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XI

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Patterns in Public Expenditure in the United States and Western Europe

1920 - 1975

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1. Overview

To discuss the cost of defense in the Twentiety-century West is inevitably to raise issues of the costs of welfare efforts foregone as well as those actually involved in procuring men and material. The causes lie both in economic reality and intellectual tradition. Allocation of constrained national resources necessarily involves hard choices and difficult "opportunity cost" calculations, particularly for advanced democracies. Classical economic theorists as well as Socialist practitioners have taught us well that such choices reflect our value preferences and indeed, are "hostages" against future choices. Asserting that a state needs both guns and butter, is in nations committed to the redistributive goals of the modern walfare state, to win few political points. And the next question, of necessity, is "how much of each?"

Our aim in this paper is to suggest the need for re-examining this familiar question. Our research suggests that emphasis on the choices between guns and butter, even at the margin, is a misreading of Western public expenditure patterns, particularly since at least 1920. The manifold increase in social welfare spending have been almost totally financed from growth--increases in national GNP and the new state revenues this growth produced. The real level of defense expenditure has also greatly increased; only defense's relative share of GNP, and of central government expenditure has declined. The causes, seemingly, can be found not in any conscious balancing of policy

tradeoffs but rather in the "ratchet effects" associated with particular redistributive policies and merchanisms. In periods of economic decline (relatively few) as in times of economic bounty (most), states are now committed to the direct provision of extended services (e.g., as in education) and, more significantly, to substantial "automatic" transfer payments to individuals (e.g., social insurance, family allowances). Western political man, elite and mass, has come to expect these services and payments, and indeed a fair rate of economic growth as the "normal" or "usual" pattern.

Our findings lead to a more basic question at which we can only hit here: What will be the impact on these patterns of one or more decades of significantly lower economic growth? The wealth and revenue of the West, its stocks of both butter and guns, will still far exceed those of most nations. Yet new sources of significant economic growth seem few, and constrained either by political immobilism or environmental limits. There may well be critical thresholds, perceived "national minima", below which further decreases mean fundamental shifts in expectations and efficiencies, in allegiences and allocations. What then will be the effects of the political, social, and economic constraints which affluence and the recent absence of war has allowed us to ignore?

At this stage in our basic research on the determinants of Western military spending, we cannot hope to arrive at a definitive answer or clear forecasts. Both the hypotheses we can test and the data base we have created will need considerable refinement and more systematic restatement before any exhaustive analysis can be complete. Our strategy here, therefore, is to attempt three tasks:

1. A description of certain national trends in spending for defense and welfare since the 1920's.
2. A preliminary estimation of a relatively complex model of the determinants of public social expenditure.
3. A delineation of the next steps which our present research seems to suggest.

For this preliminary analysis, we are restricting our focus to tradesoff within government expenditures in just four countries--the United States, Britain, France, and Germany-during various years between 1920 and 1975. These choices introduce some complicating factors. These are among the richest, most developed states with defense traditions and social welfare systems of greatest longevity--all characteristics which may well obscure the tradesoff we are seeking to investigate (Wilensky 1975). Nonetheless, they also allow examination in depth over both a long pre-war and a long post-war span. And their alliance status and level of military spending as well as their general pattern of economic growth should permit more meaningful crossnational comparisions. Investigation of the patterns of other allies (notably Japan) or of other emerging second-tier states must await further analysis.

II. Tradesoff and Theories

But before presenting the results of our analysis, we should consider the theoretical context: the basic propositions advanced by the two distinct and relatively contradictory schools of recent guns-versus-butter research. The first is what we will call here the "classical" school, the numberous researchers who have found or have assumed a direct exclusionary relationship between defense and social expenditures throughout the West. More money for defense

means less for welfare, health, education, employment assistance, or the total basket of national "butter" goods and serices, governmental. Many would add that this is true now but also for the future, given the failure of defense spending to produce new productive capacity for long-run growth and social benefit (Melman, 1973).

Perhaps the best-known recent statement of this view is that of Bruce Russett in What Price Vigilance? (1970). Russett finds clear cut evidence of gun-versus-butter choices in US spending patterns. From 1938 to 1969, every dollar increase for defense meant typically a subtraction of "42 cents from personal consumption, 29 cents from fixed capital formation, 10 cents from exports, 5 cents from federal civilian programs and 13 cents from state and local governments' activities" (Russett, 1970. 141). Russett discerned fewer traces of tradesoff in the macroeconomic patterns of Britain, France, and Canada, in part the result of their post-war decline in military effort. But he also speculated that stronger executives and more disciplined legislative majorities meant more coherent, more "objective" choices and warned Americans.

> It may well be as easy to vary the level of military spending as to change drastically the distribution of tradsoff. If so, careful evaluation of military demands is all the more essential. (Russett, 1970: 177).

Critics (and Russett himself) have since questioned the scope of these conclusions. Controlling for wartime economic patterns of the idiosyncratic nature of some American expenditure pratices leads in a number of instances to far less compelling evidence of tradesoff (Hollenhorst and Ault, 1971). Other analysts also attach far greater

importance to the effects of incremental decision making or the workings of bureaucratic politics (Wildavsky 1965, Crecine and Fisher 1971). Still others have found significant tradsoff only for certain hardware and research components of military spending (Weidenbaum, 1963) or under specified "environmental" conditions--as decreases in external hostility, an earlier relaxation of alliance guidelines, or election of a Leftist coalition (Benoit, 1973).

Yet all would support three basic theoretical propositions:

1. Changes in defense spending are directly associated both in time and in scope with other "compensating" changes in the non-military elements of GNP. These will be at least analogous in all developed market economics.
2. Distribution of the burden of defense is most easily done within governmental civilian spending or those private economic sectors (e.g., consumption, saving and investment) most accessible to governmental regulation.
3. On the whole, the pattern of past defense-welfare tradesoff will be a large factor in present and future choices (and will probably lead to more defense and less welfare than the west needs).

The work of a second school, called here the "pragmatists," supports quite contradictory propositions. Probably the most discussed as well as the most rigorous statement of this view was Frederick Pryor's Public Expenditure in Communist and Capitalist Nations (1968). Pryor employed both cross-sectional and time-series analyses across twelve European countries, the United States and Canada and found few significant or stable patterns of substitu-

tion between expenditures for guns and butter within or across states. Those that he did find were all in countries with relatively high defense/GNP ratios and these disappeared once governmental transfer payments were included. Pryor also determined that there were few consistent patterns over time and that the impacts of the particular national system, whatever its ideological orientation, cannot be ignored. Tradesoff or substitution effects, if they do exist in any but the most general sense, were neither as direct nor as simple nor as simultaneous as classical analysts had maintained. At most, Pryor concluded, one could test the interesting questions until better data and analytic techniques could be used.

Most of those who have followed Pryor have tried to take up the challenge. A number of researchers have tried to do similar analyses for the Third World, often with somewhat more significant cross-national tradeoff patterns (Benoit, 1973; Dabelko and McCormick, 1974; Abolfathi and Park, 1975). The findings are often tentative and social welfare expenditure, and the greater developmental significance of military expenditures in the countries. Of perhaps greater interest has been research into the effects of particular types of political regime (e.g., Hayes, 1975; Ames and Goff, 1975) or of political timing and electoral cycles (Nincic and Cusack, 1978). Still others attempted to explain varying rates of Western defense and social expenditures in terms of a general model of public policy (e.g., Heclo, 1972: Peters and Hennessey, 1975).

Sketched in broadest terms, this "pragmatic" school, therefore, would support the following propositions:

1. Defense-welfare tradesoff may exist but they are definable

only in general terms and conditioned by numerous other political, social, and economic factors which cannot always be traced analytically.

2. The factors which seem to show the most consistent effects are a) character of political regime; b) level of economic and social developement.

3. There is little analytic basis for determining the relationship of short-term and long-term substitution effects or for determining the existence of "critical minimums" for defense of welfare.

III. Guns and versus Butter: Trends

Our first task in sorting out these competing propositions was the simple description of the trends in defense and welfare expenditures from 1920 until 1975. Our data base was (1) the collection of European and American public expenditure files prepared by the senior author under a grant from the Center for Western European Studies at the University of Michigan (2) special data files created by all the authors in preparation for this paper. The data was organized by country, with equivalent "welfare" variables selected from those available in standard national statistical sources. A common base year was selected for each nation and the appropriate data transformations were performed to achieve constant-unit expenditure figures for each category.

When difficulties with a national series proved instrusive, two types of solutions were used. First, the national data profiles were simply split at the critical point and arrayed separately. Thus, Britain has two series 1920-1947 and 1948-1976 as does France, 1920-1939 and 1946-1973. Second, the best available indicator or

deflator was used even if we suspected a better one existed. For example, we knowingly overstated some British expenditures in later periods simply because the deflator available largely reflected the pricing of total civilian rather than separate governmental purchases.

The results of our search for significant trends in this data are displayed graphically in Figures I-VI. The similarities among the national patterns are striking, despite the different absolute levels and the different time series which had to be employed. The trends over time are clearly upward but largely proof of the incremental; with few major up- or downswings except perhaps in France. Defense expenditures, not surprisingly, fluctuate most in time of war, general or limited, but seem largely to fluctuate around a relatively stable trend line. Simple inspection, moreover, does not allow dramatic inferences about continual tradesoff in any state and suggests instead a push-pull phenomenon, most often during and immediately after war involvement.

Figure I demonstrates some of the particularistic aspects of American expenditure patterns. Defense changes show the oft-cited "boom or bust" quality even during the coldest of the Cold War periods. The peaks in the defense trend line all correspond to periods of intense mobilization for combat -- for World War II, for Korea, and for Vietnam, however hidden. A "peace dividend" does lead to positive social security changes thereafter, but increases are hardly proportionate to the previous shift toward defense. Moreover, the flat trend in changes in social welfare funding makes any discussion of tradesoff quite academic until at least the early 1970's.

The trend lines for the period 1970-1975 raise a question central

TABLE I -- CONTENTS OF "BUTTER BASKET"

U.S. 1929-1976	Federal expenditure (capital and current)for education, health, housing, public aid, and social insurance.
U.K. 1920-1947	Local government current expenditure for education, central government current expenditure for old age pensions, contributory pensions, unemployemnt insurance and labour exchanges, national health and health ministry, and unemployment payments other than insurance.
U.K. 1948-1976	Combined public authorities expenditure (capital and current) for education, national health service, and social security benefits.
F.R.G. 1950-1969	Combined public authorities expenditure (capital and current) for education, social security, health, and community services.
FRANCE 1920-1939 1946-1973	Central government expenditure (capital and current) for education and direct social assistance (excluding social security expenditures).

to all our analysis: what determines the existence of a guns-butter or indeed any tradeoff among policy alternatives? Figure I suggests a simple test: the simultaneous occurrence of a roughly-equivalent increase in one category and decrease in another, all external factors and aspects of observation and measurement being held constant over time. Clearly, however, this involves a degree of clarity and precision which most public expenditure analysis can approach only in the best of circumstances. Moreover, in this particular case, we would be forced under this standard to recast our findings because of the Nixonian manipulation of social security assets within the national budget. The trace of parallel movement of similar magnitude above and below the zero axis would still remain of considerable interest and probable significance.

The British pre-1948 patterns suggest a few limited periods of marginal tradeoff -- as in the dip in social service spending changes at the beginning of the "phony war." (Figure II) The outstanding feature of this Figure, however, is the flat curve of defense changes except in time of war -- dramatic evidence of the British tradition of mobilization and procurement once war begins or is, at least, virtually certain within months.

The period after 1948 presents a far more mixed picture. The culmulative changes in social expenditure obviously far exceed those in defense spending which remain remarkably stable and suprisingly incremental throughout the retreat from empire. Indeed, those peaks which do occur seem simultaneous -- suggesting that perhaps new resources or spending authority allowed for increases in both guns and butter.

The trends in Germany (Figure III) encompass a much shorter time period, essentially the first two decades of the West German state. Inspection suggests two tradeoff periods with quite similar effects: the clear fovoring of increases in welfare (already at relatively high absolute levels) over those for defense first in the early 1950's and then, during the great welfare surge of the mid-1960's. But elsewhere, the trend lines exhibit notable parallelism and "matched" degrees of change.

The trends for expenditure changes in France are somewhat more questionable, given the data difficulties involved in constructing a credible welfare indicator from published sources. Both French series probably significantly underestimate the French "butter basket" since they involve only traditional family, health, and social assistance, and education expenditure. Left out are social security assets and expenditure -- funded through separate semi-autonomous caisses, subject to governmental decisions and regulations. Again, changes in defense show the clear effect of war involvement (colonial and European) and the war-avoidance efforts of the 1930's.

In postwar France, changes in both guns and butter exhibit secular upward trends--as indeed is true generally throughout Europe and North America. Contrary to the usual analysis of Gaullist impact, changes in social funding begin to exceed those for defense as early as 1962 and never again fall below. The withdrawal from Algeria is one obvious contemporary event but not an explanation which accounts for all of the Giscard's new broom and the impact of French changes in military pay and procurement patterns.

These Figures, however, hardly support conclusions about broad or

continuing tradesoff between guns and butter. We turn, next, to the construction of a more complex model through which we can determine the relative impact of the determinants of "butter" expenditures.

IV. Specification of Our Model

A. The Variables

Clearly, several additional factors need to be included in any model of the determinants of expenditure patterns. These are variables that have either been suggested as important in the literature reviewed in Par II or appear to us to be likely sources of explanatory power. First, it is important to control for the size or wealth of any economy which supports the expenditures. For these analyses, gross national product in constant prices is included in the model. The statistical similarity between GNP and GNP per capita is so great enough as to render them virtually substitutable. Though not considered here, national wealth may have different effects when controlled for by the number of households.

The larger the amount of money spent by government, the greater should be the positive effect on changes in expenditures for "butter." The simple explanation is that in peacetime, there will be more equitable and probably incremental distribution of available national resources among all expenditure categories. Presumably, too, expenditures as a larger percent of GNP would indicate greater governmental intervention and control in a polity and presumably in democratic states, a greater need to satisfy citizen demands, including those for social services.

The amount of national wealth acquired as government revenue

should also be important. While one would imagine that government revenue as a percent of GNP would not be much different than total expenditure as a percent of GNP, for some of the nations at some points in time, there is a substantial gap--positive or negative gap. Politicians have, after all, often decided to invest in spending programs, that do not reflect constraints imposed by available revenue (deficit financing) as well as to reserve funds against future contingencies (the Coolidge principle). While a variable of budget balance, surplus or deficit, is clearly an effect and not a cause of expenditure decisions, the amount of resources available to governments should influence changes in spending. In particular, it is difficult to imagine drastic tradesoff in spending for guns and butter to occur in periods of ample government revenue.

The trends in these three variables for each nation and period are displayed in figures VII-XII. Briefly, they show steady economic expansion in post-war years, with the U.S. economy displaying more volatility--upward and downward swings. The inter-war period shows predictably erratic trends in GNP. In the period just before and during the Second World War, both revenue and expenditure varied considerably as a percent of GNP in response to economic dislocations which reduced revenue, expansive spending policies designed to spur growth, and the emergency defense preparations before and during the war. After the Second World War, revenue and expenditure levels were remarkably steady, varying only a few percentage points. Note that U.K. expenditures are systematically low due to the expenditures. West Germany shows remarkable balance and stability in revenue and expenditure patterns.

On the basis of the literature search and our own related re-

search we also decided to include three additional variables.

Unemployment compensation is clearly a large item in our "butter basket." Therefore, we chose to include the percent of the labor force that is unemployed in the model, as it should predict positively to change in expenditure for "butter."

Involvement in war obviously should produce such great economic dislocations that they severely constrain "butter" allocations. These indeed should be the "pure case" conditions under which trades-off, as we have definded these here, are most likely to occur. On the other hand, it may be that war efforts also demand greater social services to compensate for disruption of a society and to insure continued political allegiance. These two tendencies may balance each other to some extent, depending on the size of war effort. Such an effort would be indicated by greater government expenditure which is already included in the model. In the analysis here, U.S. involvement in World War II, Korea, and Vietnam are controlled. For the U.K. only World War II seems justified and for France, the Riffian and Druze Wars (1925-1927), Indochina and Algeria (1946-1961) are included as dummy variables for war involvement.

Finally and most difficult to operationalize and measure, are factors of prevailing political control and ideology. Presumably, labor-based or socialist parties, when in power increase spending for "butter" and may reduce the budget for guns. We therefore decided to control for the absence of such political orientation in the U.S., two "dummy" variables are included for the presence of a Republican president and a Republican Congress. For the U.K., a variable recording the presence of a conservative prime minister is

included. For West Germany, given the limitations of our data, only 1969 can be coded as a year of socialist party rule. France once again proved a coding problem. In addition therefore, to leftist party rule in 1924-1926. 1936-1937 and 1946-1947, a variable was included to investigate the impact of DeGaulle on budgeting for social services.

B. The Model

In our first-cut, we decided to follow the simplest analytic line. As the discussion fo factors relevant to the allocation of public resources to social services literature and our own efforts suggested, we decided to posit the independent additive effects. In other words, of all the variables we found relevant, (if theoretical arguments hold in empirical tests) these seven variables should prove when assessed against one another, to be significant influences on changes in expenditure for social services. Accordingly, a model in the form of:

$$\gamma = \alpha + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k + e$$

Where y denotes the outcome variable of interest, changes in expenditure for social services, x_1 through x_k are the set of relevant explanatory variables, α represents a constant term indicating the amount of change in social service expenditure if all explanatory factors were zero, and β_1 through β_k are the regression coefficients reporting the amount and direction of change in expenditure for social services produced by a unit (dollar, percentage point, etc.) change in each respective explanatory variable. Further details of our model and estimating procedures can be found in the appendix.

V. Estimation Results

The results of our estimations for each of the six models are presented in the appendix while the more interesting and telling partial correlation coefficients for each explanatory variable are displayed here in Table II. In effect, these coefficients, ranging in value from-1.0 to 1.0, indicate the relative potency of each variable in accounting for changes in social services expenditure. Our division of these into "significant" and insignificant" effects identifies those factors whose explanatory impact is so small as to be statistically meaningless from those whose effects are large enough to assure confidence in their impact, given a ninety-five percent criterion of certainty of statistical significance. In a word, each coefficient reports the standardized magnitude effect of each explanatory variable, all others being held constant.

The comparative table contains few surprises but a number of interesting findings which on the whole support the "pragmatic" school's interpretations. First, all of the models except for France in the inter-war period, predict well, assessed in terms of their fairly high goodness of fit "R^2" coefficient. Second, except for the United States very few of the variables posited as being relevant really are. Confirming Pryor's finding that the U.S. case is politically and economically sui generis, all but three of the eight explanatory variables are significantly related to changes in expenditure for social services.

Gross national product is clearly the most prominent explanatory factor for all the post-war models. The British case is the weakest; for this period, GNP is listed as an insignifianct effect, though it

TABLE II. COMPARATIVE TABLE OF PARTIAL CORRELATION COEFFICIENTS

	UNITED STATES 1929-1976		UNITED KINGDOM 1920-1947		UNITED KINGDOM 1948-1976		FED. REP. GERMANY 1950-1969		FRANCE 1920-1939		FRANCE 1946-1973	
SIGNIFICANT EFFECTS	GNP	.78	Revenue as % of GNP	.55	Wilson PM	.54	GNP	.54			GNP	.57
	Change in Def. Exp.	-.46	Conservative Prime Min.	.45	Unemp. %	.44						
	Revenue as % of GNP	-.38										
	Republican President	.32										
	Unemp. %	.31										
INSIGNIFICANT EFFECTS	Republican Congress	-.24	World War II	-.34	GNP	.40	Revenue as % GNP	-.34	Left Gov't	.33	Change in Def. Exp.	.41
	War	.22	Change in Def. Exp.	.18	Expend. in % of GNP	.35	SPD Gov't	.28	Expend. as % of GNP	.23	Expend. as % of GNP	-.17
	Expend. as % of GNP	.19	Expend. as % of GNP	-.18	Conservative Prime Min.	.30	Expend. as % of GNP	.21	War	.19	Revenue as % of GNP	.11
			GNP	.15	Revenue as % of GNP	.29	Change in Def. Exp.	.08	Change in Def. Exp.	-.18	Unemp. %	-.09
			Unemp. %	.13	Change in Def. Exp.	.23	Unemp. %	.03	GNP	.14	War	.07
									Revenue as % of GNP	-.05	Left Gov't	.02
									Unemp. %	.03	DeGaulle	.01

is very close to the threshold of statistical significance. In a model excluding the control variable for the "Wilson years," indeed, GNP is the largest and most statistically significant variable. These were years of general economic instability and employment crisis as well as those emphasizing the "social contact" between the trade unions and Wilson's Labor government. As noted earlier, increases during this period become less pronounced if public expenditures are deflated separately from GNP.

In contrast to the patterns for France and West Germany, unemployment during this period does affect the amount of government resources allocated to social services in both the United Kingdom and the United States. On reflection, this does not seem surprising given comparatively higher rates of unemployment for these two economies at times during this period and the general post-war commitment of both states to provide a direct safety net for individual economic dislocation. It may also partially be an artifact of our data base given that the 1970's are years of higher unemployment and are excluded from the West German analysis and that the indicator of unemployment for France is peculiar.

Only the United States provides a direct trace of what many see as a "tradeoff." A significant <u>negative</u> relationship between changes in expenditures for defense and those for social services. How one interprets this finding has great implication for the research question posed here. Do U.S. politicians allocate federal resources such that increases in one type of expenditure must be paid for by decreases in others? It could be argued that this relationship is produced by the coincident post-WWII trend of rising expenditure for social services and, excluding the Korean and Vietnam wars,

declining or steady expenditures for defense.

A tradeoff seems more likely given the significance of two other factors in the U.S. model. A negative relationship for revenue as a percent of GNP and a positive one for unemployment with changes in expenditure for social services suggest that government welfare spending has been greatest during times of economic downturn. Higher rates of unemployment lead to both more individual payments and more public social services programs to compensate for worker dislocation. Furthermore, economic slowdown produces less revenue from incomes and profits as well as leading often to reduced taxation in order to generate increased economic growth. Under these conditions of limited government resources and large need, reduced defense expenditure to pay for social services seems a plausible solution. Incidentally, these economic downturns have occurred immediately after U.S. war involvement. The late-forties, fifties, and mid-seventies were all periods of reduced growth requiring increases in social service expenditure and as a result of war termination, reduced defense expenditure.

The surprisingly positive value on our variable controlling for a Republican president, indeed, taps a related phenomenon. Republican administrations have simply been in office during times of economic downturn in the fifties and seventies. Moreover, while other research indicates that Republicans tend to spend less for social services than Democrats (Nincic and Cusack 1978), Republicans have indeed controlled both the Congress and the White House only during three two-year terms (1929-1931, 1931-1933, 1953-1955) and enjoyed only one additional term of Congressional majority (1949-1951).

A similar discount must be made in interpreting the positive relationship in the United Kingdom between a Conservative government and an increase in social service spending from 1920 to 1947. For most of the depression, there was a Conservative parliamentary majority in a coalition with the Liberals. Moreover, as in the United States, economic downturn produced smaller revenues and greater official programs to offset individual economic hardship and social dislocation.

It is interesting to note that only in the United Kingdom does war involvement come close to a significant negative effect on social expenditures. The British mobilization strategy was clearly more extensive and more dependent on the capture of all available resources than that of the United States in World War II or at any other period. This remains true even though we have, in effect, controlled for the longer period of British war involvement and for the lower absolute level of GNP.

Clearly the least successful of our estimations is for French expenditures for social services in the inter-war period. The reason may in part lie in the data problems we noted in Section III in regard to the content of the French "butter basket." Again, the relatively rudimentary character of the French assistance system before 1945 should not be forgotten. It may also be that the variables we have chosen are simply too generally defined to deal with the critical influences in a period of extreme political and social instability. Whatever the reason, it seems at this point a somewhat fruitless exercise to attempt interpretation of these relatively unreliable coefficients.

VI. Future Directions

One of the more useful and interesting aspects of research at this preliminary stage is the contemplation of future tasks to improve and extend "first-cut" analyses. It serves as both a means by which to identify weaknesses in current findings and a stimulus to thought about the theoretical meaning of findings and the need to incorporate new factors. We hope, too, to garner questions and criticisms from those interested in this type of research, consumers as well as practitioners.

Our list of future concerns numbers seven. Most obvious is the need to develop a more satisfactory data base. In the best of all possible worlds, definitions and categories of public expenditure, revenue, national income, and unemployment would be constant across time and national boundaries. Hopefully, the more serious deviations from the ideal have been noted. Both the U.S. and West Germany revenue/expenditure data appear sound, if only because it is taken from a single source. Revisions in definitions and categories of expenditures for the UK required an unfortunate division of the time-series; data for the latter period also suffers from frequent revisions in the annual retrospectives. The French data suffers from a "butter basket" that is probably too small, and from the need to extend the French and West German series forward in time.

We are indeed encouraged by the promised availability of several major new data collections in the near term (particularly those of Flora, NBER, Taylor and Deutsch and Haage). As others before us have discovered, however, public expenditure data series can at best serve as indicators of trends or decision traces, not as absolutely verifi-

able values for discrete policy outcomes in all areas, public or private. Protracted debates about absolute expenditure levels or the efficacy of using numbers of doctors rather annual expenditures for hospitals stress a standard of analytic rigor which is probably inappropriate as well as unattainable with extended time series.

The model of public expenditure examined here needs revision and clarification. The single equation estimated here obviously involves a heroic simplification of the process which generates increases and decreases in public expenditure for social services. Needed is a system of equations which specify at least the interactions and joint determinants of the relevant variables. We must also ask which other variables should be used with such models, which should vary according to the policies being examined. It would thus be easier to disentangle causes from effects and both from coincidental trends. Such a model would, for example, permit a more detailed and firmer explanation of the negative relationship between changes in expenditures for defense and social services in the U.S.

Unquestionably, too, we must look more closely at welfare outcomes. Instead of the aggregated "butter basket" examined here, each of the component social service should be examined--health, education, traditional social assistance, unemployment aid, individual and group subsidies. Research reported elsewhere suggests that there may be tradesoff within butter. (Kelleher, Eichenberg, and Carr, 1976.) Trends in health versus education versus social insurance, for example, are somewhat different, but much further research is needed.

The sensitivity of expenditure for social services to demographic change need also be explored. Research by several of us suggests that

controlling for increases in general population or in critical age groups is useful for statistical purposes but with little significant effect on outcome trends. But more detailed analyses of changes in school age populations, the labor force, and the pensioner class would be relevant explanatory variables of specific social welfare programs.

Because the public expenditures come from different kinds of public revenues, the investigation of the effects of different types (e.g., income versus excise versus customs duties versus social security taxes) and sources (households versus corporations) may be related to the levels of different types of expenditure. Their inclusion in future analyses will therefore help account for "threshold" effects. The impact of, for example, increased income taxation to be used for public aid designed to redistribute income will have an effect of subsequent taxation and expenditure needs. In short, the question who pays for what gotten by whom is extremely relevant.

This particualr question is obviously laden with political implications that should also be examined in more detail. The mere inclusion of a handful of "dummy" variables, (which is all we have been able to do here) cannot illuminate the various effects of the political ideology of governments and administrations, and the array of mass and interest group support that maintains them in position of authority. The difficulty in conceptualizing, let alone measuring relevant aspects of political institutions and behavior accounts in part for their absence here and indeed in most other studies of the distribution of public expenditures.

One particularly important aspect of general political conditions is the distribution of institutional responsibilities between central,

regional, and local authorities. In these analyses, decisions as to whether to combine public authorities was based partly on the availability of data, which in turn is largely determined by the policy relevance of the various sub-central authorities. For several systems, these are key costs which are now underestimated.

Finally, it is easy to see that the present model performs only in the sense of accounting for statistical variance in past patterns. The truest test of the explanatory power of any model of public expenditure is its ability to forecast future trends. Not only will forecasting be useful for assessing the viability of the model, but also for gauging changes in trends and the relationships between variables.

APPENDIX: Notes on Sources and Methods

I. DATA SOURCES

A. United States

Data on expenditure for education, health, housing, public aid, and social insurance for the United States is taken from Ida C. Merriam and Alfred M. Skolnik, Social Welfare Expenditures under Public Programs in the United States, 1929-1966 (Washington: U.S. Department of Health, Education and Welfare, 1968). It is updated through fiscal year 1976 with the use of annual issues of Social Security Bulletin. These publications are also the source of data on GNP and the deflator used to turn current expenditures into constant ones. Unemployment, defense expenditures, total federal revenue and expenditures data are taken from the Statistical Abstract of the United States. Except for unemployment, all data is in fiscal years.

B. United Kingdom

Data on public expenditures and revenues for the United Kingdom is in fiscal years and for 1920-1947 is taken from Brian R. Mitchell and Phillis Deane, Abstract of British Historical Statistics (Cambridge: Cambridge University Press, 1971) and Mitchell and H.G. Jones, Second Abstract of British Historical Statistics (Cambridg: Cambridge University Press, 1971). Because most items included in the "Butter Basket" used here are not listed in the Second Abstract, it was necessary to use data taken from United Nations, Statistical Yearbook 1951 correct for the double counting of central government of funds to local authorities. These transfers have been subtracted from the sum of central government and local authorities total ex-

penditure and revenue. Combined public authority total expenditure is systematically understated vis-a-vis revenue given that it excludes both capital expenditures and debt payment.

Gross National Product and unemployment data for these years is taken from Mitchell, European Historical Statistics 1750-1965 (New York: Columbia University Press, 1975). The GNP deflator used there is also to deflate expenditures and revenues.

The series for the U.K. since 1948 is taken from the Central Statistical Offices Publications of National Income and Expenditure and is in calendar years. All data but unemployment assistance, which comes from European Historical Statistics, is from this source. The data series were made constant using the GNP that, at times, rising costs in the goods and services purchased by the government was greater than that of the economy as a whole. The procedure used here seems warranted given the absence of price indices for individual expenditure items over the entire period. In addition, our theoretical interest is in the allocation of resources within the economy, and not whether a government is getting a good value for its expenditure. As in the earlier period for the U.K., total expenditure is systematically low due to the exclusion of debt payments.

C. West Germany

Except for unemployment, all data for West Germany is from Statistisches Bundesampt, Bevolkerung und Wirtschaft 1872-1972 (Stuttgart: Kohlhammer, 1972). European Historical Statistics is the source of unemployment data. In 1960, FRG fiscal years switched to calendar years with a shortened nine-month year. This year is weighted (multiplied by 1.33) to compensate for its reduced length.

D. France

Data for inter-war France is taken from the Resume Retrospectif in Institut National de la Statisique, Annuaire Statistique 1951, Vol. 58, and is in fiscal years. Gross National Product and a wholesale price index used to create constant expenditure items is taken from European Historical Statistics. Because only the number of unemployed French workers is easily found. The number of umemployed workers is expressed as a percent of total population and not the size of the labor force. The French had two irregular fiscal years in this period and they are corrected in the manner described for West Germany above: 1929, a fifteen-month year (multiplied by .75), and 1932, a nine-month year (multiplied by 1.33).

Data for post-war French expenditures is taken from various volumes of the Annuaire Statistique, especially the comprehensive retrospective issued in 1966.

II. ESTIMATION OF THE MODEL

The model as specified in the body of the paper was estimated using standard econometric techniques. The results of estimations for each nation and period are displayed in the following six tables. The coefficients indicate the amount of change in the outcome variable produced by a unit change in each explanatory variable.

Thus for example, for the United States, a growth in GNP in constant 1976 dollars of one billion produces a 10.9 million dollar increase in expenditure for "butter." A decrease in revenue of one percent of GNP increases "butter" by 171.2 billion dollars. The remaining information in the table reports the reliability of each estimate and is summarized by the level of significance. A significance level of .05 or less is considered here to be statistically significant, representing a reliable measure of the impact of an

Generalized Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
United States: 1929-1976

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	-5053.1	1493.5	-3.4	.00
GNP	.0109	.0014	7.6	.00
Cnange in Def. Exp.	-.0174	.0054	-3.2	.00
Revenue as % of GNP	-171.2	67.8	-2.5	.02
Unemployment %	169.7	85.0	2.0	.05
Republican President	1120.9	542.0	2.1	.05
Republican Congress	-905.2	589.0	-1.5	.13
War	772.5	556.1	1.4	.17
Expend. as % of GNP	26.9	22.9	1.2	.25

R^2 = .73 Durbin-Watson d = 2.03

Ordinary Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
United Kingdom: 1920-1947

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	-371.1	128.2	-2.9	.01
Revenue as % of GNP	13.7	4.7	2.9	.01
Conservative PM	40.1	18.3	2.2	.04
World War II	-61.9	38.6	-1.6	.13
Change in Def. Exp.	.007	.009	.8	.43
Expend as % of GNP	-1.7	2.1	.8	.43
GNP	.003	.004	.7	.51
Unemployment %	1.1	2.0	.6	.57

R^2 = .83 Durbin-Watson d = 1.88

Generalized Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
United Kingdom: 1948-1976

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	544.9	697.3	.6	.52
Wilson PM	1937.8	673.4	2.9	.01
Unemployment %	198.8	91.3	2.2	.04
GNP	.015	.008	1.9	.06
Expend. as % of GNP	-45.3	26.7	-1.7	.10
Conservative PM	135.9	98.4	1.4	.18
Revenue as % of GNP	15.3	11.2	1.4	.19
Change in Def. Exp.	.272	.263	1.0	.31

R^2 = .73 Durbin-Watson d = 2.37

Ordinary Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
Fed. Rep. of Germany: 1950-1969

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	12483.	13978.	.9	.39
GNP	.009	.004	2.2	.05
Revenue as % of GNP	-75355.	61125.	-1.2	.24
SPD Gov't	1872.	1868.	1.0	.33
Expend. as % of GNP	38073.	50142.	.8	.46
Change in Def. Exp.	.067	.241	.3	.79
Unemployment %	19.8	199.	.1	.92

R^2 = .72 Durbin-Watson d = 1.79

Ordinary Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
France: 1920-1939

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	-21.8	22.9	-.9	.36
Left Gov't	6.9	5.8	1.2	.26
Expend. as % of GNP	1.3	1.6	.8	.45
War	4.5	7.1	.6	.53
Change in Def. Exp.	-.062	.101	-.6	.55
GNP	.003	.006	.5	.64
Revenue as % of GNP	-.357	2.378	.2	.88
Unemployment %	.576	5.589	.1	.92

R^2 = .38 Durbin-Watson d = 1.32

Ordinary Least Squares Estimation of
Determinants of Change in Expenditure for "Butter"
France: 1946-1973

Variable	Coefficient	Standard Error	T Statistic	Significance Level
Constant	-349.7	1789.4	-.2	.84
GNP	.005	.002	2.9	.01
Change in Def. Exp.	.333	.175	1.9	.07
Expend. as % of GNP	-52.9	73.0	-.7	.48
Revenue as % of GNP	65.8	168.5	.5	.64
Unemployment %	-621.2	1651.8	-.4	.71
War	124.7	390.4	.3	.75
Left Gov't	42.4	600.5	.1	.94
DeGaulle President	7.9	300.8	.0	.98

R^2 = .94 Durbin-Watson d = 1.76

explanatory variable.

The models were estimated using ordinary least squares procedures. Two models, U.S. and U.K. since 1947, contained heteroskedastic disturbances which made for unreliable estimates. To correct this, generalized least squares estimation was used following Glejser's procedure (Johnson, p. 220). This led to correcting the U.S. model by weighting with the variances of GNP and changes in defense spending and the U.K. model with GNP and the "dummy" variable for the Wilson years.

There is no difficulty posed by autocorrelation of the residuals as measured by the Durbin-Watson statistic. Almost surprisingly, multicollinearity among the explanatory variables is also not troublesome. This is partly due to the strong performance of the models, which reduces the effect of inter-correlated explanatory variables, but also to the poor performance of any variable seriously collinear with another.

III. FURTHER INFORMATION

Further details about the model or analytic procedures can be obtained from anyone of the authors. The data set will, when finished, be available to any interested scholar through the Inter-university Consortium for Political and Social Research.

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Figure I

CHANGE IN U.S. FEDERAL EXPENDITURE FOR SOCIAL SERVICES AND DEFENSE: 1929-1976

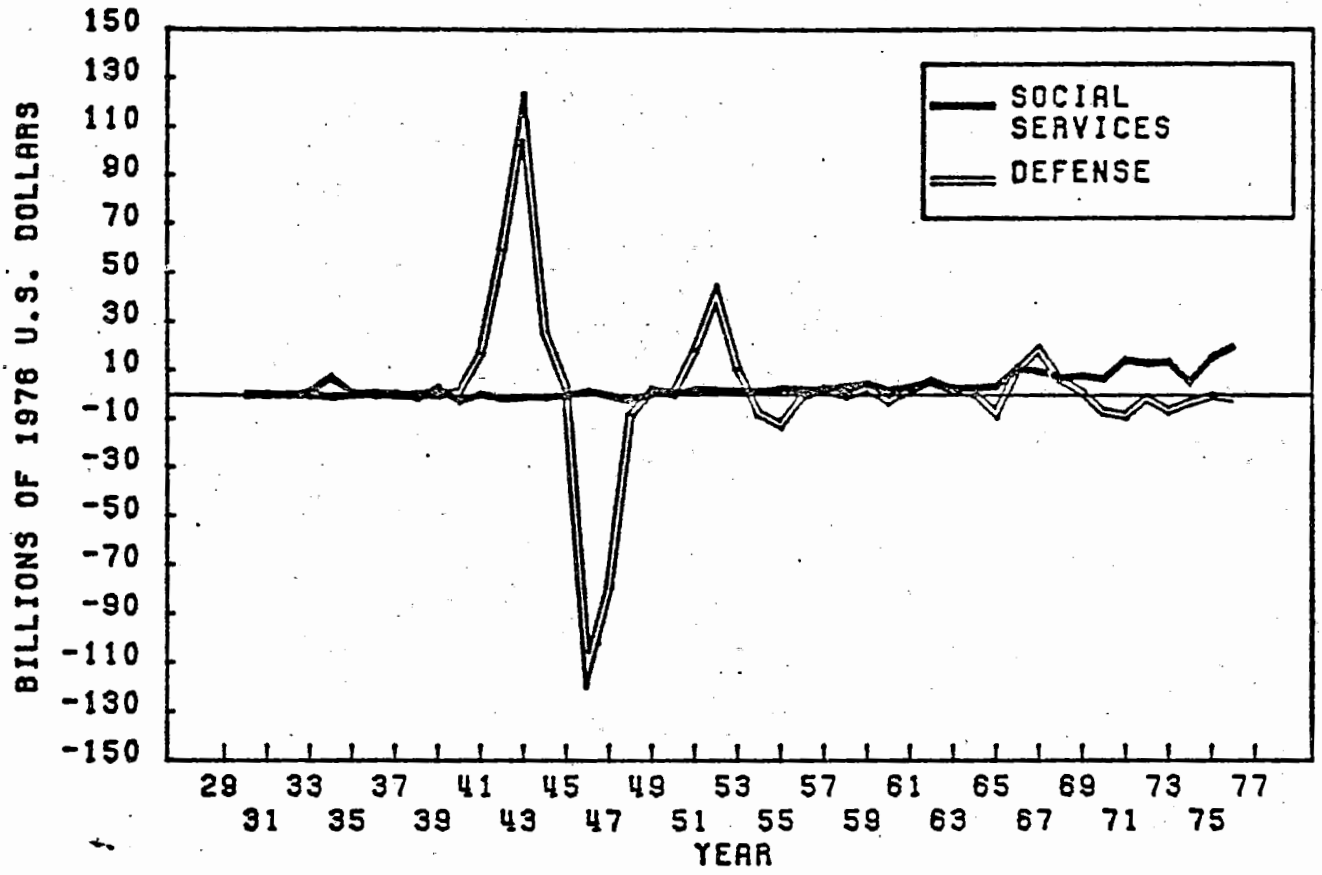


Figure II

CHANGE IN U.K. PUBLIC EXPENDITURE FOR SOCIAL SERVICES AND DEFENSE: 1920-1947

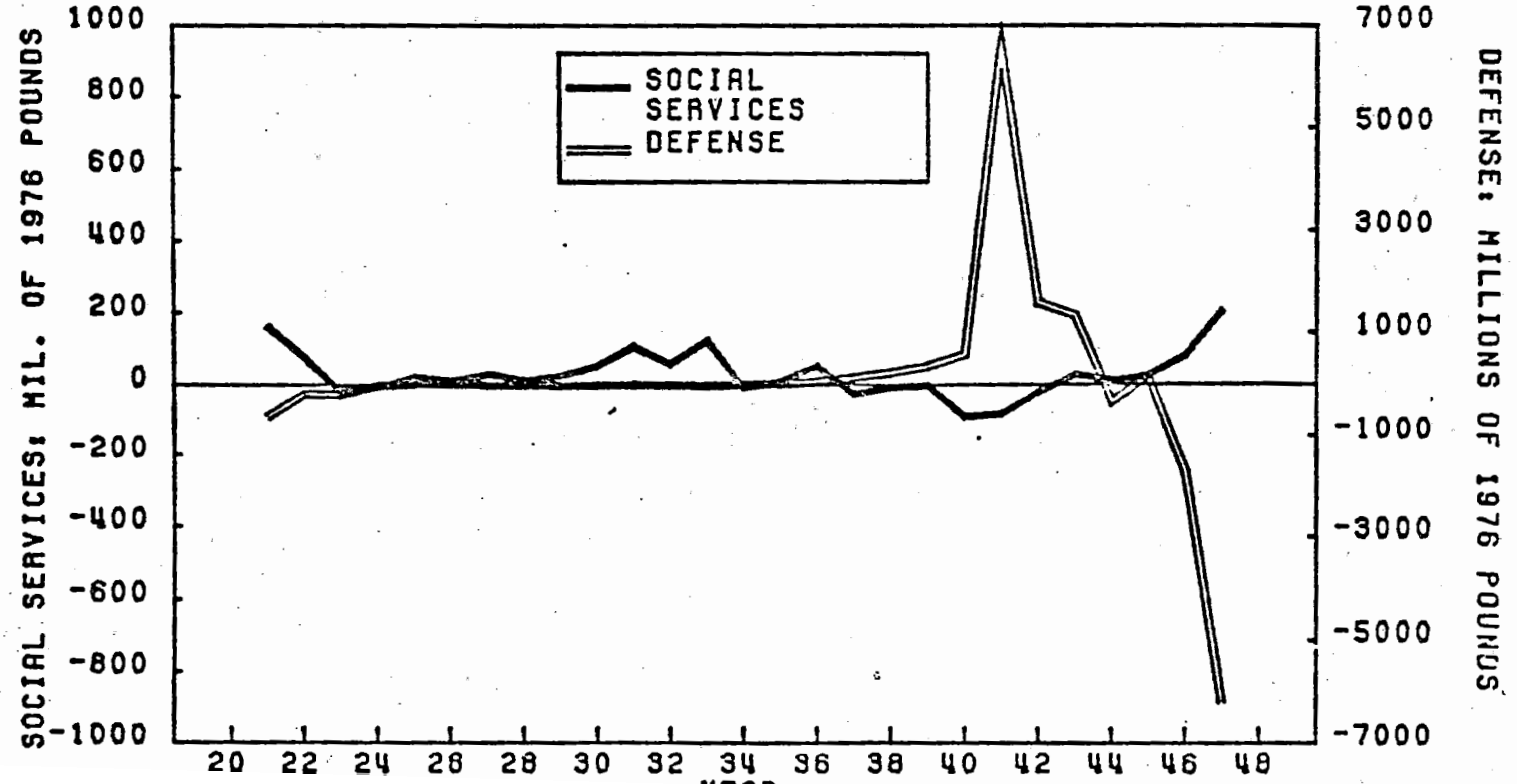


Figure III

CHANGE IN U.K. COMBINED PUBLIC AUTHORITY EXPENDITURE FOR SOCIAL SERVICES AND DEFENSE: 1948-1976

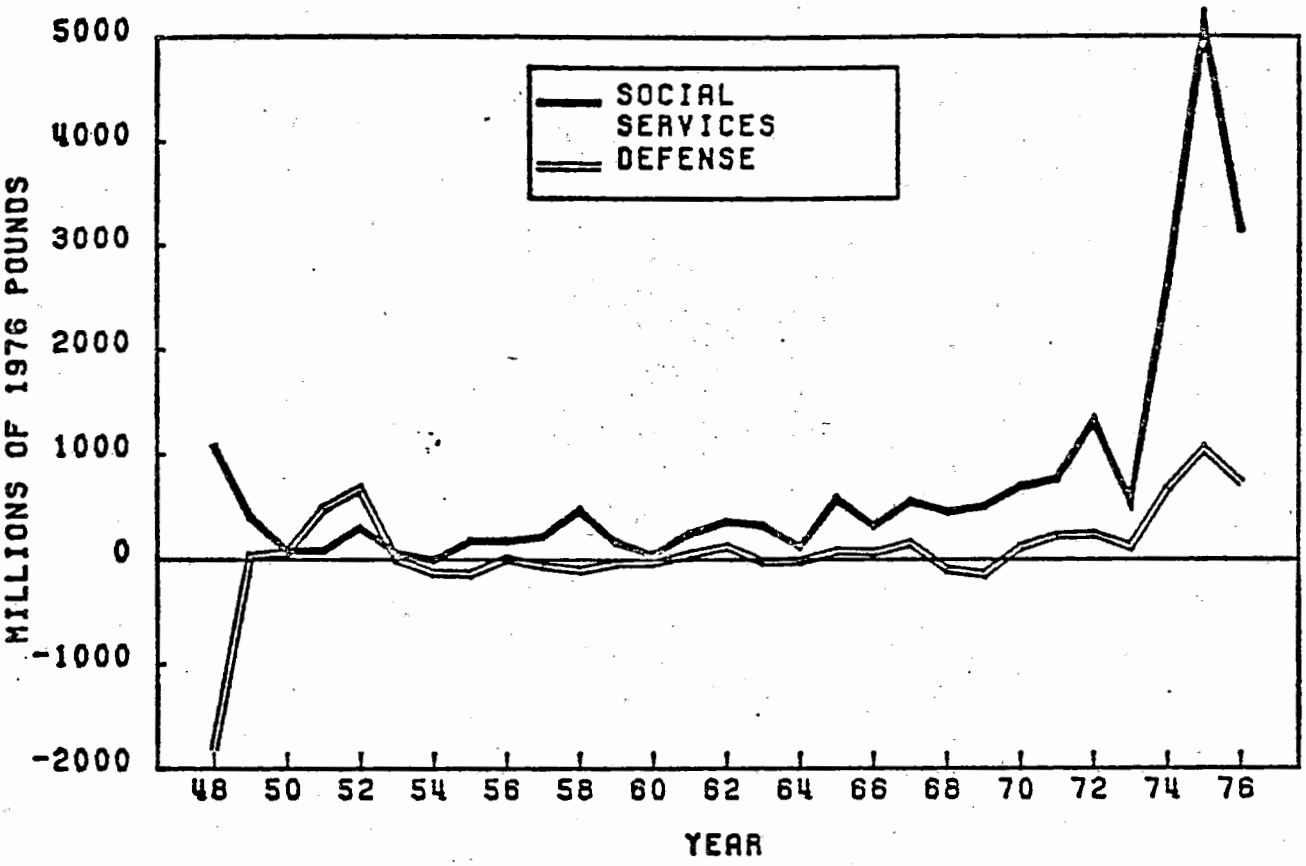


Figure IV

CHANGE IN F.R.G. COMBINED PUBLIC AUTHORITY EXPENDITURE FOR DEFENSE AND SOCIAL SERVICES: 1950-1969

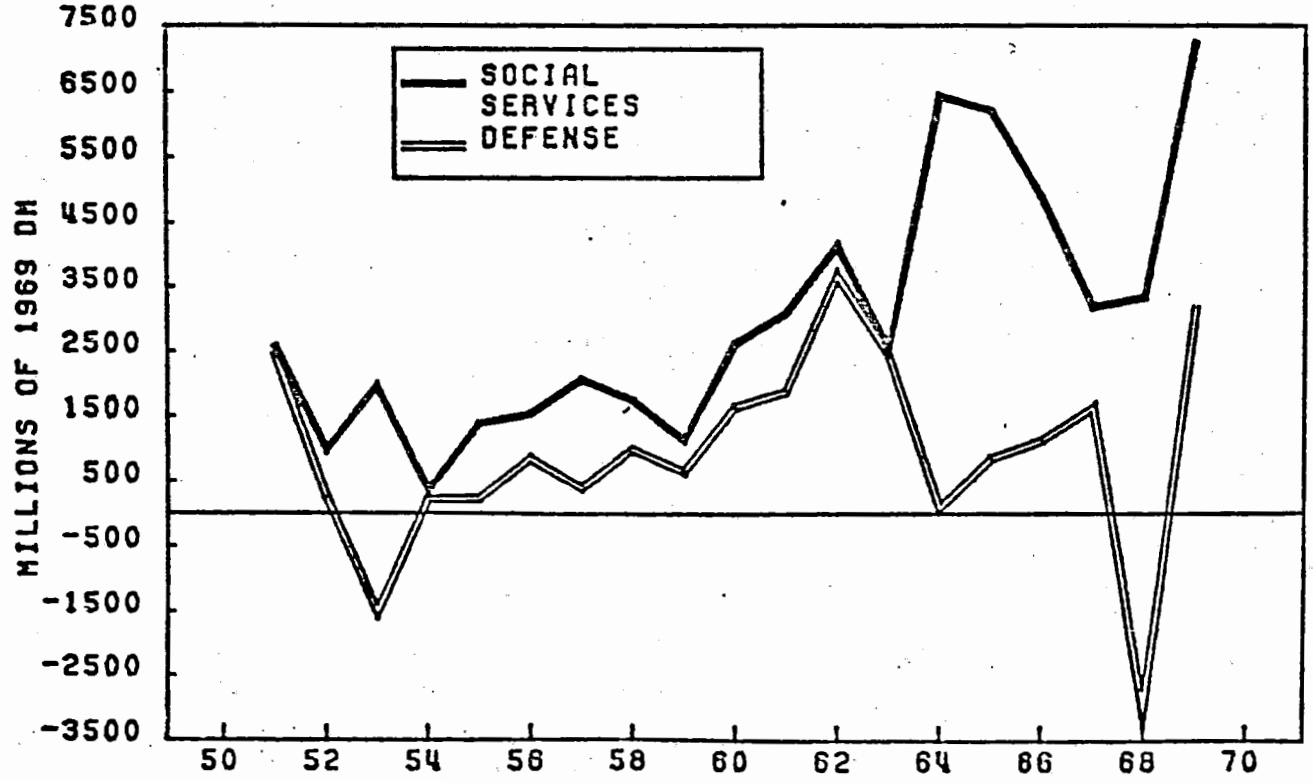


Figure V

CHANGE IN FRENCH CENTRAL GOVERNMENT EXPENDITURE FOR DEFENSE AND SOCIAL SERVICES: 1920-1939

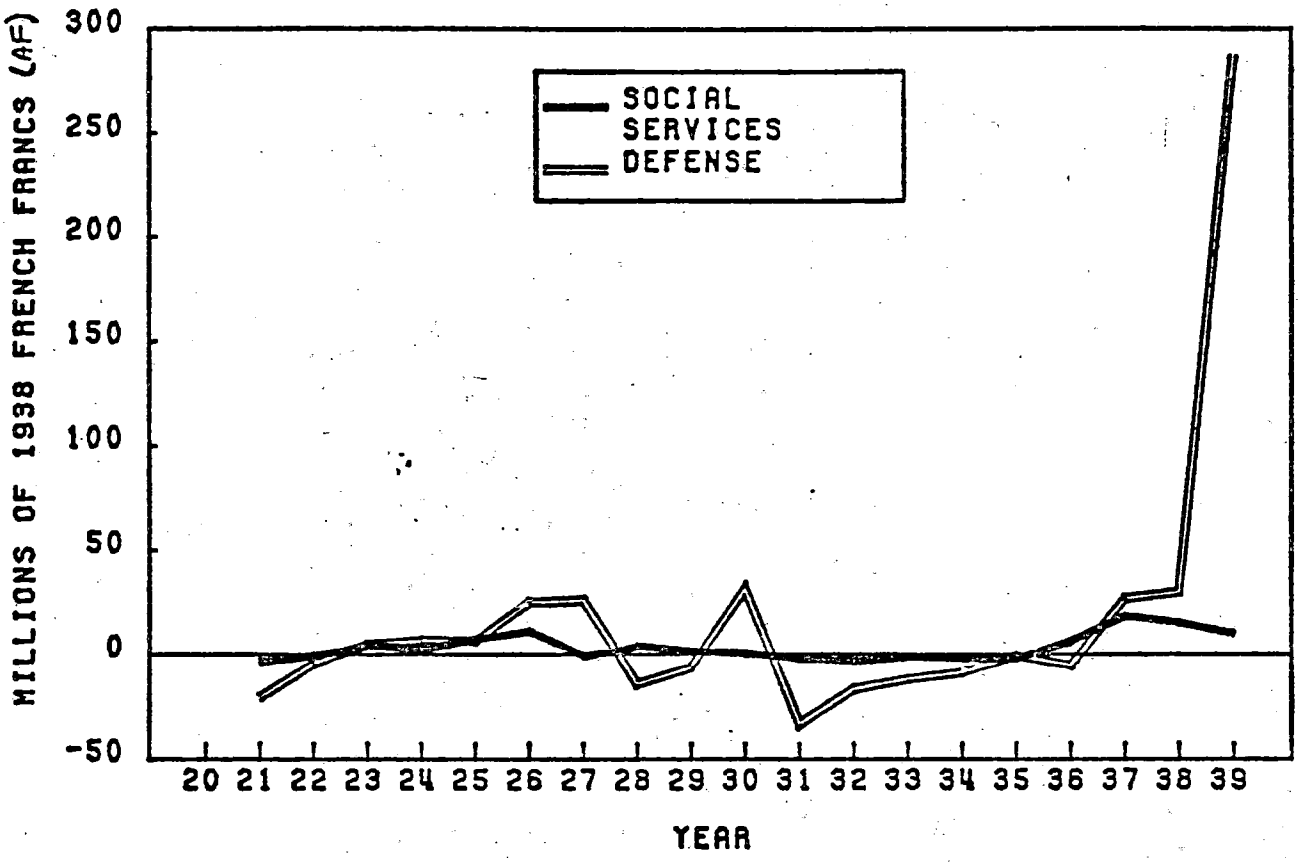
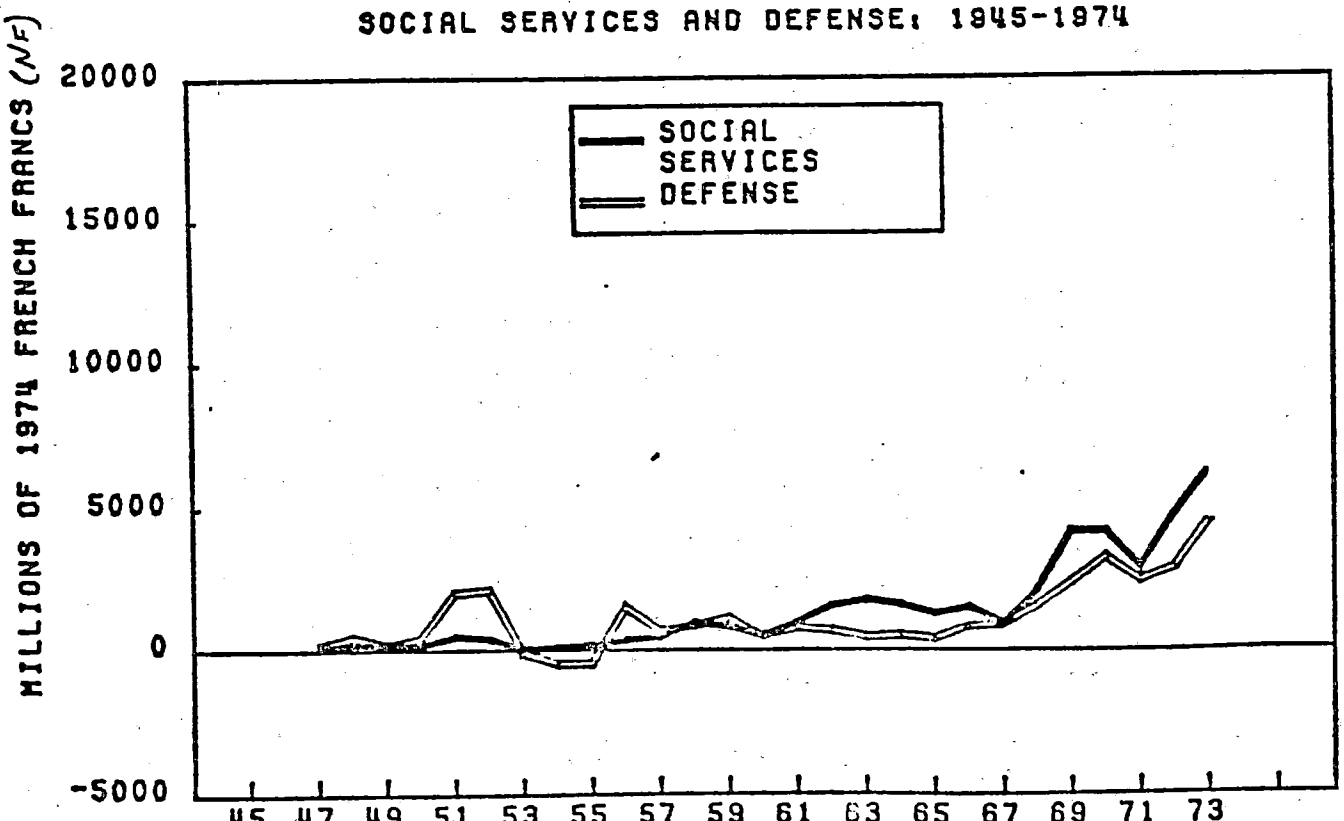


Figure VI

CHANGE IN FRENCH CENTRAL GOVERNMENT EXPENDITURE FOR SOCIAL SERVICES AND DEFENSE: 1945-1974



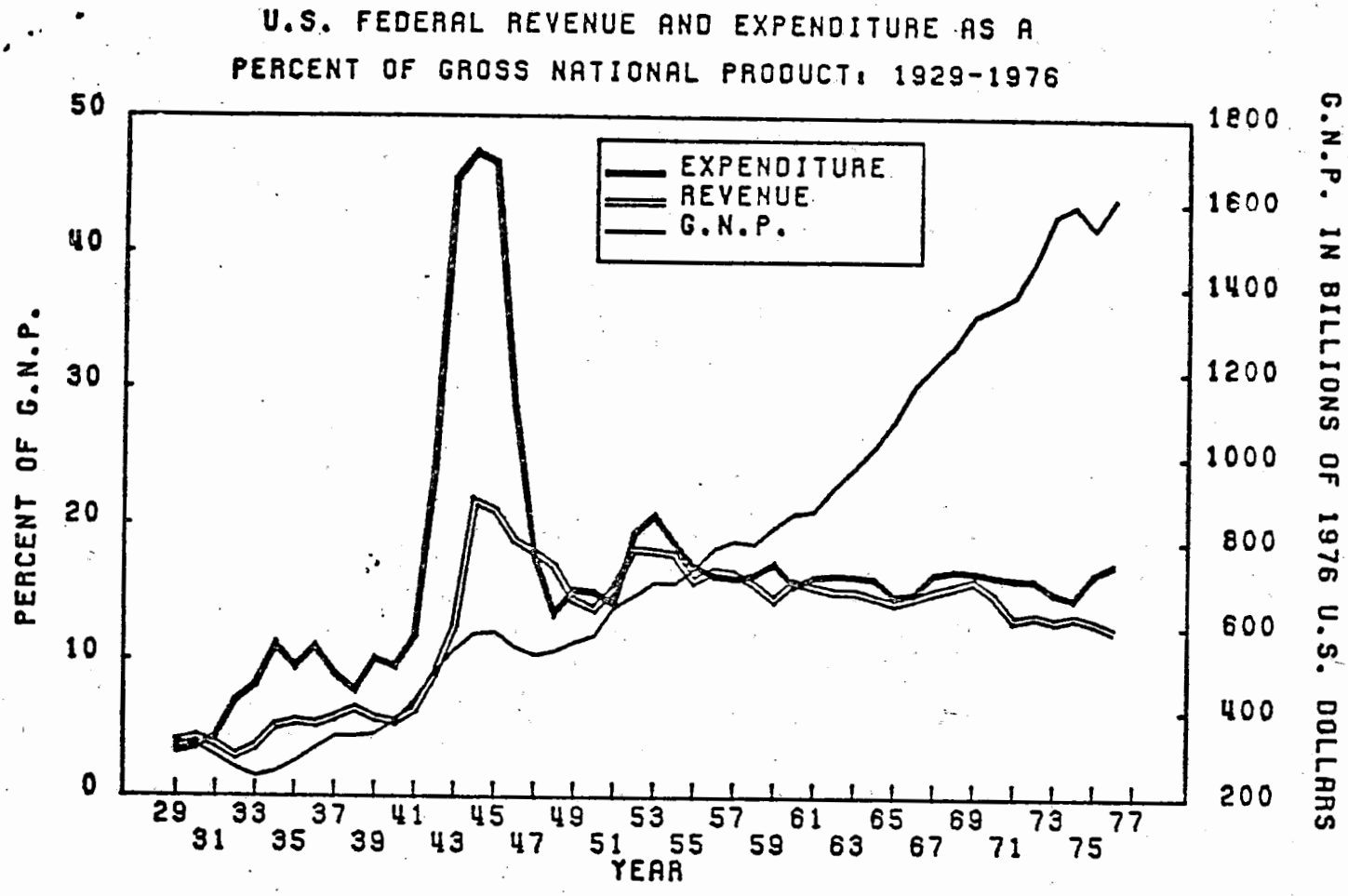

U.S. FEDERAL REVENUE AND EXPENDITURE AS A
PERCENT OF GROSS NATIONAL PRODUCT: 1929-1976
EXPENDITURE
REVENUE
G.N.P.
PERCENT OF G.N.P.
G.N.P. IN BILLIONS OF 1976 U.S. DOLLARS
YEAR
0
10
20
30
40
50
200
400
600
800
1000
1200
1400
1600
1800
29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77

Figure VIII

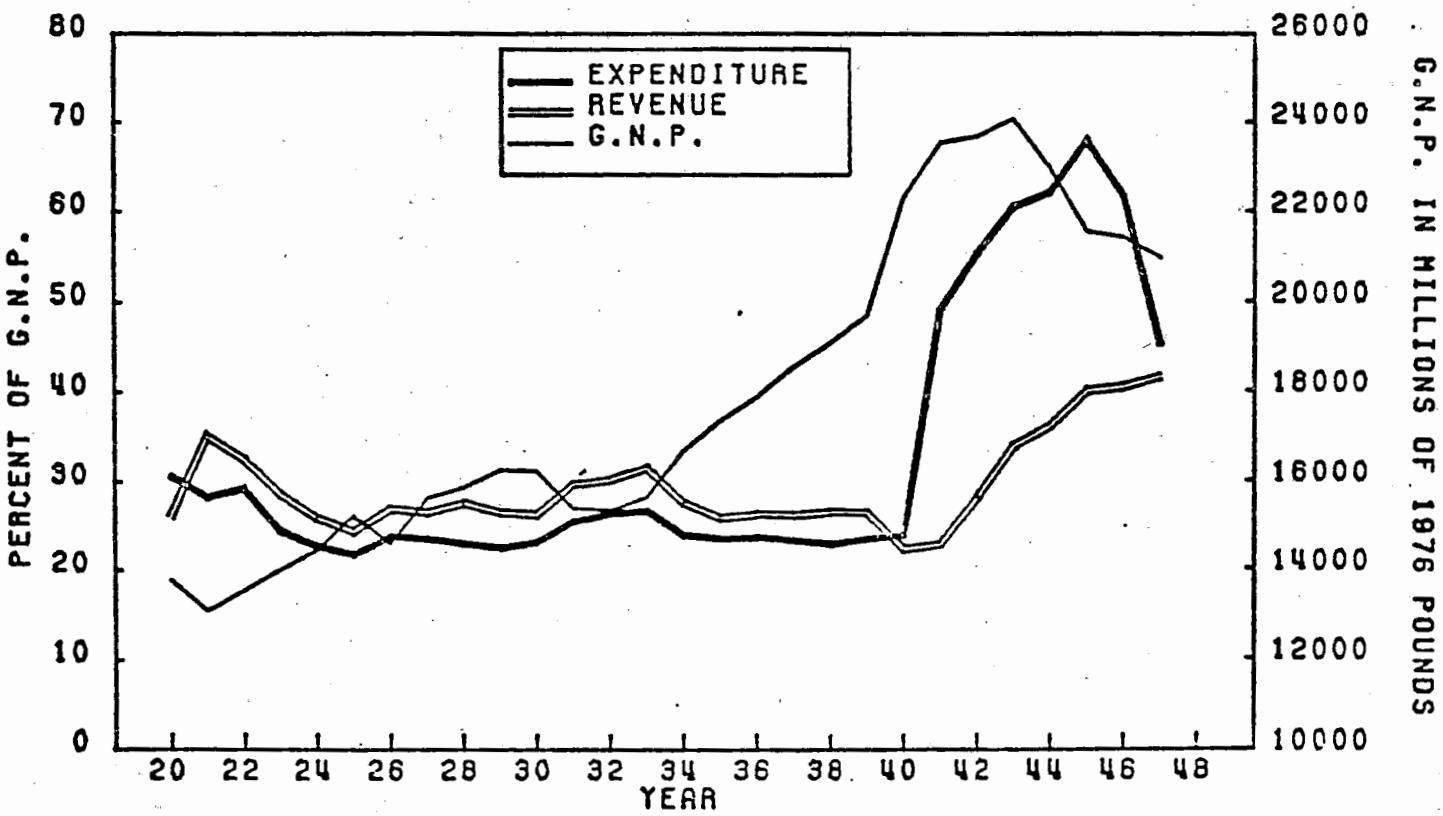

U.K. REVENUE AND EXPENDITURE OF COMBINED PUBLIC AUTHORITIES
AS A PERCENT OF GROSS NATIONAL PRODUCT: 1920-1947
EXPENDITURE
REVENUE
G.N.P.
PERCENT OF G.N.P.
G.N.P. IN MILLIONS OF 1876 POUNDS
YEAR
0
10
20
30
40
50
60
70
80
10000
12000
14000
16000
18000
20000
22000
24000
26000
20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Figure XI

REVENUE AND EXPENDITURE OF THE FRENCH CENTRAL GOVERNMENT
AS A PERCENT OF NET MATERIAL PRODUCT: 1920-1939

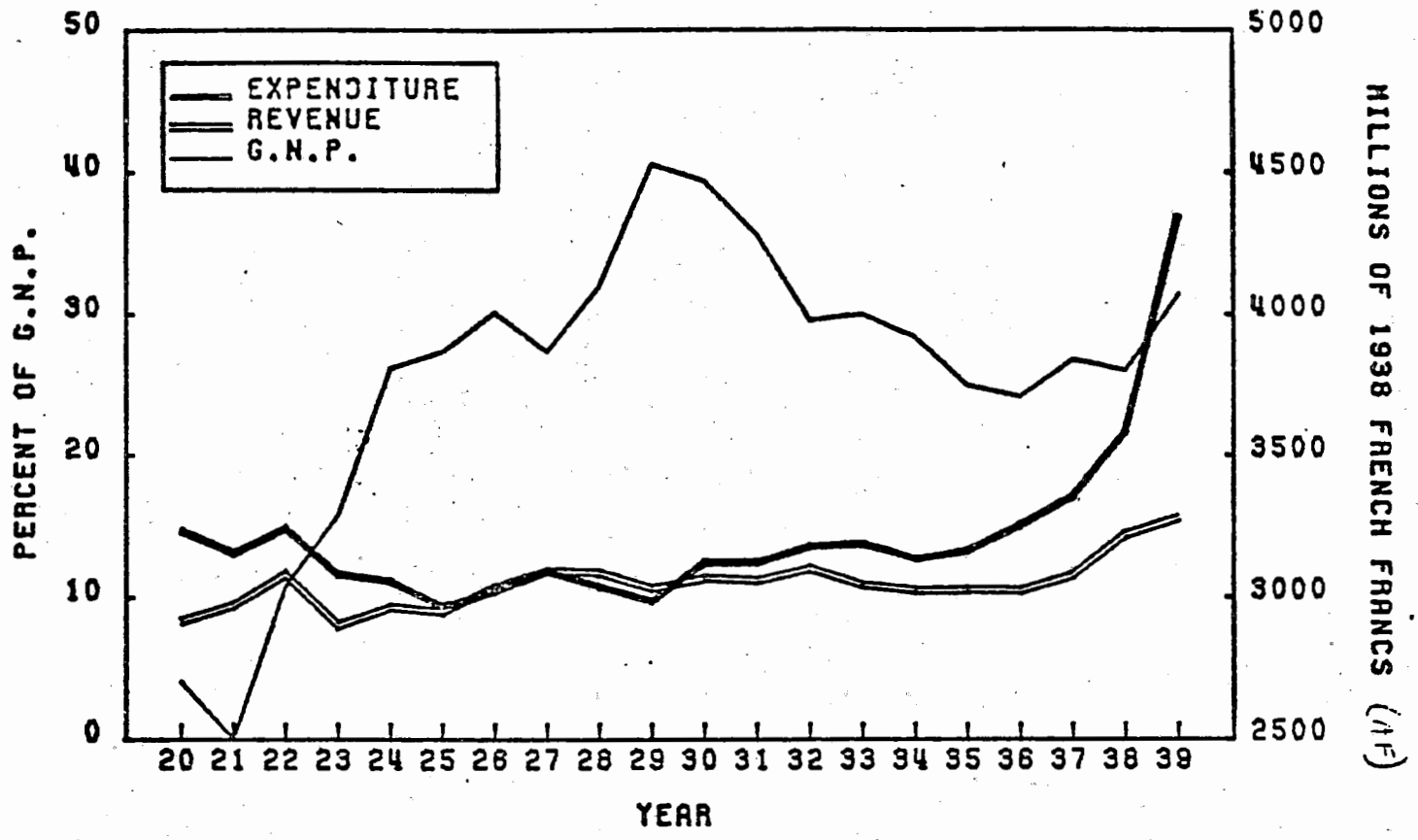


Figure XII

REVENUE AND EXPENDITURE OF THE FRENCH CENTRAL GOVERNMENT
AS A PERCENT OF GROSS NATIONAL PRODUCT: 1946-1974