

Thinking Like an Economist: How Economics Became the Language of U.S. Public Policy
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Chapter 3: How Government Should Make Decisions

The early 1960s may have marked a historical high point for economists' advisory influence, as Michael Bernstein suggests.¹ But the specific type of influence he describes, which centers heavily on the Council of Economic Advisers and on macroeconomic policy advice, would lessen after 1965. The Kennedy administration's enthusiasm for academic expertise would, however, bring economic reasoning to Washington through other pathways as well, in ways that would have lasting, if unexpected, influence.

One intellectual community, the systems analysts, would bring a distinctively economic perspective to the question of how government should make decisions. Originating at the RAND Corporation after the war and becoming tied to academic economics in the 1950s, under presidents Kennedy and Johnson systems analysts brought their Planning-Programming-Budgeting System (PPBS) first to the Defense Department and then to the rest of the executive branch. While PPBS was a failure on its own terms, the effort to implement it spread an economic thought style and created organizational change that would reproduce that style in distant new parts of the policymaking process.

Inventing Systems Analysis at RAND

Our magic way of looking at problems, or of economizing, is deceptively simple. Stripped to its essentials, it consists in arraying alternatives, estimating the utilities and costs of each, and choosing the alternative that yields the greatest excess of utilities over costs. To a well-trained economist, this procedure seems so natural and obvious—so common sensical—that he is likely to dismiss it as trivial. One of the important things I have learned in twenty years of intimate contact with noneconomists of all kinds—civil servants, engineers, scientists, and politicians—is that it is not an obvious procedure to other people, and is therefore far from trivial.

- Charles Hitch (1960:2)

Systems analysis was born not in Washington or in academia but at the RAND Corporation, a few blocks from the beach in sunny Santa Monica. An odd hybrid of laidback California openness (a 1959 feature in *Life* noted, "Staff members like to lunch in the patios") and Cold War security (it also emphasized the "many of the rooms are barricaded against even RAND employees who do not have the proper clearance"), RAND's exotic place in the popular imagination was captured in the 1964 movie "Dr. Strangelove", in which the title character—based in part on RAND analyst Herman Kahn—reports on a study of the "doomsday machine" commissioned from the "Bland Corporation."²

RAND was established by the Air Force in 1946 as a civilian organization that would continue scientific research begun by the military during the war.³ Most of its original work



Figure 1. The caption of this image, from the May 11, 1959 issue of *Life* magazine, reads: “After-hours workers from RAND meet in home of Albert Wohlstetter (*foreground*), leader of RAND’s general war studies. They are economists gathered to discuss study involving economic recovery of U.S. after an all-out war.”

focused on hardware (airborne vehicles, rockets, electronics, nuclear physics), but one of RAND's original five sections, "Evaluation of Military Worth," tackled problems closer to those of operations research, which had developed during the war as a rational, quantitative approach to select the best among alternative paths to reach a particular goal.⁴ The Evaluation Section, as it quickly became known, began with similar questions: "to what extent is it possible to have useful quantitative indices for a gadget, a tactic or a strategy, so that one can compare it with available alternatives and guide decisions by analysis."⁵ But the questions it was tackling quickly broadened, and the organization began calling its analytic approach systems analysis—short for "weapon systems analysis". Like operations research, systems analysis was both ill-defined and evolving. But while operations research might ask, "What is the best that can be done, given the following equipment having the following characteristics?", systems analysis was more "future-oriented," saying, "Here is the mission that some weapon must accomplish: what kind of equipment, having what sort of characteristics, would be best for the job?"⁶

The work of the Evaluation Section was initially conceived of as applied mathematics, and led by the brilliant and charismatic mathematician, John Williams, who (among other activities) had worked for the Applied Mathematics Panel of the National Defense Research Committee during the war.⁷ Williams was interested in bringing social science to bear on these problems as well, though, and the Evaluation Section was soon split into three divisions: Mathematics, Social Science, and Economics.⁸

But while economists would soon become integral to systems analysis and to RAND, they had not been central to the development of wartime operations research, and the Economics Division did not play a leadership role in RAND's first systems analysis.⁹ Instead, it was headed by Williams' fellow Applied Mathematics Panel alumnus, mathematician Edwin Paxson.¹⁰ Completed in 1950 after three years of work, the Strategic Bombing Study sought to identify "the most efficient way for the United States to deliver nuclear weapons to Soviet territory."¹¹ Massive in scope, its core recommendation was that the U.S. should seek to saturate Soviet targets, and thus that its best strategy would be to build a larger number of slow, inexpensive turboprop planes, rather than fewer expensive jet bombers.¹²

Yet despite its technical sophistication, the Paxson study was rejected by the Air Force, and many at RAND saw it as a failure for two major reasons. First, it sought to provide a single, mathematically defensible answer to a complex and evolving strategic problem, but doing this required making fixed and unrealistic assumptions about a one-strike campaign using existing equipment. Second, it struggled with what RAND called the "criteria problem": on what criteria would the "best" solution be determined? The Strategic Bombing Study chose to maximize damage inflicted per dollars spent, a criterion which ignored pilots' lives entirely. But the alternative criterion proposed—aircrews lost per damage inflicted—pilots also disliked for callously quantifying the value of their lives.¹³

RAND had initially been somewhat complacent about its ability to handle these problems. But, as political scientist Charles Lindblom reported after a visit, "[h]aving spent the summer tearing my finger nails on the rhinoceros hide of the criteria problem," it "is surely

as tough as it is ever said to be at RAND and much tougher than could be inferred from the relative ease with which it is disposed of in systems analysis.”¹⁴ Indeed, the early 1950s saw an intense internal debate emerge over systems analysis in general, and the criteria problem in particular.¹⁵

Finding a workable solution to this problem was what propelled the Economics Department to a central position within RAND. As Charles Hitch, the department’s founder and its leader until 1961, suggested, the problem with systems analysts was that they needed to learn to think like economists:

If you post a military problem—say, the defense of the United States against nuclear attack—to a group of physical scientists and to a group of economists, my experience is that the two groups will set about solving it in strikingly different manners. The physical scientists will start almost immediately with the characteristics of the hardware systems alleged to be available, and with the design of analytic models (e.g., of possible air battles) to reflect and predict the empirical world. The economists, by contrast, will usually begin by asking what we really want to do; what our national objectives are; what broad alternative means there are to achieve them; what test or criterion we can use to select the best or a good one in the light of national objectives.¹⁶

Hitch and his colleagues proposed a three-part solution to the problems encountered by the Strategic Bombing Study. The first involved looking for a handful of strategies robust to a range of possible conditions, rather than seeking one optimal decision under a specific set of constraints. The second was suboptimizing. A family trying simply to optimize its spending was bound to fail: “We could not write down the family’s general utility function because the family could not tell us what it was, and we could not conceivably derive it from any other source.”¹⁷ But for the family’s upcoming trip to New York, the main objective might be to minimize cost, subject to certain constraints, and here optimization might succeed. Problems of military strategy must be broken down similarly.¹⁸

And the third, and most important, part of the solution was making cost-effectiveness the ultimate criterion for comparing options. If the criterion of aircrews lost per damage inflicted had felt callous to Air Force pilots, putting a dollar value on their lives seemed even more so. But, argued the economists, only by making lives and equipment costs and damage inflicted commensurable could one make a rational choice among alternative decisions.¹⁹

RAND’s mathematicians and engineers recognized that economists had here a certain comparative advantage. Mathematician Edward Quade later recalled his work on a systems analysis conducted in 1951, just after the Paxson study, that also lacked an economist: “When we briefed the study, the economists had a field day with me....The economics part of the study that was presented was just naïve. We didn’t understand these things at all, and they were able to catch us in errors, show us where we were wrong, and make us look

ridiculous....It was after that that the economists began to get involved in systems analysis.”²⁰

Soon after, RAND produced its first systems analysis led and mostly staffed by the Economics Department. The Strategic Air Bases Study advised the Air Force on where it should locate the numerous bases it was expecting to build. While the Air Force was originally interested in minimizing costs, the study pointed out that the least expensive option—building a small number of large overseas bases—would leave the Air Force at greater risk of being disabled entirely if the Soviets struck without warning. Using cost-effectiveness as the decision criterion, it argued that basing the strike force in the U.S. and placing refueling bases overseas would best balance costs, strike capacity, and vulnerability to attack under a variety of conditions.²¹ Within RAND, the Air Bases Study, and the economic approach it took, were seen as quite successful.²²

The Economics Department’s workable solution to the challenges of systems analysis helped make it the new intellectual center of RAND. In the process, it grew dramatically in size. While it began as RAND’s smallest department in 1949, with fourteen staff members, in the following decade it expanded to fifty, even as two entirely new departments (Cost Analysis and Logistics) were spun off from it.²³ Its staff was intellectually high-powered, employing, among others, Armen Alchian, Harry Markowitz, Burton Klein, William H. Meckling, Alain Enthoven, Richard Nelson, Thomas Schelling, Daniel Ellsberg, and Robert Summers.²⁴

And the department was tightly networked with the academic elite as well: its lengthy list of consultants, who often spent time in residence, included luminaries like Kenneth Arrow, Robert Dorfman, Carl Kaysen, Albert Hirschman, Tjalling Koopmans, Wassily Leontief, Paul Samuelson, Theodore Schultz, Herbert Simon, and Robert Solow.²⁵ Indeed, RAND in this era was a place “to see and be seen,” in Simon’s words, and by the early 1960s, the department “viewed itself, rightly or wrongly, as the leader” at RAND.²⁶ Hitch, who oversaw this growth, later recalled, “No one foresaw just how important the economists and social scientists would be....If they had, they might not have let us in.”²⁷

As some of RAND’s economists came to see themselves as having solved the major problems with systems analysis, they developed ambitions to make the techniques behind it applicable to a broader range of problems. Systems analysis had been developed for military purposes, but as RAND economist Roland McKean noted, it was “closely related” not only to operations research but also cost-benefit analysis, which had developed primarily to make decisions about water resource projects, like the building of dams:

[A]ll such research provides assistance, much of it quantitative, in handling some problem of choice....[I]n all such research an attempt is made to trace out significant consequences of alternative policies that might be chosen. Operations research sometimes compares the consequences of adopting alternative policies in a business firm; systems analysis sometimes compares the implications of developing alternative weapons systems; cost-benefit

analysis compares the consequences of choosing alternative sets of water-resource projects.²⁸

Cost-benefit analysis had been developed mostly by engineers and bureaucrats, but in the 1950s it, too, was becoming linked to the discipline of economics, and RAND, drawing on an unrestricted grant from the Ford Foundation, began doing a little work of its own on water resources. McKean argued against the criterion that most water resource policy was using, the benefit-cost ratio. Instead, he argued, drawing on his systems analysis experience, projects should maximize the net present value of benefits.²⁹ In 1958 he published *Efficiency in Government through Systems Analysis: With Emphasis on Water Resource Development*, which was later called “a sort of Bible for cost-effectiveness calculators.”³⁰

As Hitch later noted, “water is a good subject matter for such studies, because there’s a lot of money involved and a lot of things you can measure.”³¹ But for McKean, and for RAND more generally, “water” came on the right side of the colon: it was interesting primarily as a place to apply systems analysis. And McKean’s interest in applying systems analysis did not end with water. By the late 1950s he was collaborating with his Economics Department colleague Joseph Kershaw to explore the extension of systems analysis to the topic of education, where, unlike water resources, it had no antecedent. With support, again, from the Ford Foundation, McKean and Kershaw wrote several papers on “the possibilities of making quantitative comparisons of education systems,” and argued “for more work to be done toward estimating the ‘input-output relationships’ in education.”³² Increasingly, RAND’s ambitions were becoming larger than the canvas with which the Air Force provided it to work.

The Pentagon and Beyond: Bringing Systems Analysis to Washington

[T]he tools of analysis that we use are the simplest, most fundamental concepts of economic theory...most of us learned as sophomores. The reason Ph.D.’s are required is that many economists do not believe what they have learned until they have gone through graduate school and acquired a vested interest in marginal analysis.

- Alain Enthoven (1963)

While RAND was using its small amount of unrestricted funding to explore water resources and education, the vast majority of its work focused on problems of immediate interest to the Air Force.³³ Yet while the systems analyses led by the Economics Department were seen internally as a great intellectual success, their findings had begun to challenge Air Force priorities and doctrine—in particular, the viability of President Eisenhower’s commitment to massive nuclear retaliation. RAND’s economists were pointing out unpleasant truths, like that the entire U.S. capacity for such retaliation could be wiped out with twenty well-placed Soviet warheads.³⁴

The resultant tensions between RAND and the Air Force came at a time when RAND’s systems analysts “continued to believe, indeed with increasing urgency, that their methods and ideas deserved elevated influence in the national policy structure.”³⁵ Alain Enthoven,

the young star economist who had written the report about U.S. vulnerability to attack, got “fed up” and left for a position in the Pentagon in early 1960.³⁶ And around the same time, RAND’s Economics Department hired a new star: Daniel Ellsberg, a Harvard graduate student and junior member of the Society of Fellows. (Ellsberg would later, of course, become known as the source of the *Pentagon Papers*.³⁷)

Also at the same time, Senator John F. Kennedy was running his campaign for president. As Chapter 2 noted, Kennedy actively solicited advice from academic experts. Ellsberg connected some of his new colleagues with Deirdre Henderson, also a Harvard graduate student, who was coordinating an academic advisory group for Kennedy.³⁸ Seeing an opportunity to bring their ideas to a larger stage, a key group of RANDites began to advise the Kennedy presidential campaign, without the knowledge of their Air Force patrons.³⁹

But even as RAND’s dissatisfaction with its Air Force patron was gradually building, the organization continued to develop practical approaches for applying systems analytic methods to military problems. The 1950s saw David Novick, who started in RAND’s Economics Department then led the Cost Analysis Department after it spun off from Economics, push for a new budgeting approach that would better integrate with systems analysis.⁴⁰ Novick’s “program budget” would begin not with categories of expenditure (installations, aircraft, personnel, petroleum), but with goals, and then work backward to their cost-effective achievement through budgeting. A program like the Strategic Air Command, whose goals could be specified, might be broken down into the types of planes that contributed to those goals (medium bombers, heavy bombers, reconnaissance, fighters), and then specific costs could be worked out within those areas.⁴¹

The general idea of program budgeting—starting with program areas rather than procurement categories—was not new. But the idea of starting with policy goals, using systems analysis to compare the cost-effectiveness of different methods of reaching them, and working backwards from there to make budgeting decisions based on the most cost-effective way of achieving those goals, was. Novick made his recommendations in a substantial 1954 report to the Air Force, which promptly ignored them.⁴²

At the same time, Charles Hitch and Roland McKean were working on book that would provide a clear, accessible argument for RAND-style “quantitative common sense” as applied to national defense.⁴³ The culmination of several years of effort, *The Economics of Defense in the Nuclear Age* was published in 1960.⁴⁴ Incorporating contributions from a number of RAND economists, it was written not for economist colleagues, but for readers not already inclined to think economically about government decisions:

Military problems are...economic problems in the efficient allocation and use of resources....[E]conomics is not exclusively concerned with financial or industrial activities, and it does not refer to scrimping, i.e., to reducing expenditures no matter how important are the things to be bought. Rather, economics is concerned with allocating resources—choosing doctrines, equipment, techniques, and so on—so as to get the most out of available resources. To economize in this sense may imply spending less on some

things and more on others. But economizing always means trying to make the most efficient use of the resources available. A major purpose of this report is to show the usefulness of *this way of looking* at military problems.⁴⁵

The Economics of Defense emphasized “program” thinking (in Novick’s sense), efficiency, opportunity costs, choosing the right criteria, the challenges of incommensurables (e.g. comparing lives with dollars), the problem of uncertainties, and the importance of discount rates (an issue water resources policy had long been concerned with). In other words, it was a synthesis of the best RAND, and the economics discipline, had to offer.⁴⁶

When Kennedy was elected president that November, he quickly asked Robert McNamara to serve as his secretary of defense. McNamara had just been appointed president of the Ford Motor Company, the first person outside the Ford family to hold the position, in recognition of his use of scientific methods of management to revolutionize the firm’s operations.⁴⁷ During the war, McNamara had worked in operations research himself, and it was these techniques that he had applied so successfully at Ford.⁴⁸ When he read *The Economics of Defense*, its rational, quantitative approach resonated, and almost immediately McNamara offered Hitch the job of assistant secretary of defense—comptroller.⁴⁹ As Enthoven later said of Hitch and McNamara’s initial meeting, “I’m told it was love at first sight.”⁵⁰

Hitch, eager for an opportunity to put his methods into action, accepted. His charge as comptroller was “to design and implement a new, centralized budgeting system that soon came to be called the Planning-Programming-Budgeting (PPB) system”—a massive task that McNamara wanted ready to go in six months.⁵¹ Accomplishing this would mean synthesizing Hitch and McKean’s economic approach to defense decisions with Novick’s budgeting techniques.

To meet this ambitious goal, Hitch called upon his RAND colleagues. Alain Enthoven, who had moved to the Department of Defense (DOD) the year before, quickly transferred in the Comptroller’s Office.⁵² Henry Rowen, an author of the Air Bases Study that had helped make economics central to systems analysis, became deputy assistant secretary for international security affairs.⁵³ And RAND’s economics and cost analysis departments (the former now under the leadership of Joseph Kershaw, and the latter still headed by David Novick) “establish[ed]...an office in Bethesda, Maryland, with fourteen staff members from Santa Monica and ten new recruits.”⁵⁴ Others were “loaned” from RAND to DOD; as Kershaw wrote later that year, due to such loans “perhaps a dozen RAND people have had a hand, and an important one, in many of the most important national security matters before the nation.”⁵⁵

Over the next couple of years, the RANDites worked overtime to integrate systems analysis into the defense budgeting practice through PPBS, the Planning-Programming-Budgeting System. PPBS started by “planning” the broad goals that the military was trying to achieve. It then compared the cost-effectiveness of different packages of “programs” that might be combined to reach them. Program packages were, in turn, broken down into program elements, “outputs such as B-52 bombers, POLARIS systems, or Army airborne divisions,”

which in turn consisted of “a bundle of integrated inputs...’a combination of equipment, men, facilities, and supplies—whose effectiveness can, in some way, be related to national security policy objectives.”⁵⁶ Finally, one “budgeted” for these basic elements in ways that would allow the broad policy goals to be achieved in the most cost-effective manner possible.

This would result in a Five Year Defense Plan that would efficiently use the nation’s resources in pursuit of its military objectives.⁵⁷ It reflected Hitch’s, and RAND’s, underlying belief: “only by using the economist’s complex tools of analysis to judge the cost and efficiency of each alternative course can military commanders choose the best solution.”⁵⁸

PPBS encountered substantial resistance from career officers, especially given the perceived “arrogance” of the “young professors” in charge of executing it.⁵⁹ As one senior officer put it, “I am profoundly apprehensive of the pipe-smoking, tree-full-of-owls type of so-called professional ‘defense intellectuals’ who have been brought into this nation’s capital.”⁶⁰ It also centralized budget decisions in McNamara’s office, forcing military branches to compete against each other on cost-effectiveness and reducing their strategic autonomy.⁶¹ And it was criticized for the limitations of its methods, their opacity, their disconnection from realities on the ground, and their potential for hiding political decisions behind neutral-sounding numbers.⁶² Many in Congress also saw PPBS as a threatening power grab by the executive branch.⁶³

Yet McNamara stood firm behind Hitch and PPBS, and the general perception in Washington was one of great success. Its implementers and fans wrote enthusiastic accounts in venues from the *American Economic Review* to the *Saturday Evening Post*.⁶⁴ And it did not take long for others to begin looking with interest at these new, rational methods for improving budgeting and policy decisionmaking while also increasing control. Even in 1954, David Novick had emphasized to the Air Force that “[t]he military is selected solely for purposes of illustration. The systems analysis methodology is applicable to other areas of governmental operations.”⁶⁵ By 1962, he confidently—and accurately—predicted that “[v]ariants of PPBS may be expected to be adopted by other Government agencies,” adding, “As a matter of fact, some agencies have already indicated more than a cursory interest.”⁶⁶

From DOD to BOB: Disseminating PPBS

In effect, [PPBS] was the vehicle chosen by the executive branch to bring economic analysis into the budgetary and other allocative decisions with which it was confronted.

- Robert Haveman (1976:235)

Economists had considerable voice within the Kennedy administration, with the Council of Economic Advisers (CEA) having unprecedented influence, economists leading the Budget Bureau (BOB), and McNamara’s Whiz Kids remaking the Defense Department. Yet despite his greater skepticism of experts, it was under Lyndon Johnson that the economic thought style most expanded its reach in the world of policy, and PPBS was the means through which this took place.

Kennedy's Budget Bureau knew about PPBS, of course. David Bell, its director from 1961 to 1962, worked closely with McNamara to implement it at the Defense Department, and his successor Kermit Gordon later emphasized that PPBS had influenced the Budget Bureau "very much, very much!" even before it was rolled out more broadly:

[T]he success that McNamara had in the application of systematic analysis to the problems of choice in the Defense budget were most impressive, and I was well aware of them while I was running the Budget Bureau and introduced, even as far back as 1963, an effort to press the agencies into a more systematic and rigorous approach to the evaluation of the programs they were running and an examination of the alternative strategies which were available to them.⁶⁷

But it was not until 1965, when Charles Schultze had replaced Gordon as budget director (making him the third economist in a row to lead the office), that BOB officials made the case to Johnson for a broader rollout of PPBS.

By that point, RAND economists had become well-represented among BOB leadership. William Capron, who had spent five years at RAND and collaborated with Hitch before joining the CEA staff, was appointed assistant director in 1964.⁶⁸ Henry Rowen, coauthor of the Air Bases Study, moved from Defense to take the other assistant director position in January 1965.⁶⁹ And when Capron followed Gordon to the Brookings Institution that summer, Schultze replaced him with yet another RAND economist, Charles Zwick, to serve in what Zwick later described as "almost a RAND chair."⁷⁰ Thus by 1965 three of the top four positions at the Budget Bureau were held by economists, two of whom were alumni of RAND.⁷¹

When Johnson tapped Joseph Califano, then a young lawyer serving as McNamara's special assistant, to serve as his top domestic adviser, it provided the perfect opportunity to move things forward. As Califano described it, "[t]here was a happy coincidence of people. Harry Rowen, who had been a PPBS man in the Pentagon, was an assistant budget director....Charlie Schultze had just begun as budget director; he and I started within a few weeks of each other with the same idea."⁷²

By the summer of 1965, when the decision took place, Johnson's Great Society was well underway. Antipoverty and civil rights legislation had been passed the previous year, the Elementary and Secondary Education Act a few months before, Medicare and Medicaid were created that summer, and the Higher Education Act was in the pipeline. Yet at the same time, the political mood was just beginning to shift, both in terms of budgetary concerns as spending on Vietnam was ramping up, and of fears that the War on Poverty was taking an undesirably radical turn.

The leaders of the Budget Bureau were appointed by a Democratic president. They were not anti-government on principle. They believed it could and should be used to solve social problems. But they were also concerned with cost and efficiency, both by virtue of their institutional location as holders of the purse strings and, at least in the case of the

economists, their professional training. And they were definitely not radicals. As Rowen later told historian David Jardini, "I had really gotten quite upset about the Great Society program....By then Charles Schultze had become budget director...and he was very skeptical of a lot of this too. It wasn't that I was the only one who thought that this presented some real problems."⁷³ Califano, too, was "appalled by the 'very unsystematic and chaotic and anarchic' state of management in the civilian agencies, particularly in contrast with the [Office of the Secretary of Defense]."⁷⁴

When Schultze and Rowen pitched PPBS to President Johnson, then, it was with several purposes in mind: rationalization of budgetary decisions, centralization of budgetary control, and counterweight to more radical tendencies in the War on Poverty. They recommended each department develop a five-year plan with specific goals, and Califano strongly endorsed the recommendation.⁷⁵ On August 25, 1965, at a cabinet meeting followed by a press conference, President Johnson ordered nearly all of the executive branch to adopt PPBS, saying, "This system will improve our ability to control our programs and our budgets rather than having them control us."⁷⁶

PPBS made quite a splash in the Washington bureaucracy, as it had five years earlier in the Defense Department. It created, for example, an unlikely bestseller out of David Novick's new book *Program Budgeting*, with federal agencies ordering 5000 copies in the month after PPBS was announced.⁷⁷ According to one observer, it

probably caused as noisy a disturbance in Washington, its field offices, and ultimately in state and local jurisdictions and foreign governments as any administrative idea since performance budgeting twenty years earlier. There were training courses galore to convert budgeteers (and many others) into PPBSers, a plethora of new monographs, case studies, and texts, and many new university courses and programs in pursuit of the new light.⁷⁸

By the middle of 1968, the General Accounting Office (GAO) identified about 1000 full-time-equivalent employees outside the Defense Department who were devoted to the implementation and management of PPBS.⁷⁹

Yet while it created a great deal of activity around its implementation, its use in most agencies remained superficial, and the rational quantitative comparison of the most effective means to achieve well-specified policy goals never became the guiding force for agencies decisionmaking, for several reasons.

First, most agencies saw it as the power grab it was, and responded with successful foot-dragging rather than a sincere effort at implementation. Just as military brass recognized that PPBS removed authority from them and placed it in McNamara's office, the executive agencies perceived PPBS as existing largely for the benefit of the Budget Bureau. But while the bureaucratic hierarchy of the Defense Department limited internal efforts to resist PPBS, BOB's authority over the executive agencies was much more limited. Indeed, a 1968 study of the implementation of PPBS found that the agencies that agreed most strongly with the statement that PPBS was implemented primarily to serve the Budget Bureau's

needs, not the agencies', were among those that made the least progress in adopting the method.⁸⁰

Second, systems analytic thinking was in many ways even harder for non-Defense agencies, with their ambiguous goals and lack of economic expertise, to adopt. The experience of the U.S. Geological Survey was a common one: it

was handicapped by the lack of well-defined objectives which could readily be translated into plans amenable to Planning-Programming analysis. The agency was staffed, as well, by professional geologists and scientists without experience in economics, quantitative analysis, or the related disciplines needed for installing systems analysis.

In the three years that have elapsed since the Presidential directive, the Geological Survey has not solved the very real problems involved in implementing PPBS. Its most difficult problem has been the identification of "output", and measurement of that output's value to the users. Without estimates of the demands for the information produced by the Survey, calculation of benefits from the present activities of the Survey and economic comparison of these with alternative activities has been virtually impossible.⁸¹

Finally, it quickly became clear to the agencies that despite the reams of analyses they were dutifully producing and sending to BOB, PPBS was often window dressing for a more political budgeting process going on behind the scenes. Congressional intervention created a back channel for challenging decisions produced using PPBS, which further undermined agencies' sense that the exercise was useful or meaningful.⁸²

In 1969, BOB and the GAO independently surveyed agencies about their implementation of PPBS, and "[t]he scorecard was dismal."⁸³ While the GAO found that twenty of the twenty-one agencies it examined had developed some kind of PPB framework as Johnson had required, BOB identified only three domestic agencies that had made "substantial progress" toward implementation.⁸⁴ In 1971, President Richard Nixon quietly eliminated the requirement for PPBS, and with the exception of the Defense Department, it quickly fell out of use.⁸⁵

On its own terms, PPBS was largely a failure. Though elements of its approach would be integrated into later fads like zero-based budgeting and management by objectives, it was never a real driver of budget decisions and it certainly did not rationalize the budgeting process so that policymakers were choosing the most efficient means to achieve well-specified ends. Yet the effort to implement PPBS would have enormous indirect impact in disseminating an economic thought style throughout the federal government through two distinct pathways: organizational change that would create beachheads for economic reasoning first in the executive agencies and eventually in Congress, and the creation of a new academic discipline of public policy that would train a future generation of policymakers in the basic logic of economics.

Policy Planning Offices and the Economic Thought Style

[The] most important effect [of PPBS] was the creation of an analytical staff at the department level, which brought into the Secretary's office a group of people who were trained to think analytically and whose job it was to improve the process of decisionmaking.

- Alice Rivlin (1971:5)

When President Johnson announced the adoption of PPBS in August 1965, he told his cabinet heads, "[E]ach of you will need a Central Staff for Program and Policy Planning accountable directly to you."⁸⁶ The months that followed saw departments scramble to find staff who could implement the new and largely unfamiliar budgeting system. A few agencies—NASA, the National Science Foundation, the Department of Labor—did this without changing their organizational structure. Most, however, created some new kind of office analogous to the Office of Systems Analysis Hitch and Enthoven had established at DOD. Often, this office reported directly to a department secretary.⁸⁷ Their names contained words like "policy," "planning," "program," or (especially a few years later) "evaluation," and they were frequently renamed; collectively, I will call them policy planning offices (PPOs).⁸⁸

Few people already working in the executive agencies held the relevant skills for implementing PPBS, so department heads looked elsewhere for the new offices' leadership. In some cases, they turned directly to RAND. William Gorham, for example, had spent nine years as an economist in RAND's Cost Analysis Department before moving to Defense in 1962; he was now tapped to head the PPBS office at the Department of Health, Education, and Welfare.⁸⁹ At the new Office of Economic Opportunity, which was leading the War on Poverty, Joseph Kershaw was chosen for the analogous position.⁹⁰ At RAND Kershaw had helped Roland McKean apply systems analysis to education for the first time; when he moved to Washington, he brought economist Robert Levine, an "old friend" and former RAND colleague, along as his deputy.⁹¹ As Charles Zwick, RANDite and BOB director (1968 to 1969) noted, "you can see we had a certain amount of incest going on here at this point in RAND."⁹²

Agencies that did not have the good fortune to hire a systems analyst trained at RAND, however, typically turned to the next best thing: someone with graduate education in economics, like William B. Ross at Housing and Urban Development or Howard Hjort at the USDA.⁹³ While these economists may not have been the "Whiz Kids" of RAND, they shared an educational background that made the cost-effectiveness, choice-among-alternatives approach of PPBS seem intuitive, as well as a skill set conducive to making such comparisons.

The new offices varied in size, bureaucratic location, and degree of support from agency leadership, as well as in effectiveness. A handful "ma[d]e substantial progress toward implementing systematic planning and analysis" and had "staffs headed by individuals with acknowledged analytic and managerial skills."⁹⁴ In others, "analysis...played a small role in agency decision making because systematic planning efforts [were] fragmented by

relatively strong bureaus and other disintegrative factors.”⁹⁵ Where they were functional, though, they introduced RAND’s system analytic approach to policy analysis to environments where such thinking was quite foreign.

At the Department of Health, Education and Welfare (HEW), for example, William Gorham hired three Harvard economics PhDs—including Alice Rivlin, who would go on to run the Congressional Budget Office and the Office of Management and Budget—and a political science PhD, and began working “to create a tradition of, if you will, scientific decision-making, which hadn’t been there at all”:

I interviewed in my office every single manager of every program of HEW. And I had a series of very simple questions like, “What is your program trying to do?” And it was amazing how few people had thought in those very simple ways. And after he answered that question, I said, “Well, what is it that you keep track of?” One of my memories: adult basic education, which was basically teaching people to read; it was literacy training. He’d say, “Yes, we’re trying to train people to reach at least the sixth-grade level.” That’s a clear objective. “Well, what is it that you measure?” “We measure attendance.” Well, attendance isn’t measuring; I mean, that just says somebody’s there. But that’s the kind of conversation it would be.⁹⁶

By producing program analyses of specific areas, like “disease control,” his office tried “to answer the question: if additional money were to be allocated to disease-control programs, which programs would show the highest payoff in terms of lives saved and disability prevented per dollar spent?”⁹⁷ This was a radically different way for the department to think about its activities, and Gorham’s office used it to advocate for particular programs: “Look...you’ve got a screening program for uterine cancer. For every dollar you spend you save this many lives. You also have a tuberculin program, in which you’re not saving lives any more; you’re far past the point where you’re saving lives. This is a much better way to spend money.”⁹⁸

When such efforts were successful, they were able to advance an economic thought style about policy decisions within an agency. At the USDA, for example, this was not so difficult, as the agency had a long tradition of economic expertise, and its Bureau of Agricultural Economics had been “the most active and experienced agency in applying social science in government planning” prior to the CEA.⁹⁹ While the Bureau was broken up in the early 1950s, economists continued to be represented in the department in very significant numbers.¹⁰⁰ Howard Hjort had the strong support of secretary Orville Freeman, and even the USDA budget office—often the group most threatened by the implementation of PPBS—saw the new office as serving a useful function, with one budget official explaining, “I have never seen a bureau which did not tend to defend its programs. Without an independent evaluation at the Secretary’s office, no changes can be made. He needs an independent and objective evaluation. Some central analytic staffs are very important.”¹⁰¹

Elsewhere, however, policy planning offices had more of an uphill battle. The Office of Economic Opportunity (OEO), led by Kennedy’s brother-in-law, Sargent Shriver, had quite a

different orientation than the USDA. While OEO, at the behest of Shriver's good friend McNamara, had created a PPO even before the Budget Bureau demanded it, by the time Kershaw and Levine arrived to launch it, the Community Action Program had been placed at the heart of the War on Poverty.¹⁰² Advocates of community action, who tended to come from more activist backgrounds and had ties to disciplines like sociology and social work, saw poverty as a community-level problem that must be addressed by providing political voice to poor communities, not just money from above.¹⁰³ But in the rapid expansion of the OEO that took place in 1964 and 1965, community action funds were provided in slapshot fashion, without the careful process of research and planning that had originally been intended.¹⁰⁴

By mid-1965, this was creating problems for the Johnson administration, as the funds provided to give the poor political voice were being used by them to challenge city governments and urban Democratic political machines all over the country.¹⁰⁵ Thus when Kershaw and Levine arrived that summer, they were expected to use PPBS not just to improve the budgeting process, but to rein in the excesses of the War on Poverty.¹⁰⁶ Their office's first five-year plan, produced a few months later, set two goals: bringing all Americans above the new income-based poverty line by 1976, and "mak[ing] permanent changes in those social and economic factors that limit poor people's access to opportunity."¹⁰⁷ The most efficient paths to doing this, they suggested, involved job training and public employment, turning Community Action into a social-service program, and a negative income tax.¹⁰⁸

What was missing from this proposal, of course, was any discussion of the other goals of community action. As Levine said later, "the economists of the planning division did not argue against the political power and community organization dicta of Shriver's social theorists...they didn't understand the concepts and ignored them....[O]rganization of the poor was not readily assimilable into the model."¹⁰⁹ William Cannon, an architect of the War on Poverty whose academic background was in political science, noted,

Mr. Levine has broader sympathies. He even espouses a form of community action. But the point is still that the discipline of economics gets in the way. He gives community action lower priority and diluted functions vis-à-vis the economic elements (income maintenance, jobs) in his mix. He does not analyze the concept of community, a striking inconsistency in terms of his tendency to be clear on other concepts.¹¹⁰

As influence of the systems analysts increased relative to that of the "social theorists," the economic conception of poverty as primarily reflecting an individual lack of income due to inadequate human capital, not community or cultural problems, and economic ideas about how to solve it—particularly through a negative income tax—gained currency. Those of community action, by contrast, faded into the background.¹¹¹ PPBS became a tool for limiting the influence of approaches that came into conflict with economic reasoning.

The PPOs of HEW, USDA, and OEO were among the most successful at implementing PPBS in their respective agencies. But even when PPOs were less successful at their explicit

purpose of introducing systems analysis into agency budgeting processes, they often created a lasting foothold for economic reasoning in their departments. The Department of Labor, for example, created a PPO, but it did not report to a high-level official and resided on the ineffectual end of the PPBS spectrum.¹¹² In 1969, though, when economist George Shultz became secretary of labor, he created an Assistant Secretary for Policy, Evaluation, and Research (ASPER) and prioritized increasing the department's analytic capacity.¹¹³ During the early 1970s, academic economists Orley Ashenfelter, George Johnson, Frank Stafford, Alan Gustman, and Daniel Hamermesh all served in leadership roles at ASPER, and the office would become a prominent player in intragovernmental debates about the effects of welfare policy.¹¹⁴

PPOs at the Antitrust Division, Federal Trade Commission, Department of Interior (DOI), and Federal Communications Commission served similar roles in "seeding" the economic thought style in ways that would have payoffs a decade or two later.¹¹⁵ As an economist who directed Interior's PPO later wrote, the office "has been an advocate not so much of specific solutions as of a broader way of thinking and an overall outlook on the world.... This outlook, derived in significant part from economics, is often at odds with other ways of thinking that are well represented in the DOI policy-making process."¹¹⁶ The Antitrust Division and Federal Trade Commission would dramatically expand their capacity for economic analysis in the 1970s, and the FTC's PPO would successfully advocate for auctions of the telecommunications spectrum in the 1980s.¹¹⁷

Making PPOs a standard part of federal agencies also created a new expectation that agencies *should* include such offices, an expectation that lasted even after PPBS was abolished. The Environmental Protection Agency (EPA), for example, was established in the waning days of PPBS, but nevertheless created an Office of Planning and Evaluation to analyze EPA activities; that office would play an important role in advancing cost-benefit analysis of environmental regulation as well as developing the prototype for emissions trading.¹¹⁸

Similarly, when HEW's Office of Education became a standalone department in 1979, it took its Office of Program Planning and Evaluation with it, despite the fact that PPBS was becoming a distant memory.¹¹⁹ As economist Robert Haveman observed in 1976, PPBS had "clearly altered both the organization and operation of the federal government. Most executive agencies now have distinct offices—some headed by an assistant secretary—devoted to policy research and program evaluation. In most cases, the role these offices play in the agency planning and budgeting process is not trivial."¹²⁰

The offices that PPBS created were intended to be politically neutral—technocratic means of identifying the most efficient and effective ways to achieve policy goals that were set by elected officials. But they had at least two kinds of political effects. First, they would repeatedly encourage agencies to bracket out policy goals that were difficult to quantify or otherwise incompatible with an economic perspective.

Second, in practice they tended to favor technocratic centrist—what we might call "neoliberal"—positions. As such, even under Democratic administrations they were often

unfriendly to arguments from the left about community, rights, power, and other difficult-to-measure concepts, and did their best to serve as, in Charles Schultze's memorable phrase, "partisan efficiency advocates."¹²¹ When conservatives were in power, by contrast, PPOs experienced a mixed bag. Where they were seen as ways to justify government action, they were often cut; one of OEO's policy analysts later wrote a book calling Reagan's the "anti-analytic presidency."¹²² Yet at other times conservative administrations leveraged them successfully to rein in agencies that were more liberal by comparison, or to recast agency goals along narrower economic lines.¹²³ But regardless of what kind of administration was in power, or how they were used in support of political goals, their political impact was greater than many of their advocates might have liked to admit.

From PPBS to Public Policy Programs

[T]he present "movement" [to create public policy programs] can be traced back to the Rand experience and, more specifically, to the application of economic theory and systems analysis to governmental problems. As such, the new policy programs reflected the same concerns that were manifest in program planning and budgeting systems: chiefly, how to make public decisions rigorously and analytically on the basis of systematic quantitative evidence.

- Joel Fleishman, as paraphrased by Douglas Yates (1977:364)

When PPBS moved out of the Defense Department and into the entire executive branch, it quickly became clear that the skills required to implement it were in short supply. While President Johnson told his cabinet members they would need a program planning staff, he couldn't provide staffers who knew how to conduct a systems analysis, or were comfortable with cost-benefit thinking. It quickly became clear to the Budget Bureau that ordinary government employees with no particular background in economics, operations research, or systems analysis would need to be brought up to speed.

The BOB staff charged with implementing PPBS began making plans for how to train these neophytes almost immediately. Within five months, they had begun planning a range of courses ranging from two-day seminars for those who merely needed familiarity with basic PPBS concepts, to a nine-month residential program for midcareer staffers who wanted serious training in policy analysis.¹²⁴ Within a year, 2,000 government managers had taken the short class; another 300 had undergone a three-week training at the University of Maryland, Harvard Business School, or the Naval Postgraduate School; and some eighty students were beginning an academic-year program at one of seven universities across the country.¹²⁵

While the two-day seminars were necessarily superficial, the three-week course had slightly more ambitious goals: not only to introduce PPBS, but "to provide the student with a grasp of the underlying economic base of program budgeting," and "to introduce the student to quantitative approaches to management planning and control, and improve his ability to communicate intelligently with quantitative analysts."¹²⁶ By mid-1968, nearly 1,100 people had enrolled.¹²⁷ Many reported that learning "economic concepts" had had the "greatest professional benefit," and large majorities agreed those economic concepts

had influenced their thinking about government programs in terms of outputs, cost, objectives, and, especially, alternatives.¹²⁸

But while it reached the fewest people, it was the academic year program that had the greatest long-run impact: less because of who it trained, than what it led to. The “Mid-Career Educational Program in Systematic Analysis” (EPSA) was initially held at Carnegie Tech (soon to become Carnegie Mellon), Chicago, Harvard, Maryland, Princeton, Stanford, and Wisconsin.¹²⁹ While each university proposed its own course of study, they shared a similar core: “mathematics (either as a prerequisite or as part of the curriculum), macroeconomics, microeconomics, public expenditure theory, and a workshop in benefit-cost and systems analysis.”¹³⁰

EPSA was not especially successful as a program for teaching government employees to become systems analysts. The executive agencies (who had to pay for employees to attend) had to be strong-armed into participating.¹³¹ Some universities were disappointed with the quality of students.¹³² And students sometimes felt like an afterthought at universities focused on other priorities.¹³³ A BOB-commissioned report was critical of what students actually learned: “At most of the participating schools, EPSA is Masters-level education in Economics, with a heavy dosage of econometrics,” but “excessive reliance on economic skills robs PPB of its utility for public decision makers.”¹³⁴

But that same report pointed to the future, arguing, “We must coin a new discipline.”¹³⁵ “For PPB,” it went on, “we need a new kind of curriculum—‘public expenditure decision making’—which would borrow from economics, systems analysis, computer sciences, public and business administration, and other fields. Its focus would be the public market as a mechanism for allocating public resources.”¹³⁶ In this new discipline, “economics must have the leading position,” but “[m]any other disciplines must be brought to bear.”¹³⁷

There was, of course, an applied discipline of government already in existence: public administration. The first public administration programs were founded in the nineteenth century, and the field’s professional association was established in 1939.¹³⁸ Yet public administration, while well-established, taught a very different set of skills. Programs were management-focused, and intentionally avoided questions of what policy should be, or of its efficacy, in favor of “training neutrally competent personnel.”¹³⁹

Many were critical of public administration for lacking a “clear conceptual identity” or even a coherent curriculum; a mid-1970s survey found “little consistency in core course requirements and (that) several programs have no core requirement at all.”¹⁴⁰ Fans of RAND-style policy analysis called public administration’s “low in quality and academic prestige,” and called its “courses short on sophistication, lacking theory of any power, devoid of quantitative analysis or, indeed, rigorous analysis of any kind, generally unconcerned about costs and rarely weighing them against benefits, and always fearful of dealing with policy.”¹⁴¹ As RAND economist Burton Klein told the field’s professional association in 1967, “of one thing I am fairly certain. If public administration is ever to get to grips with the problem, it will have to be by...substituting an entirely new line of thinking essentially based on the insights that lawyers and economists have gained.”¹⁴²

The implementation of PPBS “was instantly perceived by alert academics in key institutions as a potential market for universities to supply with graduates, a market likely to grow even larger. Moreover, it was a market for a fairly well-defined product—persons trained to do analyses like those done at RAND!”¹⁴³ Between 1967 and 1972 about a dozen new academic programs were rolled out, primarily at elite institutions, to meet this perceived need—not in the suspect discipline of public administration, but in an entirely new field: public policy.¹⁴⁴

The emergence of these new programs was not the result of an organized project. As one founder said, their creation “all seemed to happen at once, apparently without any prearranged effort.”¹⁴⁵ There was, however, “some exchange of ideas among the principals...[p]artly through various associations with the RAND Corporation.”¹⁴⁶ Indeed, a proposal for what would become the University of Michigan’s school of public policy was published as a RAND discussion paper in 1968.¹⁴⁷

Some of the new programs were at institutions (Harvard, Michigan, Minnesota) that already had schools of public administration, while others (Berkeley, Carnegie Tech, Duke) did not. A couple (Harvard, Carnegie Tech) had also been EPSA participants, but most were not. One (RAND’s Pardee School of Public Policy, founded by Henry Rowen shortly after he left BOB) was an entirely new school.¹⁴⁸

Collectively, though, they shared an intellectual sensibility, and a fairly unified curriculum, “emphasiz[ing] analytical/statistical techniques and macro/micro economics,” that overlapped heavily with the mix of courses included in the nine-month EPSA program.¹⁴⁹ As one dean later recalled, “foremost...was microeconomics, the intellectual source of the optimization techniques introduced with such apparent success into Robert McNamara’s Defense Department....Macroeconomics was also included in some of the policy programs. Next came pieces of statistics, packaged as ‘quantitative analysis.’ To these were typically added some elements of operations research and decision analysis.”¹⁵⁰ Another said that the new programs focused on “the following tools: cost/benefit analysis, micro-economic theory, decision analysis, the use of statistics, and political and organizational analysis.”¹⁵¹

That is, public policy programs were producing “RAND lite.” Some early promoters even pointed to RAND’s air bases study “as the implicit model of the kind of analysis graduates should be capable of doing and, perhaps, as a model of the process of policy making and implementation desirable for government.”¹⁵² As one founder, a lawyer by training, noted in 1975, “[m]ost of the programs were founded and developed by economists or political scientists, many with experience in government, who worked closely with other social scientists, such as statisticians and operations researchers. But, on balance, economic analysis was the dominant mode of thinking in the programs.”¹⁵³

Government demand for analysts helped these programs find rapid success. But they were also facilitated by foundation support, and particularly the Ford Foundation’s catalyzing role. Just as Ford had helped drive the reform of business schools, pushing them in a more economic and quantitative direction, a few years before, it now “decided to focus on ‘helping establish or strengthen first-class programs of advanced, professional training for

young people aimed at public service.”¹⁵⁴ “Over the following five years,” Ford “provided multi-million-dollar general support grants to eight grantee programs in public policy”: at Berkeley, Carnegie Mellon, Harvard, Texas, Stanford, Duke, Michigan, and RAND, funding that continued even after the general support grants ended.

During the 1970s, the new discipline underwent “a period of exponential growth,” establishing its own journals and professional associations.¹⁵⁵ By 1976, more than 100 universities offered degrees in “policy studies,” and in the 1980s the Association for Public Policy Analysis and Management found that 150 schools had moved at least to labeling their programs as “public policy”.¹⁵⁶ By 1990, one program founder observed that about a thousand new Masters of Public Policy (MPP) were being produced each year—roughly the same number as economics PhDs.¹⁵⁷

And they were producing a new breed of analyst: not economists, but comfortable with an economic thought style; focused on choice among alternatives, cost-effectiveness, and quantitative analysis—but paying greater attention to the political and organizational aspects of policy than the original systems analysts. These holders of the new MPP degree had “little difficulty finding places in the governmental system.”¹⁵⁸ “It turns out,” a Stanford professor noted in 1975, “that demand for these skills [analysis, evaluation, and assessment] exists disproportionately in the ‘central analytical staffs’ of the federal government: the Defense Department, the Office of Management and Budget, and HEW” — that is, the policy planning offices.¹⁵⁹

The creation of schools to produce policy analysts also gave those schools an interest in encouraging the use of policy analysis. Graham Allison, dean of the Harvard’s Kennedy School from 1977 to 1989, noted that the schools “champion[ed] the role of powerful staff offices in government agencies which hired individuals who could perform these tasks [of technical analysis of public policies], and would allow them to become influential in public policy making and implementation.”¹⁶⁰

And while demand for analysis would decline during the 1980s, at least within the executive branch, by the end of the decade MPPs had become part of the fabric of Washington:

[T]hey are, of course, legion in the Office of Management and Budget, as well as in the various policy analysis and program evaluation sections in the departments, commissions, and offices. Many of them, however, are in line positions in substantive program areas throughout the executive branch, and some are serving in important staff positions with individual members of Congress and congressional committees, as well as in the Congressional Budget Office.¹⁶¹

This

cumulation of so many persons using the same language, so to speak, has inevitably changed the character of public discourse on many issues....By

proliferating policy-analysis-based groups of individuals—who know and respect the rules and language of the same framework of reasoning and evidence—in the executive branch, in the Congress, among contending interest groups, within the academic and think-tank communities, as well as in the world of journalism, policy analysis has created a common ground for public discourse.¹⁶²

That common ground was not economics in the sense faculty in economics departments might think of it. But it reflected an economic thought style: one focused on costs and benefits, efficiency, incentives, and choice within constraints. And the ongoing prominence of economics PhDs among policy school faculty would ensure that even as the economics discipline continued to evolve, policy schools would evolve along with it. The knowledge imparted by policy schools would not remain static. But it would, over the long haul, remain tied to the economics discipline.

Analysis Begets Analysis: From the Executive to the Legislative

“Fifteen years ago if you came up with an idea that you needed an economist at GAO, people probably would have looked at you like you were crazy.”

- Robert F. Keller, General Counsel of the General Accounting Office, 1979¹⁶³

Executive agencies created PPOs to meet the demands of PPBS, and universities created public policy programs to produce graduates with the training to staff them. But while many agencies were reluctant to embrace systems analysis, a growing number began to realize that the numbers PPOs produced could be used not only by the Budget Bureau as a tool for control, but by themselves as a tool for self-defense.¹⁶⁴ The competitive dynamic that resulted from this, in which offices expanded their capacity for policy analysis in order to defend themselves from other offices wielding competing numbers, led to the growth and spread of analytic offices over the next fifteen years, not only within the executive branch but in Congress as well. This did not lead to rationalized decisionmaking, but did disseminate the economic thought style into new locations.

This dynamic could unfold in several ways. At times, the battle of the analysts took place within a single government agency. At HEW, for example, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) was not the agency’s only analytic office.¹⁶⁵ A competitor, the Office of Program Planning and Evaluation (OPPE), was located specifically within the Office of Education. Though OPPE, like ASPE, was led by an economist, the two offices had conflicting interests.¹⁶⁶ While ASPE wanted to gather “information that could reform federal decisionmaking or local educational practices,” OPPE “needed data not to reform the Title I [of the Elementary and Secondary Education Act of 1965] program but to defend it.”¹⁶⁷

This led the two offices to competing, and often contentious, efforts to evaluate Title I programs, which provided funds to schools enrolling many low-income students. ASPE wanted a cost-benefit approach, but struggled to identify inputs, outputs, and even the appropriate population to study.¹⁶⁸ OPPE set out to measure changes in test scores, but

when that proved difficult, switched to case studies of exemplary projects.¹⁶⁹ ASPE objected; cherry-picked case studies were not its idea of a proper analysis, and OPPE's director later described them as being conducted "over Alice Rivlin's dead body" (Rivlin had by then replaced William Gorham as assistant secretary for planning and evaluation).¹⁷⁰ By 1972, more than \$52 million had been spent on evaluation of Title I, but as one Office of Education evaluator confessed, evaluation had been "prostituted to such an extent now that it can't possibly have an impact...because everyone knows it is just fun and games."¹⁷¹

More commonly, the analytic arms race took place across agencies, not within them. A few years later, during the Carter-era debate over welfare reform, ASPE found itself in a similar competition with ASPER, its counterpart at the Department of Labor. While HEW favored a negative income tax approach to welfare policy, Labor preferred a jobs program.¹⁷² ASPE had been developing computer models to simulate the effects of welfare policy changes since the 1960s, and had considerable capacity to analyze the potential effects of reform proposals.¹⁷³ ASPER lacked such a capacity, but now beefed up its resources and began to develop its own microsimulation model as a way to counter ASPE's position.¹⁷⁴ Unsurprisingly, while ASPE's model suggested a jobs program would cost more than cash assistance, ASPER's said just the reverse.¹⁷⁵ The competition failed to provide decisive knowledge about the effects of policy decisions, but did strengthen the role of policy analysis at Labor.

But the expansion of analysis was not only a phenomenon of the executive branch: it also begat legislative-branch analysis. Indeed, by the end of the Reagan era, which saw the analytic capacity of the executive cut and much of its work contracted to outside organizations, Congress had arguably become the branch with the greatest analytic resources.

At the outset, though, Congress resisted analysis. Senators and representatives saw McNamara's introduction of PPBS, reasonably enough, as an attempt to increase his influence over budget decisions at the expense of their own. Their anger was intensified when McNamara declined to share key reports of the Office of Systems Analysis, arguing that they were privileged recommendations for the president alone.¹⁷⁶ By 1967, the Senate Subcommittee on Security and International Operations had launched a series of hearings challenging DOD's use of PPBS.¹⁷⁷

This skepticism continued as PPBS was rolled out more broadly. As political scientist Richard Fenno observed,

Basically, [PPBS] is an ambitious effort to structure the content of executive-legislative conversation....Obviously, the form of the budget determines what the conversation will be about. And, he who determines what executive-legislative appropriations conversations will be about has an enormous intellectual advantage....This, from the congressional perspective, is what PPBS is all about.¹⁷⁸

Congress reacted partly by trying to limit appropriations for executive-branch policy analysis, but also by beginning—very slowly at first—to develop its own capacity for analysis.¹⁷⁹

The General Accounting Office (GAO), an office of Congress dating back to 1921, was the first site of this shift. In the decades after World War II the GAO was, as its name suggested, actually an office of accountants, who audited the books of government agencies and served as consultants for their accounting needs.¹⁸⁰ But in 1966, President Johnson appointed Elmer B. Staats to the fifteen-year term of Comptroller General, which made him head of the GAO. Staats came from the Budget Bureau, where as deputy director he had helped Schultze implement PPBS.¹⁸¹ Staats' PhD was in political economy, and he was not a neoclassical economist. But he was friendly to using PPBS and related techniques to help “top decisionmakers to visualize the full implications of alternative courses of action.”¹⁸²

Under Staats' leadership, Congress began to use the GAO as its own source of policy analysis and evaluation in the late 1960s.¹⁸³ Congress first requested a major study of the effectiveness of the poverty program, and other significant evaluations followed.¹⁸⁴ In 1970, Congress formally authorized the GAO to conduct cost-benefit studies of government programs, and further expanded its responsibilities in 1974.¹⁸⁵ This shift brought with it a diversification of expertise. While in 1968 96% of GAO's professional staff were accountants, and the rest lawyers, that year the organization hired its first professionals from other fields: eleven management analysts, nine mathematicians, six economists, two statisticians, and one engineer.¹⁸⁶ By 1977 only 64% of GAO professionals were accountants or lawyers.¹⁸⁷

The GAO was a large organization and never became economist-dominated. But it did become much friendlier to an economic thought style, particularly in its new focus on cost-effectiveness. The old guard was accounting-driven, investigative, and fact-focused; this differentiated them from the newcomers, who were “social scientists educated in public administration or economics and trained as policy specialists.”¹⁸⁸ As one GAO accountant reflected on this difference, “When I worked with an economist, I found that we thought on different wavelengths.”¹⁸⁹

Nor was the GAO the only Congressional office that moved in an analytic direction in this period. In 1970 the Legislative Research Service, which conducted research for individual members of Congress, was renamed the Congressional Research Service (CRS) and given “new responsibility to provide policy analysis.” And in 1972, Congress created the Office of Technology Assessment (OTA), meant to analyze the effects of technological change.¹⁹⁰ Neither CRS nor the OTA, however, had a particularly orientation toward economics. The Congressional Budget Office (CBO), by contrast, would become a key site for reproducing the economic thought style in Congress, as well as for tying together academic economics and the world of policy.

The CBO was a product of intense budget conflicts between Congress and President Nixon, as Nixon impounded (i.e., refused to disperse) funds authorized by Congress for the executive agencies in the early 1970s.¹⁹¹ Among other responses to this infringement on its

authority, Congress created the CBO in 1974 as a means of “asserting its independence and ensuring that it would no longer be beholden to reports and data produced at the pleasure of the president.”¹⁹²

The exact responsibilities of the new organization were left quite vague, however, and while the House of Representatives saw the CBO as an organization that would simply produce cost estimates of proposed legislation, the Senate imagined something with a broader and more analytic capacity.¹⁹³ This initial “contest between two professional orientations, the budgeteer’s and the economist’s,” played out in a protracted debate over who would be appointed as the organization’s first director.¹⁹⁴ The House’s candidate was Phillip “Sam” Hughes, a “public administration type” who believed “that economic analysis...was very useful but [whose] professional history and biases centered around budgeting.”¹⁹⁵ The Senate, by contrast, wanted economist Alice Rivlin, who had led HEW’s policy planning office, written a whole book on systems analysis, and who “envisioned CBO...as [an institution] that would help frame difficult policy choices by providing analysis of the budget implications of various program and policy options”—that is, that would conduct something like systems analysis for Congress.¹⁹⁶

The Senate won, and under Rivlin’s leadership the CBO became an organization that not only provided cost estimates of legislation, but that would have the autonomy to conduct economic analysis of the likely effects of policy options not currently on the table, “generally helping Congress to become more aware of existing alternatives and their tradeoffs.”¹⁹⁷

To carry out this mission, Rivlin hired four PhD economists into key positions in the new organization, one of whom was a RANDite and two of whom had PPO experience.¹⁹⁸ Within six months, CBO had grown from two employees to 193, and “divisions were staffed, in large part, with PhD economists, reflecting Rivlin’s view of the mission of the organization.”¹⁹⁹ In addition to producing “scores” of legislation, the office launched the annual volume *Budget Options*, which provided estimates of the “economic and social impacts associated with various options to reduce the deficit...rang[ing] from the relatively small effects of replacing the dollar bill with a dollar coin to major proposals to means-test entitlement programs such as social security.”²⁰⁰

The organization also staked a claim to an expansive interpretation of its mandate by analyzing Carter’s energy plan, even though there was no bill on the table that needed to be scored. Its critical analysis made it clear that CBO would have a broad role as an independent source of budgetary information of Congress, and that it would be willing to challenge the numbers being put out by whatever administration was in power.²⁰¹ By producing such analyses, CBO helped not only establish its own autonomy and professionalism, but define the range of possibilities that were seen as within the space of legitimate consideration.

As the CBO settled into what would become its lasting form, the assumption that economics was the most appropriate form of expertise for its employees to have took lasting hold, and the eight directors who have followed Rivlin have, with one exception, all held PhDs in

economics.²⁰² And not only did the CBO become “centered on the economist,” but it created direct ties with the academic discipline.²⁰³ Rivlin immediately established a bipartisan Panel of Economic Advisers to the organization, which included highly visible economists like Joe Pechman, Alan Greenspan, Barbara Bergman, Paul Samuelson, Lawrence Klein, Walter Heller, James Tobin, Albert Rees, Herbert Stein, and Robert Solow.²⁰⁴ This both “provided a network for securing competent staff” and “helped to make certain that CBO staff feel that they are not dropping out of the economics world when they come to the Congressional Budget Office.”²⁰⁵

These close linkages between the discipline of economics and the CBO produced an organization with an allegiance to profession over politics—in part because staffers’ “education and experience—and many of whose future careers—are not in Congress but in professional groups in executive agencies of the government or in research institutions, policy analysis staffs, or universities.”²⁰⁶ Yet that profession, guided by its own norms and assumptions, would have a voice in the halls of power that had no real equivalent in other disciplines, and would go on to shape policy conversations in lasting ways.

The Success of Failure: PPBS and the Growth of an Analytic Infrastructure

The 1960s saw an intellectual community grounded in economic reasoning and tied closely to the economics discipline move into and around Washington. Starting in the Defense Department and then spreading across the executive branch, these systems analysts brought a new approach to answering a very old question, “How should we make government decisions?” They did this, in practice, by advocating for the Planning-Programming-Budgeting System—a budgeting method that encouraged policymakers to clearly quantify the goals of policy and compare potential pathways to reaching them in terms of their relative cost-effectiveness—as a means to improve decision-making.

These economists were not, collectively, right-wing or strongly laissez-faire. Though they were typically not from the most liberal wing of the Democratic party, they served a Democratic administration and were generally optimistic about the capacity of government to solve social problems. As they saw it, PPBS, and systems analysis, were tools for improving government decision-making, not a rejection of its necessity.

Yet although President Johnson threw his support behind PPBS and required executive agencies to use it, PPBS was a failure at its stated goal of rationalizing the budget process so as to encourage forward-looking, systematic comparison of alternative means to achieve well-defined ends. Most agencies never fully implemented it, it was never a real driver of budget decisions, and no agency besides the Defense Department continued to use it much past 1970.

But its long-term effects in expanding use of the economic thought style—calculative, efficiency-focused, choice-within-constraint—were considerable. PPBS created new and lasting organizational footholds for economists and economic reasoning, most immediately through policy planning offices but indirectly in Congress as well. And it directly stimulated the creation of the academic discipline of public policy, grounded in microeconomics, which

would train future generations of policy analysts to think, at least a little, like an economist. In the years that followed the intellectual effects of PPBS could be seen across both social policy and regulatory domains. And the durable ties it created between Washington and the economics discipline would pay dividends as future economists, with different sorts of ideas, would find established organizational bases from which they could advocate.

It was not only through systems analysts that the economic thought style made forward strides in policymaking, however. Another group of economists would also come to Washington in these years, bringing their own answers to a different question, "How should we govern markets?" Though the two groups occasionally overlapped, and in the years that followed their paths frequently crossed, they came from a different intellectual location and entered through a distinct set of pathways. It is to this second community, the industrial organization economists, that we turn next.

Bibliography

1961. "Brains Behind the Muscle." Pp. 22 in *Time*.
1970. "Graduate School Notes." Pp. 35 in *Princeton Alumni Weekly*.
1991. "David Novick, Analyst on Racing, Dies at 85." in *New York Times*.
- Abella, Alex. 2008. *Soldiers of Reason: The Rand Corporation and the Rise of the American Empire*. New York: Houghton Mifflin Harcourt.
- Alchian, Armen A., and Reuben A. Kessel. 1954. *A Proper Role of Systems Analysis*. Santa Monica, CA: RAND Corporation.
- Allison, Graham. 2006. "Emergence of Schools of Public Policy: Reflections by a Founding Dean." Pp. 58-79 in *The Oxford Handbook of Public Policy*, edited by Michael Moran and Martin Rein. Oxford: Oxford University Press.
- Alsop, Stewart. 1962. "Our New Strategy: The Alternatives to Total War." Pp. 13-17 in *Saturday Evening Post*.
- Amadae, S. M. 2003. *Rationalizing Capitalist Democracy: The Cold War Origins of Rational Choice Liberalism*. Chicago: University of Chicago Press.
- Anderson, Barry. 2012. "The Development of Independent Fiscal Institutions: Lessons from CBO." Pp. 38: Study Center Gerzensee.
- Banzhaf, H. Spencer. 2010. "Consumer Surplus with Apology: A Historical Perspective on Nonmarket Valuation and Recreation Demand." *Annual Review of Resource Economics* 2.
- . 2014. "The Cold-War Origins of the Value of Statistical Life." *Journal of Economic Perspectives* 28(4):213-26.
- Belfer, Donald A., Jonathan D. Casher, Peter G. Gerstberger, Cyrus F. Gibson, Paul W. MacAvoy, and Quentin S. Meeker. 1968. *A Planning Programming Budgeting System for the United States Geological Survey*. Cambridge: Alfred P. Sloan School of Management, MIT.
- Bell, David E. 1964. "David E. Bell, Oral History Interview -- JFK#1, 7/11/1964." Pp. 98, edited by Robert C. Turner. Washington, DC: John F. Kennedy Presidential Library and Museum.
- Beltramo, Michael N. 1993. *David Novick: A Leader, an Innovator, a Character*. Santa Monica, CA: RAND Corporation.

- Bernstein, Michael A. 2001. *A Perilous Progress: Economists and Public Purpose in Twentieth-Century America*. Princeton, NJ: Princeton University Press.
- Blumenthal, Richard. 1969. "The Bureaucracy: Antipoverty and the Community Action Program." Pp. 129-79 in *American Political Institutions and Public Policy*, edited by Allan P. Sindler. Boston: Little, Brown and Company.
- Boland, John J., Nicholas Flores, and Charles W. Howe. 2009. "The Theory and Practice of Cost-Benefit Analysis." Pp. 82-135 in *The Evolution of Water Resource Planning and Decision Making*, edited by Clifford S. Russell and Duane D. Baumann. Cheltenham, UK: Edward Elgar.
- Byrne, John A. 1993. *The Whiz Kids: The Founding Fathers of American Business--and the Legacy They Left Us*. New York: Doubleday Business.
- Califano, Joseph A. 1969. "Joseph A. Califano, Jr., Oral History Interview I." Pp. 40, edited by Joe B. Frantz. Austin, TX: Lyndon B. Johnson Presidential Library.
- Campbell, Richard W., and George E. Rawson. 1981. "The 'New' Public Policy Programs and Their Effect on the Professional Status of Public Administration." *Southern Review of Public Administration* 5(1):91-113.
- Cannon, William B. 1972. "The Poor Ye Need Not Have With You: Lessons from the War on Poverty by Robert Levine." *Social Service Review* 46(1):130-32.
- Capron, William M. 1981. "William M. Capron Oral History Interview I." Pp. 50, edited by Michael Gillette. Austin, TX: Lyndon B. Johnson Presidential Library.
- Collins, Martin J. 2002. *Cold War Laboratory: RAND, the Air Force, and the American State, 1945-1950*. Washington, DC: Smithsonian Institution.
- Cook, Brian J. 1988. *Bureaucratic Politics and Regulatory Reform: The EPA and Emissions Trading*. Westport, CT: Greenwood Publishing Group.
- Crecine, John P. 1971. "University Centers for the Study of Public Policy: Organizational Viability." *Policy Sciences* 2(1):7-32.
- . 1982. "Introduction and Overview." Pp. 1-23 in *The New Educational Programs in Public Policy: The First Decade*, edited by John P. Crecine: JAI Press Inc.
- Crecine, John P., H. Ayers Brinser, R. Lee Brummet, Robert S. Friedman, Floyd Mann, John H. Romani, Frederic M. Scherer, Guy E. Swanson, and Robert Vinter. 1968. *Public Policy Research and Administration: A Proposal for Educational Innovation*. Santa Monica, CA: RAND Corporation.

- Day, Dwayne A. 2003. *Gourmet Chefs and Short Order Cooks: A Policy History of the Congressional Budget Office*: Unpublished.
- DeHaven, James C., and Jack Hirshleifer. 1957. "Feather River Water for Southern California." *Land Economics* 33(3):198-209.
- DeHaven, James C., Jack Hirshleifer, and Linn A. Gore. 1953. *A Brief Survey of the Technology and Economics of Water Supply*. Santa Monica, CA: RAND Corporation.
- Doh, Joon Chien. 1971. *The Planning-Programming-Budgeting System in Three Federal Agencies*. New York: Praeger Publishers.
- Duscha, Julius. 1975. "Budget Expert for the Congress." Pp. 155 in *New York Times*.
- Eckstein, Otto. 1958. *Water Resource Development: The Economics of Project Evaluation*. Cambridge: Harvard University Press.
- Eisner, Marc Allen. 1991. *Antitrust and the Triumph of Economics: Institutions, Expertise, and Policy Change*. Chapel Hill: The University of North Carolina Press.
- Ellsberg, Daniel. 2017. *The Doomsday Machine: Confessions of a Nuclear War Planner*. New York: Bloomsbury.
- Enthoven, Alain C. 1963. "Economic Analysis in the Department of Defense." *American Economic Review* 53:413-23.
- . 1971. "Alain C. Enthoven Oral History Interview – JFK#1, 06/04/1971." Pp. 34, edited by William W. Moss. Beverly Hills, CA: John F. Kennedy Presidential Library and Museum.
- Enthoven, Alain C., and K. Wayne Smith. 1971. *How Much Is Enough? Shaping the Defense Program 1961-1969*. Santa Monica, CA: RAND Corporation.
- Estrada, Louie. 2004. "Federal Election Official Phillip 'Sam' Hughes Dies." Pp. C11 in *Washington Post*. Washington.
- Fenno, Richard F. 1968. "The Impact of PPBS on the Congressional Appropriations Process." Pp. 175-94 in *Information Support, Program Budgeting, and the Congress*, edited by Robert Lee Chartrand, Kenneth Janda, and Michael Hugo: Spartan Books.
- Fleishman, Joel L. 1990. "A New Framework for Integration: Policy Analysis and Public Management." *American Behavioral Scientist* 33(6):733-54.
- Fortun, Michael, and Sam Schweber. 1993. "Scientists and the Legacy of World War II: The Case of Operations Research (OR)." *Social Studies of Science* 23:595-642.

- Fuller, Jon Wayne. 1972. "Congress and the Defense Budget: A Study of the McNamara Years." Pp. 547 in *Politics*: Princeton University.
- Gamarekian, Barbara. 1985. "A Career of Power and Anonymity." in *New York Times*.
- Gordon, Kermit. 1969. "Oral History." Pp. 27, edited by David McComb. Austin, TX: Lyndon B. Johnson Presidential Library.
- Gorham, William. 1986. "William Gorham Oral History Interview I." Pp. 31, edited by Janet Kerr-Tener. Austin, TX: Lyndon B. Johnson Presidential Library.
- Hammond, Richard J. 1960. *Benefit-Cost Analysis and Water-Pollution Control*. Stanford, CA: Food Research Institute of Stanford University.
- Hanley, Nick, and Clive L. Splash. 1993. *Cost-Benefit Analysis and the Environment*. Cheltenham, UK: Edward Elgar.
- Harper, Edwin, Fred A. Kramer, and Andrew M. Rouse. 1969. "Implementation and Use of PPB in Sixteen Federal Agencies." *Public Administration Review* 1969(November/December):623-32.
- Hatzis, Panagiotis. 1996. "The Academic Origins of John F. Kennedy's New Frontier." Pp. 127 in *History*. Montreal: Concordia University.
- Haveman, Robert H. 1976. "Policy Analysis and the Congress: An Economist's View." *Policy Analysis* 2(2):235-50.
- Haydon, Brownlee. 1972. *Histogram of RAND Departmental Growth*. Santa Monica, CA: RAND Corporation.
- Henderson, Deirdre. 1995. "Editor's Preface." Pp. 210 in *Prelude to Leadership: The European Diary of John F. Kennedy: Summer 1945*, edited by Deirdre Henderson: Regnery Publishing.
- Herken, Gregg. 1985. *Counsels of War*. New York: Alfred A. Knopf.
- Hines, L. G. 1959. "The Economists Discover Water Resources." *Journal of Soil and Water Conservation* 14:125-26.
- Hirshleifer, Jack, James C. DeHaven, and Jerome W. Milliman. 1960. *Water Supply: Economics, Technology, and Policy*. Chicago: University of Chicago Press.
- Hitch, Charles. 1952. *Sub-Optimization in Operations Research*. Santa Monica, CA: RAND Corporation.

- . 1958. *Economics and Military Operations Research*. Santa Monica, CA: RAND Corporation.
- . 1960. *The Uses of Economics*. Santa Monica, CA: RAND Corporation.
- . 1965. *Decision-Making for Defense*. Berkeley: University of California Press.
- . 1988. "Oral History Interview." edited by Martin Collins and Joe Tatarewicz. Washington, DC: The NASM-RAND History Project, National Air and Space Museum.
- Hitch, Charles Johnston, and William M. Capron. 1952. *Implications of Potential Weapon Developments for Strategic Bombing and Air Defense: A Preliminary Study*. Santa Monica, CA: RAND Corporation.
- Hitch, Charles, and Roland McKean. 1960. *The Economics of Defense in the Nuclear Age*.
- Hjort, Howard. 2016. "Howard Hjort."
- Hjort, Howard W. 1968. "Discussion: Public Land Policy in the Context of Planning-Programming-Budgeting Systems." *American Journal of Agricultural Economics* 50(5):1685-87.
- Holmes, Beatrice Hort. 1972. *A History of Federal Water Resources Programs, 1800-1960*. Washington, DC: Economic Research Service, U.S. Department of Agriculture.
- . 1979. *A History of Federal Water Resources Programs and Policies, 1960-1970*. Washington, DC: Economic Research Service, U.S. Department of Agriculture.
- Hoos, Ida Russakoff. 1972. *Systems Analysis in Public Policy: A Critique*. Berkeley: University of California Press.
- Hounshell, David A. 2000. "The Medium Is the Message, or How Context Matters: The RAND Corporation Builds an Economics of Innovation, 1946-1962." Pp. 255-310 in *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After*, edited by Agatha C. Hughes and Thomas Parke Hughes. Cambridge, MA: MIT Press.
- Ingham, John M. 1983. *Biographical Dictionary of American Business Leaders, Volume 1*: Greenwood Publishing Group.
- Jann, Werner. 1991. "From Policy Analysis to Political Management? An Outside Look at Public-Policy Training in the United States." Pp. 110-30 in *Social Sciences and Modern States: National Experiences and Theoretical Crossroads*, edited by Peter Wagner, Carol Hirschon Weiss, Björn Wittrock, and Hellmut Wollman. Cambridge: Cambridge University Press.

- Jardini, David R. 1996. "Out of the Blue Yonder: The RAND Corporation's Diversification into Social Welfare Research, 1946-1968." Pp. 477 in *History*. Pittsburgh, PA: Carnegie Mellon University.
- . 2013. *Thinking Through the Cold War: Smashwords*.
- Jenkins-Smith, Hank C. 1990. *Democratic Politics and Policy Analysis*: Brooks/Cole Publishing.
- Johnson, Stephen B. 1997. "Three Approaches to Big Technology: Operations Research, Systems Engineering, and Project Management." *Technology and Culture* 38(4):891-919.
- Joyce, Philip G. 2011. *The Congressional Budget Office: Honest Numbers, Power, and Policymaking*. Washington, DC: Georgetown University Press.
- Juncker, Carl Frederick. 1968. "Establishing Planning-Programming Budgeting Systems in Two Non-Defense Departments." Pp. 116 in *Schools of Government and Business Administration*. Washington, DC: George Washington University.
- Kaplan, Fred. 1983. *The Wizards of Armageddon*. Stanford: Stanford University Press.
- Kershaw, Joseph A., and Roland McKean. 1959. *Systems Analysis and Education*. Santa Monica, CA: RAND Corporation.
- . 1960. *Decision-Making in the Schools: An Outsider's View*. Santa Monica, CA: RAND Corporation.
- . 1962. *Teacher Shortages and Salary Schedules*. Santa Monica, CA: RAND Corporation.
- Khurana, Rakesh. 2007. *From Higher Aims to Hired Hands: The Social Transformation of American Business Schools and the Unfulfilled Promise of Management as a Profession*. Princeton: Princeton University Press.
- Kirby, M. W. 2003. *Operational Research in War and Peace: The British Experience from the 1930s to 1970*. London: Imperial College Press.
- Klein, Burt. 1988. "Oral History Interview." edited by Joe Tatarewicz. Washington, DC: The NASM-RAND History Project, National Air and Space Museum.
- Klein, Burton H. 1958. *What's Wrong with Military R&D?* Santa Monica, CA: RAND Corporation.
- . 1960. *The Decision-Making Problem in Development*. Santa Monica, CA: RAND Corporation.

- . 1967. *Public Administration and the Contemporary Economic Revolution*. Santa Monica, CA: RAND Corporation.
- Klein, Burton H., and William Meckling. 1958. *Application of Operations Research to Development Decisions*. Santa Monica, CA: RAND Corporation.
- Kraemer, Kenneth L., Siegfried Dickhoven, Susan Fallows Tierney, and John Leslie King. 1987. *Datawars: The Politics of Modeling in Federal Policymaking*. New York: Columbia University Press.
- Krueger, Alan B. 2014. "The Department of Labor at the Intersection of Research and Policy." *ILR Review* 67 (Supplement):584-93.
- Krutilla, John V., and Otto Eckstein. 1958. *Multiple Purpose River Development: Studies in Applied Economic Analysis*. Baltimore: Resources for the Future, Inc., by the Johns Hopkins Press.
- Kwerel, Evan R., and Gregory L. Rosston. 2000. "An Insiders' View of FCC Spectrum Auctions." *Journal of Regulatory Economics* 17(3):253-89.
- Lawlor, Edward F. 1979. "Income Security." Pp. 11-59 in *Studies in the Management of Social R&D: Selected Policy Areas*, edited by Jr. Lynn, Laurence E. Washington, DC: National Academy of Sciences.
- Leonard, Robert. 2010. *Von Neumann, Morgenstern, and the Creation of Game Theory: From Chess to Social Science, 1900-1960*. Cambridge: Cambridge University Press.
- Leonard, Robert J. 1991. "War as a 'Simple Economic Problem': The Rise of an Economics of Defense." Pp. 261-83 in *Economics and National Security: A History of Their Interaction*, edited by Craufurd D. Goodwin. Chapel Hill: Duke University Press.
- Levine, Robert A. 1969. "Oral History." Pp. 62, edited by Stephen Goodell. Santa Monica, CA: Lyndon B. Johnson Presidential Library.
- . 1970. *The Poor Ye Need Not Have With You: Lessons from the War on Poverty*. Cambridge: MIT Press.
- Lindblom, C. E. 1954. *On Criteria: The Last Prose of the Summer*. Santa Monica, CA: RAND Corporation.
- Lynn, Jr., Laurence E., and David deF. Whitman. 1981. *The President as Policymaker: Jimmy Carter and Welfare Reform*. Philadelphia: Temple Universtiy Press.
- Lyons, Gene M. 1969. *The Uneasy Partnership: Social Science and the Federal Government in the Twentieth Century*. New York: Russell Sage Foundation.

- McCloskey, Joseph F. 1987a. "The Beginnings of Operations Research: 1934-1941." *Operations Research* 35(1):143-52.
- . 1987b. "U.S. Operations Research in World War II." *Operations Research* 35(6):910-25.
- McCombe, Leonard. 1959. "Valuable Batch of Brains: An Odd Little Company Called RAND Plays Big Role in U.S. Defense." Pp. 101-07 in *Life*.
- McKean, Roland. 1955. *Criteria for the Selection of Water-Resource Projects*. Santa Monica, CA: RAND Corporation.
- . 1956. "Criteria for the Selection of Water-Resource Projects." *Operations Research* 4(1):52-60.
- . 1958. *Efficiency in Government through Systems Analysis: With Emphasis on Water Resource Development*. New York: John Wiley & Sons Inc.
- McKean, Roland, and Joseph A. Kershaw. 1961. *What to Do about Teacher Shortages*. Santa Monica, CA: RAND Corporation.
- McKean, Roland N. 1953. *Sub-Optimization Criteria and Operations Research*. Santa Monica, CA: RAND Corporation.
- McLaughlin, Milbrey Wallin. 1974. *Evaluation and Reform: The Elementary and Secondary Education Act of 1965, Title I*. Santa Monica, CA: RAND Corporation.
- Meltsner, Arnold J. 1976. *Policy Analysts in the Bureaucracy*. Washington, DC: University of California Press.
- Miles, Jr., Rufus E. 1967. "The Search for Identity of Graduate Schools of Public Affairs." *Public Administration Review* 27(4):343-56.
- Minor, Harry Francis. 1978. "Policy Analysis and the Congress: An Organizational Study of the Congressional Budget Office." in *Urban Studies and Planning*. Cambridge: MIT.
- Mirowski, Philip. 1999. "Cyborg Agonistes: Economics Meets Operations Research in Mid-Century." *Social Studies of Science* 29:685-718.
- . 2001. *Machine Dreams: Economics Becomes a Cyborg Science*. Cambridge, UK: Cambridge University Press.
- Mosher, Frederick C. 1954. *Program Budgeting: Theory and Practice, with Particular Reference to the U.S. Department of the Army*: Public Administration Service.
- . 1979. *The GAO: Quest for Accountability in American Government*: Westview Press.

- . 1984. *A Tale of Two Agencies: A Comparative Study of the General Accounting Office and the Office of Management and Budget*. Baton Rouge: Louisiana State University Press.
- National Research Council, Committee on Operations Research. 1951. *Operations Research with Special Reference to Non-Military Applications: A Brochure*. Washington, DC: National Academies Press.
- National Research Council, Committee to Evaluate the Research Plan of the Department of Housing and Urban Development. 2008. *Rebuilding the Research Capacity at HUD*. Washington, DC National Research Council.
- Nelson, Richard R. 1958. *Procrastination, Commitment, and the Optimum Time for Decision: Some Applications to the Use of Systems Analysis in R. and D. Decision Making*. Santa Monica, CA: RAND Corporation.
- Nelson, Robert H. 1991. "The Office of Policy Analysis in the Department of the Interior." Pp. 122-43 in *Organizations for Policy Analysis: Helping Government Think*, edited by Carol H. Weiss: Sage.
- Novick, David. 1954a. *Efficiency and Economy in Government through New Budgeting and Accounting Procedures*. Santa Monica, CA: RAND Corporation.
- . 1954b. *Which Program Do We Mean in Program Budgeting*. Santa Monica, CA: RAND Corporation.
- . 1956. *A New Approach to the Military Budget: A Working Paper*. Santa Monica, CA: RAND Corporation.
- . 1959. *The Federal Budget as an Indicator of Government Intentions and the Implications of Intentions*. Santa Monica, CA: RAND Corporation.
- . 1962. *Program Budgeting: Long-Range Planning in the Department of Defense*. Santa Monica, CA: RAND Corporation.
- . 1966. *Origin and History of Program Budgeting*. Santa Monica, CA: RAND Corporation.
- (Ed.). 1967 [1965]. *Program Budgeting: Program Analysis and the Federal Budget*. Cambridge: Harvard University Press.
- . 1988a. *Beginning of Military Cost Analysis 1950-1961*. Santa Monica, CA: RAND Corporation.
- . 1988b. "Oral History Interview." edited by Martin Collins. Washington, DC: The NASM-RAND History Project, National Air and Space Museum.

- O'Connor, Alice. 2001. *Poverty Knowledge: Social Science, Social Policy, and the Poor in Twentieth-Century U.S. History*. Princeton, NJ: Princeton University Press.
- Pearce, David. 2000. "Cost-Benefit Analysis and Environmental Policy." Pp. 48-74 in *Environmental Policy: Objectives, Instruments, and Implementation*, edited by Dieter Helm. Oxford: Oxford University Press.
- Pfiffner, James P. 1979. *The President, the Budget, and Congress: Impoundment and the 1974 Budget Act*. Boulder, CO: Westview Press.
- Porter, Theodore M. 1995. *Trust in Numbers*. Princeton, NJ: Princeton University Press.
- Pugliaresi, Lucian, and Diane T. Berliner. 1989. "Policy Analysis at the Department of State: The Policy Planning Staff." *Journal of Policy Analysis and Management* 8(3):379-94.
- Quade, E. S. 1953. *The Proposed Course in Systems Analysis*. Santa Monica, CA: RAND Corporation.
- Quade, Edward. 1988. "Oral History Interview." edited by Martin Collins. Washington, DC: The NASM-RAND History Project, National Air and Space Museum.
- RAND Corporation. 2015. "Henry S. Rowen, Second President of RAND, Dies at 90."
- Rau, Erik P. 2000. "The Adoption of Operations Research in the United States during World War II." Pp. 57-92 in *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After*, edited by Agatha C. Hughes and Thomas P. Hughes. Cambridge: MIT Press.
- Resources for the Future. 1977. *Resources for the Future: The First 25 Years, 1952-1977*. Washington, DC: Resources for the Future.
- Rivlin, Alice M. 1971. *Systematic Thinking for Social Action*. Washington, DC: Brookings Institution Press.
- Ross, William B. 1967. "A Proposed Methodology for Comparing Federally Assisted Housing Programs." *American Economic Review* 57(2):91-100.
- Saldin, Robert P. 2017. *When Bad Policy Makes Good Politics: Running the Numbers on Health Reform*. Oxford: Oxford University Press.
- Schevitz, Tanya. 2002. "William Capron -- LBJ Aide, Professor." in *San Francisco Chronicle*.
- Schick, Allen. 1973. "A Death in the Bureaucracy: The Demise of Federal PPB." *Public Administration Review* 33:146-56.

- Schultze, Charles L. 1968. *The Politics and Economics of Public Spending*. Washington, DC: Brookings Institution.
- Shrader, Charles R. 2006. *History of Operations Research in the United States Army: Volume I: 1942-62*. Washington, DC: U.S. Government Printing Office.
- . 2008. *History of Operations Research in the United States Army: Volume II: 1961-1973*. Washington, DC: U.S. Government Printing Office.
- Shubert, Gustave. 1988. "Oral History Interview." edited by Joseph Tatarewicz. Santa Monica, CA: RAND Corporation.
- . 1992. "Oral History Interview." edited by James Digby. Santa Monica, CA: RAND Corporation.
- Simon, Herbert. 1991. *Models of My Life*. New York: Basic Books.
- Smith, Bruce L. R. 1966. *The Rand Corporation: Case Study of a Nonprofit Advisory Corporation*. Cambridge: Harvard University Press.
- Sperry, Roger, Timothy D. Desmond, Kathi F. McGraw, and Barbara Schmitt. 1981. *GAO 1966-1981: An Administrative History*. Washington, DC: United States General Accounting Office.
- Staats, Elmer. 1971. "Oral History: Interview I." Pp. 38, edited by T. H. Baker. Washington, DC: Lyndon B. Johnson Presidential Library.
- Staats, Elmer B. 1987. "Elmer B. Staats: Comptroller General of the United States 1966-1981." Pp. Oral history. Washington, DC: United States General Accounting Office.
- Staats, Elmer Boyd. 1940. "Personnel Standards in the Social Security Program." Pp. 226. Minneapolis: University of Minnesota.
- Stock, Wendy A., and John J. Siegfried. 2014. "15 Years of Research on Graduate Education in Economics: What Have We Learned?".
- Stokes, Donald E. 1986. "Political and Organizational Analysis in the Policy Curriculum." *Journal of Policy Analysis and Management* 6(1):45-55.
- Thomas, William. 2015. *Rational Action: The Sciences of Policy in Britain and America, 1940-1960*. Cambridge: MIT Press.
- Thurber, James A. 1976. "Congressional Budget Reform and New Demands for Policy Analysis." *Policy Analysis* 2(2):197-214.

- Twoood, R. Philip. 1997. "Reconciling Politics and Budget Analysis: The Case of the Congressional Budget Office." Pp. 359-70 in *Public Budgeting and Finance*, edited by Robert T. Rabin Golembiewski, Jack. New York: Marcel Dekker, Inc.
- U.S. Air Force Project RAND. 1948. *Conference of Social Scientists: September 14 to 19, 1947 - New York*. Santa Monica, CA: RAND Corporation.
- U.S. Civil Service Commission. 1968. *A Follow-Up Study of the Three-Week Residential Seminar in PPBS*. Washington, DC: Bureau of Training.
- U.S. Congress, Congressional Budget Office. 2017. "History."
- U.S. Department of Labor. 1977. "Overview of the Nixon-Ford Administration at the Department of Labor 1969-1977."
- U.S. General Accounting Office. 1969. *Survey of Progress in Implementing the Planning-Programming-Budgeting System in Executive Agencies*. Washington, DC: U.S. Government Printing Office.
- . 1978. *1977 Annual Report of the Comptroller General of the United States*. Washington, DC: U.S. Government Printing Office.
- U.S. Senate, Committee on Government Operations, Subcommittee on National Security and International Operations. 1967a. *Planning-Programming-Budgeting*. Washington, DC: U.S. Government Printing Office.
- . 1967b. *Planning-Programming-Budgeting: Initial Memorandum*. Washington, DC: U.S. Government Printing Office.
- . 1967c. *Planning-Programming-Budgeting: Part 1*. Washington, DC: U.S. Government Printing Office.
- . 1967d. *Planning-Programming-Budgeting: Part 2*. Washington, DC: U.S. Government Printing Office.
- . 1967e. *Planning-Programming-Budgeting: Selected Comment*. Washington, DC: U.S. Government Printing Office.
- . 1968a. *Planning-Programming-Budgeting: Interim Observations*. Washington, DC: U.S. Government Printing Office.
- . 1968b. *Planning-Programming-Budgeting: Part 3*. Washington, DC: U.S. Government Printing Office.
- . 1968c. *Planning-Programming-Budgeting: Part 4*. Washington, DC: U.S. Government Printing Office.

- . 1968d. *Planning-Programming-Budgeting: Uses and Abuses of Analysis*. Washington, DC: U.S. Government Printing Office.
- Walker, Jack L. 1976. "The Curriculum in Public Policy Studies at the University of Michigan: Notes on the Ups and Downs of IPPS." *Journal of Urban Analysis* 3(2):89-103.
- Walker, Wallace E. 1986. *Changing Organizational Culture: Strategy, Structure and Professionalism in the U.S. General Accounting Office*. Knoxville: University of Tennessee Press.
- Weir, Margaret. 1993. *Politics and Jobs: The Boundaries of Employment Policy in the United States*. Princeton: Princeton University Press.
- Weiss, Carol H. 1992. *Organizations for Policy Analysis: Helping Government Think*: Sage.
- Wells, Tom. 2001. *Wild Man: The Life and Times of Daniel Ellsberg*. New York: Palgrave Macmillan.
- White, Thomas D. 1963. "Strategy and the Defense Intellectuals." Pp. 10-11 in *Saturday Evening Post*.
- Williams, Walter. 1990. *Mismanaging America: The Rise of the Anti-Analytic Presidency*. Lawrence: University Press of Kansas.
- . 1998. *Honest Numbers and Democracy: Social Policy Analysis in the White House, Congress and in Federal Agencies*. Washington, DC: Georgetown University Press.
- Yates, Jr., Douglas T. 1977. "The Mission of Public Policy Programs: A Report on Recent Experience." *Policy Sciences* 8(3):363-73.
- Young, Stephanie. 2009. "Power and the Purse: Defense Budgeting and American Politics, 1947-1972." Pp. 337 in *History*. Berkeley, CA: University of California, Berkeley.
- Zwick, Charles J. 1969. "Oral History: Interview II." Pp. 41, edited by David McComb. Miami, FL: Lyndon B. Johnson Presidential Library.
- . 2000. "Oral History." Pp. 41, edited by Cynthia Barnett. Gainesville, FL: Florida Growth Management Oral History Collection, University of Florida.

Notes

¹ Bernstein (2001).

² McCombe (1959:103).

³ See Collins (2002); Jardini (1996:24-44); Smith (1966:38-60), among many sources that recount the origins of RAND. Much of Jardini (1996) was later published as Jardini (2013); however, as the latter is not paginated, when the two are similar I cite the former.

⁴ U.S. Air Force Project RAND (1948). On the World War I antecedents of operations research, see McCloskey (1987a), Shrader (2006:56); on scientific management, see Shrader (2008:Ch. 1). On operations research in Britain, see Kirby (2003); on its early origins see also McCloskey (1987a). For an excellent recent history across both countries, see Thomas (2015). On operations research in the U.S., see McCloskey (1987b), Rau (2000), Shrader (2006); see also Kirby (2003:2-5) for a discussion of definitions.

⁵ U.S. Air Force Project RAND (1948).

⁶ Kaplan (1983:86-87); Johnson (1997:898) describes systems analysis as “future-oriented operations research”.

⁷ Jardini (1996:82-91, 100); Thomas (2015:112); see also Mirowski (2001:210-211).

⁸ Jardini (1996:82-91, 100).

⁹ See Jardini (1996:107-110) for an account of how RAND’s Economics Department used systems analysis to make itself more important to RAND. In Britain and the U.S. Navy, wartime OR was dominated by natural scientists, especially physicists; the Army Air Force (AAF) groups included more nonscientists but drew particularly on lawyers. At war’s end, only two of the eighty-six personnel in the Navy Anti-Submarine Warfare Operations Research Group were economists; the AAF Operations Analysis program had three economists on a staff of 180 (Shrader 2006:28, 48). While historians of economics have written accounts focusing on the contributions of economics to operations research (Leonard 1991; Mirowski 1999), economists are marginal to most histories of operations research (Fortun and Schweber 1993; McCloskey 1987b; Shrader 2006).

¹⁰ Jardini (1996:49-64); see also Leonard (2010:300-301), Kaplan (1983:87), and especially Thomas (2015:Ch. 23).

¹¹ Young (2009:54).

¹² On the Strategic Bombing Study, see Jardini (1996:44-70); Collins (2002:Ch. 5), Thomas (2015:205-209).

¹³ Jardini (1996:60-64). See also Banzhaf (2014:215) for a discussion of this episode as an antecedent to the development of the Value of a Statistical Life (VSL) concept. The Strategic Bombing Study was also politically insensitive to the Air Force’s deep devotion to developing faster and more impressive planes.

¹⁴ Lindblom (1954:1).

¹⁵ See, e.g., Hitch (1952); Quade (1953); McKean (1953); Alchian and Kessel (1954); Lindblom (1954) for contributions to this debate.

¹⁶ Hitch (1958:11-12).

¹⁷ Hitch (1952:1-2).

¹⁸ Hitch (1952).

¹⁹ The argument in this and the previous paragraph draws heavily on Jardini (1996:107-110).

²⁰ Quade (1988:37). He mentions by name Armen Alchian, John [Jack] Hirshleifer, and Andy Marshall. It seems likely that Quade is referring here to “What is the Best System?,” by Alchian, Hirshleifer, Marshall, and three other economists, referenced in Hounshell (2000:260).

²¹ Smith (1966:107, 109-110); see also Jardini (1996:124-127).

²² Not all RAND economists were equally enamored of systems analysis; the “industry” group within the department, including Burton Klein, Armen Alchian, Reuben Kessel, William Meckling, Thomas Marschak, Richard Nelson, and resident consultant Kenneth Arrow, was less optimistic about its potential. See Alchian and Kessel (1954), Klein (1958; 1960), Klein and Meckling (1958), Nelson (1958) for some contributions to this conversation; Klein (1988:22) also mentions Marschak and Arrow as sympathetic to this position. Alchian went so far as to argue that systems analysis was essentially useless when decisions depended on the results of future research, which was so much “a shot in the dark” that “to think that we can estimate which particular study will be the one that will pay off most...is to misread the history of research” (Alchian quoted in Hounshell 2000:267).

²³ Haydon (1972).

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- ²⁴ RAND Corporation Archives, Gus Shubert Papers, Box 5, Organization Charts, Economics Department.
- ²⁵ RAND Corporation Archives, Gus Shubert Papers, Box 5, Organization Charts, Economics Department.
- ²⁶ Simon (1991:116); Shubert (1988:42).
- ²⁷ Herken (1985:355-356).
- ²⁸ McKean (1956:53). On the development of cost-benefit analysis of water resources in the U.S., see especially Porter (1995:Ch. 7), but also Boland et al. (2009:85-87), Pearce (2000:49-50), Hammond (1960:3-6), and Hanley and Splash (1993:4-8). Holmes (1972; 1979) provides bureaucratic histories of government water resources programs, including significant sections devoted to the development of cost-benefit methods.
- ²⁹ McKean (1955; 1956). See also DeHaven et al. (1953) and DeHaven and Hirshleifer (1957) for more work on water at RAND. This project was more engineer-driven but included economist Jack Hirshleifer, a collaboration that culminated, several years after Hirshleifer left RAND for Chicago, in Hirshleifer et al.'s *Water Supply: Economics, Technology, and Policy* (1960), a significant book applying economic principles to the evaluation of water projects.
- ³⁰ McKean (1958); Hoos (1972:131). McKean's was one of three landmark books published that year that linked cost-benefit analysis of water resources to welfare economics; the other two were Eckstein (1958) and Krutilla and Eckstein (1958); see Hines (1959) for a review of all three. Eckstein and Krutilla's work would later be developed at Resources for the Future (RFF), which had ties to RAND. McKean acknowledges both Krutilla and Eckstein in his book (1958:viii), and Charles Hitch was on the board of RFF in 1958 (Krutilla and Eckstein 1958:v) and would later become its president (Resources for the Future 1977:viii). Eckstein briefly spent time at RFF (Krutilla and Eckstein 1958), and was also a RAND consultant from 1957 to 1966 (Ingham 1983:341). See also Banzhaf (2010) on the RAND tradition versus the RFF tradition in cost-benefit analysis.
- ³¹ Hitch (1988:23).
- ³² Shubert (1992:75); Kershaw and McKean (1959:iii). See also Kershaw and McKean (1960; 1962); McKean and Kershaw (1961). Kershaw would go on to play a prominent role in applying the economic thought style to the War on Poverty; see Chapter 5.
- ³³ In addition to the grant from Ford, the Air Force allowed a 6% fee on top of contract costs that contributed to this "RAND-Sponsored Research," although it only comprised about 2% of RAND's budget in the mid-1960s (Jardini 1996:9, 133-134; Smith 1966:164).
- ³⁴ Jardini (1996:128).
- ³⁵ Jardini (1996:155). The tensions between the Air Force and RAND were exacerbated by RAND's acceptance of a research contract with ARPA, the Advanced Research Projects Agency, an action that the Air Force perceived as reflecting RAND's desire for influence beyond it (Jardini 1996:129-135).
- ³⁶ Enthoven (1971:1); Jardini (1996:156). See Enthoven (1971) more generally for an account of this period.
- ³⁷ Wells (2001); Ellsberg (2017).
- ³⁸ Henderson was a student of Henry Kissinger; after being hired as Kennedy's "research assistant" in spring 1958, she recruited for Kennedy's informal group of advisers information (Hatzis 1996:7-11). Henderson met Ellsberg through Kissinger's Defense Studies seminar, and they stayed in touch after he moved to RAND in 1959 (Hitch 1988:37-38; Kaplan 1983:249; Wells 2001:127). Ellsberg connected Henderson with the scientific strategists by late 1959, and during the July 1960 Democratic Convention in Los Angeles, she stayed with the Ellsbergs while visiting RAND (Abella 2008:128; Henderson 1995:xii; Kaplan 1983:250; Wells 2001:153, 157).
- ³⁹ Kaplan (1983:250).
- ⁴⁰ Novick had some graduate training in economics but no Ph.D. Described as "inimitable" and a "character," after RAND he had a second career in the economics of horse racing. See Beltramo (1993); Hitch (1988:27); "David Novick" (1991) for biographical information.
- ⁴¹ Novick (1966; 1988a; 1988b:31-34); Novick (1954a:14-15) contains an illustration.
- ⁴² See Mosher (1954; 1984); Schrader (2008:26-30); Novick (1954a). Also see Novick (1966:7; 1988a:9; 1988b:33) for brief accounts of this episode, and Novick (1954b; 1956; 1959) for his further work in this direction at RAND.
- ⁴³ The phrase "quantitative common sense" was commonly used to describe systems analysis and, before that, operations research; see, e.g., Amadae (2003:63), National Research Council (1951:2), Shrader (2008:52).
- ⁴⁴ Hitch was already working on the book in spring 1957, when he was visiting Yale (Hitch and McKean 1960:xii).

⁴⁵ The book is a single synthetic work, not an edited volume, but incorporated substantial previously published material by RAND economists Stephen Enke, Alain Enthoven, Malcolm Hoag, C. B. McGuire, and Albert Wohlstetter. Quotation is from Hitch and McKean (1960:v); italics in original.

⁴⁶ Hitch and McKean (1960).

⁴⁷ Byrne (1993).

⁴⁸ Byrne (1993); Shrader (2008:16-17). McNamara was in the Army Air Force's Statistical Control Division.

⁴⁹ Jardini (1996:210-212).

⁵⁰ Enthoven (1971:4). Although McNamara and Hitch had not met prior to this, McNamara was acquainted with John Williams during the war, however; see Thomas (2015:114).

⁵¹ Jardini (1996:212).

⁵² Enthoven (1971:4). See Enthoven (1971) for his account of this period events.

⁵³ Jardini (1996:166).

⁵⁴ Jardini (1996:165-166).

⁵⁵ Jardini (1996:167).

⁵⁶ Young (2009:114); see also Jardini (1996:214-215).

⁵⁷ Jardini (1996:216-217); Young (2009:114-125). See also Novick (1962); Hitch (1965); Enthoven and Smith (1971) for firsthand accounts.

⁵⁸ "Brains Behind the Muscle" (1961).

⁵⁹ Jardini (1996:220-221).

⁶⁰ White (1963:10), quoted in Jardini (1996:222-223).

⁶¹ Jardini (1996:221).

⁶² Jardini (1996:221-222); Young (2009:128-131; 147-148).

⁶³ Young (2009:149-163).

⁶⁴ Enthoven (1963); Alsop (1962).

⁶⁵ Novick (1954a:v).

⁶⁶ Novick (1962:1).

⁶⁷ Bell (1964:76-78); Gordon (1969:17-18).

⁶⁸ Capron was at RAND from 1951 to 1956; see Hitch and Capron (1952) for a coauthored report. Capron joined the CEA staff in 1964, where he worked with Gordon and was deeply involved in developing the War on Poverty (O'Connor 2001; Schevitz 2002).

⁶⁹ Jardini (1996:339).

⁷⁰ Jardini (1996:342-343); Zwick (2000:6). Zwick would follow Schultze as director in 1968.

⁷¹ According to Capron, during his time at BOB the agency was led by four political appointees: a director, a deputy director, and two assistant directors, who were informally split between defense and domestic spending (Capron 1981). The fourth appointee during these years was Elmer Staats, who held a PhD in political economy from the University of Minnesota in what he described as "a combined program in economics, business administration, and government" (Staats 1971:15-18; Staats 1987:2, 23). He would go on to reorganize the General Accounting Office around policy analysis and evaluation, as discussed later in this chapter.

⁷² Califano (1969:17).

⁷³ Jardini (1996:339). Rowen would later move to the right politically, serving in the Reagan and George H.W. Bush administrations and becoming a fellow at the conservative Hoover Institution; Schultze would chair Carter's Council of Economic Advisers and associate with the center-left Brookings Institution. Califano would also serve in Carter's cabinet.

⁷⁴ Jardini (1996:340-341).

⁷⁵ Jardini (1996:339-341).

⁷⁶ U.S. GAO (1969:4, 11). PPBS was required at the Agency for International Development, the Atomic Energy Commission, the Central Intelligence Agency, the Department of Agriculture, the Department of Commerce, the Department of Health, Education and Welfare, the Department of Housing and Urban Development, the Department of Interior, the Department of Justice, the Department of Labor, the Federal Aviation Agency, the General Services Administration, NASA, the National Science Foundation, the Office of Economic Opportunity, the Peace Corps, the Post Office, the State Department, the Treasury Department, the United States Information Agency, and the Veterans Administration, and was encouraged for the Civil Aeronautics Board, the Civil Service Commission, the Export-Import Bank of Washington, the Federal Communications Commission, the Federal Home Loan Board, the Federal Power Commission, the Federal Trade Commission,

the Interstate Commerce Commission, the National Capital Transportation Agency, the National Labor Relations Board, the Railroad Retirement Board, the Securities and Exchange Commission, the Selective Service System, the Small Business Administration, the Smithsonian Institution, the Tennessee Valley Authority, and the United States Arms Control and Disarmament Agency (BoB Bulletin No. 66-3). Several other agencies were required to adopt PPBS in 1968 (BoB Bulletin No. 68-2) U.S. GAO (1969:12-13).

⁷⁷ Novick (1967 [1965]); Jardini (1996:343).

⁷⁸ Mosher (1984:124).

⁷⁹ U.S. GAO (1969:48). Another 1442 FTEs were employed by the Defense Department.

⁸⁰ Harper et al. (1969:628-629).

⁸¹ Belfer et al. (1968:1).

⁸² Mosher (1984:124).

⁸³ Williams (1990:42).

⁸⁴ Harper, Kramer and Rouse (1969); U.S. GAO (1969:1). The three agencies making “substantial progress” included the Office of Economic Opportunity; the Department of Health, Education and Welfare; and the Department of Agriculture (Harper, Kramer and Rouse 1969:624).

⁸⁵ Mosher (1984:124); Schick (1973). A version of PPBS continues to be used in the Defense Department today.

⁸⁶ U.S. GAO (1969:4).

⁸⁷ U.S. GAO (1969:46) gives the Atomic Energy Commission, Defense, the Office of Economic Opportunity, the Peace Corps, Transportation, and the USDA as examples of agencies where PPB staff reported directly to an agency head or undersecretary.

⁸⁸ U.S. GAO (1969:46; see Appendix IV:1 for a list of offices). These names were current circa 1969, but changed over the years, often multiple times. For example, in 1969 the Department of Commerce had an Office of Programming, Planning and Research; Housing and Urban Development had an Office of Policy Analysis and Program Evaluation; and the Department of Justice had an Office of Planning and Evaluation; as of 2017, those agencies have, respectively, an Office of Policy and Strategic Planning; an Office of Policy Development and Research; and a Policy and Planning Staff.

⁸⁹ Gorham (1986:1-4). Gorham had finished graduate coursework in economics at Stanford, but not a dissertation.

⁹⁰ Levine (1969:2).

⁹¹ Levine (1969:2). Kershaw had become chair of RAND’s economics department after Hitch left for Washington.

⁹² Zwick (1969:6).

⁹³ NRC (2008:12); Hjort (1968). Ross appears to have held a graduate degree in economics from Princeton (“Graduate School Notes” 1970), but a dissertation does not appear in ProQuest. Also see Ross (1967). Hjort held an MS from Montana State University, and his resume lists four subsequent years at North Carolina State in agricultural economics (Hjort 2016), but similarly seems not to have completed a dissertation.

⁹⁴ Harper et al. (1969:624, 626). The Office of Economic Opportunity, USDA, and Department of Health, Education and Welfare were the three identifies as particularly successful.

⁹⁵ Harper et al. (1969:624).

⁹⁶ Gorham (1986:8-9). The staff of the Assistant Secretary of Planning and Evaluation included Robert Grosse, a Harvard economics PhD who Gorham had known at RAND; Alice Rivlin, a Radcliffe economics PhD who Gorham hired away from Brookings; Samuel Halperin, a legislative specialist who held a PhD in political science; and C. Worth Bateman, another Harvard economics PhD who came from Defense with Gorham (1986:6); Departmental History, Office of the Assistant Secretary for Planning and Evaluation, pp. 3-4, folder “Assistant Secretary for Planning and Evaluation,” Administrative History, Department of Health, Education, and Welfare, Volume I, Parts I & II, Box 1, Papers of Lyndon Baines Johnson, President, 1963-1969, LBJ Presidential Library. Information on PhDs can be found in the ProQuest Dissertations & Theses database. Economist Mancur Olson, who joined in 1967 to lead a project on social indicators, was another noteworthy hire (p. 4).

⁹⁷ Other initial program areas included Human Investment, Child Health, Income Maintenance, and Financing Higher Education; Departmental History, Office of the Assistant Secretary for Planning and Evaluation, p. 16.

⁹⁸ Gorham (1986:14).

⁹⁹ Lyons (1969:220).

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- ¹⁰⁰ Lyons (1969:223). In 1965, USDA “had 792 persons officially classified as economists,” compared to 56 at HEW (Doh 1971:154). Relatively few of these economists would have held PhDs, however, in either case, and many were doing work that today would not be classified as “economics”.
- ¹⁰¹ Doh (1971:68). Several studies point to USDA as being unusually effective in implementing PPBS; see also Juncker (1968); Harper et al. (1969).
- ¹⁰² O’Connor (2001:167-176). See Blumenthal (1969) for a good account of how the War on Poverty became so focused on community action during its early development.
- ¹⁰³ O’Connor (2001:158-165).
- ¹⁰⁴ O’Connor (2001:168-169).
- ¹⁰⁵ O’Connor (2001:169-173).
- ¹⁰⁶ Jardini (1996:334-340); O’Connor (2001:176). Other early hires at OEO’s Office of Research, Plans, Programs and Evaluation included economists Harold Watts, Walter Williams, and Robinson Hollister; sociologist Myron Lefkowitz; and social work PhD Alvin Schorr (O’Connor 2001:177).
- ¹⁰⁷ O’Connor (2001:178).
- ¹⁰⁸ O’Connor (2001:178).
- ¹⁰⁹ Levine (1970:61), quoted in O’Connor (2001:179).
- ¹¹⁰ Cannon (1972:132). Cannon held a master’s degree in political science, and became involved because of his position at the Budget Bureau. He later led the University of Chicago’s School of Social Service Administration.
- ¹¹¹ O’Connor (2001:190-194).
- ¹¹² Harper et al. (1969); U.S. GAO (1969:101). The Office of Policy Planning and Research was best known for its 1965 production of the Moynihan report on the “Negro family”.
- ¹¹³ O’Connor (2001:203-210); U.S. DOL (1977); Lawlor (1979:53-54); Weir (1993:109).
- ¹¹⁴ Krueger (2014:585); Kraemer et al. (1987); see also Chapter 5.
- ¹¹⁵ See, e.g., Eisner (1991); Nelson (1991); Kwerel (2000), as well as Chapters 6 and 8 of this book.
- ¹¹⁶ Nelson (1991:139).
- ¹¹⁷ Eisner (1991); Kwerel (2000). The State Department’s PPO is a notable exception to this general trend. Its Policy Planning Staff has been quite influential over the years, but its creation predated PPBS and the systems analytic movement. As a function of its earlier origins, the office has never been analytic or economic in the same way as the PPOs that can be traced back to PPBS. See Pugliaresi and Berliner (1989) for a discussion of this office.
- ¹¹⁸ Cook (1988); see also Chapters 7 and 8.
- ¹¹⁹ See Meltsner (1976:173-175) for a list of such offices in the mid-70s.
- ¹²⁰ Haveman (1976:236).
- ¹²¹ Schultze (1968:96).
- ¹²² Williams (1990).
- ¹²³ The Nixon administration used the PPOs of OEO and the Department of Labor strategically in this way; the FTC’s PPO under the leadership of economist Wesley Liebeler during the Ford administration, or the EPA’s during the first Reagan administration, are good examples of the second; see Chapters 5 through 8.
- ¹²⁴ “PPBS Education,” Program Evaluation Staff report, 25 January 1966, unnamed folder, Box 1, RG 51 Bureau of the Budget, Series 62.10a, Evaluation Division 1962-68, National Archives.
- ¹²⁵ Memorandum from Peter L. Szanton to Mr. [Philip Samuel] Hughes, 1 September 1966, unnamed folder, Box 1, RG 51 Bureau of the Budget, Series 62.10a, Evaluation Division 1962-68, National Archives.
- ¹²⁶ U.S. Civil Service Commission (1968:4).
- ¹²⁷ U.S. Civil Service Commission (1968:2).
- ¹²⁸ U.S. Civil Service Commission (1968:34,36).
- ¹²⁹ “Training for PPB,” report by Allen Schick, p. 1, March 1968, folder EPSA #3; and “Minutes of the Education Advisory Committee Meeting,” p. 3, 2 May 1967, folder EPSA #2; Box 1, RG 51 Bureau of the Budget, Series 62.10a, Evaluation Division 1962-68, National Archives. The second year saw Chicago leave the program and UC Irvine and MIT join it. Memorandum from Fred Hoffman to Charles Schultze, p. 2, 16 June 1967, folder EPSA #2, Box 1, RG 51.
- ¹³⁰ “Minutes of the Education Advisory Committee Meeting,” p. 3.
- ¹³¹ Hoffman to Schultze, p. 2.

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- ¹³² “University Offerings in the Mid-Career Educational Program in Systematic Analysis,” report by BOB and the National Institute of Public Affairs, December 1966, unnamed folder, Box 1, RG 51 Bureau of the Budget, Series 62.10a, Evaluation Division 1962-68, National Archives.
- ¹³³ “Program Description of the Educational Program in Systematic Analysis for the 1960-1970 Class,” folder EPSA, Box 5, RG 51 Bureau of the Budget, Series 62.10a, Evaluation Division 1962-68, National Archives.
- ¹³⁴ “Training for PPB,” pp. 13-14.
- ¹³⁵ “Training for PPB,” p. 15.
- ¹³⁶ “Training for PPB,” p. 5.
- ¹³⁷ “Training for PPB,” p. 14.
- ¹³⁸ Allison (2006).
- ¹³⁹ Fleishman (1990:736); Allison (2006).
- ¹⁴⁰ Miles (1967:346); survey quoted in Campbell and Rawson (1981:98). The most commonly required class, organization theory, was still only required in half of all programs (Campbell and Rawson 1981:97).
- ¹⁴¹ Stokes (1986:46); Fleishman (1990:736-737).
- ¹⁴² Klein (1967:15). Note that the lawyers referred to here are specifically those working at the intersection of law and economics. See also Crecine (1982) and Walker (1976) for representative critiques of the state of public administration in the 1960s. Note, however, that these were largely critiques made by those who successfully supplanted public administration. For an internal critique that takes a different approach, see Miles (1967).
- ¹⁴³ Fleishman (1990:735).
- ¹⁴⁴ Fleishman (1990:733). These included programs at Michigan (1967), Harvard (1968), Berkeley (1969), SUNY Buffalo (1969), Carnegie Mellon (1979), Penn (1969), Ohio State (1969), Minnesota (1970), Yale (1970) (Crecine 1971:9) and RAND (1969), Texas (1970), and Duke (1971) (Fleishman 1990:734). Yates (1977:364) adds SUNY Stony Brook to this list.
- ¹⁴⁵ Fleishman (1990:733).
- ¹⁴⁶ Crecine (1982:2,21).
- ¹⁴⁷ Crecine et al. (1968).
- ¹⁴⁸ RAND Corporation (2015).
- ¹⁴⁹ Campbell and Rawson (1981:103).
- ¹⁵⁰ Stokes (1986:46).
- ¹⁵¹ Yates (1977:364).
- ¹⁵² Crecine (1982:3); see Fleishman (1990:735) for another reference to the air bases study.
- ¹⁵³ Yates (1977:364).
- ¹⁵⁴ Khurana (2007:Ch.6); Allison (2006). Ford also was RAND’s primary non-military funder in RAND’s first decade, though Ford’s role was dwarfed by that of the Air Force.
- ¹⁵⁵ Campbell and Rawson (1981:91). The journal *Policy Sciences* would begin publication in 1970, *Policy Studies Journal* in 1972, and *Policy Analysis* in 1975; see Campbell and Rawson (1981:100). In 1981 *Policy Analysis* would merge with *Public Policy* to become the *Journal of Policy Analysis and Management* in 1981, which remains the discipline’s premier journal. The Council on Graduate Education for Public Administration was renamed the National Association of School of Public Policy and Administration in 1970, and in 1979, APPAM, the Association for Public Policy Analysis and Management, was established (Allison 2006).
- ¹⁵⁶ Jann (1991:112).
- ¹⁵⁷ Fleishman (1990:750); Stock and Siegfried (2014:4).
- ¹⁵⁸ Walker (1976:102).
- ¹⁵⁹ Yates (1977:369), quoting Edward Hamilton.
- ¹⁶⁰ Allison (2006).
- ¹⁶¹ Fleishman (1990:750).
- ¹⁶² Fleishman (1990:733).
- ¹⁶³ Quoted in Sperry et al. (1981:94).
- ¹⁶⁴ As political scientist Hank Jenkins-Smith noted in 1990, while PPBS had called for the centralization of analysis in the Budget Bureau, instead government had seen “the *dispersion* of analysts throughout Congress and the various executive program offices and departments....Because of this dispersion, not only has analysis failed to achieve the centralization so useful for the implementation of the policy analysis paradigm, but also it has come to serve as a resource employed by all sides in the policy and budgetary struggles” (Jenkins-Smith 1990:51).

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- ¹⁶⁵ ASPE was initially called the Office of Program Coordination but it took on the name it retains to the present under Gorham's watch (Gorham 1986:6-7).
- ¹⁶⁶ McLaughlin (1974:79, 88). OPPE was led by Joseph Froomkin, a Chicago economics PhD who came to HEW from IBM and the Army.
- ¹⁶⁷ McLaughlin (1974:79, 83).
- ¹⁶⁸ McLaughlin (1974:Ch. 3); see also Rivlin (1971:79-85).
- ¹⁶⁹ McLaughlin (1974:72-82).
- ¹⁷⁰ McLaughlin (1974:27, 82). Rivlin replaced Gorham as director of ASPE in 1968; see Departmental History, Office of the Assistant Secretary for Planning and Evaluation, p. 4.
- ¹⁷¹ McLaughlin (1974:110).
- ¹⁷² Kraemer (1987:128); see also Lynn and Whitman (1981) for a largely corroborating account of this welfare reform episode.
- ¹⁷³ Kraemer (1987:35-42, 129-134).
- ¹⁷⁴ Kraemer (1987:134-136).
- ¹⁷⁵ Kraemer (1987:136).
- ¹⁷⁶ Young (2009:159).
- ¹⁷⁷ U.S. Senate (1967a; 1967b; 1967c; 1967d; 1967e; 1968a; 1968b; 1968c; 1968d). See Young (2009) and Fuller (1972) on Congress and the defense budget during the McNamara years.
- ¹⁷⁸ Fenno (1968:183).
- ¹⁷⁹ Fenno (1968:193).
- ¹⁸⁰ Mosher (1979:96-97, 104). According to GAO historian Frederick Mosher, "virtually no professionals from fields other than accounting and law were appointed to the GAO until 1967" (Mosher 1979:146).
- ¹⁸¹ Staats (1971:15-18; 1987:2, 23).
- ¹⁸² U.S. Senate (1968b:167). Staats' testimony in this hearing (pp. 166-177) gives a nice sense of his perspective, as well as placing PPBS into a historical context that included not only RAND but cost-benefit analysis of water resources programs and the performance budgeting movement of the 1950s. He described his PhD as "a combined program in economics, business administration, and government," and his dissertation was titled *Personnel Standards in the Social Security Program*; see Staats (1971; 1987; 1940).
- ¹⁸³ Walker (1986:47) points specifically to the use of systems analysis, PPBS, and related techniques in the executive branch as leading Congress to demand their adoption by GAO.
- ¹⁸⁴ Mosher (1979:175-176; 1984:145); see also Walker (1986:50).
- ¹⁸⁵ Mosher (1979:176); see also Thurber (1976:207).
- ¹⁸⁶ Mosher (1979:191-192).
- ¹⁸⁷ U.S. GAO (1978:187).
- ¹⁸⁸ Walker (1986:97).
- ¹⁸⁹ Walker (1986:97).
- ¹⁹⁰ Walker (1986:41). See also Williams (1998:Ch. 9) and Weiss (1992) for more on the CRS and OTA as analytic organizations.
- ¹⁹¹ See Saldin (2017:Ch. 2) for a brief review of problems with the budget process in the early 1970s and how they led up to the "Budget War" between Nixon and the Congress and Pfiffner (1979) for a more extensive history of events leading to the Congressional Budget Impoundment Control Act.
- ¹⁹² Saldin (2017:35).
- ¹⁹³ Joyce (2011:20).
- ¹⁹⁴ Twogood (1997:361).
- ¹⁹⁵ Minor (1978:101). Hughes spent most of his career at the Budget Bureau, where he eventually served as deputy to Charles Schultze; at the time of his consideration for the position of CBO director, he was Assistant Comptroller General under Elmer Staats (Estrada 2004; Gamarekian 1985).
- ¹⁹⁶ Rivlin (1971); Joyce (2011:20).
- ¹⁹⁷ Minor (1978:107).
- ¹⁹⁸ These included Robert Reischauer, a Columbia PhD and her Brookings colleague; Robert Levine, Yale PhD, RANDite and former head of the OEO's policy planning office; Frank De Leeuw, Harvard PhD and former staffer at the Federal Reserve and Urban Institute; and James Blum, who previously held leadership roles at Labor's ASPER and at the Council on Wage and Price Stability; into key positions (Duscha 1975; Minor 1978:106). PhD information is from ProQuest dissertations; while Minor lists Reischauer as being "from Harvard," he was a Harvard undergrad but received his PhD from Columbia. Blum had completed the

coursework for an economics PhD at Michigan, but not the dissertation (Day 2003). Non-economists in leadership roles included attorney Alfred Fitt, who had held high-level roles in the Department of Defense, and David Mundel, an MIT political science PhD who had worked with Rivlin at ASPE (Duscha 1975; Minor 1978:106). Day (2003) provides an unpublished but colorful and personal account of the early development of CBO; Chapter 2 can be found in the appendix to Anderson (2012).

¹⁹⁹ Minor (1978:114); Joyce (2011:23).

²⁰⁰ Joyce (2011:54, 59).

²⁰¹ Joyce (2011:123-128).

²⁰² U.S. Congress (2017). The one exception is Dan L. Crippen, whose PhD is in public finance.

²⁰³ Twogood (1997:361).

²⁰⁴ Minutes of Panel of Economic Advisers Meeting, 8 June 1977, folder "Congressional Budget Office 1975-1994," Box 23, Paul A. Samuelson Papers, Duke University Archives.

²⁰⁵ Minor (1978).

²⁰⁶ Mosher (1979:276).