SYM-AM-22-054

Excerpt from the Proceedings of the Nineteenth Annual Acquisition Research Symposium

Acquisition Research: Creating Synergy for Informed Change

May 11–12, 2022

Published: May 2, 2022

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

Acquisition Research Program
Department of Defense Management
Naval Postgraduate School

The research presented in this report was supported by the Acquisition Research Program at the Naval Postgraduate School.

To request defense acquisition research, to become a research sponsor, or to print additional copies of reports, please contact any of the staff listed on the Acquisition Research Program website (www.acquisitionresearch.net).

Acquisition Research Program
Department of Defense Management
Naval Postgraduate School

Pathways to Defense Budget Reform

Eric Lofgren—is a Senior Fellow with the Center for Government Contracting at George Mason University where he performs research on agile acquisition practices, budget reform, and cost or price analysis. He also manages the blog "Acquisition Talk" and produces a podcast with the same name where he speaks with leading experts in the field. Prior to that, Lofgren was a senior analyst and employee owner at Technomics, Inc., where he led cost data initiatives, performed weapon system cost estimates, and supported economic studies. [elofgren@gmu.edu]

Abstract

The Planning-Programming-Budgeting-Execution (PPBE) process is the most powerful system of incentives affecting acquisition management in the Department of Defense. It is the conduit to money. A key feature of PPBE is the program of record concept that relies on a multi-year planning process. Not only does the program of record hamper technology adoption through adherence to baselines, it creates barriers to interoperability by stovepiping program decisions. Many researchers have detailed the inadequacies of PPBE and the need for embracing a portfolio management approach that aligns with best practices found in commercial and international organizations. This paper dives deeper into the history of how the legislative and executive branches managed defense budget portfolios in the 1960s and before, as well as how PPBE upended those traditional processes. First, it traces the reduction in execution flexibility over time by documenting the budget structure and thresholds for reprogramming. Second, it examines criteria for effective oversight in the PPBE and portfolio settings. The paper concludes that execution flexibility in the form of portfolio budgeting is not only consistent with economic efficiency, it is consistent with United States traditions of congressional control.

Keywords: PPBE, Budgeting, Portfolio Management, Oversight, History

Introduction

Reformers can't know where they are going if they don't know where they've been. The Department of Defense is a complex institution that underwent radical change in the 1960s with the advent of the Planning-Programming-Budgeting-Execution process (PPBE). It had a profound effect not just on bureaucratic processes, but on the ability of innovators to field game-changing weapons systems. There has been a growing recognition of the need to reform the industrial age PPBE process so that the United States can outpace peer-competitors like China and Russia in military technology. Senator Jack Reed said of PPBE, "It is likely too slow and cumbersome to meet many of the DoD's requirements to adopt new technologies in a rapid, agile manner." Representative Adam Smith said, "We've got to give the Pentagon greater flexibility in terms of moving money around so that they're not locked into a two-year or five-year cycle." Former Representative Mac Thornberry wrote how "today's rapid innovation and technological change renders our industrial age approach to funding obsolete" (Lofgren, 2022).

The recognition that PPBE requires change led to action. The FY 2022 National Defense Authorization Act created the Commission on PPBE Reform. While the commission has a broad mandate, an emerging consensus in PPBE reform is the need for portfolio management. The National Security Commission on Artificial Intelligence, for example, recommended accelerating "efforts to implement a portfolio management approach for requirements and budget" (NSCAI, 2021). Representative Seth Moulton agreed to look at a "mission-based pilot" to "restructure funding so that it's tied to missions instead of specific hardware" (Hudson, 2021). Other studies have also detailed the importance of portfolio budgeting to acquisition innovation (e.g., Lofgren, 2020; Patt & Greenwalt, 2021; Modigliani et al., 2021).

This paper will examine the historical context of portfolio management in defense acquisition. It presents the idea that there was wisdom to traditional methods of appropriations

and oversight that offers a pathway to thinking about future reforms. Two important areas include: (1) a discussion of how the budget structure and reprogramming authorities have changed over time; and (2) an investigation of the criteria for effective transparency and oversight. It will show that execution flexibility has dramatically decreased since the introduction of PPBE, affecting defense officials' ability to adapt to change. It will also show how PPBE replaced value-focused oversight with universal metrics based on performance to baseline. It concludes that budget portfolios are compatible with congressional control, and that traditional methods can be updated to reflect new capabilities available in the 21st century.

Budget Structure and Execution Flexibility

The structure of the budget and the process for reallocating resources in execution are intimately tied. When budget lines are finely-tuned to specific projects multiple years in advance, changes are inevitable by the time defense officials execute the funding. There could be contract delays, emergency situations, political factors, unexpected inflation, new technologies, evolving threats, and any number of fact-of-life changes. During the 1960s and 1970s, defense officials not only lost their ability to make cost-schedule-technical tradeoffs within programs, they also lost flexibility to reallocate resources between programs. This section will outline how PPBE led to a significant reduction in defense execution flexibility.

Though it is hard to imagine for many defense officials in the 21st century, there was no Congressional authorization process prior to 1959. In this context, "authorizations" establishes activities performed by the government whereas "appropriations" finances those activities. In years past, Congress would provide lump-sum appropriations to the President who then had broad discretion in defense programming. The discretionary tradition of appropriations went all the way back to the founding fathers. The foundation was set in 1801. President Thomas Jefferson intended to request "specific sums to every specific purpose susceptible of definition." Alexander Hamilton strongly disagreed, and so did Jefferson's Secretary of Treasury. Eventually, Jefferson admitted that "too minute a specification has its evils" (Fisher, 1971).

Logical controls were added to financial management over time. The Anti-Deficiency Act of 1905 made sure departments could not obligate funds in excess of the amount appropriated. The Budget and Accounting Act of 1921 required the president to submit a complete budget request along with simplified line itemization of spending categories. Although the President was not legally bound to obligate funds to anything more specific than what Congress writes into law, there existed a custom that they would be obligated according to the line items presented in budget justification documents. Still, movement of funds occurred under various names like "adjustments," "interchangeability," or even "transfers." Only the particular context made it clear whether the action occurred between appropriations or between line items within an appropriation (Fisher, 1975). In World War II, the need to move funds for emergency situations was high. Congress provided a "transferability clause" which allowed the departments to unilaterally move funds across appropriations by up to 10% percent (*Department of Defense Reprograming of Appropriated Funds*, 1965).

In the early post-WWII years, the defense budget continued on a traditional basis. Until FY 1952, the Army and Navy proposed budgets based on appropriations that were essentially organizational in structure, and budget line items based on two classifications: by activity and by object. For example, the Army's FY 1950 request had an organic appropriation of "Ordnance Service and Supplies" totaling $730 million. That figure was broken down into 13 budget activities including $103 million for "Procurement of artillery," $48 million for "Research and development," and $1 million for "Ordnance military training." The $730 million appropriation was broken down in a second way, according to nine objects of expenditure including $293 million for "Equipment," $132 million for "Personal services," and a mere $54,900 for "Printing

and binding." This budget structure provided major organizational units broad flexibility in terms of allocating resources to particular weapons projects.

While "Ordnance Services and Supplies" was one large appropriation, the Army also had several small appropriations scattered throughout, such as "Expenses of Courts-Martial," "Promotion of Rifle Practice," and "Salaries" for sixteen different offices in Army headquarters. While some accounts were small, the program objectives related to development and procurement were relatively unconstrained except by budget ceilings and high-level policies.

In order to rein the services in from duplication, competition, and overlap, the budget was reorganized for FY 1952 to adopt the Hoover Commission's principles of performance budgeting. The first step was to re-classify the appropriations from broad organizations to investment and expense accounts like Research, Development, Test & Evaluation (RDT&E), Procurement, and Operations & Maintenance (O&M). This had the effect of simplifying the appropriations structure, reducing accounts from as much as 186 to roughly 40 (*Organizing for National Security*, 1961). The budget lines underneath the reorganized appropriations continued to be presented to Congress on the traditional basis of activities and objects of expenditure. The effect was to simplify the budget structure and broaden DoD discretion.

The Hoover Commission, however, intended budgetary classifications to be based upon functions, projects, and outputs. This could allow the Secretary of Defense to assign priorities and eliminate competition amongst the services through budgetary review alone. The DoD standardized the budget activities it submitted to Congress along a program basis. For example, the Army Procurement appropriation had programs including "Vehicles (Noncombat)," "Weapons," and "Ammunition." These programs included projects and sub-activities that were not submitted to Congress. The "Weapons" program included projects like "Artillery," "Small Arms," and "Chemical Weapons" (Mosher, 1954). Even project-level budgets in the 1950s represented broad portfolios.

Defense officials could not only freely move funds within budget activities, they retained flexibility to reallocate funds. Wilfred McNeil, the first Assistant Secretary of Defense Comptroller from 1949 to 1959, told Congress that in his tenure the DoD would often shift funds between budget lines, such as "between guns and ammunition, or between guns and trucks." However, Congressional approval was sought for major deviations. McNeil provided an analogy:

> If I were in business and borrowed $10,000 from the Riggs National Bank and said I wanted to put $9,000 in inventory and $1,000 in show cases, then I would not go out and spend $5,000 for show cases and $5,000 for inventory without going in and discussing it with the loan committee. (*Department of Defense Reprograming of Appropriated funds*, 1965).

The appropriations committee report for FY 1956 recognized that "rigid adherence to the budgetary activity and the budget breakdowns might unduly jeopardize the effective accomplishment of the planned program in the most businesslike and economical manner." However, the report explained that "it has never been, nor is it the intention of the committee this time, to permit the military departments to have unrestricted freedom in reprogramming." Appropriators asked defense officials to respect "the integrity of the justification presented in support of the budget requests" (Report, 1955).

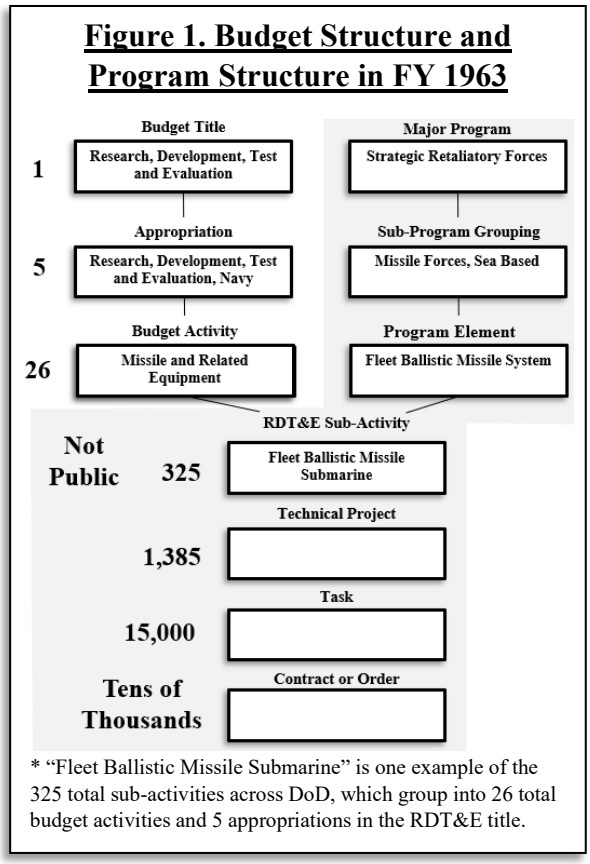
Following the report in December 1955, DoD Instruction 7250.5 was issued outlining procedures and reporting for reprogrammings, or the moving of funds between budget lines. Actions requiring Congressional prior approval included: (1) actions greater than 5% for budget activities less than $200 million; (2) actions of $10 million or more for budget activities $200 million or more; and (3) actions in which the committee has "shown a specific interest"

(*Department of Defense Reprograming of Appropriated Funds*, 1965). The level of reprogramming remained high with budget activities. For example, the FY 1956 budget request for Navy "Major Procurement and Production" totaled $2.9 billion and showed 11 budget activities including $755 million for "Aircraft," $1.3 billion for "Ships and harbor craft," and $30 million for "Combat vehicles" (*Department of Defense Appropriations for 1956*, 1955). Within the budget activities, defense officials retained broad discretion to make tradeoffs between particular weapons projects such as between classes of ships or types of aircraft. However, regular congressional reporting was added to the DoDI 7250.5 in October 1959 at the request of appropriators. The reports listed DoD-approved reprogramming action greater than $1 million for RDT&E and O&M, and greater than $5 million for Procurement (*Department of Defense Reprograming of Appropriated Funds*, 1965). Early in 1960, DoD started notifying Congress immediately after a reprogramming whereas before it compiled them into reports every six months (*Department of Defense Appropriations for 1961*, 1960).

Starting in 1961, Secretary of Defense Robert McNamara began implementing the Planning-Programming-Budgeting System (PPBS) which sought to add programmatic definition to budget preparation. Charles Hitch, one of the founders of the PPBS, became McNamara's Assistant Secretary of Defense (ASD) Comptroller and described how it worked to Congress. The basis of the budget would result from analyses of program elements. For example, in the RDT&E title, the Army contained 24 program elements that included particular weapons like the Pershing missile and Mauler anti-aircraft system, as well as broader portfolios like "Aircraft propulsion systems" and "Tactical communications." The Navy had just 10 program elements in RDT&E, and the Air Force 17. There were an additional seven program elements in Space Systems and three in the Advanced Research Projects Agency (*Organizing for National Security*, 1961).

In support of the FY 1964 appropriations, Hitch presented a chart comparing the budget structure to the program structure. The RDT&E budget title included five appropriations and a total of 26 budget activities. The request to Congress was supported by 325 RDT&E sub-activities, themselves made up of 1,385 technical projects, and 15,000 tasks. The sub-activities also supported a separate program structure that consisted of program elements and major force programs. The chart presented by Hitch is reproduced in Figure 1 below. While the budget structure was presented to Congress, program funding was not shown publicly.

Senator Richard Russell asked Hitch why the DoD did not create "specific appropriations" for the sub-activities rather than "having it hidden in the appropriations." Hitch responded that Bureau of Budget deputy director Elmer Staats objected. As Hitch recounted it, Staats wrote a letter that "simply states they have no other practical way of handling this matter than the way it has been handled in the past" (*Department of Defense Appropriations for 1964*, 1963a). Program estimates had long been detailed to Congress in appropriations and other hearings, but they were never married to the budget request.



A major incident sparking a change in reprogramming authorities was when the Navy started construction of five Fleet Ballistic Missile submarines in 1961 without approval from Congress. On March 20, 1961 Chairman of the Appropriations Committee George Mahon wrote to McNamara requesting committee prior approval to four areas of reprogramming:

1. Procurement of items omitted or deleted by Congress.
2. Programs for which specific reductions in the original request were made by Congress.
3. Programs which had not previously been presented to or considered by Congress.
4. Quantitative program increases proposed above the programs originally presented to Congress.

McNamara accepted the first two points, but not the last two. Chairman Mahon largely agreed to the more modest prior approval procedure (Fisher, 1975). McNamara had already created a program change control system, personally making 400 reprogramming decisions at the budget sub-activity level between spring of 1961 and the close of 1962 (*Department of Defense Appropriations for 1964*, 1963a). McNamara verified early in 1963 that prior approval was only required when the DoD "proposed to act contrary to the stated desires of the committee." For example, if a committee reduced a request from $100 million to $80 million on a particular project. Representative Melvin Laird, who later succeeded McNamara as Secretary of Defense, remained confused. Sub-activities like the Gemini and Dyna-Soar being discussed for reprogramming had "never been listed" in Air Force budget justifications (*Department of Defense appropriations for 1964*, 1963b).

A March 4, 1963 change reprogramming procedures brought these sub-activities or programs more fully to the attention of Congress. DoD Directive 7250.5 specified three areas of congressional prior approval: (1) items or activities omitted or deleted by the Congress; (2) items or activities for which specific reductions in amounts originally requested were made by the Congress; and (3) any increases in procurement quantity of aircraft, missiles, or naval vessels. Most reprogramming actions, however, remained the purview of the DoD. A new DoD Instruction 7250.10 added reprogramming procedures internal to the DoD that required approval from the Secretary of Defense and prompt notification to the Armed Services and Appropriations committees which could reject the action within 15 days. DoDI 7250.10 outlined three reprogramming procedures: (1) increase of $5 million or more in a budget activity for Military Personnel or O&M appropriations; (2) increase of $5 million in a procurement line item or a new procurement line greater than $2 million; and (3) increase of $2 million to any budget sub-activity line item in RDT&E, or addition of a new sub-activity estimated to be $10 million or more within a three-year period (*Department of Defense Reprograming of Appropriated Funds*, 1965).

Reprogramming actions in the 1960s were relatively high. For example, FY 1961 RDT&E reprogramming was $994 million (*Department of Defense Reprograming of Appropriated Funds*, 1965). Director, Defense Research & Engineering Harold Brown remarked that reprogramming actions were roughly 20% of the RDT&E title in FY 1961. “These actions are instituted by and large by the services,” Brown said. “They are reviewed by the Secretary of Defense Office—by me, as a matter of fact. By and large, they are passed and passed quickly” (*Federal Budgeting for Research and Development*, 1961b).

The reprogramming thresholds outlined in DoDI 7250.10, replaced in 1996 by the Financial Management Regulation (FMR), only required Congressional notification and not prior approval. For example, a reprogramming above the $2 million threshold for RDT&E that did not cross appropriation accounts required Secretary of Defense approval and Congressional notification. It wasn’t until the August 2000 update to the FMR that these reprogramming thresholds were brought under Congressional prior approval as well, further reducing execution flexibility.

Increased controls over reprogramming have not been as restrictive to execution flexibility as increasingly detailed budget line items. Until FY 1971, the DoD submitted its budget request in a format that corresponded to the traditional budget activities and objects of expenditure. Defense program elements and sub-activities were not exposed. Discussions and charts of program elements at congressional hearings had dollar amounts redacted (*Department of Defense Appropriations for 1971*, 1970). The FY 1972 budget request was the first to display program elements and projects underneath them in an appropriations hearing. By this time, the program element also became more detailed in definition; closer to what had been called a budget sub-activity in the early 1960s. In the RDT&E title, each military department had nearly 200 program elements and perhaps five times as many projects. Recognizing the burden of additional detail and control, the DoD submitted its FY 1973 budget with consolidated program elements. For example, Army program elements in RDT&E were reduced from 173 to 85 (*Department of Defense Appropriations for 1972*, 1971; *Department of Defense Appropriations for 1973*, 1972). This had the effect of widening DoD flexibility and triggered a protest from the Senate Armed Services Committee. The DoD subsequently returned to the previous format (Fisher, 1975). That format has seen some evolutions but remains largely the same 50 years later in terms of structure and quantity of budget lines. While Army proposed 173 program elements in FY 1972 RDT&E, the Army proposed 208 in FY 2022.

Long planning timelines and excess detail in budgeted programs will inevitably lead to a misallocation of resources that must be traded off in execution. Defense officials begin programming the budget—deciding on the projects and objectives of weapons acquisition—two

years before Congress releases appropriations to go execute. In reality, the constraint is much worse than that. Acquisition programs require full funding, meaning they have to be linked to a sponsored requirement, run through an analysis of alternatives, and supported by up to 49 documents including a life cycle cost estimate, life cycle sustainment plan, and test and evaluation master plan (GAO, 2015). Before officials are ready to enter the two-year process for PPBE, several years of paper documentation have elapsed. When appropriations become available, it can take another one, two, three, or five years to obligate funding (e.g., award a contract).

While O&M and Military Personnel reprogramming actions are controlled at the higher budget activity level, RDT&E and Procurement actions are controlled at the program element level, also called Budget Line Items (BLIs). The FY 2022 budget request includes 928 unclassified BLIs across the RDT&E title. Half of these BLIs are less than $30 million. The detail of program budget planning restricts tradeoffs and new opportunities not foreseen multiple years ahead of time. For comparison, the median tech startup, mostly working on software applications rather than deep tech, received $53 million in Series C funding from venture capital (Fundz, 2022).

For accounts in the FY 2022 RDT&E title, prior approval is required for any reprogramming action to a BLI that is more than $10 million or 20% of its starting value, whichever is less. Each appropriation title has its own thresholds for reprogramming, summarized in Figure 2 below. All actions above the threshold, called Above Threshold Reprogramming (ATR), must first seek up to 12 layers of approval within the Department of Defense. It can then move to the Office of Management and Budget (OMB) and four congressional committees for final approval. Congressional response takes about 45 days on average (Comptroller, 2015). The total time to approve an ATR ranges from four to six months (Section 809, 2019). Another source found that between FY 2007 and FY 2018, it took the Navy an average of 96 days to complete an ATR transaction from first record to congressional decision. The longest was 236 days (Fritsch, 2020). Roughly 30 prior approval reprogramming packages get submitted each year averaging less than $8 billion annually between FY 2000 and FY 2020 (McGarry, 2020).

Below the reprogramming thresholds, the DoD has flexibility to move funding. Comptroller DD1416 reports collected for this study reveal that between FY 2012 and FY 2020, Below Threshold Reprogramming (BTR) actions for the RDT&E title did not veer far from $1 billion annually.[1] BTRs affect more than half of all RDT&E budget lines, the average amount being roughly $2 million. Over that time, the Navy, Air Force, and DoD-Wide accounts shared roughly equally in BTRs, with the Army contributing half the amount. Yet as a percent of RDT&E funding, the Army achieved BTRs of 1.6% compared to the Air Force which BTRs about 1% on average.[2]

While total BTR dollars have been relatively stable for RDT&E between FY 2012 to FY 2020, BTRs as a percent of title funding has fallen from roughly 1.7% per year to 1%. A similar trend is apparent for Procurement, with BTRs falling from roughly 2% percent of the title per year toward 1%. The BTR data in the DD1416 report shows cumulative effects and does not reveal each individual BTR action. For example, Comptroller guidance states that “the BTR is calculated using the net of increases and decreases to a budget line.” If one budget line is

[1] DD1416s show the cumulative result of reprogramming actions by BLI. Fiscal year data reported using DD1414 show figures pertaining to the appropriation and not when the action occurred. The FY 2020 RDT&E appropriation is available for obligation and reprogramming actions in both FY 2020 and FY 2021.

[2] This is likely due to Army BLIs being smaller on average, and thus more likely to hit the 20% threshold than $10 million

increased by $5 million in January and then decreased by $4 million in March, the DD1416 quarterly report would only record the net result of $1 million.

Figure 2. Congressional Prior Approvals

Reprogramming: Moving funds between authorized elements, but above appropriation-specific thresholds. Also, whenever procurement quantity is increased or a congressional special interest item is affected. FY 2022 thresholds:

RDT&E: $10 million or 20%* of a program element
Procurement: $10 million or 20%* of a budget line item
O&M: $10 million of a budget activity or defense agency

*whichever is less

Transfers: A reprogramming action of any size that crosses appropriations. Internal reprogrammings that do not change the intent of a budget line item may use transfer authority, but do not require congressional prior approval. The FY 2022 cap on cumulative transfers:

General Transfer Authority: $4.0 billion
Specific Transfer Authority: $2.0 billion

New Starts/Terminations: A new start is a BLI or major component thereof not previously justified in the President's Budget submission. Terminations are when an authorized program's funding is zeroed out. Below the threshold, new starts and terminations only require a letter notification to Congress. FY 2022 thresholds:

RDT&E: $10 million for entire effort
Procurement: $20 million for entire effort

The above analyses only scratch the surface of how defense officials achieve execution flexibility. It gets to a larger issue of congressional control. The rules around prior approval reprogrammings are not found in law but in the customs and defense regulations that have emerged over the past decades. As former chair of the House Armed Services Committee Melvin Price remarked in a 1985 hearing, "The handling of reprogrammings is really a gentleman's agreement between Congress and the Executive Branch. It is really a pretty fragile process." In remarks prepared for the hearing, Deputy Secretary of Defense William Taft IV concurred, "I also recognize that the history of, and precedence for, these procedures rests not in statutory authority, but rather in terms of continuous understanding and agreement between the appropriate congressional committees and the Department of Defense."

Legally, the executive branch is only required to spend according to what is written in law. Defense appropriations are usually limited to a few dozen accounts and special items like ship construction. BLIs are not written into law, and the prior approval process is a regulation created by the Executive. Even use of transfer authority only requires prior approval from the OMB, not Congress. However, when the Executive veers too far from established norms and breaks trust with Congress, it can result in a tightening of the purse strings.

One executive action that damaged trust was President Richard Nixon's impoundment of funds for an environmental project in 1972. It led to a congressional backlash that spilled over into defense.[3] The number of approved ATRs dropped from an average of about $2.6 billion a year in the 1960s to less than one billion in FY 1973 and FY 1974. The number of reprogramming actions also dropped from approximately 100 to just 24 in FY 1974, while each action affected fewer BLIs. While 1960s reprogrammings could bundle 30 or 40 BLIs together, the 24 actions in FY 1974 involved just 37 BLIs total (Fisher, 1975).

DoD started to rely more heavily on other sources of execution flexibility in the 1970s and 1980s including unexpended balances. Prior to 1949, obligational authority that had not been turned into expenditures were available to cover contract claims up to two years after the appropriation expired after which time funds lapsed, or were cancelled, and returned to the Treasury. In 1949, Congress allowed the DoD to accumulate lapsed funding into a Treasury account that remained available for covering claims with General Accountability Office approval. In 1956, the authority to clear the use of lapsed funding was delegated to the agencies. Separate processes were created for unobligated balances (merged surpluses) and obligated balances. In the latter case, the final contract payment may be different than the amount obligated for reasons like termination for default. These obligated balances went into the "M" account where they lost their identification with a fiscal year appropriation and were thus unlikely to encounter any Anti-Deficiency Act violations (GAO, 2004).

The merged surpluses and "M" accounts were not as large a source of execution flexibility for acquisition in the 1950s and 1960s because the RDT&E and Procurement accounts had been "no-year" money. In other words, obligational authority did not expire (Fisher, 1975). Appropriations from past years were available for future obligations. Indeed, the carryover balances were so great for Army Procurement accounts after the Korean War that Congress did not provide any new obligational authority in FY 1955 and FY 1956. The Army already had all the obligational authority it needed (*Department of Defense Appropriations for 1956*, 1955). However, total unobligated balances were large, ranging between $7 billion and $13 billion between FY 1957 and FY 1969 (GAO, 1990).

RDT&E and Procurement accounts moved from a no-year to multi-year bases after Congress discovered in 1970 that funds left over from the Polaris submarines had been a major source of DoD execution flexibility. The Appropriations report for FY 1971 stated that "The availability of these funds makes defense planners, to a limited extent, immune from tight Congressional fiscal control" (Fisher, 1975).

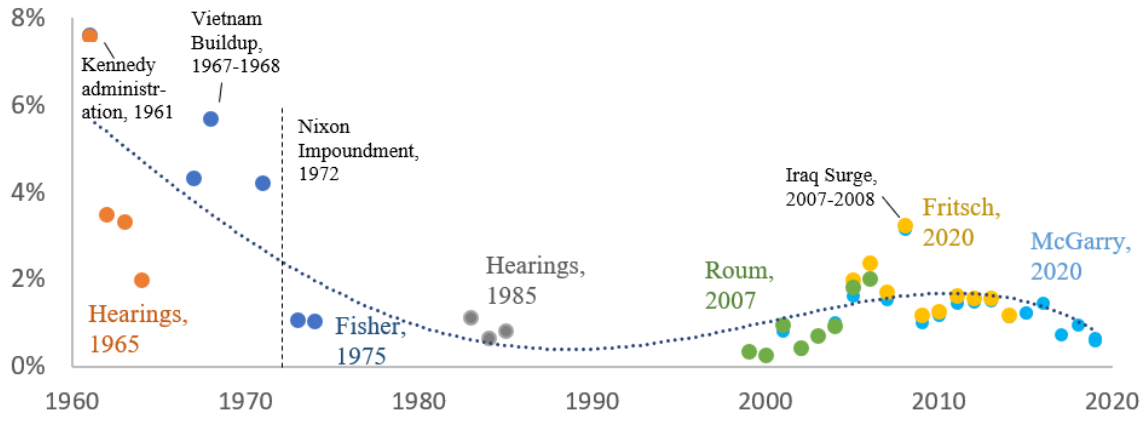
With the expiration of RDT&E and Procurement accounts, and the subsequent tightening of Above Threshold Reprogramming, defense officials relied more heavily on the use of lapsed funding. High inflation in the 1970s led the high inflation estimates being built into budget justifications and in turn led to large balances. By 1989, there was $25 billion in merged surpluses and $18.7 billion in the "M" account. The GAO estimated that between 53% and 95% of "M" account usage was not used for the original purpose of the appropriation and was therefore not valid (*Abuses in the "M" Account System and Proposals for Reform*, 1990). For example, the GAO discussed how the Air Force wanted to use $1 billion of expired funds for a B-1B contract modifications. While the case was completely legal, the GAO did not find it proper (GAO, 2004). The Air Force told the GAO that it was common to reprogram funds from a valid program requirement for use elsewhere, only to make the donor program whole again by use of expired funds. The GAO called this practice "questionable." By 1995, $5.2 billion from the "M"

[3] A number of other issues also emerged in the early 1970s. It was discovered in 1971 that defense officials performed BTRs between appropriation years, in effect saving funding from expiration. In 1972, there was a controversy over the Navy failing to receive prior approval of military personnel reprogramming actions.

account could not be matched to disbursements (GAO, 1990). In 1995, Congress decided to cancel the accounts and later replaced them with the Defense Modernization Account that has additional restrictions including a $1 billion ceiling and quarterly reporting requirements (GAO, 1999; 10 U.S. Code §2216). Between FY 2013 and FY 2018, theDoD saw $81 billion cancelled.

As is common in wartime, Congress grants the military additional flexibility. During the Global War on Terror, Congress increased its approval of ATRs from $853 million in FY 2020 to a peak of $21 billion in during the 2007–2008 Iraq Surge. The Overseas Contingency Operations (OCO) account provided another source of flexibility. Although ATR reprogramming actions for OCO ran through the prior approval process, the budget request was not as specified to meet unanticipated wartime needs (CRS, 2019). However, as the United States began drawing down its counter-terror operations and OCO was dropped from the FY 2021 budget, flexibility has decreased. Figure 3 below depicts the total dollar value of Above Threshold Reprogrammings as a percent of the defense budget between FY 1961 and FY 2019. It is important to remember that overall execution flexibility may have fallen more than Figure 3 suggests due to: (1) the increasing definition of budget line items leading to less flexibility within a single BLI; (2) the increasing scope of congressional prior approval to include thresholds in that had only required notification in the past; and (3) reduced opportunities to use unexpended balances to cover claims and maximize use of current budget authority. Additional reductions in flexibility include the demise of large innovation funds that had regularly been over $150 million each year in the 1950s, (Fisher, 1975) and the increased prevalence of continuing resolutions that resulted in appropriations getting passed five-months late on average between FY 2010 and FY 2022.

Figure 3. Above Threshold Reprogramming as a Percent of the Defense Budget



The other side of the coin of execution flexibility is budget flexibility. If Congress accepts consolidated budget lines and higher-level requirements, then the DoD has a greater capacity to make cost-schedule-technical trades without imposing many changes related to prior approval reprogramming, expired balances, or other sources of flexibility.[4] For example, consider the 18 defense Procurement accounts which are composed of 85 budget activities and roughly 900 Procurement BLIs. Between FY 2011 and FY 2019, the DoD averaged roughly $1.7 billion in positive and negative BTR actions that affect more than half of all BLIs. If BLIs were consolidated into portfolios that correspond to their budget activities (e.g., combat aircraft, ammunition, tactical and support vehicles) then many of the BTRs would offset each other. For example, the FY 2019 Army budget activity “BA 02: Communications and Electronics

[4] Portfolio management will likely require more authority in new starts and terminations.

Equipment" shows BTR actions for 31 BLIs, 21 of which amounted to –$29.3 million and the remaining 10 amounted to +$14.7 million. Instead of requiring a total of $44 million in BTRs, a portfolio at the budget activity level could make two-thirds of those tradeoffs internal to the portfolio. Indeed, the DD1416 report indicates that three-quarters of all Procurement BTRs could be made internal to budget activity portfolios between FY 2011 and FY 2019. ATRs, on the other hand, would only be reduced by one-quarter on average, indicating that larger actions are more likely to cross portfolios and so would continue to be brought to the attention of Congress for prior approval. This move towards budget portfolios reflects the wisdom of traditional financial management practices described above.[5]

This brief overview of defense spending provides evidence that flexibility has decreased substantially since the World War II era. Budget flexibility has been reduced along two principal paths: (1) the classification and specificity of budget line items; and (2) the ability to make tradeoffs between budget line items and maximize use of budget authority. The decrease in flexibility would not matter to defense outcomes if weapon systems analyses accurately predicted program objectives and costs. Experience has proven that even the best laid plans can be upset by new technological opportunities, enemy threats, concepts of operations, and macroeconomic trends.

Yet there is something comfortable about multi-year analyses. It gives stakeholders with oversight functions a simple measure of success: performance to baseline. But in a dynamic world where technology development is modular, iterative, software-intensive, and leveraging commercial advances, execution to a fixed baseline no longer signals success. Leading technology enterprises have moved from project-based budgeting to funding persistent development teams with delegated responsibility (Rigby et al., 2019). These "new" agile processes in technology firms reflects the wisdom of traditional business practices used by defense officials prior to PPBS. However, if defense leadership, the Executive, and Congress decide to permit a dynamic system of portfolio management, a transparent process of reporting and evaluation will have to be built to establish a base of trust.

Criteria for Transparency and Oversight

Traditionally, the appropriations function and policy-making function were separate. In traditional budgeting, Congress finances a department's bureau to perform a government function but does not legally commit it to a precise level of service. If the budget also contained the policies and programs bureaus must accomplish, then there would be no point to separating appropriations from normal policy-making routines (Jones & McCaffery, 2005). Compared with debating whether an unmanned system would be available in three years at a certain cost, appropriators had historically been more comfortable with questions of overtime, travel expenses, purchase of equipment, and the leasing of property. Lump-sum appropriations allowed Congress to weigh evidence in hearings and issue across-the-board edicts such as a 10% cut without passing judgment of specific programs that could raise the ire of affected constituents (Murphy, 1969). Program choice was delegated, incremental, and repeatedly evaluated such that if harm were done, it would be incremental harm.

To reform-minded advocates of PPBS, the tradition was inadequate. Incremental program choices allowed the services to prioritize their "pet projects" at the expense of the combined forces. Charles Hitch complained that prior to PPBS in 1961, the policy had been to "divide a total defense budget ceiling among the three military departments, leaving to each department, by and large, the allocation of its ceiling among its own functions, units, and

[5] Because Congress appropriates to individual ships, the Navy's Shipbuilding and Conversion 1611N account does not use BTR authority and would not benefit from a portfolio budget. Current RDT&E budget activities make little sense for portfolios because they represent linear stage-gates rather than capability, mission, or organizational portfolios.

activities." Compounding the problem was the rapid increase in defense budgets and weapons complexity. Hitch concluded that "The revolution in military technology since the end of World War II, alone, would make necessary the central planning and direction of military program. The great technical complexity of modern day weapons… cannot be made properly by any subordinate echelon of the Defense establishment" (Hitch, 1965).

For Hitch, the primary impediment to rational analysis was the fact that budgets had been based on broad classifications that did not relate dollars to programs, and programs to military requirements. The fundamental precondition for creating a programmatic budget was reliable methods of systems engineering and quantifying all measures of cost and effectiveness. These "systems analysis" techniques were being developed at RAND during the late 1940s and early 1950s in order to eliminate duplicative aircraft developments by companies competing for defense production contracts. Hitch and others in the economics division at RAND like David Novick recognized that cost data were sparse and scattered throughout organizations. In order to make the right analytical decisions, it was necessary to collect better cost data. And a precondition to better cost data was a budgeting and accounting structure classified by program outputs (Hough, 1989). As Charles Hitch testified to Congress in 1961:

> It is precisely in this area that the financial management system showed its greatest weakness. It did not facilitate the relating of costs to weapon systems tasks, and missions. Its time horizon was too limited. It did not disclose the full time-phased costs of proposed programs.
>
> … Admittedly, the financial management system must serve many other purposes. Certainly it must produce a budget in a form acceptable to the Congress. It must account for funds in the same manner in which they are appropriated…
>
> But all this is not enough. The financial management system must also be made to provide the data needed by top Defense management to make the really crucial decisions on the major forces and weapon systems.

The long-range planning of weapons costs is the central aspect of PPBS. The important question in PPBS is not how much a program will cost in any one budget year, but how much it will cost to complete. This applied not only to the procurement and sustainment of systems but also to their research and development starting with operational prototyping. If defense programs were not costed across the life cycle, then analytical decisions could not meet the criteria of rationality. If one design offers twice the reliability as an alternative, that fact must be weighed against its higher investment costs. Hitch presumed that putting the DoD on a program basis would create a system for creating cost factors, activity rates, and other measures to permit accurate program predictions (*Department of Defense Appropriations for 1964*, 1963). Like others of his generation, Hitch simply presumed that the innovation and production processes had been reduced to a routine where teams of experts could turn out what is needed in predictable ways.

If analyses could be made accurately enough, the additional complexities PPBS layered on the budget process could be managed. Once a program life cycle cost estimate was formulated, there shouldn't be any need for "hectic and hurried" program reviews. The program should only require some "last minute adjustments," with the upcoming five years being reported in the Five-Year Force Structure and Financial Program. Moreover, Hitch stated that "Our five-year program and the improvement in our planning definitely should tend to reduce the amount of reprograming that would otherwise have to be done. The better you do your planning the less frequently you have to change it. I think this is a great contribution to better planning" (*Department of Defense Appropriations for 1964*, 1963). The need for reprogramming is in fact a

failure of PPBS. Program changes represent execution not to plan. If programs frequently needed execution flexibility, then what was the purpose of careful cost-effectiveness analyses and the program structure in the first place?

Determining the correct solution in advance, costing it out, and budgeting for the long-range implications is certainly the most rational course of action whenever possible. For complex weapons technologies, however, systems analysis has two major faults. The first is reliance on prediction. Analysis requires certainty that an engineering specification is feasible, that it will cost a certain amount, that it hits performance metrics, that threats and operating environments don't change, that new commercial solutions won't appear, and so forth. Even if analysts were clairvoyant, the second requirement of systems analysis is optimization. The central problem here is reducing to a single number the criteria upon which alternatives are judged. What really matters? Speed, payload, range, survivability, reliability? And how about the numerous non-quantifiable factors which are often decisive in any analysis? There is no generally acceptable way to rank alternative system designs.

Neither the Bureau of the Budget nor Congress were ready in the 1960s to turn the budget structure onto a programmatic basis. Throughout the decade, the DoD continued to submit to Congress the budget classifications that resembled the previous decade. Budget Director Charles Schultz remarked in a hearing on PPBS, "When the chips are down, no President, no Cabinet officer or Budget Director—or Congress for that matter—is really willing to commit himself in advance to decisions in 1967 about the specific level of Federal programs in 1970 or 1972. Nor should he be" (Hearing, 1967). This worked out for Charles Hitch, because the President's Budget was directly compiled from the five-year program of weapons costs and objectives through a process known as the "cross-walk."

Hitch's successor at ASD Comptroller, Robert Anthony, in some ways sought to take PPBS to its logical conclusion.[6] Anthony was an accountant by trade rather than economist like Hitch. He wanted to conform the budget to the program structure and develop an accrual accounting system to match. That way, cost data could directly feed program budget estimates. By extending the programmatic structure into contract Work Breakdown Structures, more granular cost detail could be received through contractor reports. The larger effort called Project PRIME was cancelled by appropriators for FY 1969 and Anthony left the Pentagon at the start of that fiscal year. As an FY 1969 appropriations committee report explained:

> The principal element of the system is known as Project PRIME, a proposal to completely alter the character of Defense budgeting and accounting so as to bring it in consonance with the program system of the Department. The Committee is of the opinion that this proposal appears to be a case of too much too soon . . . Project PRIME would indicate a massive change which to some extent would temporarily diminish Congressional control and which appears to be proposed for at least partial initiation without regard to Congressional expression.
>
> There are a number of pitfalls that can be foreseen with respect to the proposed system, not the least of which is the inflexibility of the program structure which would necessarily follow. At present the program structure, being independent of the budgeting and accounting system, can be altered or redirected as circumstance or prudent management appears to require. Once such a program system becomes the legislative history in support of an appropriation

[6] In 1965, Anthony tried to "undermine" the Office of Systems Analysis program structure (Murdock, 1971).

act it can be changed only by some further legislative expression. (Carignan, 1969)

During the 1960s, congressional trepidation about PPBS and the program structure derived from fear of losing of control. If program decisions were made by teams of experts based on careful analysis, then Congress would not be in a place to argue for changes to the President's Budget. Congress would be "in the dark" about "analyses of costs and benefits of competing policies" and so "may not welcome all the implications of PPBS." Congress largely ignored the program structure throughout the 1960s. GAO Director Elmer Staats suggested GAO should move from the role as auditor to one of cost-benefit analyzer (Murphy, 1969). In 1974, Congress broadened the GAO's evaluation role and increased its budgetary responsibility, prompting it to hire scientists, actuaries, and other experts.

The entire point of PPBS is the cost-effectiveness analysis enabled by a program structure. PPBS puts an exact dollar figure on every military program, bridging the planning and budgeting functions. Advocates charged that without PPBS, military planners and civilian authorities simply blundered along with no program coordination. As Army General Maxwell Taylor testified in 1961: "We do not know what kind and how much defense we are buying with any specific budget. This kind of [traditional] budgeting makes it hard to determine what our military posture will be at any given time in the future." Former ASD Comptroller Wilfred McNeil was bewildered by the statement. He said that General Taylor could read the force statement and had inventory data on "every conceivable type and size of weapon we had." Analyses of these data and their costs had long informed budget estimates.

> I would be forced to conclude there is some lack of knowledge of what has been the general practice for years . . . Although I am sure that there are better and more formal ways to get comparisons of systems than has been true in the past, certainly the "new look" of 1953 was not decided in a budgetary vacuum, nor on the basis of a single year. Certainly the successful B-52 program of some 500 or more aircraft, planned for execution over a number of years, was not undertaken without some knowledge of the long range budgetary considerations.

McNeil reiterated multiple times to Congress that he would not budget according to the program structure. It is simply one way of evaluating the defense enterprise, and one that is highly reliant on predictions of cost-effectiveness (*Organizing for National Security*, 1961). McNeil criticized McNamara's system for relying on 40,000 pages of paperwork. He would rather take the opinion of a lieutenant commander or an Air Force major as he climbed out of the airplane. McNeil recalled consciously starting competing programs. "Eventually, we'd cancel half of them, perhaps; but it was still the cheapest way to get along. Every day you developed something a little bit better" (McNeil, 1972).

The "budget ceiling" approach complemented the iterative development practice pervasive in the 1950s. McNeil continued his defense of the tradition: "I can think of no time that a budget ceiling has prevented the presentation and full discussion of any item that senior people in Defense thought was really necessary." Moreover, with the program structure, McNeil wondered what good it was to know 10% went to continental defense without knowing whether "a decent job was being done." McNeil said he kept one-third of his budget staff on the road at any given time to stay informed. In the Korean War, for example, budgeteers would visit overhaul shops on the 38th parallel and check hours on engines to judge budget markups (McNeil, 1972).

Senator Henry Jackson, Chairman of the Senate Armed Services Committee, commented how "Some good historians and objective scholars are going to have a field day

with the oversimplifications that officials have put in the record since 1961 about previous Defense Department policies and methods." He recognized that "Well before PPB, it had proved possible to assemble Defense budgetary information by functions or missions for special requirements" (Hearings, 1967).

Program decisions in pre-PPB years had consistently related issues of military planning and budgeting. Military plans and programs flowed from the President down through the Joint Chiefs of Staff and to the commands, bureaus, and technical services where responsibility of estimating costs had been delegated to line-managers in charge of execution. These plans also fed Secretary of Defense budget guidance which flowed down the civilian chain of command to the same line-managers. There was a decentralized system of checks and balances along the axes of military—civilian, staff—bureau, operational—administrative, substantive—fiscal. The relation of budgets and programs was the product of annual improvisations and personal coordination at all levels of the hierarchy (Mosher, 1954). This allowed non-quantifiable factors to be considered alongside hard data, without tying any decision-maker down until more evidence is made available. As budget scholar Allan Schick (1971) noted of traditional management, "Much program innovation is extrabudgetary, proceeding via task force, legislation, and administration action which subsequently is channeled through the budget process."

Through the revolutionary PPB System, McNamara intended to "dispense with the checks and balances of the decentralized political process" by use of "properly formulated studies of cost-effectiveness" (Murdock, 1974). The key building blocks of PPBS are not the budget elements themselves, but the larger program of record to which they are connected. Before the program of record starts, it must be baselined using long-range estimates of the cost, schedule, and key performance indicators. While this creates multiple year lag that stifles technology transition, it creates the foundations for measuring success. All that is necessary to know about program success is whether the capability was delivered on-cost and on-schedule to the approved plan. One universal metric for program evaluation can serve the needs of oversight. It relied on performance to baseline. These figures started being reported to Congress in 1968 with the Selected Acquisition Reports. With the cost growth metric, programs could be measured as if they were subsidiaries reporting profit/loss statements to their parent company.

Universal cost growth metrics, however, do not measure success if circumstances change or information is learned along the way. If the plan is riddled with errors, then execution to plan represents failure. Just how prone cost-effectiveness was to error was evidenced by the first major systems analysis performed by RAND. Analysts recommended a turbo-prop engine for the B-52 rather than a turbo-jet, while the Air Force simply ran the analysis with different assumptions and got a different answer. Another famous example was Admiral Hyman Rickover's debate with the systems analysts about whether aircraft carriers should be nuclear-powered or not. In both cases, the systems analysis performed by neutral third parties were not satisfactory. "One of the prime obstacles to adequate defense weapons," said Air Force Lt. General Ira Eaker in 1965, "has been a hurdle called cost effectiveness. This test applied by scientists and theorists has killed off many new weapons, urgently requested by military leaders" (Hough, 1989).

Not only did the analyses kill off many good ideas, they resulted in many bad ideas like the joint-service TFX aircraft, later the F-111. Senator Henry Jackson wondered how analyses of the TFX completely neglected Navy requirements. The Pentagon's top analyst Alain Enthoven said that the joint-service design was the result of "common sense judgment." Senator Jackson again pressed the point, questioning the how systems analysis could have been used to foresee the TFX difficulties. Enthoven said he was handicapped by not having as much

"knowledge and experience" as the Senator. "That is the most distressing news I have heard," responded Senator Howard Baker (Hearings, 1967). Writing in Armed Forces Magazine, C. W. Borklund concluded that "we are haunted by the spectre of over-study in weapon needs; while at the same time much of the influencing analysis and basic knowledge upon which weapon development decisions are founded is superficial and shallow."

PPBS focuses on future plans at the expense of analyzing current operations. Over time, a fully articulated planning and programming system was prioritized over management control systems (Jones & McCaffery, 2005). Indeed, because planning and programming are performed by individuals not responsible for execution, it shifted power to administrators and analysts whose actions cannot be policed (Murphy, 1969). Even the term "program evaluation" in DoD has shifted from a review of development and operational outcomes to a review of forward-looking plans in the budget. Rarely are program outcomes evaluated holistically. "In taking a look at what was spent last year," Allan Schick wrote, "budgeters rarely look back to see what was accomplished." He found program evaluation to be a superior method of control to analysis which had "hobbled PPB." With evaluation, the scope and demands for data are less and can be built on the "bedrock of past experience rather than 'iffy' conjectures about the future" (Shick, 1971). Admiral Hyman Rickover largely agree. "This is where I think Congress falls down," Rickover told appropriators in 1971.

> Even when you appropriate money for a particular purpose, the Administration can decide not to spend it. Therefore, the way for Congress to gain some measure of control is through your oversight function. This is what I have been advocating all these years to this committee; to exercise your oversight function. In the case of the Defense Department, it is desperately needed.

An important example of oversight performed prior to PPBS was the commission led by Harry Truman during World War II. Truman at the time was a senator on the Military Subcommittee on Appropriations. He staged 432 hearings that interviewed 1,798 witnesses between 1941 and 1948 (Hamilton, 2009). The Truman Committee did not control military plans before programs started and measure success back to that plan. Instead, the committee fact checked and observed the consequences of program decisions. Truman himself was cognizant of the need to move fast and not unduly interfere with the executive branch. Yet he was able to save perhaps seven or eight times the entire cost of the Manhattan Project by exposing faulty weapons production. The investigations had knock on effects throughout the system. Fear of investigations created a deterrent and promoted an untold amount of honest dealings (McCullough, 1992).

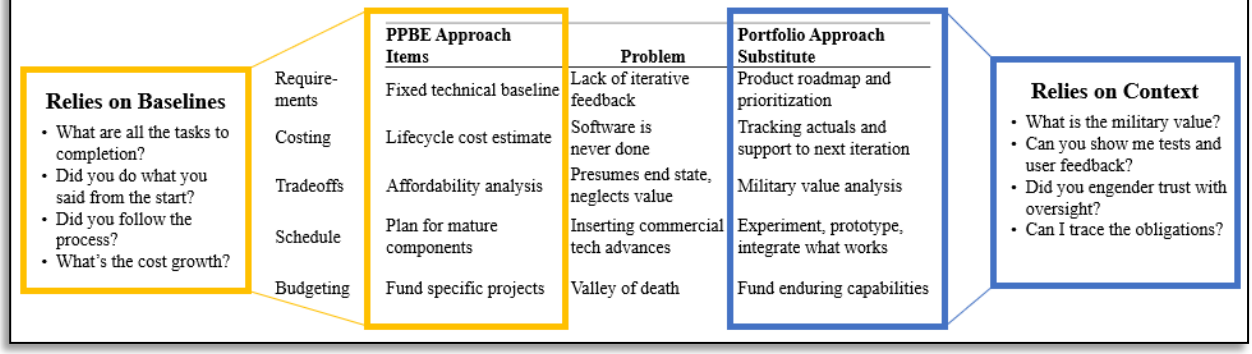
One of the important facts about program choice is that the technology is so complicated, moves so fast, and depends on so many factors in military operations, that a multi-year baseline of costs and capabilities cannot be locked down in advance. If universal metrics like cost growth do not signal value, then oversight must be driven by contextual metrics, user feedback, cost actuals, operational testing, and judgments of personal conduct. Modern information technology systems allow for large, real-time, and even unstructured datasets. Some high-level requirements for contextual reporting for acquisition portfolios include:

1. Real-Time Spend Reports. Organizations should report obligations and expenditures with multiple dimensions of program tagging as well as traceability to deliverables.
2. Metrics of Effectiveness. Metrics should be tailored to the program context. For example, a command and control system might track the number of connected shooters and sensors, the number and types of users, time to complete particular workflows, system uptimes, time to restore critical capabilities, user satisfaction, and so forth.

3. Descriptive Analysis. Rather than spending months at a time creating a life cycle estimate, actual cost data should be continually curated and connected with technical attributes into a single source of truth that helps inform incremental decisions.
4. Program Traceability. Project costs and technical outcomes at the lowest possible level should be mapped to their antecedents and dependencies between programs, creating a "family tree" of individual efforts.
5. Human Factors. Participant and stakeholder perspectives should be reported using the multi-disciplinary methods of project histories and linked to the strategic landscape.

Additional principals for oversight are outlined in Figure 4 below. It contrasts PPBE approach to oversight that relies on adherence to baseline with the portfolio approach that relies on contextual reporting.

Figure 4. Comparison of Oversight Paradigms



The question of oversight has become relevant again with acquisition reform over the FY 2016 to FY 2022 era. New acquisition pathways allow programs of record to become disaggregated and proceed incrementally using rapid prototyping, rapid fielding, and iterative software development practices. However, the GAO finds that such flexibility creates "challenges for reporting, monitoring, and oversight" such as tracking "cumulative cost, schedule, and performance data for programs transitioning between acquisition pathways or conducting multiple efforts" (GAO, 2022).

Because PPBE reduces the defense enterprise into a set of analytically independent programs of record, there is no method for baselining efforts that evolve over time, merge into one another, and leverage enterprise tools. The PPBE reliance on measuring variance to baseline is an industrial era notion that worked well for repetitive manufacturing of widgets. It does not capture the value generated by creative, adaptive, and innovative behavior associated with modern technology development. As Representative Seth Moulton said in 2021:

> The truth of the matter is that the current system doesn't really give us the oversight we need. We're sort of circling the drain with this system where the DoD describes in intricate detail the ways that it isn't buying effectively, Congress signs off on that oversight, and we just keep going in circles. . . . As a member of Congress, I can keep the DoD accountable by asking that they show us how the money that they spend in a mission-based funding bucket actually meets the mission and if it's not meeting the mission then we can dive into more detail. (Hudson, 2021)

Representative Moulton touched on the need for contextual oversight within a construct of portfolio budgets. Current reports on program cost growth do little to inform stakeholders of what is going on or whether viable alternatives exist. Adding controls to new acquisition pathways will more likely destroy the intent of those pathways than add value to oversight. Complementing the pathways with portfolio budgeting and contextual metrics for oversight provides the best opportunity for improving outcomes. The GAO, Congress, and stakeholders in the Department of Defense should work towards a data collection and reporting strategy that is consistent with agile development, portfolio management, and delegated decision-making.

Conclusion

The Planning-Programming-Budgeting-Execution process represents a radical break from traditional methods of defense management. Incrementalism was replaced by analytical holism. Liberal institutions were replaced by Soviet-inspired systems. Delegated decisions were replaced by superficial cost-effectiveness analyses. This paper traced the history of execution flexibility in the Department of Defense, showing how portfolio budgets were fractured into narrow weapons programs and how reprogramming authorities have decreased over time. It also examined how traditional methods of oversight held defense officials into account for their actions using a variety of budgetary and non-budgetary methods that relied on evaluation of outcomes.

This paper has only addressed the issues in broad strokes. It is intended to provide reformers a historical lens for understanding the wisdom of traditional financial management, and a starting point for how defense acquisition can reignite the dynamism it once had. Fifty years of reforms to acquisition, contracting, requirements, and workforce can only go so far without addressing the overarching governance mechanism found in budgeting and policy making. Portfolio management is at the heart of the necessary reforms. Large technology companies no longer budget to specific projects; they budget to persistent development teams that are empowered to make cost, schedule, technical trades throughout. If the Department of Defense wants to compete against peer adversaries and do business with the most innovative commercial companies, greater execution flexibility in the form of portfolio budgets are required. A precondition to that flexibility, however, is value-driven methods of reporting and oversight.

References

Abuses in the "M" account system and proposals for reform: Hearing before the U.S. House of Representatives Legislation and National Security Subcommittee of the Committee on Government Operations, 101st Cong. (1990).

Carignan, R. E. (1969, February). *An installation study of Department of Defense resources management system*. Graduate School of Public Administration, New York University.

Comptroller. (2015, March). *U.S. Department of Defense budget execution: Processes and flexibility*. Officer of the Under Secretary of Defense (Comptroller) / CFO.

Congressional Research Service. (2019, September 6). *Overseas contingency operations funding: background and status* (R44519).

Congressional Research Service. (2020, March 3). *Defense authorizations and appropriations bills: FY 1961–FY 2020* (CRS 98-756).

Department of Defense appropriations for 1956: Hearings before the U.S. House of Representatives Subcommittee of the Committee on Appropriations, 84th Cong. (1955).

Department of Defense appropriations for 1961. Part 1: Hearings before the U.S. Senate Subcommittee of the Committee on Appropriations. (1960).

Department of Defense appropriations for 1964: Hearings before the U.S. House of Representatives Sub Subcommittee on Appropriations, 88th Cong. (1963a).

Department of Defense appropriations for 1964. Part 1: Hearings before the U.S. House of Representatives Sub-committee on Appropriations, 88th Cong. (1963b).

Department of Defense appropriations for 1971. Part 6: Research, development, test, and evaluation: Hearings before a U.S. House of Representatives subcommittee of the committee on appropriations, 91st Cong. (1970).

Department of Defense appropriations for 1972. Part 6: Research, development, test, and evaluation: Hearings before a U.S. House of Representatives subcommittee of the committee on appropriations, 92st Cong. (1971).

Department of Defense appropriations for 1973. Part 4: Research, development, test, and evaluation: Hearings before a U.S. House of Representatives subcommittee of the committee on appropriations, 91st Cong. (1972).

Department of Defense reprograming of appropriated funds: A case study: Report of the U.S. House of Representatives Subcommittee for Special Investigations of the Committee on Armed Services, 89th Cong. (1965).

Federal budgeting for research and development: Hearings before the U.S. Senate Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, 85th Cong. (1961b).

Financial Management Regulation. (2015, September). *Volume 3, chapter 6: Reprogramming of DoD appropriated funds* (DoD 6000.14-R).

Fisher, L. (1971). *Presidential spending discretion and Congressional controls* [Presented to the 1971 annual meeting of the American Political Science Association].

Funds. (2022). *Series A, B, C funding: Averages, investors, valuations.* https://www.fundz.net/what-is-series-a-funding-series-b-funding-and-more

GAO, (1990, September 20). *Financial management: DoD's use of expired and lapsed appropriations*.

GAO. (1999, June). *Report to Congressional committees. "Defense modernization account: Operations and benefits.*

GAO. (2004, January). *Principles of federal appropriations law third edition volume I.* Office of the General Counsel.

GAO. (2015). *DoD should streamline its decision-making process for weapon systems to reduce inefficiencies* (GAO-15-192).

GAO. (2022). *Space acquisitions: Changing environment presents continuing challenges and opportunities for DoD*. Statement of Jon Ludwigson.

Hamilton, L. H. (2009). Relations between the President and Congress in wartime. In Thurber, J. (Ed.). *Rivals for power: Presidential-Congressional relations*. Rowman & Littlefield.

Hitch, C. J., & McKean, R. N. (1960). *The economics of defense in the nuclear age*. RAND Corp., published by Antheneum.

Hitch, C. J. (1965). *Decision-making for defense*. University of California Press.

Hough, P. (1989). *Birth of a profession: Four decades of military cost analysis*. http://www.dtic.mil/dtic/tr/fulltext/u2/a228246.pdf

House Appropriations Committee. (2020). *Department of Defense appropriations bill, 2021, full committee print*. 116th Cong.

Hudson Institute. (2021). *Transforming defense for a competitive era*.

Jones, L. R., & McCaffery, J. (2005). Reform of the planning, programming, budgeting system, and management control in the U.S. Department of Defense: Insights from budget theory. *Public Budgeting and Finance*, 1–19.

Lofgren, E. (2022). *PPBE reform*. https://acquisitiontalk.com/budget-reform.

Lofgren, E. (2020, April 27). *The last frontier of acquisition reform: The budget process* (SYM-AM-20-073). Naval Postgraduate School Symposium.

McCullough, D. (1992). *Truman*. Simon & Schuster.

McGarry, B. (2020, June 17). *DoD transfer and reprogramming authorities: Background, status, and issues for congress* (7-5700, R46421). Congressional Research Service.

McNeil, W. J. (1972, September 19). *Oral history interview with Wilfred J. McNeil by Jerry H. Hess*. Truman Library Oral History Project.

Modigliani, MacGregor, & Ward. (2021). *Five by five: Five disciplines and five strategic initiatives for the Pentagon in the digital age*. MITRE.

Murphy, T. (1969). *Congress, PPBS, and reality*. University of Missouri, Kansas.

National Security Commission on Artificial Intelligence. (2021). *Final Report*.

Novick, D. (Ed.). (1969). *Program budgeting, second edition*. RAND Corp.

Organizing for national security: The budget and the policy process: Hearings before the U.S. Senate Subcommittee on national policy machinery of the committee on government operations, 87th Cong. (1961).

Orr, Kelly. (1990). *Hornet: The Insight Story of the F/A-18*. Presidio Press: Novato, CA.

Patt, D., & Greenwalt, W. (2021). *Competing in time: Ensuring capability advantage and mission success through adaptable resource allocation.* Hudson Institute.

Report, 1955. “Defense appropriation bill for fiscal year 1956.” (H. Rept. 493, 84th Cong., 1st sees.)

Roherty, J. (1970). *Decisions of Robert S. McNamara: A study of the role of the Secretary of Defense*. University of Miami Press.

Scherer, F. M. (1962). *The weapons acquisition process: Economic incentives.* Harvard University Press.

Section 809. (2019, January). *Report of the advisory panel on streamlining and codifying acquisition regulations volume 3 of 3.* Recommendation 46.

Wiladvsky, A. (1966, December). The political economy of efficiency: Cost-benefit analysis, systems analysis, and program udgeting. *Public Administration Review, XXVI*(4).

Acquisition Research Program
Naval Postgraduate School
555 Dyer Road, Ingersoll Hall
Monterey, CA 93943

www.acquisitionresearch.net