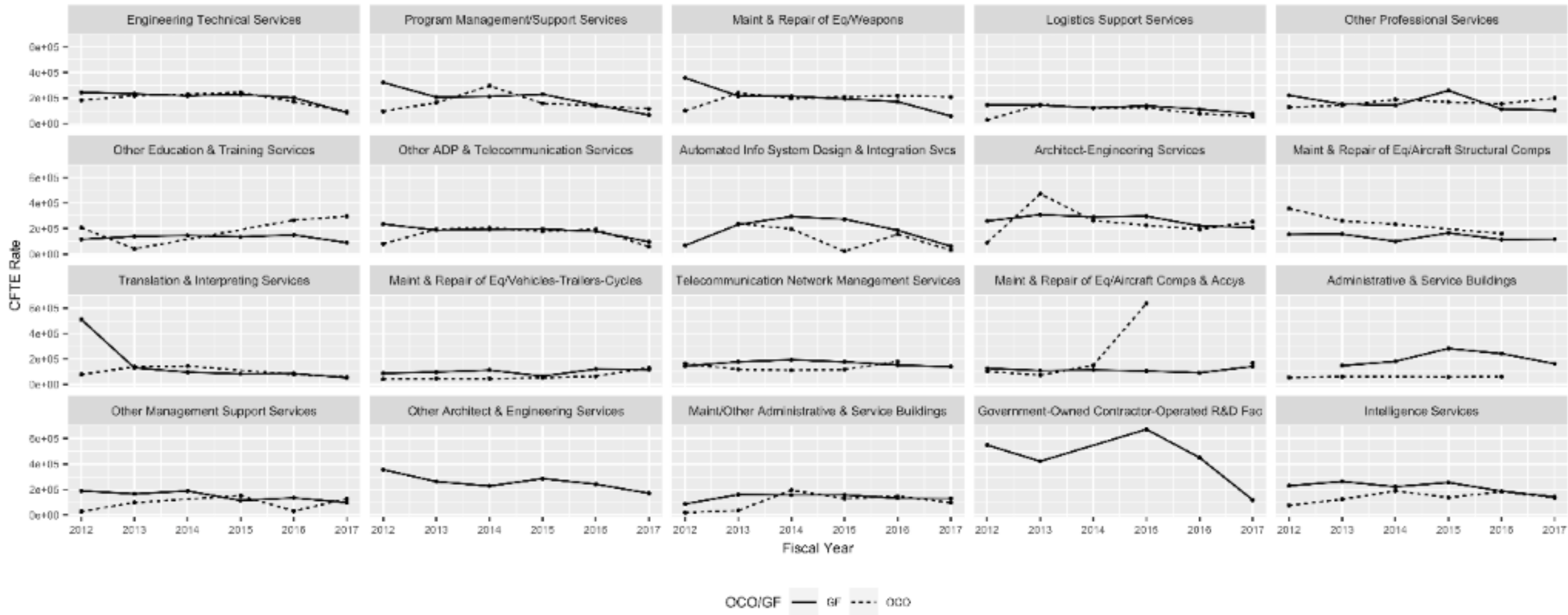
H₃: As the extent of the government's prior relationship with its vendor increases (decreases), the likelihood of cost ceiling breaches and terminations for that partnership decreases (increases).

H1: Service Complexity

H_{1A}: As average salary increases (decreases), the likelihood of cost ceiling breaches and terminations increases (decreases) and the likelihood of exercised options decreases (increases)

H_{1B}: As average cost per employee increases (decreases), the likelihood of cost ceiling breaches and terminations increases (decreases) and the likelihood of exercised options decreases (increases)

Services Contract Inventory



H2: Contracting Office Capacity

H_{2A}: As contract office usage of performance-based services acquisition increases (decreases), the likelihood of cost ceiling breaches and terminations decreases (increases) and the likelihood of exercised options increases (decreases)

H_{2B}: As the share of contracting office obligations for a given service code increases (decreases), the likelihood of cost ceiling breaches and terminations decreases (increases) and the exercised options decrease (increase) for that service.

H3: Past Office-Vendor Relationship

H_{3A}: As the number of past years of a vendor has contracted with an office increases (decreases), the likelihood of cost ceiling breaches and terminations for that partnership decreases (increases).

H_{3B}: As the number of contract actions a vendor has performed for an office in the past year increases (decreases), the likelihood of cost ceiling breaches and terminations for that partnership decreases (increases).

Logit Bivariate Look at Study Variables and Ceiling Breaches

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(Intercept)	-2.82 (0.01) ^{***}	-2.82 (0.01) ^{***}	-2.81 (0.01) ^{***}	-2.86 (0.01) ^{***}	-2.81 (0.01) ^{***}	-2.81 (0.01) ^{***}	-2.88 (0.01) ^{***}	-2.95 (0.02) ^{***}
Services Complexity								
Log(Det. Ind. Salary)	0.21 (0.02) ^{***}						0.08 (0.02) ^{***}	-0.11 (0.03) ^{***}
Log(Service Invoice Rate)		0.22 (0.02) ^{***}					0.19 (0.02) ^{***}	0.12 (0.02) ^{***}
Office Capacity								
Office Perf.-Based %			0.19 (0.02) ^{***}				-0.15 (0.02) ^{***}	-0.17 (0.02) ^{***}
Office Service Exp. %				0.70 (0.01) ^{***}			0.83 (0.02) ^{***}	1.04 (0.02) ^{***}
Past Relationship								
Paired Years					-0.10 (0.02) ^{***}		-0.15 (0.02) ^{***}	0.01 (0.02)
Log(Paired Actions)						0.13 (0.02) ^{***}	-0.17 (0.02) ^{***}	0.07 (0.03) [*]
AIC	108725.01	108706.55	108741.52	106534.77	108834.82	108807.65	106110.50	100984.93
BIC	108745.87	108727.41	108762.38	106555.63	108855.67	108828.51	106183.50	101308.24
Log Likelihood	-54360.50	-54351.27	-54368.76	-53265.38	-54415.41	-54401.83	-53048.25	-50461.47
Deviance	108721.01	108702.55	108737.52	106530.77	108830.82	108803.65	106096.50	100922.93
Num. obs.	250000	250000	250000	250000	250000	250000	250000	250000

***p < 0.001, **p < 0.01, *p < 0.05, †p < 0.1. Numerical inputs are rescaled.

Logit Bivariate Look at Study Variables and Terminations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(Intercept)	-4.02 (0.02) ^{***}	-4.02 (0.02) ^{***}	-4.03 (0.02) ^{***}	-4.04 (0.02) ^{***}	-4.02 (0.02) ^{***}	-4.03 (0.02) ^{***}	-4.05 (0.02) ^{***}	-4.11 (0.04) ^{***}
Services Complexity								
Log(Det. Ind. Salary)	0.02 (0.03)						-0.10 (0.04) ^{**}	-0.01 (0.04)
Log(Service Invoice Rate)		0.02 (0.03)					0.07 (0.03) [*]	0.00 (0.03)
Office Capacity								
Office Perf.-Based %			0.19 (0.03) ^{***}				0.02 (0.03)	-0.15 (0.04) ^{***}
Office Service Exp. %				0.41 (0.03) ^{***}			0.33 (0.03) ^{***}	0.86 (0.04) ^{***}
Past Relationship								
Paired Years					-0.07 (0.03) [*]		-0.25 (0.03) ^{***}	-0.10 (0.04) ^{**}
Log(Paired Actions)						0.34 (0.03) ^{***}	0.32 (0.03) ^{***}	0.63 (0.04) ^{***}
AIC	44268.44	44268.26	44229.55	44043.89	44263.71	44133.48	43950.94	39465.85
BIC	44289.30	44289.12	44250.41	44064.75	44284.57	44154.33	44023.95	39789.16
Log Likelihood	-22132.22	-22132.13	-22112.77	-22019.94	-22129.86	-22064.74	-21968.47	-19701.93
Deviance	44264.44	44264.26	44225.55	44039.89	44259.71	44129.48	43936.94	39403.85
Num. obs.	250000	250000	250000	250000	250000	250000	250000	250000

***p < 0.001, **p < 0.01, *p < 0.05, ·p < 0.1. Numerical inputs are rescaled.

Regression Bivariate Look at Study Variables and Log (Options Growth)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(Intercept)	0.65 (0.00) ^{***}	0.65 (0.00) ^{***}	0.65 (0.00) ^{***}	0.65 (0.00) ^{***}	0.64 (0.00) ^{***}	0.64 (0.00) ^{***}	0.64 (0.00) ^{***}	0.66 (0.01) ^{***}
Services Complexity								
Log(Det. Ind. Salary)	-0.10 (0.00) ^{***}						-0.05 (0.01) ^{***}	-0.00 (0.01)
Log(Service Invoice Rate)		-0.14 (0.01) ^{***}					-0.12 (0.01) ^{***}	-0.11 (0.01) ^{***}
Office Capacity								
Office Perf.-Based %			-0.05 (0.01) ^{***}				-0.03 (0.01) ^{***}	-0.02 (0.01) ^{***}
Office Service Exp. %				0.11 (0.01) ^{***}			0.28 (0.01) ^{***}	0.18 (0.01) ^{***}
Past Relationship								
Paired Years					-0.05 (0.00) ^{***}		-0.00 (0.01)	-0.01 (0.01)
Log(Paired Actions)						-0.04 (0.00) ^{***}	-0.13 (0.01) ^{***}	0.14 (0.01) ^{***}
AIC	155442.32	155194.86	155809.17	155519.24	155790.14	155800.22	153857.96	146285.15
BIC	155469.98	155222.52	155836.83	155546.90	155817.80	155827.88	153931.72	146580.19
Log Likelihood	-77718.16	-77594.43	-77901.58	-77756.62	-77892.07	-77897.11	-76920.98	-73110.58
Deviance	35085.49	34969.30	35258.43	35121.68	35249.44	35254.21	34343.64	31008.71
Num. obs.	74605	74605	74605	74605	74605	74605	74605	74605

^{***}p < 0.001, ^{**}p < 0.01, ^{*}p < 0.05, [·]p < 0.1. Numerical inputs are rescaled.