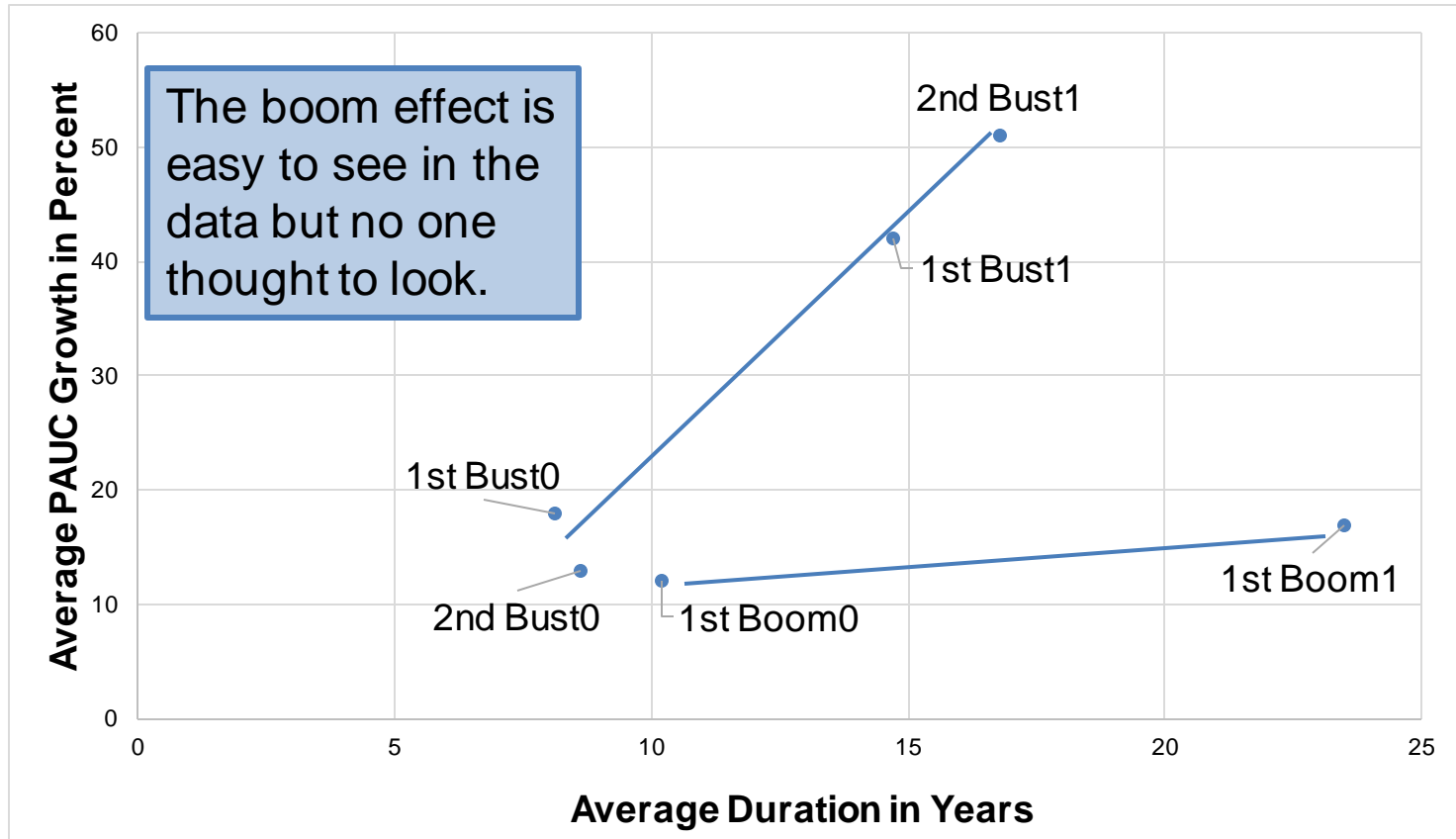


Further Evidence on Program Duration and Unit Cost Growth

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1st bust cycle: 1970–1980
 2nd bust cycle: 1987–2002
 1st boom cycle: 1981–1986

Bust0: Passed MS B in bust climate and completed in that climate
 Bust1: Passed MS B in a bust climate and subsequently entered a boom climate
 Boom0 and Boom1 similarly defined

- A RAND paper (Dews et al., 1979) found that the 1969 Packard reforms to DoD acquisition policy had reduced average PAUC growth.
- A later RAND paper (Drezner et al., 1993) argued that the reduction was due to a change in program duration, not acquisition policy.
- There the matter rested for about 25 years.
- An IDA paper (McNicol, 2017) added a complication; it showed that, for programs that passed MS B in a bust funding climate, those that later entered a boom climate had significantly higher cost growth than those that did not.

The problem:
Incorporate the boom effect into a statistical analysis of the clustering of quantity adjusted Program Acquisition Unit Cost (PAUC) growth.

Sources of Cost Growth Associated with Program Duration and the Boom Effect

- Duration
 - Errors of Execution
 - Requirements creep
 - Cost of stretches
 - Inaccurate inflation indexes

- Boom Effect
 - Program Growth: Capabilities added to programs that were austere at MS B.
 - Errors of Inception: Programs with unrealistic MS B baselines “get well;” i.e., capabilities shortfalls are turned into cost growth.

1. Include both a variable for duration and a variable for the boom effect.

Objection: Duration and the presence of a boom effect are likely to be highly correlated.

2. Use only a duration variable or only marker for boom effect or use principal components.

Objection: Hard to interpret results.

3. Use years in boom climates (T_{boom}) and years in bust climate (T_{bust}).

Rationale: Time spent in boom climates captures the boom effect. Rate of PAUC growth per year differs between bust and boom years.

Estimated Coefficients for a Model that Includes the Boom Effect and Program Duration

	Coefficients	p-value
\hat{a}_0 Intercept †	76.5%***	< 0.001
\hat{a}_1 DSARC	-57.5%***	< 0.001
\hat{a}_2 PCDSARC	-44.5%***	0.002
\hat{a}_3 DAB	-57.5%***	< 0.001
\hat{a}_4 AR	-83.1%***	< 0.001
\hat{a}_5 Climate	-40.2%***	< 0.001
\hat{a}_6 T_{boom}	4.2%/yr***	0.008
\hat{a}_7 T_{bust}	0.2%/yr	0.804

† McNamara-Clifford (FY 1965–FY 1969)

$$\begin{aligned}
 \text{PAUC}_i = & \mathbf{a}_0 + \mathbf{a}_1 \text{DSARC}_i + \mathbf{a}_2 \text{PCDSARC}_i + \mathbf{a}_3 \text{DAB}_i + \mathbf{a}_4 \text{AR}_i \\
 & + \mathbf{a}_5 \text{Climate}_i + \mathbf{a}_6 T_{boom,i} + \mathbf{a}_7 T_{bust,i} + \mathbf{e}_i
 \end{aligned}$$

CLIMATE, DSARC, PCDSARC, DAB, and AR are all zero/one categorical variables.

*** Statistically significant at less than the 1 percent level.

R-Square = 0.30 F = 8.471 (P < 0.001) N = 149.

Estimated using OLS. Boom2 programs and the three mid-1980s MDAPs acquired using TPP-like contracts are omitted.

With the Bonferroni correction, Wald's test for the equality of the estimated coefficients of the categorical variables for acquisition policy periods yields: F= 2.18, p = 0.3724.

- PAUC growth for an MDAP increases by an estimated 4.2%/yr. in boom climates but by much less in bust periods (0.2%/yr.) The coefficient for T_{boom} is statistically significant; that for T_{bust} is not.
 - There is a large (-40.2%) and statistically significant climate effect.
1. PAUC growth during the period following the 1969 Packard reforms (DSARC) was significantly less than that of McNamara-Clifford.
 2. This was true also of the other three acquisition policy periods.
 3. Changes in acquisition policy after the 1969 Packard reforms did not result in additional decreases in PAUC growth.

The 1969 Packard reforms were successful; they resulted in a reduction in PAUC growth, and that reduction persisted over the following 40+ years. Subsequent changes in acquisition policy did not, however, produce any further reduction in PAUC growth.