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THE WELFARE EFFORT OF THE UNITED STATES: KNOW THEM THYSELF

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The Argument and the Findings

It seems obvious that the United States is not meeting the welfare needs of all its citizens in a adequate and equitable manner. But, it is neither clear what rearrangement of national priorities would result in more resources for welfare state usage, nor, given the resources at its disposal, is it clear what priorities and activities within the welfare state would lead to best meeting the needs of its users. Countrymen, what is to be done?

There are two basic strategies that can be followed. One focuses on securing larger budgets for the welfare state, the other focuses on making more efficient usage of existing budgets. The purpose of this article is to come to some judgement, albeit tentative, about the probable success of pursuing the first strategy, and to suggest areas of priority relevant to the second strategy. To facilitate the making of these judgements we make three calculations which comprise the body of this paper and they have some intrinsic interest of their own.

Let us begin with the strategy of increased budgets. Two questions relevant to this strategy are immediate: what is the likelihood of anticipating a major welfare state budget change in the near future?; and what is the likelihood that the military budget would offer a source of funds for such an increase?

Wilensky has argued that welfare states in advanced nations structurally resemble one another, and that this pattern of similarity increases with the development process.¹ Following Wilensky's work one of the authors of this paper showed that the magnitude of national welfare efforts in 64 nations throughout the world are similarly determined by supply and demand forces.² There appears to be a structural pattern, an international "social normalcy," or expectation about what constitutes the appropriate size of any national welfare state, given a basic national description. If, as Wilensky argues, patterns are converging, then one should anticipate that national welfare state budgets smaller (larger) than expected would be more (less) likely to increase over time than to decrease (increase) over time. Our first calculation determines whether the size of the United States welfare effort is more or less than expected when the size of her per capita income, the size of her military effort, the proportion of her aged, and her political system are considered simultaneously. Contrary to the rather commonly held opinion we find that the United States is not a welfare state laggard, but for 1966 at least, she spent more than would be predicted, given her description. From the argument above it follows that the U.S. is less likely to increase her welfare state size

than if she actually were a laggard.

The second question relevant to the increased resources strategy is to determine where budget increases might come from and how large they might be. The single largest competitor to the welfare state for resources is the defense budget. Consequently, it may appear as a likely source for welfare state funding increases. David Stockman's most interesting article in the *Public Interest* argues persuasively, in our opinion, that very little can be expected from this source. We quote:

The basic problem is that strategic weapons and other military hardware have always constituted the primary targets for cuts, but the share of the defense budget attributable to these items has dropped from nearly 50 per cent in 1964 to less than 30 per cent during the current fiscal year (or in 1975 dollar amounts, from \$38 billion in the former year to \$23 billion today). This rather pervasive shift is largely the result of the escalating costs of manpower under the volunteer army. Since the latter is probably invulnerable at present, the effect has been to narrow the target for defense budget reductions quite substantially.³

In relentless pursuit of even the possibility of a diminished defense budget, we ask how much of each reduced dollar of defense spending should one expect society to transfer to welfare state purposes? To estimate an answer to this question we first formulate and estimate a model that describes this historical welfare effort of the United States. Based on this model we estimate the welfare-warfare trade-off, the increase in the welfare state budget that is expected from saving a dollar of defense expenditures. We find that six cents is the expected welfare state budget allocation for every dollar saved from the military budget.

The combination of a welfare state level that is above "normal" in size, and consequently less likely to increase than to decrease, the likelihood that defense is not subject to severe cuts at this time, and the rather small increases in welfare budgets that would follow a successful effort to demilitarize, suggest that a strategy to increase the welfare budget, at least through marauding the defense budget, is likely to be bankrupt. Consequently, our focus shifts and attention is directed to the welfare state itself.

Using the historical model of the United States welfare effort, developed to estimate the welfare-warfare tradeoff, which is naturally limited in its considerations of possible welfare state programs, we estimate where future welfare state problems probably lie and indicate how present research and planning might best prepare for expected future increases. Our results suggest that problems associated with aging populations are the number one future priority. This result is in agreement with the recent call for the development of the technology of care, or maintenance programs, within welfare.⁴ The discussion that follows indicates in greater detail the analysis and methodology behind the calculations that led us to the above judgements.

Are U.S. Welfare State Expenditures Greater Than or Less Than Expected?

The United States has been characterized as a welfare state "laggard," a description that is beset with negative performance characteristics: the failure to spend some expected proportion of GNP; a level of spending that is low in comparison to other rich nations; a nation slow to start social programs, such as workmen's compensation and national health insurance, and one that is grudging in its support of programs once they have begun.^{5,6} In short, the laggard view placed the United States in the company of the reluctant public welfare providers, such as Australia, Canada, Japan and Switzerland, in contrast to the welfare state leaders, West Germany, Belgium, Austria, the Netherlands, and France. How does this view hold up under analysis?

A decade ago the United States' welfare effort (government expenditures on welfare and health as a proportion of GNP) was 7.9%. How close is this value to the value that would be predicted for any country with similar per capita GNP, military effort (government expenditures on military as a proportion of GNP), political system, and proportion aged in the population? A recent international study of the structural determinants of the welfare effort by one of the authors estimated a relationship between these descriptive variables and the welfare efforts of 64 nations (23 of which were advanced nations).⁷ That model predicts a 1966 U.S. welfare effort of 7.4%, a half of a percentage point less than the actual U.S. performance.

As the United States has the highest GNP per capita it might be suspect of being an outlier, a nation not appropriately represented by the estimated international model. While there may be some truth in this point, one's reservations might be tempered with the knowledge that of the four explanatory variables in the model only in GNP per capita was the U.S.'s variable values at an extreme. Moreover, the implications that follow from excluding the U.S. from the international model's estimation lead to a comparative portrait of the U.S. showing her even more relatively advanced than that described above. Because (1) the U.S. welfare expenditures were less than those predicted by the model, and (2) the method of least squares was used to estimate the model's coefficients, excluding the U.S. from the estimation sample only results in an international model that predicts less of a U.S. effort than the model that includes her in its estimation. In point of fact, a model estimated without the U.S. predicts a U.S. effort of only 6.9%, a full percentage point less than her actual performance. Tests showed no significant differences between the estimates of the two models. Because we will be using two of these international coefficient estimates in the section to follow we present them in Table I.

TABLE I: Estimates of the
Structural Determinants of the Welfare Effort

<u>Variables^a</u>	<u>Units</u>	<u>Coefficient Estimates U.S. Included</u>	<u>Coefficient Estimates U.S. Excluded</u>
Constant		8.834.10E-1†	8.998.10E-1†
HC	\$	-2.598.10E-3†	-2.793.10E-3*
HM	% GNP	1.696+	1.681+
HM ²	% GNP	-1.606.10E-1+	-1.612.10E-1+
LG	\$	5.304.10E-3+	5.248.10E-3+
HA	Proportion of population	1.211.10E2+	1.245.10E2+
P1	Nominal	4.721+	4.755+
P2	Nominal	2.239*	2.259*
P3	Nominal	6.190.10E-1	6.188.10E-1+

a) H and L denote high and low income countries: G = GNP per capita, M = military effort, A = proportion of population aged 65 and over; P1, P2, and P3 are the political system indicators - totalitarian, liberal democratic and authoritarian oligarchic states, respectively. See Wilensky (1975), p. 138 for the classification by nation. The United States is a liberal democratic state.

* = significant at $\alpha = .05$

+ = significant at $\alpha = .01$

† = No standard errors are provided by the algorithm.

Our positive difference between actual and estimated expenditure level contradicts Aaron's finding that estimated U.S. welfare expenditures (again, as a percentage of GNP) exceeded actual expenditures.⁸ The goal of his study was also to discover if there were common determinants of social security expenditures. He had a sample of twenty-two countries and found the most important determinants to be per capita income, age of the social security system, and household saving. His model predicted a U.S. welfare effort for 1956-57 at 6.2%, while the actual U.S. effort was 4.9% (these figures are based on data somewhat different from ours, and accordingly only the difference between us is important to this argument). There seems to be a clear difference between these two results. We are somewhat comforted by the fact that while Aaron found age of the system to be one of his three most important explainants it only accounted for an additional one-half of one percent of the variance in welfare effort in the international model discussed above after GNP per capita, proportion aged, military effort, and political system

had been included. While there is need for further clarification on the comparison between predicted and actual welfare state expenditures, we must tentatively reject the supposition that the United States is somehow performing below expectations.

The Potential Welfare-Warfare Tradeoff

If expenditures on welfare and expenditures on warfare were the only social choices, then every dollar withheld from military expenditures would be available for welfare expenditures. This is obviously not the case, as the competition for government monies extends into every sector of social concern. Including, as one should, the possibility of not collecting taxes, the competition extends into every private concern as well. This recognition prompts us to ask how much of each dollar withheld from military expenditures can one expect to be allocated to welfare expenditures? We call this reallocation the potential welfare-warfare tradeoff.

Estimating the magnitude of this tradeoff is quite straightforward. First, one needs an explanation for the size of the welfare effort as a function of the size of the military effort. For illustrative purposes we can use either of the international models presented in Table I. We say illustrative because a cross-sectional international model is only suggestive of average changes which may occur in some artifact average nation. It is not an appropriate description for any particular country.

Second, using this explanation, one can calculate the rate of change in the welfare effort due to a unit reduction in the military effort. The derivative of the welfare effort supply with respect to the military effort, according to Table I (U.S. included model) and evaluated at the U.S. military effort for 1966 (9.1 per cent), yields the result that a unit decline in military effort, which in this case is 1 percentage point, produces a 1.23 unit increase in welfare effort, which in this case is 1.23 percentage points. If the dollar increase in welfare spending arising from the dollar decline in military spending is divided by the dollar decline in military spending we have the welfare-warfare tradeoff—the welfare increase for each dollar reduction of military expenditures. Thus the third step is to determine the dollars associated with the 1 percentage point decline in military effort and the dollars associated with the 1.23 percentage points rise in welfare effort and then to divide the former into the latter.

Let \$M measure the dollar reduction in military expenditures and \$W measure the military-induced increase in welfare expenditures. Given our data, \$M is the product of (1) the military effort, which is the ratio of military expenditures to the GNP, (2) the GNP per capita, and (3) the population size. Similarly, \$W is the product of 1.23 times (1) the welfare effort, which is the ratio of welfare expenditures to the GNP, (2) the GNP per capita, and (3) the population size. Dividing the former expression into the latter expression yields:

$$(1) \text{ Welfare-Warfare tradeoff} = \frac{\$W}{\$M} = \frac{(1.23)(\text{Welfare effort})(\text{GNP/capita})(\text{capita})}{(\text{Military effort})(\text{GNP/capita})(\text{capita})}$$

The latter two terms of this expression cancel. According to Wilensky's data the tradeoff is simply:

$$\text{Welfare-Warfare tradeoff} = \frac{(1.23)(7.9\%)}{(9.1\%)} = 1.07.$$

A welfare-warfare tradeoff of approximately 1 means that if the international model were the appropriate model, and if one were only interested in welfare expenditures, demilitarization would be a fruitful goal--every dollar saved from military expenditures would result in the increase of a dollar in welfare expenditures. This result implies that no other private or social interests would capture any of these savings.

For our purpose, a more accurate calculation of this tradeoff would result from an analysis of the welfare effort of the United States itself. To fulfill the task of calculating a reasonable estimate of the welfare-warfare tradeoff for the U.S. we must first estimate an historic model of the U.S. welfare experience, and then apply the methodology just illustrated. The data used to estimate the model are U.S. observations for the years from 1935-1973. The structure of this model, built on supply and demand forces, will parallel that developed for the international model. Let us turn to supply considerations first.

The Variables of the U.S. Historical Model

Military effort, similar to the international model, is measured as the proportion of GNP spent for national defense. Results from the international model suggest that military efforts of more than 5.5 percent of GNP substitute for welfare efforts. Except for the five years we considered that preceded World War II, annual military efforts have exceeded 5.5 percent, with few exceptions. Thus, a negative, or substitute, relationship between military expenditures and welfare expenditures is expected.

This expectation conforms with previous research on the question. Russett found significant decreases in health, education, and welfare spending when defense spending increased, with the greatest decrease in welfare programs.⁹

It would seem sufficient to specify the military effort measure in an equation for welfare effort and anticipate a negative sign on its coefficient. However, to test for the possibility of a somewhat more complicated curvature in the relationship between welfare effort and military effort we began by including both the military effort value and the square of the military effort variable in the welfare effort specification.

In the international model we found that increases in per capita GNP in the rich nations led to diminishing percentage GNP expenditures on welfare. There, per capita GNP was considered as a supply variable, which was probably a specification error. Per capita GNP actually measures both the availability of resources, which is supply related, and the national income, which is demand related. As a supply measure the availability of resources should be positively related to welfare. The more resources that are available, the more that can go to welfare. As a demand

measure the opposite prediction is expected. Positive increments in national income, over the historic period in question, are usually interpreted to mean that people are better off. Consequently, their welfare needs are lower and they demand less welfare. These arguments imply that the effect of an increase in per capita GNP on welfare effort is ambiguous. If the supply forces exceed the demand forces, the sign of the coefficient on per capita GNP should be positive. If the demand forces exceed the supply forces the sign of the coefficient on per capita GNP should be negative. And if there is a balance between these two forces the estimate of the coefficient on per capita GNP should not differ (statistically) from zero. We turn now to considerations about less ambiguous demand variables.

While populations at risk are more or less able to voice their needs, society has collectively determined that certain groups have needs which require public responses, and has fashioned a welfare system to respond to these needs. The major groups so recognized are the aged, children in need, and workers whose connections with the market has been temporarily or permanently disrupted. Direct and indirect measures of these populations should provide reasonable demand variables.

The proportion of the population aged 65 and older is an obvious choice--it was the most important variable in the international model. There is no reason to believe that this variable would be any less important in the United States. We expect a positive relation between the proportion aged and the welfare effort.

There appears to be an increasing propensity for women in disrupted families to form separate households than in the past.¹⁰ It seems plausible to believe that female-headed families, particularly those with children, are a higher-risk group (in terms of needing aid from the public sector) than families in general. The proportion of primary families which are female-headed becomes the second demand variable. As the proportion of female-headed families rises, we expect the welfare effort to rise as well.

Unfortunately, accurate and comparable data on both female-headed and primary families were not available prior to 1950. Consequently, an indicator variable, which we denote D_f , was also included in the specification for welfare demand. Between 1935 and 1949 the indicator variable takes on the value 1 and the proportion female-headed of primary families takes on the value zero. Between 1950 and 1973 the indicator variable takes on the value 0, and the proportion female-headed of primary families takes on its estimated value.

The annual unemployment rate, an average of the monthly rates, also measures welfare effort demand. The reasons seem obvious. Unemployment benefits and welfare payments to those whose benefits have been exhausted or to those who were not covered in the first place are part of welfare effort. In addition, in times of high unemployment some people, ineligible for Social Security benefits solely because of earned income, are made eligible by unemployment and collect those benefits.

While there may be some methodological argument about the accuracy of government data with regard to unemployment (especially for the earlier period of our

analysis), we consider the annual rate an adequate approximation of the condition of the labor market in any one year. As unemployment rises we expect welfare effort to rise as well.

There is no doubt that other variables could be considered here as well, but we believe these three to be sufficient to test our specification. We did not use data strictly comparable to that used in the international model, due to different sources. Details may be found in the Appendix. One final point: we chose to lag the annual demand variables by one year as we expected that their full impact would not be felt until that time.

In summary, and to clarify notation that is to follow, the following variables are included in the model:

W^S	welfare effort supplied, the proportion of GNP allocated to public expenditures on health and welfare
W^D	welfare effort demanded, which is not measured
GNP	gross national product per capita, converted to 1966 prices
MIL	military effort, the proportion of GNP spent on national defense
MIL^2	military effort, squared
AGED	the proportion of the population which is aged sixty-five and older
UN	the average of monthly unemployment rates
FHF	the proportion of primary families which are female-headed
D_F	an indicator variable taking on the value of 1 or 0 as the year is before 1950 or is 1950-73, respectively
ϵ	a random variable.

Model Specification

Equations (2) and (3) denote the supply and demand equations, respectively.

$$(2) \quad W_t^S = \beta_0 + \beta_1 GNP_t + \beta_2 MIL_t + \beta_3 MIL_t^2 + \beta_4 W_t^D + \epsilon_{St}$$

$$(3) \quad W_t^D = \gamma_0 + \gamma_1 GNP_t + \gamma_2 AGED_{t-1} + \gamma_3 UN_{t-1} + \gamma_4 FHF_{t-1} + \gamma_5 D_{Ft-1} + \epsilon_{Dt}$$

Substituting equation (3) into (2) yields the model to be estimated:

$$(4) \quad W_t^S = (\beta_0 + \beta_4 \gamma_0) + (\beta_1 + \beta_4 \gamma_1) GNP_t + \beta_2 MIL_t + \beta_3 MIL_t^2 + \beta_4 \gamma_2 AGED_{t-1} + \beta_4 \gamma_3 UN_{t-1} + \beta_4 \gamma_4 FHF_{t-1} + \beta_4 \gamma_5 D_{Ft-1} + \eta_t$$

where $\eta_t = \epsilon_{St} + \beta_4 \epsilon_{Dt}$

Table II presents, in summary form, the hypotheses associated with the estimates of the coefficients. Descriptive statistics of the variables are displayed in Table III.

TABLE II
Hypotheses on the Estimate of the Specified Model

<u>Variable</u>	<u>Coefficient</u>	<u>Null</u>	<u>Alternate</u>
Constant	$\beta_0 + \beta_4 \gamma_0 = \delta_1$	$d_0 = 0$	$d_0 \neq 0$
GNP _t	$\beta_1 + \beta_4 \gamma_1 = \delta_2$	From the discussion of the hypotheses about GNP we would expect $\beta_1 > 0$, $\beta_4 > 0$, and $\gamma_1 < 0$. Therefore,	
		$d_1 = 0$	$d_1 \neq 0$
MIL _t	$\beta_2 = \delta_2$	$d_2 = 0$	$d_2 > 0$ if $d_3 < 0$ < 0 if $d_3 = 0$
MIL _t ²	$\beta_3 = \delta_3$	$d_3 = 0$	$d_3 < 0$
AGED _{t-1}	$\beta_4 \gamma_2 = \delta_4$	$d_4 = 0$	$d_4 > 0$
LN _{t-1}	$\beta_4 \gamma_3 = \delta_5$	$d_5 = 0$	$d_5 > 0$
FHF _{t-1}	$\beta_4 \gamma_4 = \delta_6$	$d_6 = 0$	$d_6 > 0$
D _{Ft-1}	$\beta_4 \gamma_5 = \delta_7$	$d_7 = 0$	$d_7 > 0$

TABLE III
Descriptive Statistics of the Historic Model's Variables

<u>Variable</u>	<u>Units</u>	<u>n</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Standard Deviation</u>
W ^S	Proportion of GNP	38	0.115	0.019	0.063	0.022
GNP	\$1000	38	4.474	1.508	2.904	0.799
MIL	Proportion of GNP	38	0.383	0.010	0.101	0.087
AGED	Proportion of the Population	38	0.100	0.061	0.084	0.012
LN	Percent of Labor Force	38	20.100	1.200	6.510	4.930
FHF	Proportion of Primary Families	23	0.115	0.093	0.101	0.006

Estimation of the Historic Model

Our first estimate (Model 1, Table IV) indicates that the forces of increased resource availability and decreased demand are in balance. The coefficient on the percapita GNP term estimates not statistically different from zero. The model 1 estimates also show that the more complex curvature between military effort and welfare effort is unnecessary. The coefficient on the square of the military effort term is also not statistically different from zero. All other estimates are statistically different from zero in the predicted directions.

Unfortunately, the Durbin-Watson statistic indicates that there is a problem of autocorrelation, a not uncommon occurrence in time-series analysis.¹¹ Consequently, we have reason to doubt whether these estimates are best linear unbiased. The Durbin-Watson d statistic has a distribution that depends on sample size and the number of variables in the specification. For example, the area of uncertainty for 38 observations and 5 variables lies between 1.12 and 1.70. A d less than the lower limit of 1.12 indicates autocorrelation; a value above the upper limit of 1.70 indicates the absence of autocorrelation at the 5 percent level of significance. A value lying in the area between the limits is considered inconclusive. Since the d

value for model 1 is 1.17, the odds heavily favor the presence of autocorrelation.

The standard method to rectify this problem is to substitute the procedures of generalized least squares for those of ordinary least squares.¹² While the methodology to do this is straight forward, its employment requires one to know (in this case) the intertemporal relationships between the error terms of equation (4). After considerable experimentation the best meaningful intertemporal relationship we could find was a simple correlation between an error and its 4 year lagged error. Such an error structure suggests a life cycle in the office of the presidency. Relative advances and declines in annual welfare efforts are made during particular phases of the four year cycle. After transforming Model 1's variables to neutralize its autocorrelation, model 1 was re-estimated. These results appear in Table IV as Model 2. Having verified that the per capita GNP and MIL^2 coefficients were indeed not statistically different from zero, we eliminated them from the specification. We then estimated the simplified specification with ordinary least squares, which is presented as Model 3, used these estimates to construct the generalized least squares variable transformations, then re-estimated Model 3 to obtain our final results, which appear in Table IV as Model 4.

Note that the generalized least squares procedure increased the Durbin-Watson d from a value of 1.06 for the variables in the Model 3 to a value of 1.55 for Model 4. While the value of 1.55 does not suggest the absence of autocorrelation (at the .05 level of significance), it shows considerable improvement over the ordinary least squares estimates.

Estimating the Welfare-Warfare Tradeoff

As we expected, military spending erodes welfare spending, but not to the extent that the international model suggested that it would. A one percentage point increase (decrease) in military spending is associated with 9/100th of a percentage point decrease (increase) in welfare spending. Substituting the U.S. average military effort, 10.1 percent, and the U.S. average welfare effort, 6.3 percent, and the rate of increase in welfare effort for a decrease in military effort of 1 percentage point, .09, into equation (1), yields a U.S. historic welfare-warfare tradeoff of only .056. Unless there is some major qualitative change in the historic determinants of welfare, one should expect 6 cents, on the average, to be shifted over to welfare for every dollar saved from military expenditures.

Interpreting the Demand Variables of Model 4

As in the international model the proportion of persons age sixty-five and older proves to be a significant determinant of the welfare effort. An increase of 1 percentage point in the proportion aged leads to an increase of 1.3 percentage points in the welfare effort. Changes in the proportion aged affect welfare similarly in both the international model and the U.S. historic model.

TABLE IV
Estimates of the Historic Determinants of United States Welfare Effort

<u>Variable</u>	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
Constant	-.29627+ (.05894)	-.25382+ (.05048)	-.25670+ (.02402)	-.25985+ (.01640)
GNP	-.00788 (.00742)	-.00064 (.00630)		
MIL	-.15901* (.06562)	-.14753+ (.05357)	-.08700+ (.01757)	-.08992+ (.01646)
MIL ²	.21395 (.15254)	.14314 (.12183)		
AGED	1.48851+ (.52085)	1.29001+ (.43886)	1.12929+ (.39345)	1.29851+ (.32502)
UN	.00104* (.00049)	.00073 (.00041)	.00128* (.00048)	.00085* (.00038)
THF	2.63009+ (.58864)	2.15382+ (.53099)	2.24383 (.39121)	2.13916+ (.31501)
D _F	.25867+ (.05512)	.21618+ (.04954)	.22354+ (.03462)	.21661+ (.02737)
Durbin-Watson d Statistic	1.169	1.479	1.062	1.551
R ²	.944	.965	.939	.966

(Figures in parentheses are the standard errors of the estimates)
* Significant at $\alpha = .05$
+ Significant at $\alpha = .01$

Changes in unemployment rates are approximately as significant in their effect as are changes in the military effort. An increase in unemployment by 1 percentage point increases the welfare effort again by 9/100ths of a percentage point. The model we are estimating is extremely simple and does not really allow us to study the full nexus of interrelationships between the explainants of welfare effort. However, as our society is presently constructed, unemployment is probably negatively related to military spending; demilitarization probably increases unemployment. Consequently, welfare should doubly rise from demilitarization--first because of the direct effect of demilitarization, and second, because of the indirect effect of unemployment. While no one wants to increase welfare expenditures through actions that lead to unemployment, demilitarization, in this piecemeal world we live in, probably would cause this result.

The proportion of primary families which are female-headed proves to be the determinant of greatest magnitude in the historic model. A 1 percentage point increase in the proportion female-headed primary families leads to a 2.1 percentage points increase in the welfare effort. While contemplating the better types of social restructuring to come, let us hopefully look forward to a diminishing importance to this estimate. Over the past two decades this variable has been strongly associated with increases in welfare effort. But, if economic discrimination against women diminishes, and if the birth rate remains low, the proportion female-headed families could continue to rise without evoking such an increased demand on the welfare system.

Discovering Welfare Priorities

Though we have been somewhat speculative in interpreting our results, provided there are no major changes in social functioning, the overall conclusion must be that little is likely to be gained for welfare by pointing a finger at the military. Let us be more self-reflective.

Our third calculation probes the future with the purpose of determining priorities within the welfare industry itself. First we make predictions of the welfare effort, for five year intervals, to the year 2001, ignoring the possibility of major social change, complete economic depression, and total nuclear war. Then we compare the size of each variable's increment to the welfare effort and order these increments as to their implied priorities.

Predictions

To predict welfare effort we need projections for the independent variables in the model. In the case of the proportion aged and proportion of female-headed families, we were able to use Census Bureau projections. For female-headed families projections, the Bureau has provided high and low estimates. But for the remainder of the determinants, we were limited only by reason and imagination.

Military effort projections were problematic and highly speculative. Under

what conditions will military expenses as a proportion of GNP increase, remain the same, or decrease? If the military establishment continues to be a strong demander of the national resources we might expect the level to remain at least the same, or increase incrementally. If a "backlash" against military expenditures is combined with increasing demand strength in other sectors, we might expect military effort to remain the same or decrease to some level of minimum maintenance. Russett¹³ showed that the level of proportional military expenditures after major wars has seldom fallen to its pre-war level, so that, omitting war years as special cases, expenditures have tended to increase over the years, perhaps as a result of incremental budgeting or increasing international tensions or both.

To explore the historical relationship between GNP and military effort we regressed military effort on GNP for the period 1947-73 (to omit the extraordinary expenses of the World War II years). The coefficient on GNP was not statistically different from zero. The Durbin-Watson statistic indicated severe positive correlation between first difference errors, which was not significantly diminished by regressions on first differences in the variable observations.

$$M_t = .0936 - .00284 \text{ GNP}_t \quad ; R^2 = .006; \text{ Durbin-Watson} = .42; \text{ (standard errors)}$$

Given these results we chose to specify military effort as a constant proportion of GNP. The average U.S. military effort over the period 1947-1973 was 8.44 percent.

Unemployment has been portrayed at two constant rates; 8 percent, indicating market failure, and 4 percent, indicating market success.

Table VI lists the independent determinants of welfare effort to the year 2001.

We have included four projections here, but the reader can predict any situation he or she might find plausible. Examination of Table VII, which presents the projections, indicates that most of the differences in projections are caused by the differences in the projected proportions of female-headed families. A comparison of estimate 1 with estimate 3, or of estimate 2 with estimate 4, shows that the 4 percent unemployment differential accounts for only a miniscule increment in welfare effort. The high unemployment and the high projected proportion of female-headed families predictably produces the highest level of welfare effort. A high unemployment scenario would probably be associated with a slow labor market advance for women. This possibility lends credence to model 4's female-headed families coefficient estimate and, by implication, to the projected welfare effort percentages. A low unemployment scenario would probably be associated with more rapid labor market advances for women, a diminishing female-headed families coefficient, and projected welfare effort percentages that are smaller than those based on model 4's proportion female-headed families coefficient.

TABLE VI
Projections of Determinants

<u>Supply Variable</u>		<u>Demand Variables</u>					
<u>Year</u>	<u>Military effort projected at constant rate</u>	<u>Year</u>	<u>Proportion of Population 65</u>	<u>Unemployment Low</u>	<u>High</u>	<u>Proportion female-headed families</u>	
				<u>%</u>		<u>Low</u>	<u>High</u>
1976	.0844	1975	.10461	4	8	.10775	.10926
1981	.0844	1980	.11008	4	8	.10690	.10978
1986	.0844	1985	.11389	4	8	.10519	.10975
1991	.0844	1990	.11806	4	8	.10305	.10980
1996	.0844	1995	.11909	4	8	.10069*	.10977*
2001	.0844	2000	.11657	4	8	.09824*	.10982*

*Projections based on previous proportions. U.S. Census projections available only through 1990.

TABLE VII
Prediction of Future U.S. Welfare Efforts

<u>Year</u>	<u>Estimate 1</u>	<u>Estimate 2</u>	<u>Estimate 3</u>	<u>Estimate 4</u>
	<u>Unemployment-8% Female-Headed Families/High</u>	<u>Same as 1, but Female-Headed Families/Low</u>	<u>Unemployment-4% Female-Headed Families/High</u>	<u>Same as 3, but Female-Headed Families/Low</u>
1976	.1072	.1040	.1038	.1006
1981	.1154	.1193	.1120	.1059
1986	.1203	.1105	.1169	.1072
1991	.1258	.1114	.1224	.1180
1996	.1271	.1076	.1237	.1043
2001	.1239	.0992	.1205	.0958

While the projected level of welfare effort does not appear to vary much, the range in predicted welfare effort is between $-.005$ and $+.017$. Note that a change from $.10$ to $.11$, when considered in absolute dollars, is not an inconsiderable sum; given a present welfare expenditure of approximately \$140 billion annually, a $.01$ difference refers to an additional \$1.4 billion to be allocated to welfare needs.

Induced Increments to Welfare Effort

The U.S. historic model, as a predictive tool, can suggest the future influences its variables might have on the size of welfare efforts. It is easy and obvious to say that the proportion of aged persons is growing, therefore we should allocate more resources to this group. Without an empirical base, however, we can only guess the relative importance of competing welfare effort demands. What inferences can be drawn from the model to guide resource allocation within the welfare industry?

An interesting example of relative priority determination arises out of the comparison between the female-headed family induced effort and the proportion aged induced effort. Taking the average 1976 female-headed family projection, $.10850$, and subtracting this figure from the year 2000 projected female-headed family proportions, for each series, results in a proportion female-headed family change of either $-.01026$ or $+.00132$. Multiplying these changes by the estimate of the marginal change in welfare effort induced by a unit change in proportion female-headed families predicts either a decrease of $-.02$ or an increase of $.002$ in welfare expenditures as a proportion of GNP. The same procedure applied to the projected increase of the proportion aged population over the next twenty-five years results in a predicted increase in welfare effort of $.013$. Thus, by the year 2000, we estimate that the aged population will induce an additional 1.5 billion dollars of expenditures over that induced by AFDC and related considerations.

Further extension into the future emphasizes the importance of the aging population as a welfare concern. Census Bureau quinquennial projections through the year 2050 reach a maximum proportion of persons aged 65 and older to total population of $.17$ in the year 2030.¹⁴ According to our model an increase of $.069$ in welfare effort is predicted for the period from 2000 to 2030. This roughly implies an additional 10 billion dollar growth in the welfare industry.

Our models are simple, all other variables are assumed to be held constant, and our results must be considered crude. However, they have clear implications for social work policy. Until better estimates become available it seems likely that we should place added emphasis in the curriculum and in the field on those programs and services directed toward the aging and in developing research in the area of care or maintenance services for this target group.¹⁵

Conclusion

In the body of this paper we have offered answers to three questions. First, is the United States truly a welfare state laggard? In terms of percentage of GNP expended on public welfare programs and compared to other rich countries it seems so. However, we found that the United States actually spent more on welfare state programs than would be predicted for a country with its description, at least for 1966.

We went on to estimate the historic U.S. welfare-warfare tradeoff by specifying and estimating time-series determinants of this effort. The chosen variables seem to explain much of the variance in welfare effort produced in the United States. The coefficient estimates indicate that if relatively small changes are made in the determinants of social choice, six cents would go into welfare state spending for every dollar saved from military spending. Finally, we used the historic model to predict the expected welfare state effort over the next twenty-five years. Our results suggest that among the areas considered, services for the aging population have the highest future priority.

As Ulysses sailed past the island of the Sirens, bound hand and foot as he was to the mast of his ship, truly he must have heard a tempting sweet song, for the Sirens promised him foreknowledge of all future happenings on earth. Figuratively, we too have offered such a song. But, rather than lure the reader off course, by reason and calculation we have pointed him/her in the same direction Ulysses was headed--home. The task before social work and social welfare lies at home. It lies in making our welfare institutions into the very best they can be.

Appendix: Data Sources

Welfare Effort: To obtain data for the maximum number of years data on welfare programs were taken from the Historical Statistics of the United States and various years of Statistical Abstracts.^{16,17} Although the data are not strictly comparable, most of the discrepancy seems to fall into education, which along with public housing, we are omitting from the welfare effort measure. Public expenditures for social insurance, public aid, health and medical programs, veterans programs, and other social welfare were totalled and divided by Gross National Product.

Military Effort: Federal Government expenditures for national defense functions (Statistical Abstracts, 1962 and 1974), have been divided by Gross National Product to provide a measure of military effort. Veterans benefits and services are not included in this measure.

GNP: Gross National Product data have been divided by population and converted to 1966 dollars to indicate GNP per capita in constant dollars.¹⁸ These figures are not comparable to the international model data as in that case GNP was computed at factor cost.

Aged: The aged variable represents the proportion of the population age 65 and older and was obtained from the Economic Report of the President, 1974, and Historical Abstracts of the United States, 1960. The projection of proportion aged is based on Census Bureau data.¹⁹

UR: The annual unemployment rate, an average of the monthly rates, was obtained from the Economic Report of the President, 1974 and Historical Abstracts of the United States, 1960. There have been some changes made in the definition of unemployment, but it is beyond the scope of this paper to attempt to derive more accurate figures. While some sets of years may not be strictly comparable, we feel that the rates are adequate approximations for our purposes.

FHF: The proportion of primary families headed by females was obtained from Current Population Reports and Statistical Abstracts, 1955, 1962.²⁰ This series is entered only for the years 1950-73. The information on both primary families and female-headed families was first collected in 1947 and we felt the most accuracy could be obtained in using 1950 and later census data. The projections of female-headed families are from Census Bureau data.²¹

Notes

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12. According to the Gauss-Markov theorem, $E(\epsilon)=0$ and $V(\epsilon)=\sigma^2$. Under conditions of autocorrelation, or serial correlation, $V(\epsilon)=\sigma^2\Omega$; this produces a non-minimum variance in the regression estimates. The generalized linear regression model estimates the BLUE estimates. For an explanation of this technique, see A.S. Goldberger, Econometric Theory (New York: John Wiley and Sons, Inc., 1964), pp. 231-48.
13. Russett, op.cit.
14. United States, Bureau of the Census, "Population Estimates and Projections," Current Population Reports, Series P-25, Number 601 (Washington, D.C.: Government Printing Office, October, 1975).
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