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Post Milestone B Funding Climate and Cost Growth in MDAPs

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Background

- This briefing is drawn from:

  David McNicol, Post Milestone B Funding Climate and Cost Growth In Major Defense Acquisition Programs, IDA Paper P-8091, March 2017.

- That paper extends results presented in:

  David McNicol and Linda Wu, “Evidence on the Effect of DoD Acquisition Policy and Process and Funding Climate on Cost Growth of Major Defense Acquisitions Programs,” IDA Paper P-5126, September 2014.

- Both papers were sponsored by the Director, Performance Assessments and Root Cause Analyses.

A pdf of the paper can be found at

https://www.ida.org//idamedia/Corporate/Files/Publications/IDA_Documents/CARD/2017/P-8091.ashx

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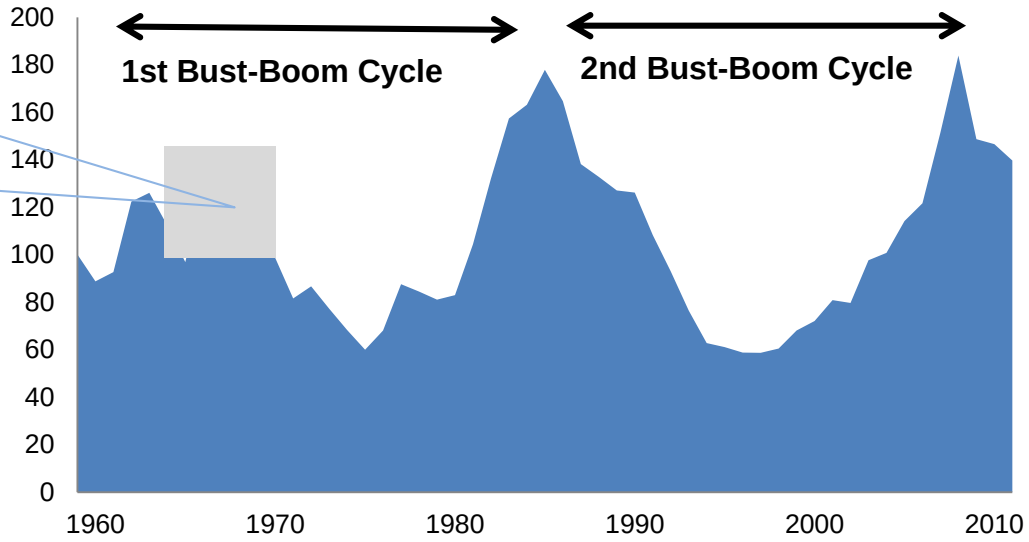
Budget Authority Appropriated for Procurement, FY 1960–FY 2010*

Procurement funding was high but much of it went to replace systems lost in combat



* In Billions of Constant FY 2015 Dollars.
Source: "National Defense Budget Estimates for FY 2014," Office of the Under Secretary of Defense (Comptroller), May 2013, Table 6-8, 142–148.

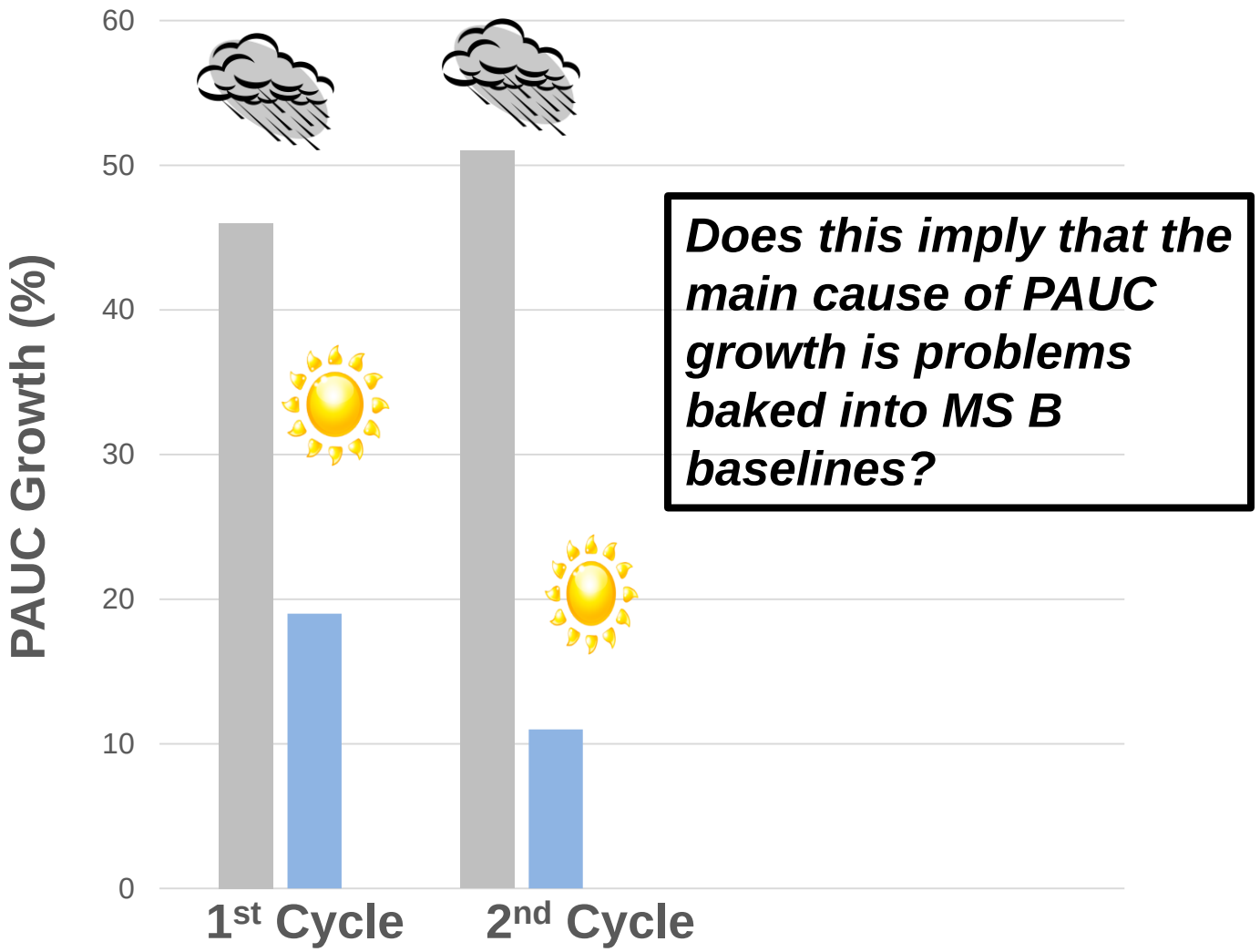
Topic
What do we know about influences of funding climate on cost growth of Major Defense Acquisition Programs (MDAPs)?

Agenda

- Program Acquisition Unit Cost (PAUC) and funding climate at Milestone (MS) B
- Average PAUC growth and post MS B funding climate
- PAUC, funding climate at MS B, and time in bust and in boom climates

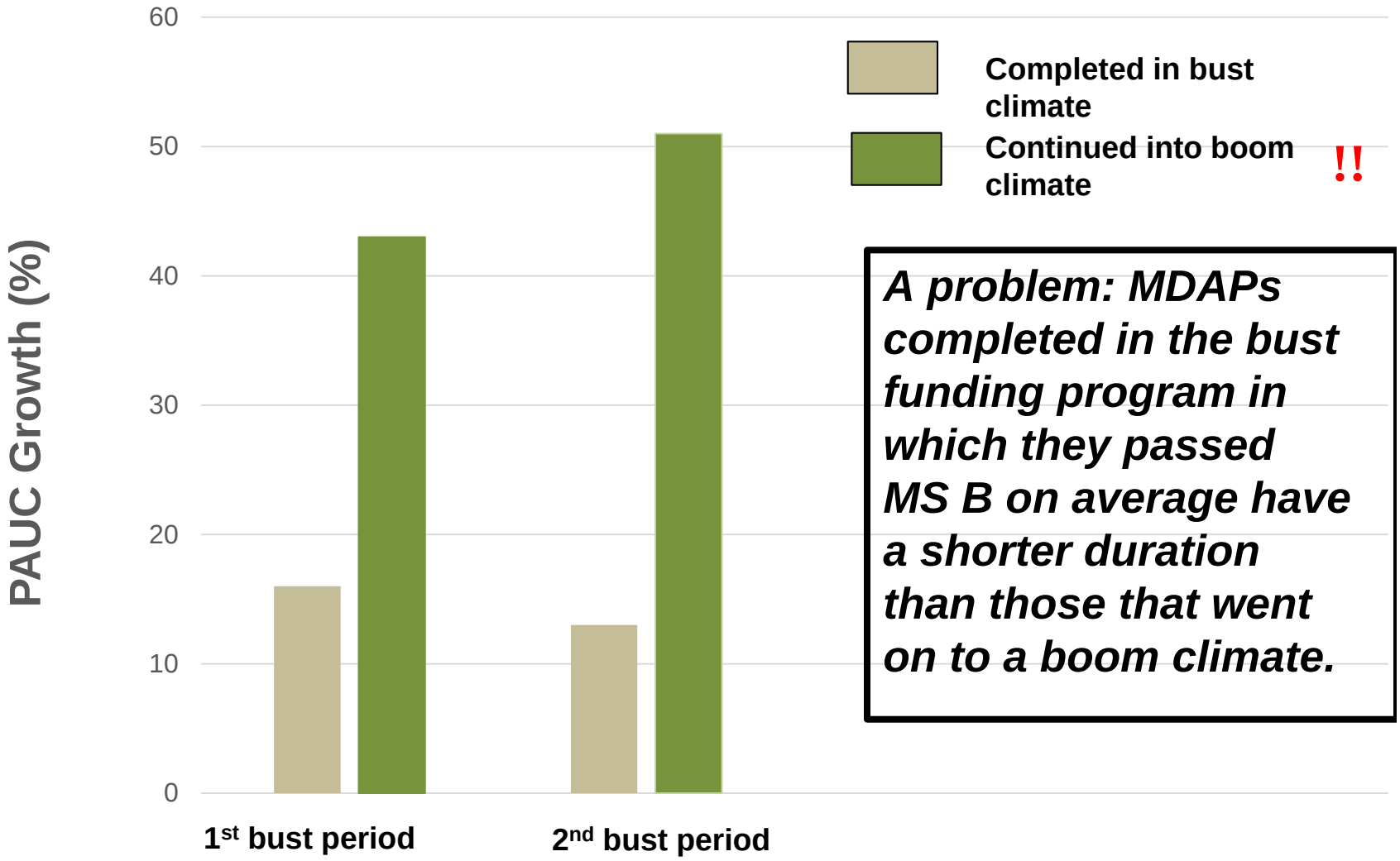
These are successive steps, not stand-alone results.

Average Growth in for MDAPs that Passed MS B in Bust and in Boom Funding Climates



Does this imply that the main cause of PAUC growth is problems baked into MS B baselines?

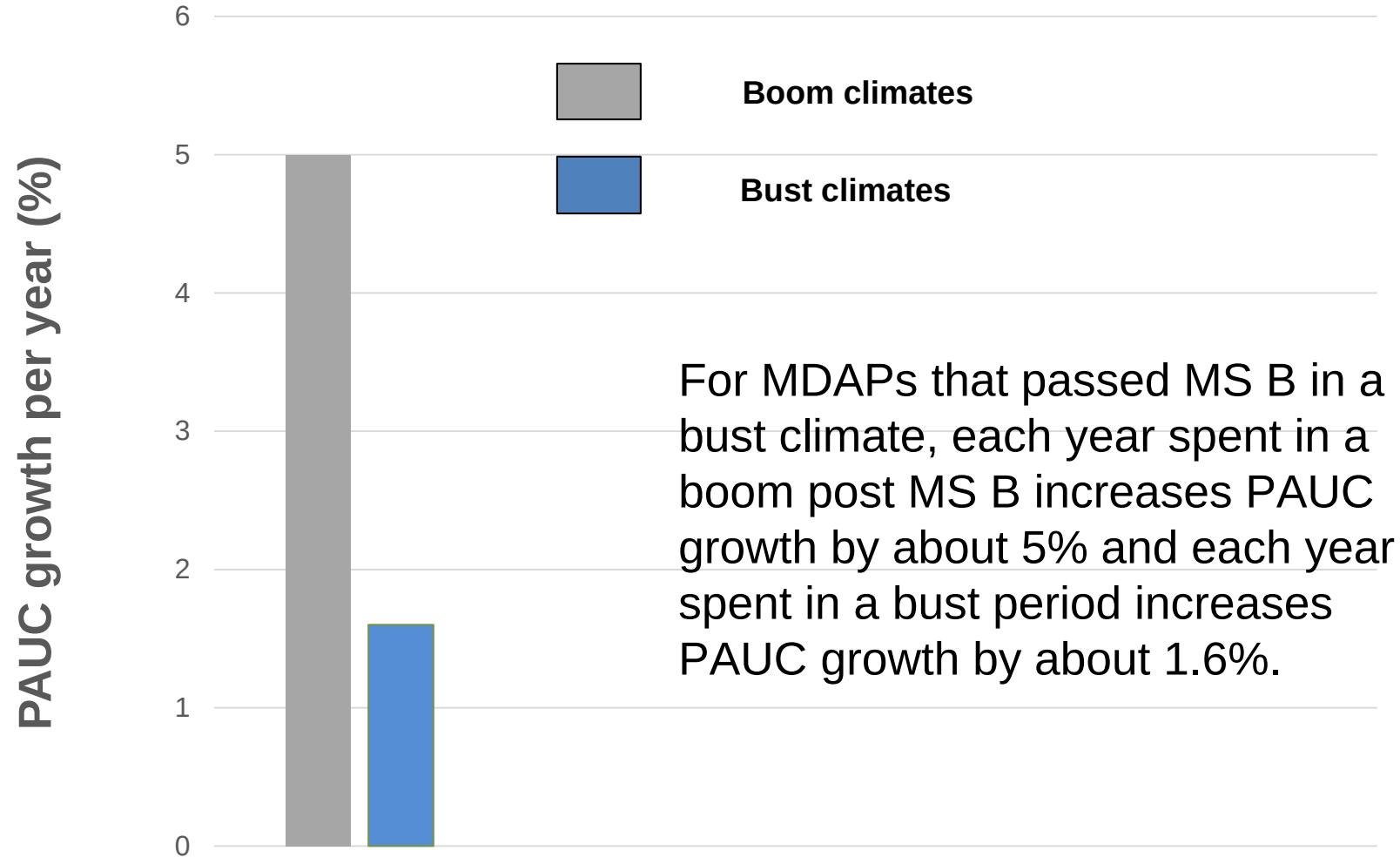
Effect of a Post MS B Boom Climate on Average PAUC Growth for Completed MDAPs that Passed MS B in a Bust Climate*



A problem: MDAPs completed in the bust funding program in which they passed MS B on average have a shorter duration than those that went on to a boom climate.

* Except FY 1965-FY 1969 and FY 1994-FY 2000

Average PAUC Growth per year in Bust and Boom Funding Climates for Completed MDAPs that Passed MS B in Bust Climates*



For MDAPs that passed MS B in a bust climate, each year spent in a boom post MS B increases PAUC growth by about 5% and each year spent in a bust period increases PAUC growth by about 1.6%.

* Except FY 1965-FY 1969 and FY 1994-FY 2000

Observations

- MDAPs that passed MS B during a boom climate do not present a serious cost growth problem—the average PAUC growth is low and very few have high cost growth.
- MDAPs that pass MS B in a bust period and are completed in that period—mainly fairly short duration programs—also have low cost growth.
- Cost growth is concentrated in programs that passed MS B in a bust funding climate and went on into a boom climate.

We do not know what the higher cost growth of these programs reflects:

- Getting well from problems baked in at MS B; or
- Addition of capability beyond that in the MS B baseline

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In progress

- Mini case studies of about 20 MDAPs that passed MS B during the second bust period (FY 1987-FY 2002) and continued into the second boom period (FY 2003-FY2009).

- Consolidation into a single report (IDA Report R-8396) of:

  - David McNicol, David Tate, Sarah Burns, and Linda Wu, “Further Evidence on the Effect of Acquisition Regime on Cost Growth,” IDA Paper P-5330 (Revised), April 2016.
  - David McNicol, “Post Milestone B Funding Climate and Cost Growth In Major Defense Acquisition Programs,” IDA Paper P-8091, March 2017.
  - David McNicol, “Influences on the Timing and Frequency of Cancellations and Truncations of Major Defense Acquisition Programs,” IDA Paper P-8280, March 2017.

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Backup

Growth in Program Acquisition Unit Cost (PAUC)

- Our research used PAUC growth for 185 Major Defense Acquisition Programs (MDAPs) that passed MS B during FY 1965–FY 2009.
  - Each of these MDAPs went into production.
  - Programs that were cancelled are not included in the sample.
- PAUC growth is measured from the MS B baseline and adjusted to the MS B total quantity acquired.
- PAUC growth over the entire acquisition cycle is associated with the Fiscal Year in which the MDAP passed MS B; for example:
  - PAUC growth for the F-22 over FY 1991–FY 2006 is assigned to FY 1991, the year in which the F-22 passed MS B (i.e., MS II).
  - The average PAUC growth for FY 1987–FY 1993 is the average quantity adjusted PAUC growth of all MDAPs that passed MS B during those years.

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Average PAUC Growth in Bust and Boom Funding Climates

Bust (FY)		Boom (FY)	
1965-1980	46% (65)	1981-1986	19% (38)
1987-2002	51% (58)	2003-2009	11% (24)
Total	49% (123)	Total	16% (62)

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Average PAUC Growth for Completed MDAPs that Passed MS B in Bust Funding Climates*

Bin	1st Bust Period FY 1970-FY 1980	1st Bust Period FY 1970-FY 1980
Bust0	16% (6)	13% (8)
Bust1	43% (39)	51% (17)
Bust2	19% (3)	none

Bust0: Passed MS B in a bust climate; did not proceed to a boom climate post MS B

Bust1: Passed MS B in a bust climate; went into one boom climate post MS B

Bust2: Passed MS B in a bust climate; went into two boom climates post MS B

* Except FY 1965-FY 1969 and FY 1994-FY 2000

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Years in Bust Climates and Years in Boom Climates and PAUC Growth for Completed MDAPs*

	Passed MS B in Bust Period†		Passed MS B in Boom Period‡	
	Estimate	p-value	Estimate	p-value
Intercept	3.4%	0.719	3.7%	0.608
Years in Boom	5.0%/yr***	<0.001	3.7%/yr**	0.039
Years in Bust	1.6%/yr**	0.042	0.05%/yr	0.937

**** Statistically significant at less than the 5 percent level.**

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

† R-Square = 0.22 F = 9.445 (p < 0.001) N= 70. Estimated by Ordinary Least Squares (OLS). Excludes the three MDAPs in the Bust2 bin of DSARC/DAB.

‡ R-Square = 0.20 F = 5.563 (p = 0.002) N= 32. Estimated by OLS. Excludes C-17, T-45, and JSTARS.

* Except FY 1965-FY 1969 and FY 1994-FY 2000

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What in the World??!

- Funding climate does not ***cause*** cost growth.
- Apart from increases in the capability to be acquired, the proximate causes of cost growth are such factors as unrealistic programmatic assumptions, unreasonable optimistic cost estimates, use of an inappropriate contract type, insufficient developmental testing, excessive concurrency, etc., etc.
- What we see in the chart is an indication that that the features that cause cost growth are more likely to be present in MDAPs that pass MS B in a bust climate.

The competition for funding among MDAPs within DoD presumably is much more intense in bust climates than it is in boom and hence the incentive to make unrealistic program baseline assumptions is greater.

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It is not just PAUC and this database….

- In addition to PAUC growth, the contrast between boom and bust periods appears in:
  - schedule slips of major subsystems of MDAPs
  - MDAP new starts per year
  - MDAP cancellations

- It also appear in cost growth for Army, Navy, and Air Force programs, MDAP new starts, variant-modification-remanufacturing programs, satellites, and helicopters.

- Although not recognized at the time, the contrast between cost growth in boom and bust periods is present in the cost growth data developed by IDA for a study published in 1992 (IDA Paper P-2722.)

Selection of Break Points between Funding Climates

- This research used only two funding climate categories—Relatively Constrained and Relatively Accommodating.
- Our touchstone in selection of break points was major shifts in the expectation about future funding of senior DoD decision makers.
- We used three events to identify the break points between funding climates:
  - The invasion of Afghanistan by the USSR in late December 1979;
  - The passage of the Gramm-Rudman-Hollings Act in December 1985; and
  - The terrorist attack on the U.S. on Sept. 11, 2001.
- Senior decision makers could reasonably expect each of these events to result in major and sustained changes in the defense funding climate.
- After examining contemporary policy statements and events, we selected:
  - FY 1981 as the first year of the Carter-Reagan buildup;
  - FY 1986 as the final year of the Carter-Reagan buildup; and
  - FY 2003 as the first year of the post-9/11 defense buildup.