

**Walter Oi and His Contributions to the All-Volunteer Force: Theory, Evidence,
Persuasion**

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Milton Friedman acquired the “AVF Purchase” for economists. Walter Oi was Lewis and Clark for those who followed him. He had explored the territory, discovered the routes through it and which were dead ends, met the natives and tribes, learned their languages, and documented what he found. Everyone who followed him into AVF work is indebted to him. I think that the Gates Commission staff could not have done what it did in the time it had without Walter’s knowledge and skills.

David B. Kassing

INTRODUCTION

Today’s symposium on the history and current status of the All-Volunteer Force (AVF) is in honor of Professor Walter Y. Oi, who passed away late last year at the age of 84. The charge of our paper is to set the stage for the panel discussions by reflecting on Walter’s contributions to the discipline of Economics, the end of the draft in the United States, and the management of the AVF. A bit of Walter Oi’s early background is in order. He was born in 1929 to Japanese immigrants and grew up in Los Angeles. In 1942, he and his parents were interned in a Japanese-American internment camp in Colorado for the duration of World War II. Returning to Los Angeles at the end of the war, Walter entered the University of California Los Angeles, where he received a B. S. degree in Business Statistics in 1952 and an M.A. degree in Economics in 1954. Walter then entered the PhD program in Economics at the University of Chicago and received his PhD degree in 1961. His decision to pursue a PhD degree was made remarkable, indeed unbelievable, by the fact that he was effectively blind since the 4th grade.

Despite his physical handicap, Walter became one of the 20th century’s most accomplished economists. We will now review his contributions to the discipline of Economics and his involvement in both the end of conscription and the management of the AVF. Those who knew Walter know that not only was he a first-rate economic theorist, he was an articulate, authoritative communicator of economic concepts to persons not schooled in the arcane language used by economists. When Walter talked, people listened. Because of his communications skills, he played a key role in persuading politicians and policy makers that the draft was an unfair and inefficient method for procuring manpower and that a volunteer system would indeed work.¹

CONTRIBUTIONS TO THE DISCIPLINE OF ECONOMICS

Walter Oi was the consummate Chicago economist, cast in the same mold as fellow Chicago economists Gary Becker and Sherwin Rosen. In the Chicago tradition, the purpose of economics is to explain human behavior based on the assumption of rational actors. With the proper approach, many apparent puzzles or seeming departures from rational behavior can be explained with the tools of economics. His research spanned a wide range of sub-disciplines within the field of Economics. In each case, he would describe the puzzle or puzzles to be explained, develop a model to explain the puzzles

¹Walter’s contributions to the end of conscription have already been discussed by others [Meckling (1990), Henderson (2005) and Rostker (2006)].

under the assumption of rational behavior, advance refutable hypotheses implied by the model, and test the hypotheses with data.

Selected publications by Walter are shown in the box below. By the time he had just taken his first tenure-track academic position at the University of Washington in 1962, Walter had published two papers in top-tier economics journals. The first demonstrated the desirability to producers in competitive markets (e.g., farmers) of varying prices brought about by random shocks to demand, a counterintuitive result explained by the fact that producers gain more producer surplus when demand increases than they lose when demand declines.

Selected Economics Publications by Walter Oi

The Desirability of Price Instability under Perfect Competition, *Econometrica*, January 1961.
Labor as a Quasi-Fixed Factor, *Journal of Political Economy*, December 1962.
The Neoclassical Foundations of Progress Functions, *Economic Journal*, September 1967.
A Peasant's View of a Soviet Collective Farm, with E. Clayton, *American Economic Review*, March 1968.
On the Relationship among Different Members of the K-Class, *International Economic Review*, February 1969.
A Bracketing Rule for the Estimation of Simple Distributed Lag Models, *Review of Economics and Statistics*, November 1969.
A Disneyland Dilemma: Two-part Tariffs for a Mickey Mouse Monopoly, *Quarterly Journal of Economics*, February 1969.
The Consumer Does Benefit from Feasible Price Stability, *Quarterly Journal of Economics*, August 1972.
The Economics of Product Safety, *Bell Journal of Economics and Management Science*, Spring 1973.
Residential Location and Labor Supply, *Journal of Political Economy*, August 1976.
Slack Capacity: Productive or Wasteful?, *American Economic Review*, May 1981.
Heterogeneous Firms and the Organization of Production, *Economic Inquiry*, April 1983.
On Working: Presidential Address for the Western Economics Association, *Economic Inquiry*, January 1993.
Employment Relations in Dual Labor Markets (It's Nice Work If You Can Get It), *Journal of Labor Economics*, 1990.

The second paper has since become a classic in the field of labor economics. Standard economic theory treated labor as a perfectly variable factor of production. Walter challenged this assumption. His paper "Labor as a Quasi-Fixed Factor" reconciled the following puzzles: (1) occupational differences in the stability of employment and earnings, (2) the uneven incidence of unemployment, (3) the persistence of differential labor turnover rates, and (4) discriminatory hiring and firing policies. The unifying factor in all of these puzzles is the existence of fixed costs of hiring workers. When they exist, fixed hiring costs induce employers to (1) discriminate against groups of workers that exhibit high quit propensities, (2) pay wages less than productivity in order to recoup these costs, and (3) be less likely to lay off workers with high fixed costs during downturns. Walter's empirical analysis demonstrated that the wages and employment

of blue collar workers, who have lower fixed costs, vary more over the business cycle than the wages and employment of white collar workers, who have higher fixed costs. This analysis has clear implications for contemporary public policies that impose costs related to the number of employees rather than the hours they work.

Shortly into his tenure at the University of Washington, Walter took a leave of absence to accept a consultancy, to be discussed below, with the Department of Defense (DOD) that began in the summer of 1964. This consultancy slowed down his academic publication rate somewhat, but he caught up in the period 1967-1969, publishing five articles in top-tier journals. His 1967 paper on neoclassical progress functions addressed a puzzle related to the defense industry - why average costs decline with the cumulative amount ever produced but increase with the rate of production per time period. Walter advanced nine theorems that collectively explained how cumulative amount produced and rate of production were related to one another. The analysis has important applications for defense procurement.

His two 1969 papers revealed him to be a first-rate econometrician.

In 1971, Walter published a paper titled "A Disneyland Dilemma: Two-part Tariffs for a Mickey Mouse Monopoly." In this beautifully written paper, Walter addressed the question of how Disney should price its theme parks. Disney has a number of options ranging from free admission with a high charge per ride to a high admission fee with no charge per ride. Walter showed that the optimal policy (the one that maximizes profits) is to (1) set the price P per ride equal to the marginal cost of supplying the ride and (2) charge an admission fee A that extracts the consumer surplus that remains after paying for the rides they take at price P . Since Disney has a zero marginal cost of supplying rides (with a given infrastructure), it should set a high admission fee and make the individual rides free. And that is what Disney does. This pricing model has a wide range of real world applications.

Finally, we highlight Walter's contributions to the emerging field of personnel economics. As distinct from labor economics, personnel economics hones in on the firm and attempts to explain such phenomena as the organization of production, the ability distribution of workers by firm size, and the structure of compensation.² In his 1983 paper "Heterogeneous Firms and the Organization of Production", Walter built a model to consistently explain the following facts: (1) many different-sized firms co-exist in the same industry, (2) large firms produce standardized goods while small firms supply customized goods, (3) large firms have more capital per worker than small firms and operate their capital at constant rates, (4) large firms organize workers in teams, (5)

² Personnel economics focuses on how organizations solve the agency problems of adverse selection (hidden information) and moral hazard (hidden action). Adverse selection occurs when workers and firms are not perfectly informed about worker abilities and firms' demands for ability. Moral hazard occurs when actions such as work effort cannot be perfectly observed by both firms and workers. These agency problems give rise for opportunism on the part of both workers and firms; personnel economics focuses on how these agency problems get resolved.

large firms spend more on hiring, and (5) large firms pay more than small firms. Walter developed a model to consistently explain these facts. Key to the explanation are (1) the assumption that managers have two roles in a firm: strategic planning and worker monitoring and (2) the fact that managerial time is a limited resource such that managerial time spent in one activity leaves less time for the other activity. According to his model, large firms reduce the need for monitoring workers by mass producing standardized goods using capital that is operated at constant rates. Large firms pay more partly because team production on a fast-paced production line requires a compensating wage differential. Furthermore, large firms demand more able workers because more able workers increase the productivity of capital. (But part of this productivity differential is dissipated by the fact that large firms incur larger hiring costs in the effort to identify the more able workers.) These substitutes for managerial monitoring free up managers to devote more time to strategic planning functions. As Walter put it, "The model developed here predicts that more productive workers will be matched with more productive entrepreneurs. Assortive mating is efficient because highly paid, productive employees are assigned to large firms that incur high monitoring costs." (p. 160)

Walter's 1990 paper "Employment Relations in Dual Labor Markets (It's Nice Work If You Can Get It)" extended the argument in his 1983 paper. In this paper he incorporated another reason why large firms pay more – to extract more effort from its workers. Large firms find it more profitable to pay an efficiency wage (wage above the worker's opportunity cost) and threaten termination if more effort is not supplied as another means of reducing managerial monitoring cost. Small firms find it more profitable to not pay efficiency wages, but as a consequence managers in these firms must devote more time to monitoring and less time to planning. Because large firms pay efficiency wages and small firms do not, large firms have lower turnover. Related back to his 1962 paper, the lower turnover allows larger firms to recoup their larger hiring costs.

Walter's contributions to economic analysis included a series of studies about the consequences of government intervention into markets: product safety (1973), workplace safety (1974, 1995), federal subsidies to mass transit (1975), workplace fairness rules (1991), and minimum wages (1997). These studies are all characterized by rigorous development of a model of the marketplace without government intervention and then analysis, both theoretical and empirical, of the effects of intervention. He viewed government intervention in markets with a healthy degree of skepticism, and his models teased out the often subtle unintended consequences of the intervention.

CONTRIBUTIONS TO THE END OF CONSCRIPTION AND THE IMPLEMENTATION OF THE AVF

In 1964, Walter took leave from the University of Washington to accept a position as a consultant to the Department of Defense (DOD) and work for Dr. William Gorham, the

DOD official responsible for conducting an internal study of the feasibility of ending military conscription.³ Walter's consultancy in DOD began a long involvement with issues related to the termination of conscription and the implementation and management of an AVF. During this long involvement, he played the roles of economic analyst, research manager, communicator, mentor, and public servant. Dividing his contributions into three time periods (1964-68, 1969-1972, and 1973 onward), we articulate his contributions and the various roles he played. The following table summarizes Walter's primary publications related to these topics.⁴

Walter Oi's Primary Publications Related to the Draft and the AVF

The Costs and Implications of an All-Volunteer Force, in <i>The Draft, A Handbook of Facts and Alternatives</i> , edited by Sol Tax, (Chicago, IL: University of Chicago Press), 1967.
The Economic Cost of the Draft, <i>American Economic Review</i> , May 1967.
<i>Proposal for a Military Manpower Procurement Bill</i> , Hearing before the Committee on Armed Services, U.S. Senate, April 18, 1967.
Manpower and Budgetary Implications of Ending Conscription (with B. Forst), in <i>Studies Prepared for the President's Commission on an All-Volunteer Armed Force Volume I</i> (Washington, DC: U.S. Government Printing Office), 1970.
Educational Attainment of Military and Civilian Labor Forces (with D. Reaume), in <i>Studies Prepared for the President's Commission on an All-Volunteer Armed Force Volume I</i> (Washington, DC: U.S. Government Printing Office), 1970.
National Service: Who Bears the Costs and Who Reaps the Gains?, in <i>National Service, Pro and Con</i> , edited by W. M. Evers (Stanford, CA: Hoover Institution Press), 1990, 82-102.
The Historical Perspectives on the All-Volunteer Force: The Rochester Connection, in <i>Professionals on the Front Line: Two Decades of the All-Volunteer Force</i> , ed. J. Eric Fredland, Curtis Gilroy, Roger D. Little, and W.S. Sellman (Washington, DC: Brassey's), 1996.
No More Greetings, in <i>The All-Volunteer Force (Thirty Years of Service)</i> , edited by B. Bicksler, C. Gilroy, and J. Warner (Washington, DC: Brassey's), 2004.

The Draft Debate Years 1964-1968

From the end of World War II to the mid-1960s, the prospect of being drafted was a fact of life for male youth in America. Economists of the period showed little interest in economic analysis of military manpower procurement. That all changed as the United States became more involved in Vietnam and draft calls began to increase. Critics of conscription argued that the draft system is inherently unfair, especially when the youth population is growing and the likelihood of being conscripted is declining. The draft imposes on those who are conscripted a hidden tax that is not borne by those who avoid conscription or the taxpayer at large. Critics saw the conscription tax as unfair

³According to Oi (1999, 16), he took the consultancy because he needed summer research funding and had not yet heard back about a prospective offer to do research in Honolulu, which later came through.

⁴Some of his other writings are cited in the reference list found at the end of the paper.

when it is levied on a small fraction of those at risk and particularly when the draftees come from lower income groups.⁵ While the unfairness of conscription was the central objection, some economists also began to question the economic efficiency of the system.

In addition to Walter, The Pentagon study team assembled by Dr. Gorham included David Bradford of Princeton University, Stuart Altman of Brown University and Alan Fechter of the Institute for Defense Analyses. The Pentagon study team conducted its research over the course of the next year and completed its work in the summer of 1965. Assistant Secretary of Defense for Manpower and Reserve Affairs Thomas D. Morris tabled the report for a year for fear that if it were acted upon it would hamper DOD's ability to meet increasing manpower demands resulting from the escalation in Vietnam. On June 30, 1966, Mr. Morris testified about the study and the prospect of a volunteer force before the House Armed Services Committee (HASC). Parts of the study were read into the record. They contained estimates of the budgetary impact of moving to a volunteer force. Depending on assumptions, the estimates ranged from \$4 billion to \$17 billion, with "mostly likely" estimates in the \$8-9 billion range. Given that the DOD manpower budget at the time was about \$12 billion, HASC members were not impressed. Secretary Morris flatly stated during his testimony that "Increases in military compensation sufficient to attract a volunteer force cannot be justified."

To this point, Walter's work for the Pentagon had not been revealed to the public. That was about to change. Professor Sol Tax of the University of Chicago organized a conference on the draft that was held at the University of Chicago on December 4-7, 1966. Participants included prominent academics Milton Friedman, Morris Janowitz, and Margaret Mead; Director of the Selective Service System General Lewis Hershey; DOD representatives Colonel Samuel Hayes and General S. L. A. Marshall; Senator Edward Kennedy; and Congressman Donald Rumsfeld. Many different viewpoints about the merits of conscription versus volunteerism were presented. Aside from cost, the main objection to a volunteer force was that it would be socially unrepresentative and become an all-black force. DOD representatives worried that personnel quality would suffer under a volunteer force. Others worried that the reserves would fall apart and that the services would be unable to attract certain skill groups such as medical personnel. To solve the issue of who should serve when not all serve, some advocated universal training and others advocated universal national service.

In his discussion at the conference, Milton Friedman gave an impassioned defense of volunteerism on logical grounds and countered the various objections to a volunteer force. But it was Walter Oi who demonstrated the feasibility of a volunteer force on empirical grounds. Based on his work for the Pentagon, Walter presented a paper that

⁵ Benjamin Franklin stated the unfairness over 200 years ago when he stated that "The question will then amount to this; whether it be just in a community, that the richer part should compel the poor to fight for them and their properties for such wages as they think fit to allow, and punish them if they refuse?"

accomplished several things. First, he estimated the budgetary cost of moving to a volunteer force. Then he estimated the true social cost of conscription and the hidden conscription tax that it implies. His analysis was impressive in its detail and its understanding of the military manpower system and how prospective recruits and military members would alter their behavior in a volunteer system with better compensation. Key to his analysis was the fact that a volunteer system with higher first-term compensation would not only attract more volunteers, but volunteers who would stay at higher rates after completion of their initial enlistments. Higher retention and lower turnover would reduce the demand for new accessions and would allow for a reduction in total force size due to the fact that fewer recruits reduce the size of the training establishment.

His analysis involved the following steps:

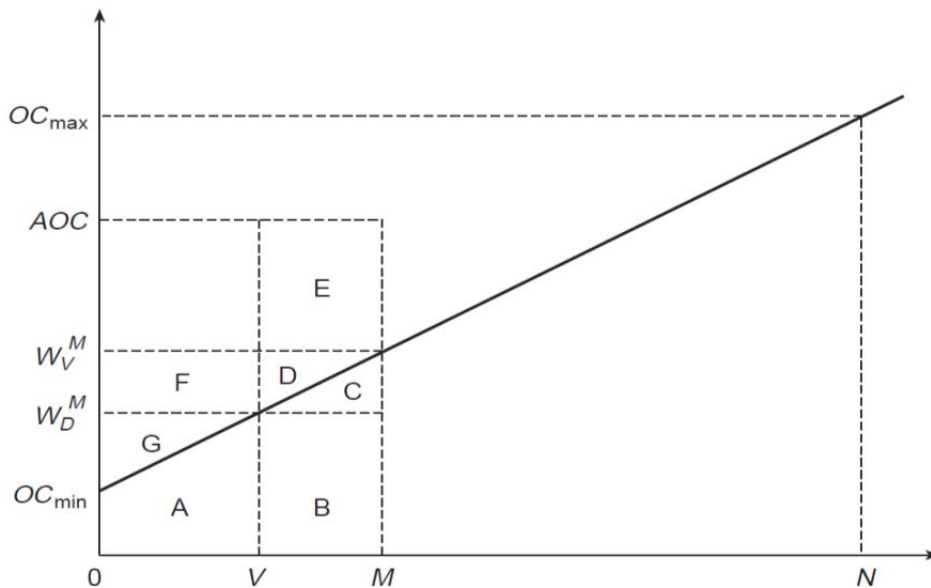
- Estimate the increase in the career ratio due to a volunteer force. The regular Army career ratio was estimated to increase from 43% with a draft to 54% under an AVF.
- Determine the reduction in force size due to fewer people in training. His estimate was 3%.
- Estimate how sensitive new recruiting is to military compensation. Using data from the 1963 Census and other sources, he estimated the elasticity of the supply curve of voluntary enlistments to be 1.36. (Altman and Fechter produced a slightly lower estimate, 1.17.)
- Determine the percentage of true volunteers in the current (mixed force) accession pool. Based on a 1964 DOD personnel survey, the number was put at 62%.
- Estimate new accession requirements in a volunteer force. After accounting for the increase in retention and the reduction in force size due to a smaller training establishment, accession requirements were estimated to be 29% smaller under a volunteer force.
- Estimate the shortfall in required accessions at current, draft-level pay for first-term personnel. He estimated that the recruiting shortfall would be 60%.
- Estimate the first-term pay increase necessary to eliminate the shortfall. He estimated that pay would need to be increased by 68% based on the 1.36 supply elasticity.
- Finally, estimate how much the military personnel payroll would rise. Based on 1965 pay levels, he estimated that the DOD personnel budget would increase from \$12.6 billion under conscription to \$16.1 under a volunteer force (27%).

In addition to this, Walter estimated the size of the conscription tax. This tax can be illustrated with the aid of Figure 1, which shows the relationship between military pay

and the number of individuals willing to join the military in a population of size N . If the military demands M recruits, in a volunteer system it must pay the wage W_V^M and its wage bill will be $W_V^M * M = A + B + C + D + F + G$. Under a draft with wage W_D^M , the military gets V volunteers and must therefore draft $M - V$ individuals. The wage bill under conscription is $W_D^M * M = A + B + G$ and the government payroll is reduced by $C+D+F$. Using data for 1965, Walter estimated this area to be about \$5 billion. But area $F+D$ represent *economic rents*, a payment above and beyond recruits' opportunity costs, which are given by the area under the supply curve ($A+B+C$). Rents do not count as true costs, but represent a pure transfer from taxpayers to military personnel. The area C is thus the part of opportunity cost that is extracted as an implicit tax on conscripts. Using his point estimate of the supply elasticity, Walter estimated the implicit draft tax (area C) to be \$826 million.⁶ With a smaller supply elasticity estimate, the tax was placed at \$1,134 million. These estimates indicated the large burden that the low level of first-term compensation at the time placed on young. Note that, under this concept of the draft tax, Walter's estimate is a lower bound, because it assumes that those with the lowest opportunity costs would be the ones drafted to fill the gap between volunteers, at the conscription wage, and total accession demand.⁷

Walter discussed two other costs, costs to the government of collecting this tax and costs to individuals of evading the tax, but he did not try to estimate them.

Figure 1: The Conscription Tax and the Opportunity Cost of a Military Force



⁶ Assuming that these are 1965 dollars, the approximate equivalent in 2014 dollars is about \$6.25 billion.

⁷ Walter knew that his estimate of the draft tax was a lower-bound estimate: "The economic cost or implicit tax placed on men who were coerced to serve by the draft provides a lower bound estimate of the opportunity cost of acquiring enlisted men. The estimates shown in the preceding table are biased downward because the men who bear the cost are assumed to be those with the lowest supply prices in the absence of a draft." [Oi (1967, 59)]

During the course of his analysis, Walter addressed with detailed statistics and insight the concerns people expressed about the social representativeness and quality of a volunteer force. Walter's analysis and the confidence with which he presented it was the high point of the conference, and he is widely credited with having changed the minds of many conference participants about the feasibility of a volunteer force. Years later, Milton Friedman wrote the following:

“Walter Oi...gave what I believe was the most effective paper at the conference...an eloquent paper presenting the case for ending the draft on grounds of both principle and expediency. The impact was dramatic. Here was a blind man, enormously impressive simply for his capacity to prepare and deliver a cogent, closely argued, and fully documented paper. He conveyed a clear sense of moral outrage on an issue about which he had no conceivable personal ax to grind. To me, it was the high point of the conference.”
(Friedman and Friedman, 377-378)

It is important to note that Walter's estimate of the budgetary cost of ending conscription was much smaller than the costs cited by Secretary Morris in his congressional testimony. In May of 1967, a similar analysis by Walter was published in the *American Economic Review* along with a paper by Stuart Altman and Alan Fechter, his colleagues on the Pentagon study. The Altman-Fechter paper contained the cost estimates cited by Secretary Morris. A reading of their paper and a comparison with the Oi paper indicates that the higher base case cost estimates (\$8-9 billion) were due to the fact that Altman and Fechter maintained a constant career force and did not permit retention to increase or required accessions to decline under a volunteer force. Consequently, their estimates of the first-term pay increase required to sustain a volunteer force were much larger than Walter's 68% increase.⁸

Congressman Donald Rumsfeld of Illinois attended the Chicago draft conference. Already a proponent of a volunteer force, Mr. Rumsfeld was one of those inspired by Walter's analysis. On April 18, 1967, Mr. Rumsfeld testified before the Senate Committee on the Armed Services. In that testimony, he not only laid out the case for a volunteer force, but he introduced a plan for phasing out conscription and moving to a volunteer force. His plan drew from a document that Walter authored (dated March 31, 1967) entitled *Proposal for a Military Manpower Procurement Bill*. The plan called for a 2-year extension of the draft to be followed by first-term enlisted pay raises ranging from

⁸ Their extremely large increase (\$17 billion) was obtained as a “worse case” scenario by using an enlistment supply elasticity that was one standard error below their base case elasticity, which was essentially the same as Oi's. But because the standard error was based on a regression with only 9 cross-section observations, it was extremely large and led to use of what was almost surely an unrealistically small value of the supply elasticity. Later estimates of supply elasticities with much more data and spanning longer periods of time have been remarkably similar to Oi's original estimates. See Asch and Warner (1995) and Asch, Hosek, and Warner (2007) for reviews of these studies.

71% for personnel in their 1st year of service to 17% for those in their 4th year. Walter's plan was read into the *Congressional Record* along with his Chicago conference paper.

The Gates Commission Years 1969-1972

The Congress did not act on Rumsfeld's proposal to end conscription. But in the fall of 1968, Martin Anderson, a faculty member at Columbia University and advisor to presidential candidate Richard Nixon, prepared a memorandum about the possibility of ending conscription and shared it with the Nixon presidential campaign.⁹ Impressed by Anderson's arguments, Nixon advocated the end of conscription in a speech delivered on October 17, 1968. Some observers believe that this speech was the margin of difference in the 1968 presidential election.

Soon after the election, W. Allen Wallis, President of the University of Rochester, approached Presidential transition team member Arthur Burns about the prospect of a Presidential commission to consider moving to an AVF.¹⁰ According to Wallis, Burns promised that he would propose it to the President if it could be shown that it could be done at a cost of a billion dollars or less the first year. On December 19, 1968, Wallis assembled a team of Rochester faculty members that included Oi, Martin Bailey, Harry Gilman, and Business School Dean William Meckling to quickly prepare a report. The team delivered its report on December 30.¹¹

On March 27, 1969, President Nixon established the President's Commission on an All-Volunteer Armed Force, known as the Gates Commission after its chairman Thomas Gates, to study the feasibility of an AVF. The Commission included a number of prominent Americans from all walks of life. The three economists on the Commission included Milton Friedman, Allen Wallis and Alan Greenspan. Wallis spearheaded the assembly of a research team to provide analytic support to the Commission. Meckling served its Executive Director, and Walter Oi, Stuart Altman, David Kassing, and Harry Gilman were appointed to serve as research directors. Meckling engaged a number of academics as well as professional staff at the Center for Naval Analyses (CNA), the Institute for Defense Analyses (IDA), and the Rand Corporation, to serve as Commission staff members.¹²

⁹ Anderson (2004) recounts these events.

¹⁰Rostker (1996, 61-103) provides a detailed account of the establishment of the Gates Commission. Wallis's account of the events leading up to the Gates Commission is contained in Olken (1991, 127-129).

¹¹ Walter put work above family matters to work on this report. Marjorie Oi wrote to us that "Walter and I had just flown to California so I could meet his family before our January wedding. We were there about 24 hours before Bill called and said come home so we can get this paper to the Nixon team. We were on the next plane."

¹²Staff members who studied enlistment supply included Stuart Altman, Robert Barro, Alvin Cook, Jr., Alan Fechter, and Burton Gray. Harry Grubert, Rodney Weiher, Gary Nelson, and Robert Wilburn studied reenlistment supply. Larry Sjaastad and Ronald Hansen estimated the conscription tax. John Sullivan and John White studied quality requirements. David O'Neill estimated the cost of military turnover. Huston McCulloch compared the experience

The Gates Commission staff began its work in early 1969. The work must have been hectic, because the Commission submitted its final report to President Nixon on February 21, 1970. (The staff papers were published in November of 1970.) Walter played key roles in the research process, both as a coordinator and manager of research and as a researcher himself.

Walter and Brian Forst co-authored a very detailed report on which the Gates Commission's main recommendations were based. Drawing on key parameters derived in the other staff studies, this report performed steps similar to those found in Walter's 1967 papers. This report differed from Walter's earlier works by treating each service separately by officer/enlisted status and by projecting not only future steady-state forces but the transitions to them from the force prevailing in 1970. Projections were made under the assumption of four different steady-state force sizes (in millions, 3.0, 2.5, 2.25, and 2.0). The AVF pay raises required to achieve each of these steady-state force sizes was computed along with costs. The detail of the analyses and the care with which the analyses were conducted remain truly impressive. It is fair to say that this work provided a guide for all military manpower force structure analyses since then.

From an analytical perspective, what is most interesting about this work is that it provided *much smaller estimates* of the cost of transitioning to a volunteer force than Walter had estimated earlier. His 1967 work estimated the budgetary cost of a volunteer force to be around \$4 billion, a 27% increase over the cost of the 1965 force. The new work indicated that a first-term pay increase of around 35% (50% basic pay increase) was needed to meet accession requirements for forces of 2.5 million or less compared to his 1967 estimate of a 68% pay increase. The extra annual costs during the transition period and in steady-state were about \$2.1 billion for the 2.5 million person force.

Three factors appear to account for the smaller costs. The first is that the 1970 force had about 3 million active duty personnel. Downsizing to the smaller force sizes would not require as large a pay increase to meet accession requirements as would be required with a smaller initial force. Second, the youth population was growing as a result of the baby boom. This growth shifted the supply of potential enlistees outward, implying a smaller pay raise would be needed to meet future accession requirements. Third, estimates from the other studies (and incorporated into the Oi-Forst analysis) indicated that retention would increase even more under an AVF than Walter assumed in his 1967 papers.¹³

structure of volunteer and conscripted forces. Mordechai Lando studied the health services and David Reaume and Walter Oi examined educational attainment in the military and civilian labor forces.

¹³ The Gates Commission predictions turned out to be remarkably accurate. In 1970, careerists – those with more than 4 years of experience – comprised 30% of the DOD enlisted force. The Commission predicted that the careerist percentage would increase to 47% in 1980. The actual (1982) number was 46%. By 1987, the careerist percentage had increased to 50%. Since 1987, it has grown to over 54%.

Gates Commission staff members Larry Sjaastad and Ronald Hansen re-estimated the size of the conscription tax and found it to be about \$2.1 billion, *more than double* the size of Walter's 1967 estimate of \$826 million. The source of the difference is that Walter assumed that the same individuals who were conscripted would be the ones to serve under a volunteer force.¹⁴ With the aid of Figure 1, it is clear that under such a draft, the opportunity cost of both the draft force and a volunteer force is A+B+C. So while the (narrow) conscription tax is still area C, both forms of manpower recruitment have the same opportunity cost.

Referring to Figure 1, under a random lottery draft with no exemptions, the average probability of conscription is equal to $p_c = \frac{M-V}{N-V}$. In such a draft, the average conscript would have the opportunity cost AOC in Figure 1 and the total opportunity cost of the M-V conscripts would be B+C+D+E. The excess opportunity cost of the conscripted force over the volunteer force is therefore D+E. Assuming completely random conscription, their report suggests a conscription tax of about \$3.4 billion.¹⁵ Their smaller estimate of \$2.1 billion was obtained by assuming that the probability of conscription varies inversely with opportunity costs due to the fact that individuals with higher costs will expend more resources to evade conscription.

Sjaastad and Hansen put the conscription tax rate at 51% of what draftees and reluctant volunteers would have earned in civilian life, a rate more than three times the tax rates borne by other citizens.¹⁶ Sjaastad and Hansen also estimated the resource costs associated with draft avoidance to be *larger* than the conscription tax itself. Together with this sizable estimate of draft avoidance costs, the Commission's lower cost estimates and larger conscription tax estimates made the case for ending the draft even more compelling than Walter's earlier estimates.

On April 23, 1970, President Nixon requested Congress to move toward an AVF while extending the draft.¹⁷ John J. Ford, staff director of the House Armed Services Committee, wrote about the opposition in Congress toward ending conscription:

“a substantial percentage of the members of Congress at that time were veterans of military service ... They had lived with the Selective Service law in

¹⁴ That is to say, Walter had assumed what Cooper (1977) called a Least Value Drafted First (LVDF) draft. The World War I draft was essentially a LVDF draft in which individuals were drafted in inverse order of their civilian sector productivities. As noted in an earlier footnote, Walter knew that his estimate of the draft tax was a lower-bound estimate.

¹⁵ They did not report this number, but they reported the conscription tax on Mental Group I-III high school graduate conscripts under the assumption of completely random taxation to be about \$2.28 billion. When the probability of conscription was allowed to vary (inversely) with opportunity costs, they derived this group's conscription tax to be \$1.35 billion. An estimate of the conscription tax on all draftees under a random draft with no exemptions is $\$2.059 * (2.28/1.35) = \3.4 billion.

¹⁶ And, of course, a random lottery draft with no exemptions would have an even larger implicit tax rate.

¹⁷ See Rostker (2006, 90-96) and Lee and Parker (1977) for detailed accounts of the debates in Congress over the Gates Commission report and the various hearings about the administration's proposals.

effect virtually all their adult life. They had a sense of the *moral rightness*, if you will, of service to your country, or at least being liable for such service. This feeling of moral rightness is probably also what informed proposals for universal military service that were advanced all through the time of the Selective Service System and continue to be offered in every Congress up to the present time”.¹⁸

Walter played a significant role in the legislative process, testifying before the House Armed Services Committee. According to Mr. Ford, it was Walter’s testimony that finally swayed the committee: “The most helpful witness from outside the government was Dr. Walter Oi. My colleague, Frank Slatinshek questioned Dr. Oi at some length and for the Committee it was perhaps the most informative and useful testimony in the hearings...His candor, knowledge, and willingness to challenge DOD data undoubtedly helped the Committee members feel more comfortable with an all-volunteer approach.” Walter’s ability to communicate complex ideas to a lay audience shone through again.

Opposition to the end of conscription spanned party lines and political ideologies. But whether or not they supported the draft, most members of Congress came to realize the unfairness of the low level of first-term pay with its implied conscription tax, and most eventually backed the administration’s proposed pay increases. Legislation to create an AVF, augmented by a standby draft, was signed on September 28, 1971, and conscription was terminated on June 30, 1973. Walter’s research going back to 1965 provided the evidence and the argument for this to happen.

The AVF Years

After the AVF was implemented, Walter continued to play important roles in its evolution, not as a direct researcher but as a communicator, mentor, and participant in conference panels and DOD study groups. Whenever pundits called for a return to conscription, Walter would write an op-ed piece or an article for a popular magazine that would summarily dismiss the arguments for why a return to conscription was necessary.

Walter was a regular participant in the defense economics sessions held as part of the annual Western Economic Association meetings. There he formed relationships with younger economists who were studying the AVF and provided them with valuable comments, guidance and encouragement. Over the years, Walter participated in a number of DOD manpower study groups, most recently as a member of the 2005-2006 Defense Advisory Committee on Military Compensation (DACMC) for which Paul Hogan was the Executive Director.

¹⁸ Mr. Ford’s interesting recollection about the draft hearings is contained in a document titled *Looking Back on the Termination of the Draft* available from John Warner. He penned his thoughts after attending the 30th Anniversary of the AVF Conference in September of 2003.

Drawing on his expertise in the field of Personnel Economics, Walter raised several concerns about the structure of the military compensation system. His sentiments were expressed in several places, including comments he provided at the 1979 Hoover Institution-University of Rochester conference on the draft and the 20th and 30th AVF conferences [Oi (1982, 1996, 2004)]. And he made these concerns well known at DACMC meetings.

The first concern was a belief that the military compensation lacked sufficient performance incentives. At the 1979 Hoover-Rochester conference, Walter stated that

“The costs of machinery...are homogeneous and predictable. Humans, on the other hand, are not predictable. If you can show them the most efficient way to do a task, they will not repeat it steadily; rather, they will have a tendency to monkey. You must design a pay system that will provide incentives and penalize poor behavior. If we go with a system of [up-front] bonuses, especially initial entry-level bonuses and reenlistment bonuses, we establish a system of pay that is something very much like an overhead cost – a lump-sum payment. Once you have it (the bonus), you have very little incentive to perform properly. If you move from that sort of system to one in which you give pay for good performance and penalize bad performance, I think the effectiveness of the force is going to increase. I think we ought to give this more thought in designing the pay package [Oi (1982, 25-26)]

Walter’s second concern was the military retirement system. In 1970 he and Brian Forst wrote that

“In our opinion, the present retirement system is unduly costly, inflexible, and fosters inefficient manpower utilization practices. A drastic revision of the retirement program should be an integral part of the move to an all-volunteer force.” Oi and Forst (1970, I-1-82)

At the 20th AVF conference he elaborated further:

“Retirement and a pension after 20 years of service were probably initially adopted for reasons of physical fitness. Higher real incomes and medical science have increased longevity and health, and advances in military technology have reduced the need for brute strength...A policy that staggers the length of service requirements to qualify for full retirement could result in substantial savings in training and recruiting costs. A staggered retirement policy should be linked to a pay system that breaks the correlation between pay on the one hand and length of service and rank on the other.” [Oi (1996, 50)]

Walter’s third concern was the military “up-or-out” system, which requires that service members must be promoted within a certain period of time or be forced to leave the service. Walter thought that this system causes unnecessary turnover and wastes

valuable talent and experience. At the 30th AVF conference, he remarked that “Up-or-out” rules are of questionable value in a professional force.” Without being explicit about it, he seemed to be implying that the military should have an “up-and-stay” system: “In the British and Canadian Armed Forces, one can occasionally find a corporal who has 18 years of service.”

Walter’s concerns about military compensation and personnel policy have been shared over the years by observers and policymakers inside and outside of DOD. Responding to these concerns, economists at Rand, CNA, IDA, and elsewhere have used the models developed by Walter and others as a point of departure, developing very sophisticated models of personnel decision-making in the military setting and estimating them with modern econometric techniques and micro-data from personnel records. The models have then been applied to study how personnel would respond to complicated changes to the military compensation system, including radical changes to the retirement system.^{19, 20} These models have supported numerous compensation policy recommendations by DOD and by commissions and study groups such as the DACMC and the 10th Quadrennial Review of Military Compensation. AVF researchers owe a debt of gratitude to Walter and others working in the early-AVF era for the groundwork they laid for this modern research.²¹

POSTSCRIPTS ON THE ECONOMICS OF CONSCRIPTION

The Gates Commission presented a compelling case for an AVF, especially when the required force size is small relative to the population. But discussing the situation in which a large force is required relative to population, Friedman (1967, 202–203) stated:

“And to rely on volunteers under such conditions would then require very high pay in the armed services, and very high burdens on those who do not serve. . . It might turn out that the implicit tax of forced service is less bad than the alternative taxes that would be used to finance a volunteer army.”

¹⁹ For a very recent example of such models, see Asch et al. (2008). Many of the earlier contributions are reviewed in Warner and Asch (1995) and Asch, Hosek and Warner (2007).

²⁰ Asch and Warner (2001) used one of these models to analyze the up-or-out system. They showed that two factors account for the presence of up-or-out rules in the military setting – a hierarchical rank structure and lack of lateral entry. The hierarchical rank structure means that there are fewer positions to be filled at a given rank than the next lower rank. The lack of lateral entry means that positions can only be filled from those in the next lower rank and not from the outside. Personnel thus have value in their current position and in their ability to fill the next higher position. Up-or-out rules kick in once personnel have revealed that they are not promotable. Retention of non-promotable personnel reduces the promotion rates of individuals who are promotable and reduces their effort as well as their retention. Their analysis indicated that the case for elimination of up-or-out rules in the military setting is not unambiguous.

²¹ In addition to the Gates Commission economists, one person who deserves specific mention here is the late Professor Sherwin Rosen of the University of Chicago. Professor Rosen was the primary architect of modern compensation theory and its application to large, hierarchical organizations. He had a keen interest in the military compensation system, and along with Walter was a mentor to many AVF-era military manpower economists.

Over the last 20 years, economists have developed formal models that account for the various social costs of a volunteer force and how they vary with force size.²² This literature accounted for the cost implied by Friedman – deadweight losses arising from taxation. Deadweight tax losses arise from the fact that when the government increases taxes to pay for government programs, those taxes distort economic behavior. They increase at a faster rate as force size increases under a volunteer system than a draft because in the volunteer system pay has to be increased, to attract more personnel. The models indicate that there is a force size F^* beyond which a draft force will in fact have lower social cost than an equivalent-sized volunteer force. These analyses indicate that a conscripted force may in fact be cheaper during periods of mass mobilization, but is still unlikely to be so when the demand for personnel is small in relation to the size of the population eligible to serve.

Walter's analyses and those of the Gates Commission all indicated that a volunteer force does not need to be as large as a conscripted force to have the same effectiveness. In their analyses, this was due exclusively to the AVF's lower turnover and therefore lower training requirements. It was clear from Walter's writings that he thought that more experienced personnel would be more productive than less experienced personnel, but neither he or others tried to estimate how much more productive more experienced personnel are or how much smaller a volunteer force could be on productivity grounds. We suspect that this was because no empirical data existed at the time that would permit such analyses. (If the data had existed, Walter would have analyzed them.) But the advent of productivity measures during the AVF period has permitted such analyses, and studies with these data have found more experienced personnel to be significantly more productive than junior personnel.²³ Had the Gates Commission been able to account for how much more productive a more experienced volunteer force would be, its case for terminating conscription would have been even more compelling.

After the fall of the Berlin Wall, a number of European countries terminated conscription and implemented volunteer forces [Gilroy and Williams (2006)]. Central to these decisions was the fact that, as force size declines and smaller fractions of the youth population are needed for military service, the social cost of volunteer forces falls below the social costs of conscripted forces and the implicit tax that conscription imposes becomes less and less defensible. Walter was no doubt pleased by the fact that these countries came around to the economic way of thinking about how to acquire military manpower.

²² See Warner and Asch (1995) and Asch, Hosek and Warner (2007) for a review of this literature. See Perri (2010) for a recent analysis not contained in this literature.

²³ See Warner and Asch (1995) and Asch, Hosek and Warner (2007) for surveys of the literature on military personnel productivity. Part of the experience gain comes through higher retention. The other part comes from the fact that in the volunteer system first-term personnel serve longer initial enlistments. Most enlistees now serve terms of 4-6 years, compared to the 2-year enlistments that draftees served prior to the AVF.

CONCLUSION

This brief survey of Walter Oi's contributions to the economics profession over the past 50 years makes clear that he was a giant among economic theorists. The Economics profession has appropriately recognized those contributions by making him a Fellow of the Econometrics Society (1976), a Fellow of the American Academy of Arts and Sciences (1993), a Distinguished Fellow of the American Economic Association (1996), a Distinguished Fellow of the Society of Labor Economics (2004), and a Distinguished Senior Fellow of that society (2007). Without question, Walter played the largest role of any single individual in terminating conscription in the United States. For this and other contributions to the Department of Defense, Walter was awarded Secretary of Defense Medal for Outstanding Public Service in November of 1999.

In closing, Walter was proud to be an economist and a staunch advocate of the economic way of thinking. In the late 1970s and early 1980s, there was much debate between economists and sociologists about whether the AVF was working. At the 1979 Hoover Institution conference on the draft, Walter got miffed about the criticism of the economic approach. Responding to criticism of the economic approach by a well-known sociologist, Walter expressed a keen sense of humor about this controversy:

"I am an economist. I realize that economists' reputations differ. I was at the European econometrics society meetings in Athens where Mr. Joffe, a Soviet economist, described a May Day parade. 'First came the tanks, then the weapons carriers, the little missiles, the intercontinental missiles, and, finally at the end of the parade came a little truck with three little men on it. Brezhnev turned and asked, 'Who are they?' The Minister of Defense replied, 'Those are the economists. You wouldn't believe the destructive power they can unleash.' Yes, I am an economist." [Oi (1982, 27)]

And a great one he was!

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