



No Estimation without Escalation

The Inflation Revolution

Shannon Cardoza

Quantech Services, Inc.

Analyst, Business Analytics (K2)

scardoza@quantechsर्व.com

Alex Smith

Quantech Services, Inc.

Business Area Manager, Business Analytics (K2)

asmith@quantechsर्व.com



- **Background / Purpose**
 - Policy & Guidance
 - Sources of Escalation data (FPRA, FPRP, Vendor-Specific)
 - Commitments, Obligations, Expenditures

- **Outlays**
 - Common Appropriations (APPNs)
 - Illustrated Examples

- **Specific Scenarios**
 - Illustrated Examples

- **Conclusion**

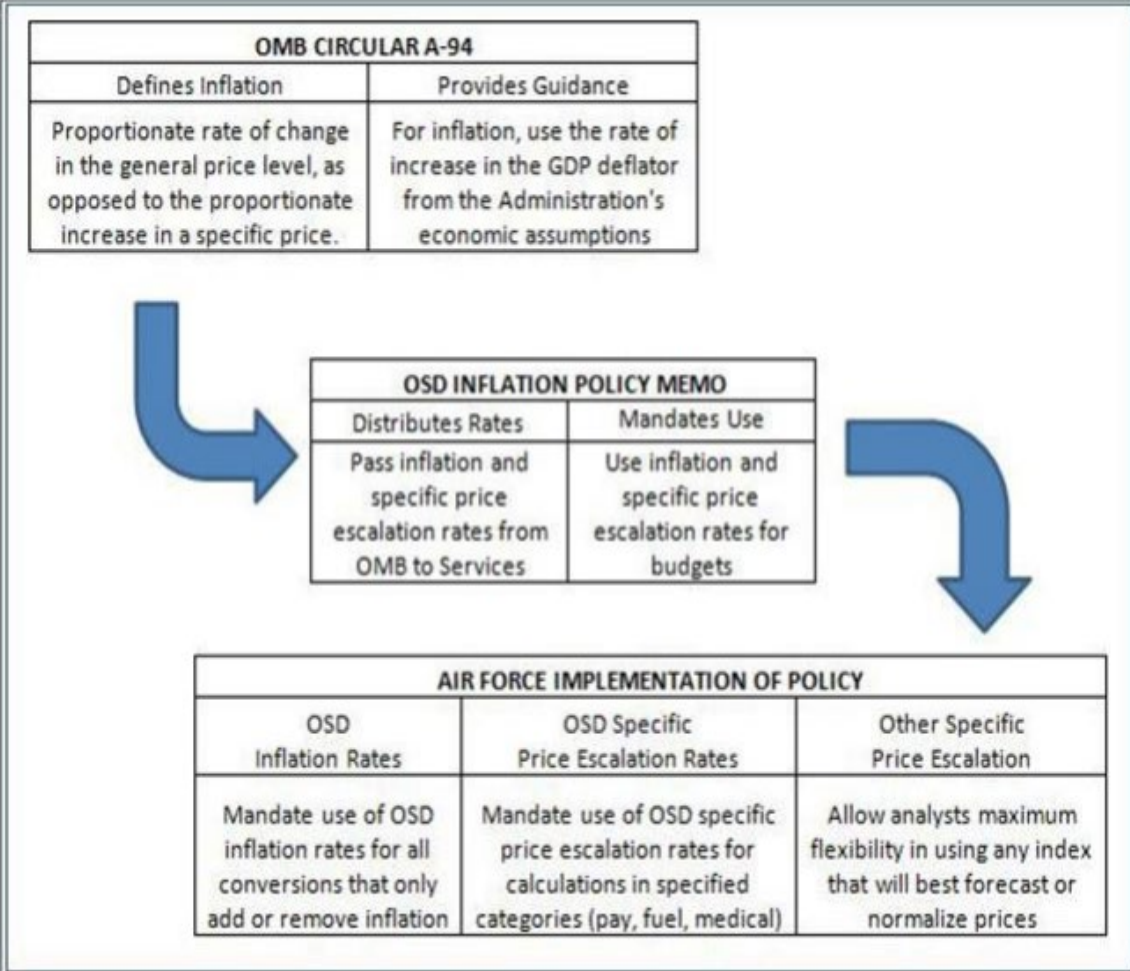


- **Inflation:** Economy-wide increase in the average price level
- **Escalation:** Changes in the prices of specific goods and services (including inflation)

“The difference between inflation and escalation raises several significant issues for cost analysis. In addition to understanding concepts and terms, analysts must be able to determine the most appropriate index for a given analysis.”

-OSD CAPE Inflation and Escalation Best Practices for Cost Analysis (Dec 2021)

- Many of *the indices DoD publishes represent inflation only*, so analysts may need to perform additional research to find appropriate escalation indices
- **Analysis Impacts:** Budgetary Estimates, Data Normalization / CER Development, Comparative Analysis / Analogies / Reasonability Checks, Economic Analysis / Net Present Value



• **Figure 3.1: Chain of Policy – AFMAN 65-502; 30Oct2018**

- **Key Take-Aways:**
 - **OMB Circular A-94**
 - Inflation does not account for demand / market forces / Escalation
 - Provides guidance necessary for calculating Net Present Value (NPV) when performing Economic Analysis
 - **OSD Inflation Policy Memo**
 - Distributes Inflation Rates (USG Inflation Indices)
 - Allows specific price escalation for budgetary purposes
 - **AF Implementation**
 - Mandatory for conversions that add/remove inflation only (NOT Escalation)
 - Mandatory for specific commodities (Mil/Civ pay, fuel, medical)
 - Mil/Civ pay are NOT intended to account for contracted labor
 - Allows specific price escalation for budgetary purposes

• **Office of the Under Secretary of Defense (Comptroller) (OUSD(C)) provides Inflation Rates and APPN-specific Outlay Rates**



“When developing estimates of the annual budget authority required on a specific program, the analyst is encouraged to use the appropriate *price escalation* coupled with appropriate outlay rates”

- AFMAN 65-502 (Oct 2018)

Labor Category	2022	2023	2024
Program Manager	\$54.97	\$56.56	\$58.20
Sr Program Manager	\$63.25	\$65.27	\$67.36
Jr Software Developer	\$37.89	\$39.03	\$40.20
Mid Software Developer	\$49.86	\$51.36	\$52.90
Sr Software Developer	\$62.90	\$64.79	\$66.73
Test Engineer	\$55.47	\$57.13	\$58.85
Full Stack Developer	\$78.32	\$80.51	\$82.77
Technician	\$32.45	\$33.42	\$34.43
Financial Analyst	\$41.27	\$42.51	\$43.78

Escalation Year 1	Escalation Year 2
2.9%	2.9%
3.2%	3.2%
3.0%	3.0%
3.0%	3.0%
3.0%	3.0%
3.0%	3.0%
2.8%	2.8%
3.0%	3.0%
3.0%	3.0%

• **Considerations:**

- Average? Mode?
- CY, FY, or OY for Rate Change?
- Direct rates or Burdened?
- Weight categories by Labor Hours?
- Vendor Unknown?
- Applicability to Labor WBS Elements only

• *Note: Data shown is completely fictional for example purposes only*

- *Source: Forward Price Rate Agreement (FPRA), Forward Price Rate Proposal (FPRP), Contract Data Requirement List (CDRL)*
- *Vendor may have multiple rate tables if supporting multiple locations to account for cost of living*



APPN Type	Years											
	1	2	3	4	5	6	7	8	9	10	11	
O&M	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red	Red
RDT&E	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red
Procurement	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red
Ships	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red
MILCON	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red
MILPERS	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red	Red



Current Period: Available for new obligations



Expired Period: Available obligation adjustments, expenditures and outlays



Cancelled: Unavailable for obligation, obligation adjustments, expenditures, and outlays

- **Commitment**: Administrative reservation of allotted funds in anticipation of Obligation
- **Obligation**: Responsibility to pay for future goods or services to be received
- **Expenditure**: Charge against available funds or the actual payment of funds
- **Outlay Profiles**: The rate at which funds are expected to be expended

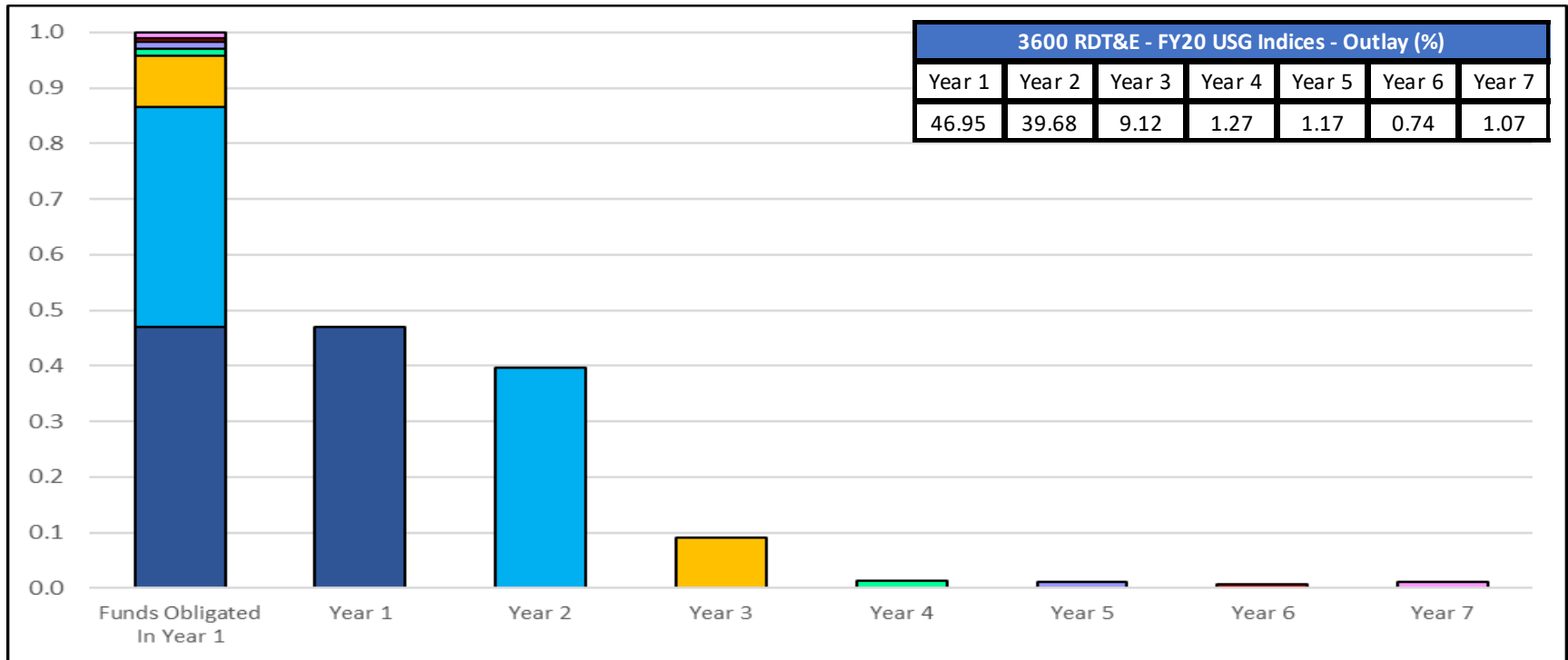


“When developing estimates of the annual budget authority required on a specific program, the analyst is encouraged to use the appropriate price escalation coupled with *appropriate outlay rates*”

- AFMAN 65-502 (Oct 2018)

	Outlay / Expenditure Profile (%)									
APPN - 2020 USG Inflation Indices	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
3400 O&M	7.03	82.64	4.96	3.10	2.27					
3600 RDT&E	46.95	39.68	9.12	1.27	1.17	0.74	1.07			
3300 MILCON AF	2.00	29.68	30.00	16.00	7.00	5.00	4.00	3.00	2.00	1.32
3830 MILCON ANG	2.00	41.00	33.00	10.00	7.00	3.00	1.50	1.00	0.50	1.00
3730 MILCON AFR	1.20	22.00	32.00	19.00	12.00	8.00	2.30	1.50	1.00	1.00
3010 Aircraft Procurement	7.00	25.00	28.40	23.30	8.00	5.80	1.50	1.00		
3020 Missile Procurement	13.00	33.00	22.00	15.80	7.50	5.00	2.00	1.70		
3080 Other Procurement	70.00	18.00	5.00	3.00	2.00	1.00	1.00			
3021 Space Procurement	18.00	27.00	22.00	12.80	9.50	7.00	2.00	1.70		

- **Applicability:** Each APPNs Yearly Inflation Rate is paired with Expected Expenditure Profile to produce TY\$ Estimate
- **Note:** Procurement must comply with Full-Funding Policy
- **Considerations:** When might these Outlay Profiles be applicable? When not?



- *Applicability: Each APPNs Yearly Inflation Rate is paired with Expected Expenditure Profile to produce TY\$ Estimate*
- *Considerations: When might this Outlay Profile be applicable? When not?*



BY20 RDT&E Outlay Profile (%)

FY	Inflation (%)	Raw	Weighted	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
2016	1.2	0.9257	0.9370	52.06	37	6.77	1.25	1.15	0.73	1.04	
2017	1.7	0.9414	0.9561	48.42	38.04	9.24	1.29			0.75	2.26
2018	2.2	0.9621	0.9759	48.27	38.15	9.27	1.29	1.19	0.75	1.08	
2019	1.9	0.9804	0.9948	48.73	37.81	9.19	1.28	1.17	0.75	1.07	
2020	2	1	1.0151	46.95	39.68	9.12	1.27	1.17	0.74	1.07	

• Considerations: USG Inflation Rate (%) Varies from year to year; Expected Outlay / Expenditure Profile fairly steady



$$\text{Weighted Index} = 1 / \left(\frac{Y_1 \text{ Outlay } \%}{Y_1 \text{ Raw Index}} + \frac{Y_2 \text{ Outlay } \%}{Y_2 \text{ Raw Index}} + \dots + \frac{Y_N \text{ Outlay } \%}{Y_N \text{ Raw Index}} \right)$$

FY	Inflation (%)	Raw	Weighted	BY20 RDT&E Outlay Profile (%)						
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
2020	2	1.000	1.015	46.95	39.68	9.12	1.27	1.17	0.74	1.07
2021	2	1.020	1.035							
2022	2	1.040	1.056							
2023	2	1.061	1.077							
2024	2	1.082	1.099							
2025	2	1.104	1.121							
2026	2	1.126	1.143							

$$1.015 = 1 / \left(\frac{0.4695}{1.000} + \frac{0.3968}{1.020} + \frac{0.0912}{1.040} + \frac{0.0127}{1.061} + \frac{0.0117}{1.082} + \frac{0.0074}{1.104} + \frac{0.0107}{1.126} \right)$$

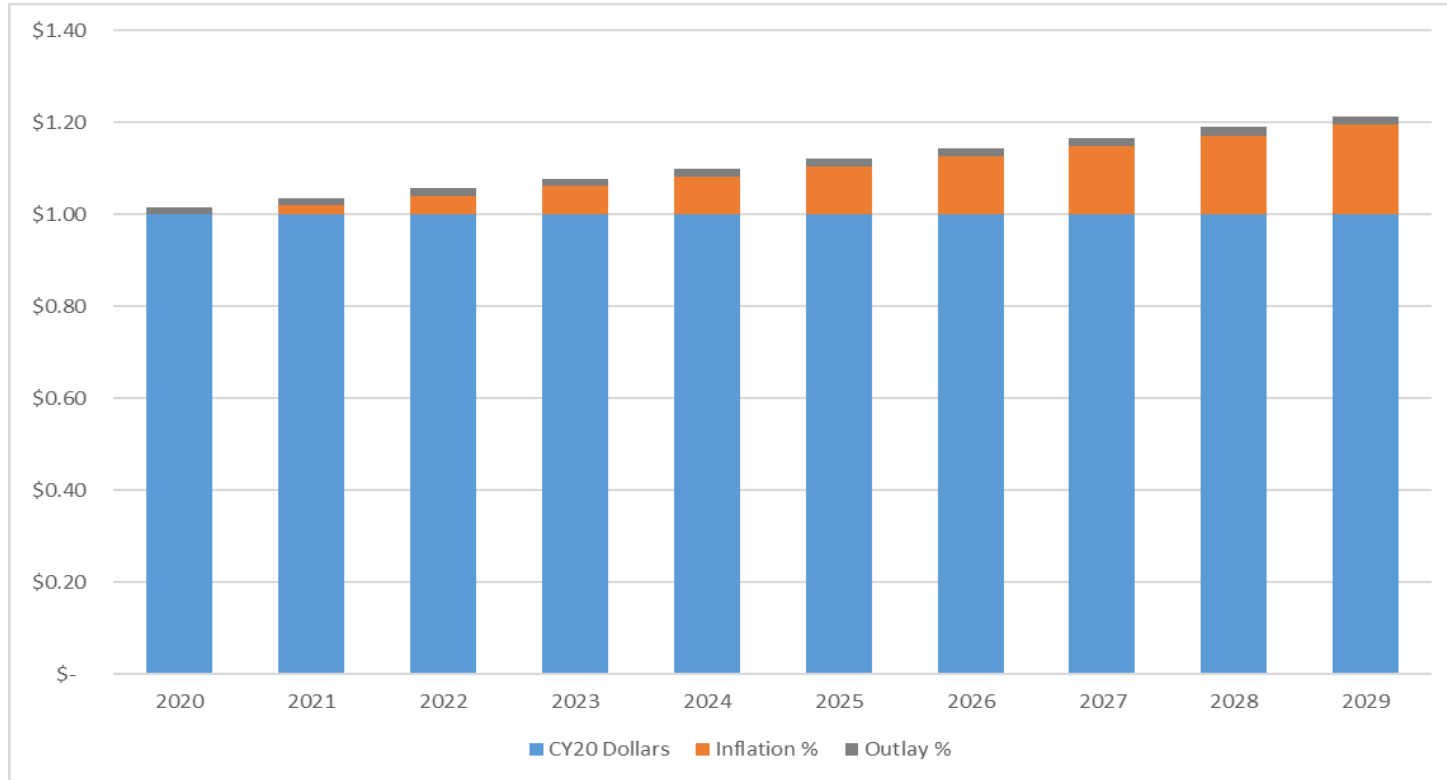
• Considerations: USG Inflation Rate (%) Varies from year to year; Expected Outlay / Expenditure Profile fairly steady



$$\text{Weighted Index} = 1 / \left(\frac{Y_1 \text{ Outlay \%}}{Y_1 \text{ Raw Index}} + \frac{Y_2 \text{ Outlay \%}}{Y_2 \text{ Raw Index}} + \dots + \frac{Y_N \text{ Outlay \%}}{Y_N \text{ Raw Index}} \right)$$

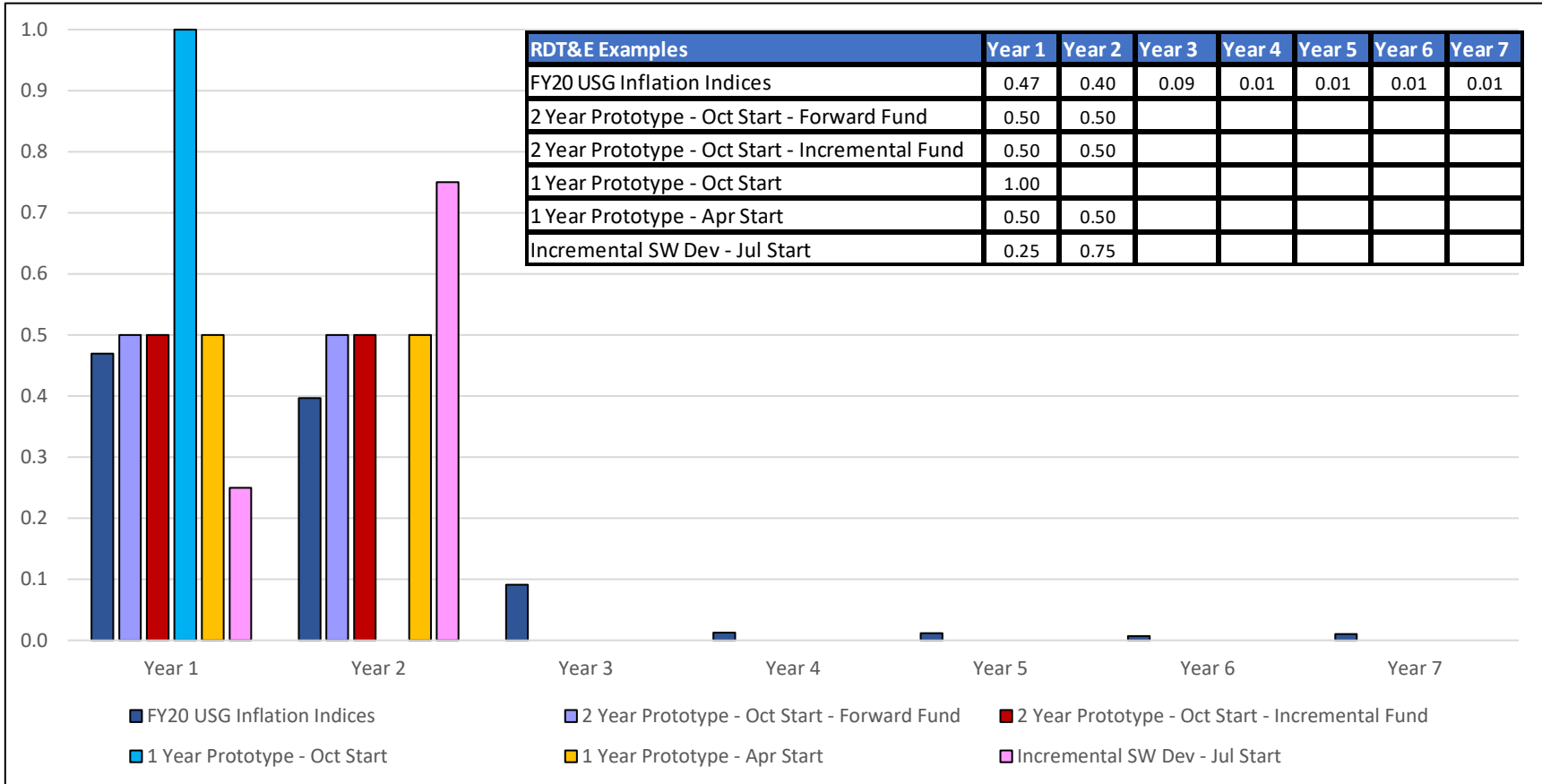
				BY20 O&M Civ Pay Outlay Profile (%)						
FY	Inflation (%)	Raw	Weighted	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
2020	2.770	1.000	1.000	100	0	0	0	0	0	0
2021	1.577	1.016	1.016							
2022	1.798	1.034	1.034							
2023	2.100	1.056	1.056							
2024	2.100	1.078	1.078							
2025	2.100	1.101	1.101							
2026	2.100	1.124	1.124							

- *Civ/Mil Pay has raw and weighted indices are the same since outlay profile assumes all funds are spent in the same year in which they are obligated*

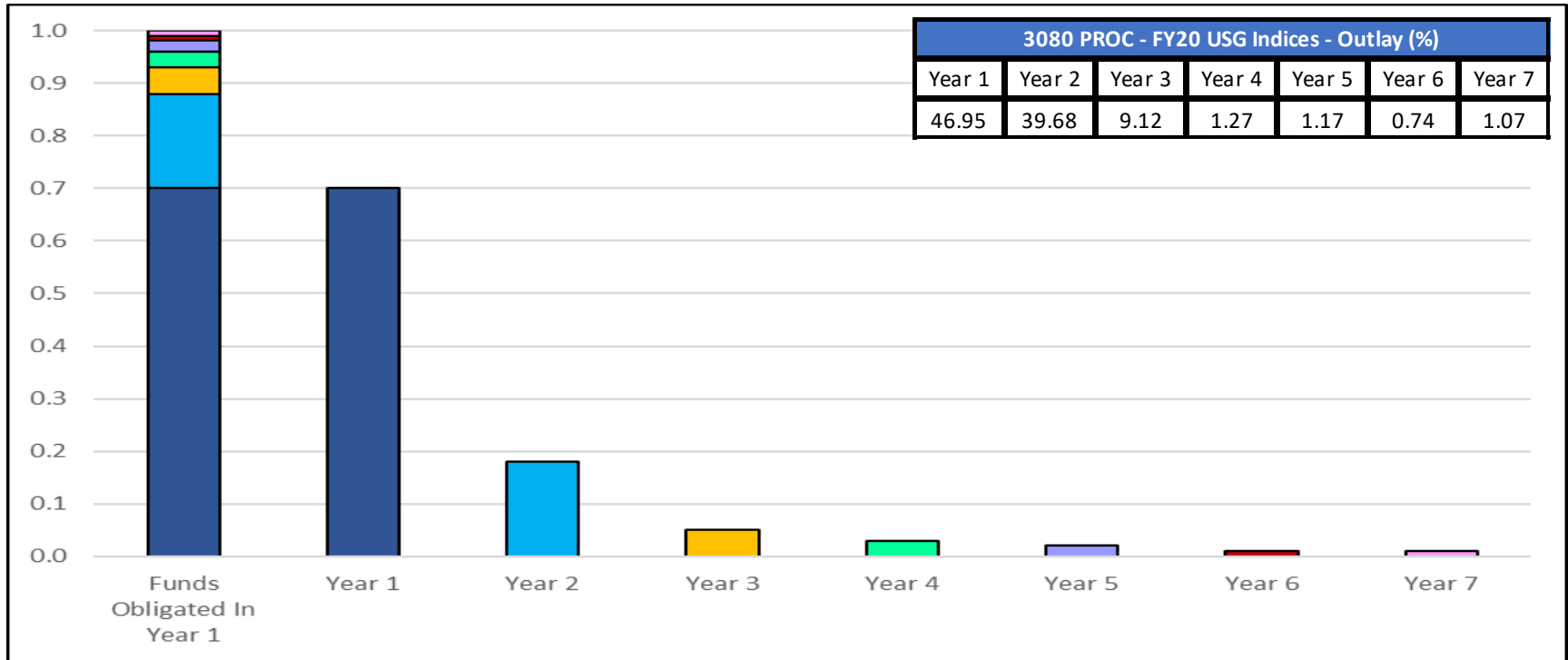


RDT&E - 3600 Index	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Raw	1.000	1.020	1.040	1.061	1.082	1.104	1.126	1.149	1.172	1.195
Weighted	1.015	1.035	1.056	1.077	1.099	1.121	1.143	1.166	1.189	1.213

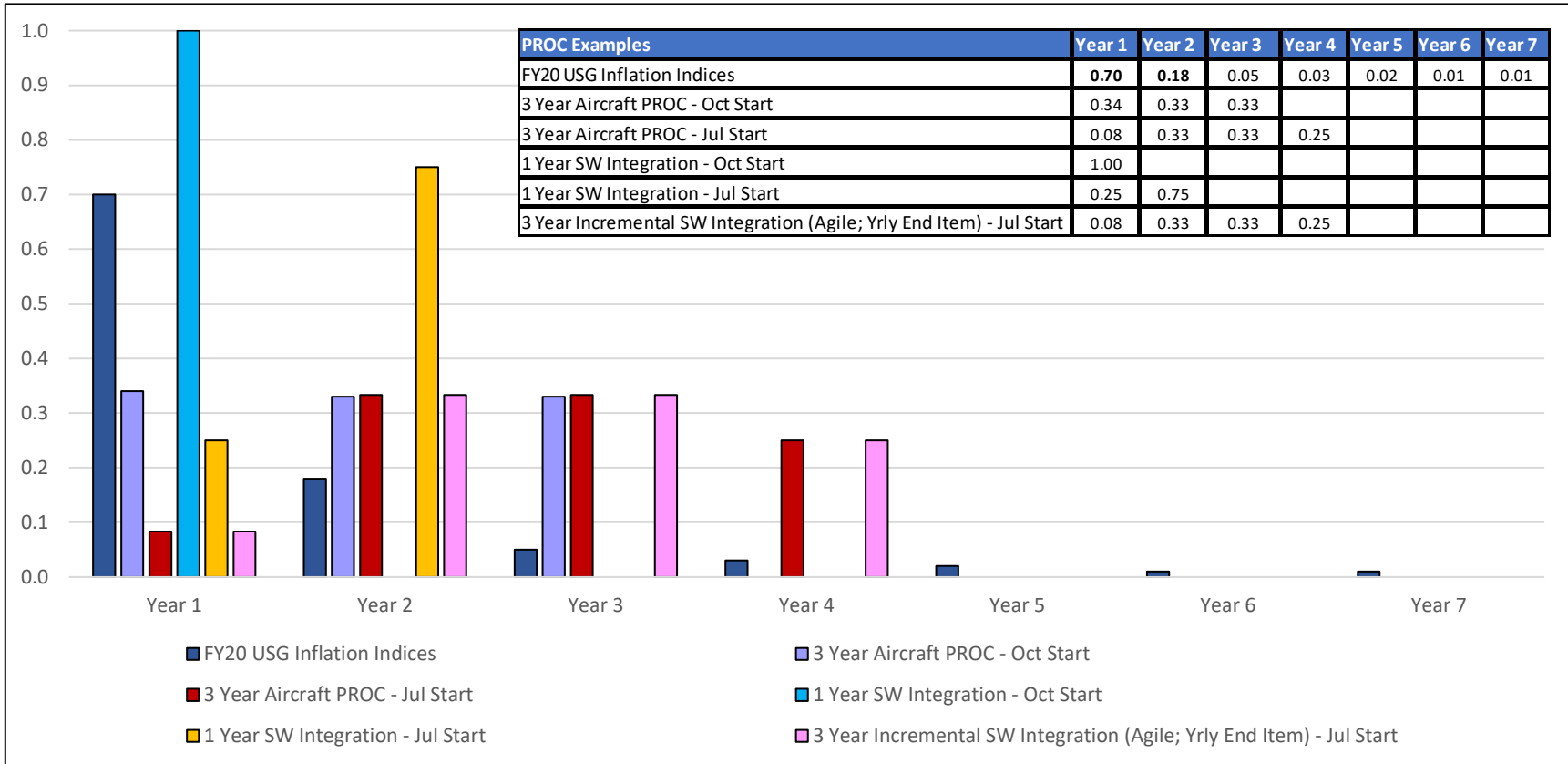
- Use raw indices for CY to CY conversions, use weighted indices for CY to TY conversions
- Considerations: USG Inflation Rate (%) Varies from year to year; Expected Outlay / Expenditure Profile fairly steady



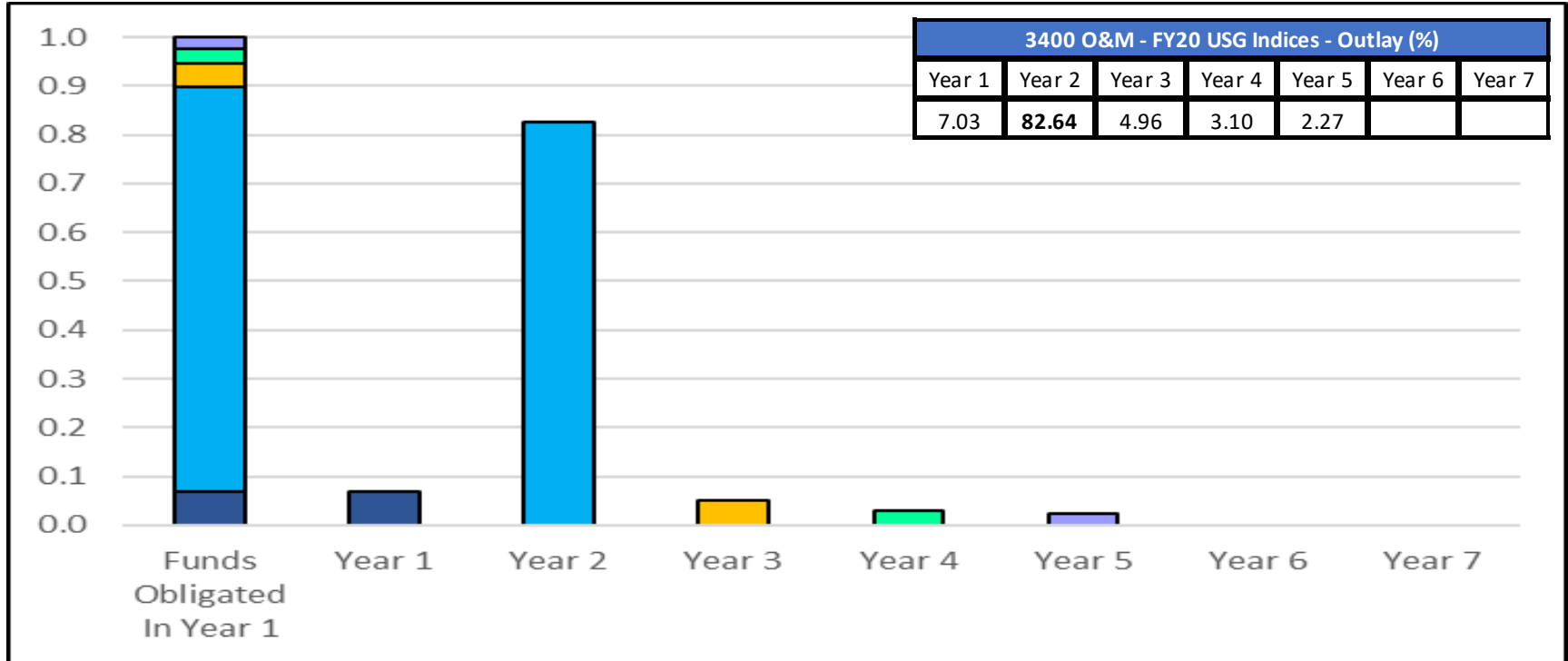
- Labor Expenditures primarily driven by Period of Performance (PoP) / Weekly / Monthly Invoices
- Consideration: Expenditure Profile for Scenario 1, 2, 3, 5 extremely similar – Obligation Profile?



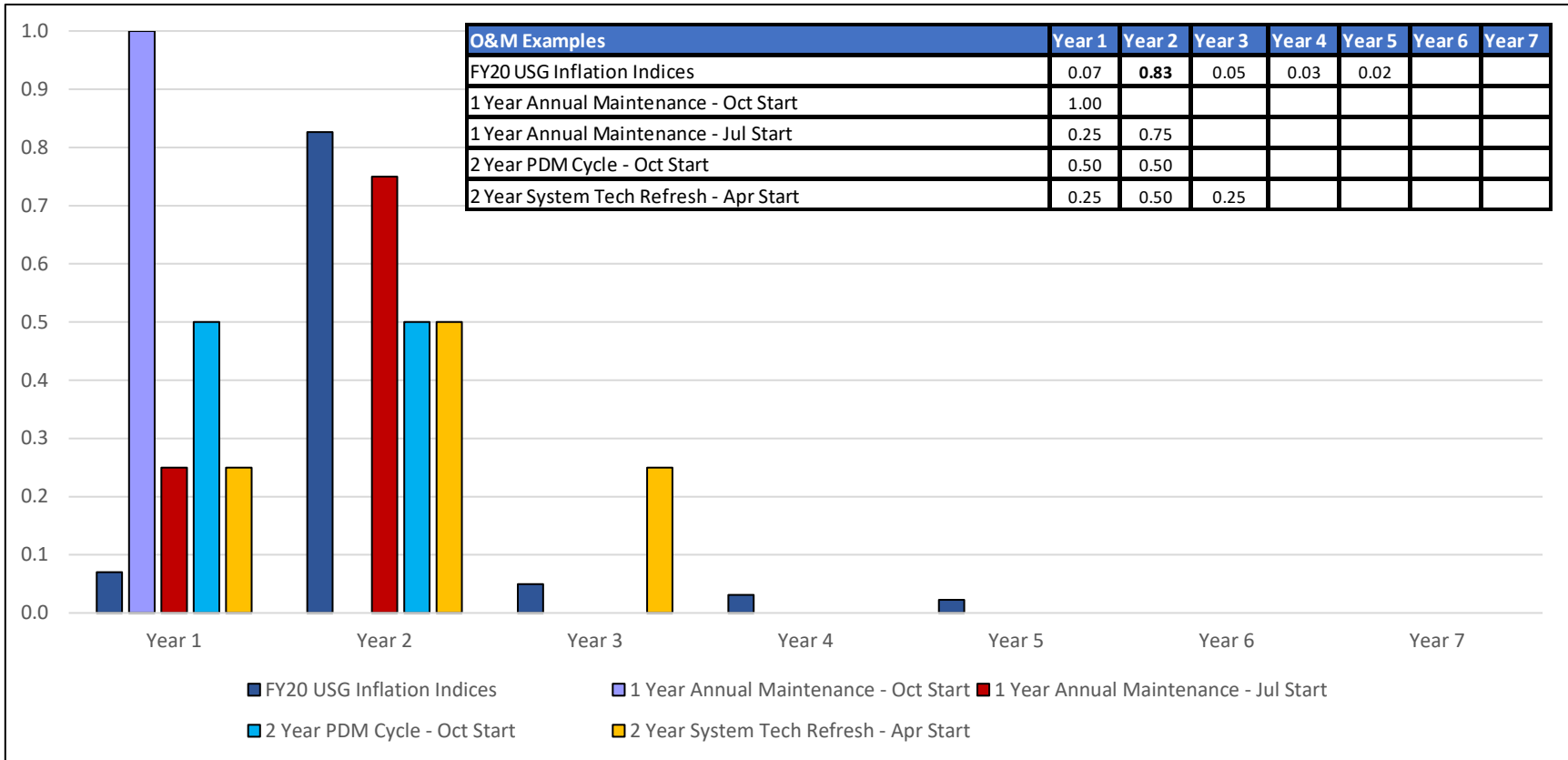
• *Considerations: When might this Outlay Profile be applicable? When not?*



- Labor Expenditures primarily driven by Period of Performance (PoP) / Weekly / Monthly Invoices
- Consideration: Expenditure Profile for Scenario 3, 6 extremely similar – Obligation Profile?



• Considerations: When might this Outlay Profile be applicable? When not?



• Labor Expenditures primarily driven by Period of Performance (PoP) / Weekly / Monthly Invoices



- **Analyst is encouraged to use the appropriate price escalation coupled with appropriate outlay rates**
 - Labor Escalation vendor-specific: calculate from FPRA, FPRP, CDRL, etc.
 - Non-Labor Elements (Material, ODC, Travel, etc.) considered separately
 - Outlay rates depend on Commodity, Project Type, Project Start, and Project PoP
- **Analyst must consider program budgetary plan (when to request / Obligate funding) vs. expected expenditure profile**
- **Data Normalization for CER Development & Comparative Analysis should account for most applicable Escalation and Outlay as well**
- **Simple in Theory – but lots to consider!**



Back-Up



- **Base Year:** The year against which costs are measured for comparison, as in CY\$ and CP\$, or the year of an index relative to which prices are measured, as in the base year of a general inflation index.
- **Base-Year Dollar:** This is an ambiguous term no longer recommended for use. Costs previously labeled “base year dollars” may refer to either CY\$ or CP\$ under the current definitions, depending on the type of index used to produce them.
- **Constant-Year Dollar:** A cost that has been normalized relative to a selected base year via an inflation index. Constant-year dollars exclude the effect of inflation relative to the base year, and include real price change. Also known as “real dollars” outside the DoD community.
- **Then-Year Dollar:** Costs that reflect the value of money at the time of a transaction. The type of transaction defines the two types of TY\$: obligations (which include outlay profiles) and expenditures (which do not include outlay profiles). Also known as “nominal dollars” outside the DoD environment.
- **Raw Index:** An index that does not include the effect of an outlay profile.
- **Weighted Index:** An index that includes the effect of an outlay profile.
- **Constant Price:** A cost that has been normalized relative to a selected base year via an escalation index, or that is used as a “flat-line” modeling technique for subsequent application of escalation. Constant prices do not include the effect of escalation (i.e., neither inflation nor real price change) relative to the base year, nor do they include the effect of outlay profiles. Costs should generally be normalized to CP\$ prior to performing calculations, but costs should not generally be presented to decision makers in CP\$.



- OSD CAPE Inflation and Escalation Best Practices for Cost Analysis (Dec 2021)
 - <https://cade.osd.mil/content/cade/files/csdr/guidance/OSDCAPEEscalationHandbook2021.pdf>
- AFMAN 65-502 (Oct 2018)
 - https://static.e-publishing.af.mil/production/1/saf_fm/publication/afman65-502/afman65-502.pdf
- OMB Circular A-94
 - https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A94/a094.pdf
- DoD Inflation Handbook 2nd Edition (Jun 2011)
 - <https://cade.osd.mil/content/cade/files/csdr/guidance/Inflation%20Handbook.pdf>