HOW I LEARNED TO START WORRYING AND HATE REAL GROWTH

ANALYSIS OF THE 2023 DEFENSE BUDGET REQUEST

TRAVIS SHARP
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CSBA
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Executive Summary

The Pentagon’s fiscal year (FY) 2023 budget is poised to continue the general trend of rising U.S. defense spending that has prevailed since 2016. If Congress increases the FY 2023 budget above the Biden administration’s $773 billion request, as seems increasingly likely, then Department of Defense (DoD) spending will have grown in real terms, accounting for inflation, in seven of the past eight fiscal years. That streak would equal the multi-year consistency, though not the budgetary magnitude, of spending increases during the late Cold War and the Iraq and Afghanistan wars. The current trend of rising spending has lasted through three administrations, four Senate-confirmed secretaries of defense, five Congresses, and six years of the Budget Control Act. In an age of political turmoil, the upward drift in defense spending represents a rare instance of relative stability in Washington policymaking.

A central debate over the FY 2023 budget involves deciding how to deal with inflation’s erosion of DoD’s purchasing power. Some legislators have proposed increasing the FY 2023 budget well above the request to hedge against inflation remaining worse than expected. Other legislators have characterized such increases as unnecessary or wasteful. In making these arguments, many policymakers have shied away from proposing budget toplines, instead articulating desired levels of real growth. Real growth is the annual percentage change in the topline after accounting for inflation. Real growth of 0 percent increases the topline by the same percentage as the forecasted inflation rate.

During periods with volatile inflation, like today, real growth can be a confusing way to judge the defense budget. When inflation is changing quickly, policymakers tend to have different outlooks on the accuracy of the inflation forecast. As a result, they also have different standards for what qualifies as “real” growth. A pessimistic policymaker who believes the forecast underestimates future inflation may regard budgetary growth as real only if it exceeds the forecasted inflation rate. By contrast, an optimistic policymaker who

believes the forecast overestimates future inflation may regard budgetary growth as real even if it undershoots the forecasted inflation rate.

This year, making smart budget choices requires policymakers to consider both their outlooks on future inflation and their preferences about real growth. To demonstrate why both factors matter greatly, this report develops a framework illustrating options for the FY 2023 DoD budget topline based on policymaker outlooks on future inflation. The framework uses prediction error in past inflation forecasts to benchmark potential error in the current inflation forecast. It shows that, depending on a policymaker’s outlook, providing 0 percent real growth could produce a Pentagon topline ranging from $768 billion to $792 billion, with any extra real growth added to those figures. In the maximalist scenario—supreme pessimism about future inflation plus 5 percent real growth—the FY 2023 DoD topline would climb to $830 billion, nearly $60 billion above the administration’s request.

These widely ranging illustrative toplines demonstrate why policymakers need to define, even if privately, the size of potential inflationary losses in defense buying power that they intend to avert or accept in this year’s budget. Real growth alone does not provide an adequate standard for setting defense spending given today’s uncertainty about tomorrow’s inflation.
CHAPTER 1

Appraising the Topline: Growth Rates and Upward Trend

Comparing the requested FY 2023 DoD budget topline to previous years presents more difficulties than usual due to complications induced by recent supplementals and unpredictable inflation. Nevertheless, the requested topline preserves the general trend of rising U.S. defense spending that has prevailed since the mid-2010s.

Nominal Growth

Calculating the nominal growth rate, which does not account for inflation, is complicated by recent influxes of supplemental appropriations to DoD, including funds provided to rescue Afghan refugees and respond to Russia’s invasion of Ukraine. The requested $773 billion FY 2023 topline represents 2.2 percent nominal growth relative to the enacted $756.6 billion FY 2022 topline (Table 1). In public remarks, however, Pentagon officials instead have cited 4.1 percent nominal growth. That figure comes from comparing the requested $773 billion FY 2023 topline to the enacted $742.3 billion FY 2022 base budget, thus excluding $14.3 billion in FY 2022 supplemental funding. By citing a growth rate derived strictly from base budgets, Pentagon officials have anticipated Congress appropriating supplemental funding again in FY 2023, whether in response to events in Ukraine or another emergent requirement.

Real Growth

Calculating the real growth rate adds the additional wrinkle of accounting for inflation during a time of volatile prices. The requested $773 billion FY 2023 topline provides o
percent real growth relative to the enacted $756.6 billion FY 2022 topline after adjusting for inflation using the GDP price index included in the FY 2023 budget documents. In public remarks, however, Pentagon officials instead have cited 1.5 percent real growth. Context makes clear that, as with nominal growth, DoD officials calculated that figure by comparing the requested FY 2023 topline to the enacted FY 2022 base budget. Yet, that comparison works out to 1.9 percent real growth, not 1.5 percent, based on the GDP price index. This discrepancy highlights the potential confusion associated with using real growth to evaluate defense spending when inflation is volatile.

### TABLE 1: DISCRETIONARY BUDGET AUTHORITY IN THE PRESIDENT’S BUDGET REQUEST, FY22 TO FY27

<table>
<thead>
<tr>
<th></th>
<th>FY22 enacted</th>
<th>FY23 requested</th>
<th>FY24 projected</th>
<th>FY25 projected</th>
<th>FY26 projected</th>
<th>FY27 projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoD topline (051)</td>
<td>756.6</td>
<td>773.0</td>
<td>801.0</td>
<td>809.0</td>
<td>822.0</td>
<td>828.0</td>
</tr>
<tr>
<td>Base budget request from DoD</td>
<td>715.0</td>
<td>773.0</td>
<td>801.0</td>
<td>809.0</td>
<td>822.0</td>
<td>828.0</td>
</tr>
<tr>
<td>Base budget additions from Congress</td>
<td>27.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Supplemental funding from Congress</td>
<td>14.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National defense (050)</td>
<td>796.1</td>
<td>813.4</td>
<td>842.6</td>
<td>851.1</td>
<td>864.7</td>
<td>870.7</td>
</tr>
<tr>
<td>DoD (051)</td>
<td>756.6</td>
<td>773.0</td>
<td>801.0</td>
<td>809.0</td>
<td>822.0</td>
<td>828.0</td>
</tr>
<tr>
<td>Atomic energy defense activities</td>
<td>29.1</td>
<td>29.7</td>
<td>31.3</td>
<td>31.6</td>
<td>31.6</td>
<td>31.8</td>
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<td>Defense-related activities</td>
<td>10.4</td>
<td>10.6</td>
<td>10.4</td>
<td>10.5</td>
<td>11.1</td>
<td>10.9</td>
</tr>
<tr>
<td>DoD topline (051) nominal growth</td>
<td>7.4%</td>
<td>2.2%</td>
<td>3.6%</td>
<td>1.0%</td>
<td>1.6%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Base budget nominal growth</td>
<td>5.5%</td>
<td>4.1%</td>
<td>3.6%</td>
<td>1.0%</td>
<td>1.6%</td>
<td>0.7%</td>
</tr>
<tr>
<td>DoD topline (051) real growth (FY23 GDP price index)</td>
<td>3.3%</td>
<td>0.0%</td>
<td>1.6%</td>
<td>-1.0%</td>
<td>-0.4%</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Base budget real growth (FY23 GDP price index)</td>
<td>1.5%</td>
<td>1.9%</td>
<td>1.6%</td>
<td>-1.0%</td>
<td>-0.4%</td>
<td>-1.2%</td>
</tr>
</tbody>
</table>

**Sources:** Department of Defense (DoD) and Office of Management and Budget (OMB).4

**Notes:** In billions nominal $ discretionary budget authority. FY22 supplemental figure only includes funds appropriated through March 2022 when the administration released the FY23 budget request.

### Upward Spending Trend

A discrepancy of four-tenths of one percent in the real growth rate may have budget warriors sharpening their calculators – tiny percentages equal massive dollars in DoD budgets, after

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3 Ibid.

all — but it does not change the general trajectory of U.S. defense spending. Annual real growth in DoD’s topline has averaged 1 percent since FY 2014 and 2 percent since FY 2016, when the upward trend took hold (Figure 1). If Congress increases the FY 2023 topline above the Biden administration’s request, then the DoD budget will have received real growth in seven of the past eight fiscal years. That streak would equal the multiyear consistency, though not the budgetary magnitude, of spending increases during the 1970s, 1980s, and 2000s (Figure 2).

The upward drift in defense spending has lasted through three administrations and five Congresses possessing different priorities and perspectives. It also survived the long reign of the Budget Control Act, a law intended to suppress government spending. Given its persistence through years of political turmoil and polarization, the trend of generally rising DoD spending represents one area where Washington policymakers have kept finding ways to agree.

**FIGURE 1: REAL GROWTH IN DOD TOPLINE, FY14 TO FY23**

```
      9%  6%  3%  0% -3% -6% -9%
      -1.2% -4.7% 2.7% 2.6% 8.2% 3.8% 3.3%

FY23 requested
FY14  FY15  FY16  FY17  FY18  FY19  FY20  FY21  FY22  FY16

Adjusted for inflation with FY23 GDP price index
```

**Sources:** DoD and OMB.

**Notes:** Calculated from discretionary budget authority. FY22 figure only includes funds appropriated through March 2022 when the administration released the FY23 budget request.

5 The averages include 0 percent real growth requested in FY23. Excluding the FY23 request does not alter the averages appreciably.

6 This finding holds whether one uses discretionary nominal budget authority adjusted with the GDP price index or discretionary and mandatory constant budget authority contained in DoD reference volumes.

**FIGURE 2: DOD TOPLINE IN CONSTANT DOLLARS, FY48 TO FY23**

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**Sources:** DoD and OMB.\(^8\)

**Notes:** In billions FY23$ discretionary and mandatory budget authority. Pre-2023 figures represent DoD-reported FY22$ values adjusted to FY23$ with GDP price index. FY22 figure assumes mandatory spending level included in FY22 request and only includes funds appropriated through March 2022 when the administration released the FY23 budget request.

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CHAPTER 2

Adjusting the Topline: Illustrative Options based on Past Prediction Error

A central debate over the FY 2023 defense budget involves deciding how to deal with inflation’s erosion of the Pentagon’s purchasing power. DoD officials have stated that inflation drove them to increase the request’s size to $773 billion.9 Some members of Congress have proposed increasing the budget further because inflation may remain worse than expected.10 Other members of Congress have opposed such increases, characterizing them as unnecessary at best and wasteful at worst.11 In short, policymakers have mostly staked out their usual positions on defense spending but supported those positions with arguments about current and future inflation.

Inflation considerations should not supplant other criteria used to judge the defense budget’s sufficiency, including the important question of how the U.S. forces supported by the budget would fare against enemy forces in likely conflict scenarios.12 If we believe that the forces and budget provide roughly the right level of defense, then estimating inflation’s deleterious effects matters greatly. By contrast, if we believe that the forces and budget do not provide the right defense, then devoting disproportionate attention to inflation distracts from larger

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12 However, inflation interlopes in questions like this, too, since purchasing power determines how many forces a given budget can support.
problems. In sum, inflation can, alongside other factors, rightfully inform judgments about the appropriate level of defense spending.

This chapter develops a framework that illustrates options for the FY 2023 DoD budget topline based on policymaker outlooks on future inflation. The framework uses prediction error in past inflation forecasts to benchmark potential error in the current inflation forecast. It shows that, depending on one’s outlook, providing 0 percent real growth could yield a topline ranging from $768 billion to $792 billion, with any extra real growth added on top. In the framework’s maximalist scenario, supreme pessimism about future inflation plus 5 percent real growth, the topline would reach $830 billion, nearly $60 billion above the administration’s request. These widely ranging illustrative toplines demonstrate why using real growth to set defense spending can create confusion during periods with shifting inflation. Making sound judgments about the FY 2023 defense budget will require policymakers to consider both their outlooks on future inflation and their preferences about real growth.

**Current Inflation Forecast**

According to Pentagon officials, the FY 2023 DoD request assumed inflation would average 2.2 percent in FY 2023.\(^\text{13}\) This rate represents the GDP price index. It anchors DoD’s budget planning as mandated by the Office of Management and Budget (OMB) and reflects what the Pentagon purchases fairly well relative to alternative indices.\(^\text{14}\) Policymakers lack the means to know with certainty whether the forecast will prove accurate, especially since FY 2023 ends 15 months from now.\(^\text{15}\) Pinpointing inflation that far in the future entails irresolvable uncertainty.

Critiques of the FY 2023 request have asserted that DoD’s assumed inflation rate is potentially too low.\(^\text{16}\) Analysts have referenced alternative indices reporting higher rates, such as the consumer price index, to suggest that the defense budget risks losing buying power if it does not grow at a higher rate.\(^\text{17}\) As a practical matter, the GDP price index should continue

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\(^{15}\) McCord, remarks at Pentagon press briefing.


to anchor DoD’s budget planning in accordance with OMB policy. The GDP price index has limitations, including a tendency to increase at a lower rate than several categories of defense expenditure, such as aircraft. Still, technical studies have repeatedly found that it performs well relative to alternatives.

All the attention paid to alternative indices has distracted from a more basic question vitally important to policy: How accurately has the U.S. government forecasted the GDP price index in the past? By surveying the range of prediction error in previous forecasts – specifically forecasts looking one year ahead – we can benchmark the range of potential error in the current forecast. This benchmark could prove inaccurate if something unprecedented happened with inflation. However, including periods with extreme inflation outcomes, such as the late 1970s, lowers that risk. Other benchmarks could also be derived for longer-range forecasts or future years, although this chapter concentrates on the one-year forecasts most relevant to the current request.

**Prediction Error in Past Forecasts**

From FY 1977 to FY 2020, the period for which data exists in DoD reference volumes, ex ante inflation forecasts looking one year ahead predicted ex post estimated inflation rates reasonably well, including during periods with surging and shrinking inflation (Figure 3). The U.S. government overestimated inflation, meaning the forecast exceeded the rate, more often than it underestimated inflation, with 24 overestimates, 16 underestimates, and four bullseyes (Figure 4). The type of prediction error often recurred in successive years, resulting in multi-year periods when forecasts repeatedly overestimated or underestimated inflation.

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21 The operative word here is range. Inflation forecasting models already use historical error to generate predictions, typically reported as point estimates with confidence intervals. In this econometric approach, outliers get transformed into averages. This approach may dissatisfy policymakers who prefer using best- and worst-case scenarios to benchmark future policy. On the importance of studying outliers in defense spending research, see Travis Sharp, “Wars, Presidents, and Punctuated Equilibriums in U.S. Defense Spending,” *Policy Sciences* 52, no. 3, September 2019, p. 370.
FIGURE 3: INFLATION RATE VS. FORECAST FROM YEAR PRIOR, FY77 TO FY20

Source: DoD, National Defense Budget Estimates volumes, various years.

Notes: In GDP price index %. Inflation rate represents most recent estimate in source data.

FIGURE 4: PREDICTION ERROR IN INFLATION FORECAST, FY77 TO FY20

Source: DoD, National Defense Budget Estimates volumes, various years.

Notes: In GDP price index % points. Inflation rate represents most recent estimate in source data.
During periods of repeated overestimates, such as the 1980s, DoD earns an inflation “dividend” whereby it has more buying power than expected. By contrast, during periods of repeated underestimates, such as the late 1970s, DoD pays an inflation “tax” whereby it has less buying power than expected. These dividends and taxes greatly affect weapons purchases, among other expenditure categories, because procurement funds pay out for years after being appropriated, meaning mismatches between forecasted inflation and actual inflation accumulate over time. In the past, defense specialists floated several ideas to resolve these mismatches, including 1) adjusting the process used to forecast and/or budget for defense inflation; 2) establishing a defense inflation fund from which DoD could withdraw (or return) money after price changes were verified; and 3) funding inflation through supplemental appropriations.

**Benchmarking the FY 2023 DoD Topline**

The range of historical prediction error shows how policymakers might adjust the FY 2023 DoD topline to keep up with inflation. We can start by using statistical quartiles – the spread of observations divided into four equal segments – to summarize the historical error, ranging from the maximum inflation underestimate to the maximum overestimate to key values in between. We can then map generic policymaker inflation outlooks onto the key quartile values, creating a framework that combines outcomes from the past with outlooks on the future to illustrate options in the present (Figure 5).

For example, policymakers deeply concerned that the assumed FY 2023 inflation rate of 2.2 percent is too low, a model we will call “supreme pessimist,” might consider increasing the topline growth rate by an additional 2.5 percentage points, matching the maximum inflation underestimate (FY 1979), to hedge against potential inflationary losses. This adjustment would produce a FY 2023 topline of $792 billion, representing 0 percent real growth due to the higher assumed inflation rate, which supreme pessimists could then increase further, if desired, based on their judgments about how much real growth the budget requires (Figure 6).

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24 On the pros and cons of these ideas, see CBO, Budgeting for Defense Inflation, pp. 27–47.

Policymakers skeptical about the worst-case thinking embedded in supreme pessimism might instead prefer the “pessimist,” “optimist,” or “supreme optimist” models depending on their outlooks on future inflation. Each model corresponds to a different quartile value in the historical prediction error range, as noted above. As a result, each model also yields a slightly different “0% real growth” FY 2023 topline, with any real growth added on top. The “optimist” model most closely matches the FY 2023 request of $773 billion, making that model the center of gravity for deliberations about topline adjustments. For the sake of completeness, the framework includes a “record low inflation” model even though that model is not particularly relevant to the current context.²⁶

### FIGURE 5: 0% REAL GROWTH TOPLINES BASED ON POLICYMAKER OUTLOOK ON FUTURE INFECTION

<table>
<thead>
<tr>
<th>Inflation Rate</th>
<th>FY22 Topline</th>
<th>FY23 Topline</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7% inflation</td>
<td>792 Supreme Pessimist</td>
<td>792 Supreme Pessimist</td>
</tr>
<tr>
<td>2.5% inflation</td>
<td>776 Pessimist</td>
<td>776 Pessimist</td>
</tr>
<tr>
<td>2.0% inflation</td>
<td>772 Optimist</td>
<td>772 Optimist</td>
</tr>
<tr>
<td>1.5% inflation</td>
<td>768 Supreme Optimist</td>
<td>768 Supreme Optimist</td>
</tr>
<tr>
<td>0.2% inflation</td>
<td>758 Record Low Inflation</td>
<td>758 Record Low Inflation</td>
</tr>
</tbody>
</table>

**Source:** Prediction error data from Figure 4.

**Notes:** In billions nominal $ discretionary budget authority for FY23 DoD budget. FY22 figure rounded up from $756.6 billion referenced elsewhere in report.

²⁶ The model incorporates the maximum inflation overestimate of 2 percentage points (FY86), resulting in an inflation rate of 0.2 percent; however, the lowest rate in the source data is 0.9 percent (FY10 and FY16). Inflation plunging that far that fast seems unlikely in the case of the GDP price index, although alternative indices might experience such a drop.
Implications for Decisions about the FY 2023 Topline

The framework shows that one of policymakers’ favored metrics for judging how much defense spending is enough, real growth per annum, does not provide clear answers during periods with volatile inflation – unless policymakers also clarify their outlooks on future inflation.

Congressional positioning on the defense budget demonstrates why clarifying one’s outlook on future inflation is important. On one side of the debate, some legislators have called for 5 percent real growth in the FY 2023 budget. Depending on whether one is supremely optimistic or supremely pessimistic about future inflation, however, 5 percent real growth could produce a topline of $806 billion or $830 billion, respectively, an appreciable difference nearly equaling the amount of funding Congress added to last year’s defense budget (FY 2022). On the opposite side of the debate, other legislators have expressed satisfaction with the size of the DoD’s $773 billion request for FY 2023. If future inflation followed the supremely pessimistic model, however, then a $773 billion topline could result in DoD losing approximately $20 billion in buying power, the difference between 0 percent real growth in the supreme pessimist and optimist models.

28 Ibid.
As the framework demonstrates, specific real growth percentages yield different toplines depending on one’s underlying outlook. For this reason, policymakers need to stipulate, even if privately, the inflationary losses in buying power that they seek to avoid or accept in the FY 2023 budget. The framework should help with that task. Real growth alone does not provide an adequate standard for setting defense spending in FY 2023.
LIST OF ACRONYMS

CBO  Congressional Budget Office
CSBA  Center for Strategic and Budgetary Assessments
DoD  Department of Defense
FY  Fiscal year
GAO  General Accounting Office / Government Accountability Office
GDP  Gross domestic product / gross domestic purchases
OMB  Office of Management and Budget