The incidence of tax burdens and government expenditure benefits: a study of metro and nonmetro Arizona

THE INCIDENCE OF TAX BURDENS AND GOVERNMENT EXPENDITURE BENEFITS: A STUDY OF METRO AND NONMETRO ARIZONA

by

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ABSTRACT

This study analyzes the effect of government taxation and spending on the distribution of income for Arizona households in 1974. The results of this study are compared to previous studies which used the same methodology and procedures as this study. A new measure of the equality of income distribution is also presented.

State and local government taxation was found to be a larger burden (relative to income) to lower income households than to higher income households in Arizona. However, expenditures by all levels of government in Arizona were found to benefit lower income households much more (relative to incomes) than higher income households. Overall, net government fiscal action (expenditures minus taxes) was of greater relative benefit to lower income households than to higher income households for Arizona in 1974.

CHAPTER I

INTRODUCTION

Poverty and the unequal distribution of income have become a topic of increasing concern to government units in the United States. Starting with the progressive income tax and social security in the 1930's, the federal government has taken an interest in alleviating the gross inequities of income distribution. With the "War on Poverty" in the 1960's, the Federal Government has increased the number and scope of programs to assist low income people and further reduce income inequities. State and local governments have also greatly increased their public assistance programs. Thus, all levels of government have used their fiscal powers (the power to tax and the power to spend) in an effort to reduce poverty and the inequities of income distribution.

The income distributional effects of government fiscal action can be divided into three categories: regressive, neutral and progressive. Regressive fiscal actions are those which benefit (proportionately to income) higher income households more than lower income households. (Taxes can be thought of as negative benefits). Neutral fiscal actions benefit all income levels by the same proportions of their income. Progressive benefits are those which benefit lower income households more (or tax less) than higher income households in proportion to their incomes. Thus, progressive fiscal action distributes benefits inversely to income while regressive fiscal actions distribute benefits in a direct

relationship to income. Inequities of income distribution are decreased with progressive action and increased with regressive action.

Inequities of income distribution may be expressed by an index of income concentration (Gini Ratio) which is based upon a Lorenz Curve, depicted in Figure 1. The Lorenz Curve shows the cumulative percent of households, ranked from lowest to highest incomes, and the cumulative percent of total income which they have received. If incomes were exactly evenly distributed, the Lorenz Curve would be a 45° line from the origin, or line of perfect equality. The Gini Ratio is calculated by dividing the area (A) between the line of perfect equality and the Lorenz Curve by the total area (A + B) under the line of perfect quality. Thus, the less the inequality of income distribution, the smaller the area A and the smaller the Gini Ratio. Conversely, greater inequality is represented by a larger Gini Ratio. The numerical valve of the Gini Ratio is always between zero and one, perfect equality and perfect inequality, respectively.

In Table 1, it can be seen that Arizona has more inequality in income distribution than the western U. S., but about the same inequality as the entire U. S. The incidence of poverty is greater in Arizona than in either the entire U. S. or the western region. Within Arizona, the incidence of poverty is almost twice as great in nonmetro areas compared to metro areas. The proportion of nonmetro families with incomes over $15,000 in 1969 was one-half the metro percentage (U. S. Bureau of the Census, 1973b).

Poverty and unequal distribution of income in Arizona are still a problem in spite of increased government fiscal action. Between 1950 and

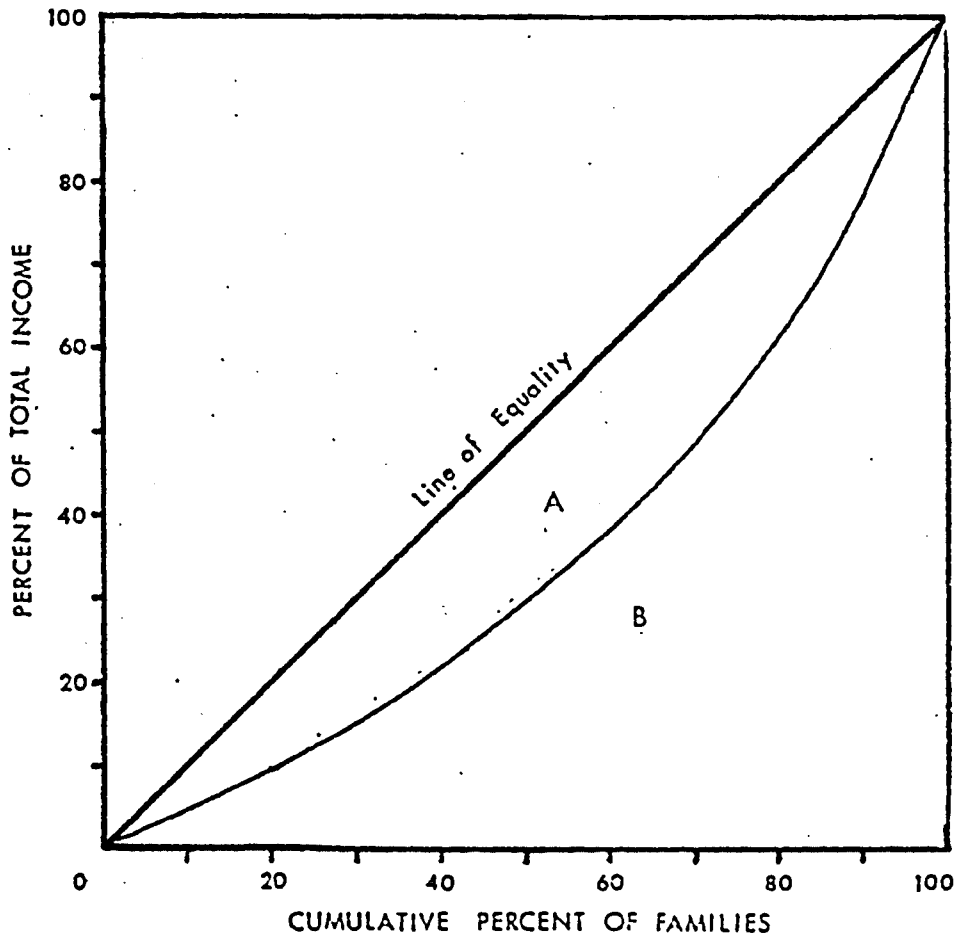


Figure 1. Lorenz Curve.

NOTE: The index of income concentration, or Gini Ratio, is derived by dividing Area A by Areas A plus B. The larger the index, the greater the inequality in the distribution of income. The "Line of Equality" represents an equal income distribution.

Table 1. Incidence of Poverty and Index of Income Concentration (Families in 1969).

Region	Families Below Poverty Level (%)	Index of Income Concentration (Gini Ratio)
United States	10.7	.364
Western U. S.[a]	8.9	.354
Arizona	11.5	.363
Metro Arizona	9.4	.359
Nonmetro Arizona	18.1	.373

a. Includes thirteen western states: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Source: U. S. Bureau of the Census (1973a).

and 1974, taxes as a percent of personal income increased from 17% to 27% (Valley National Bank, 1960; 1975). In 1974, all levels of government spent over $4 billion in Arizona while collecting taxes of a little more than $3 billion (Valley National Bank, 1975, pp. 25-31). In spite of this, per capita state-local government expenditures and revenues were the lowest of the eleven western states (U. S. Bureau of the Census, 1975, pp. 263-265).

Because of Arizona's problems, the effect of government fiscal policy on income distributions of metro and nonmetro areas should be of interest to Arizona policymakers.

Few studies have been done which estimate the effect of both taxation and government expenditures on income distributions. One of the problems has been the difficulty of estimating the value of public goods benefits. Public goods are those goods which are not diminished by any individual's consumption and are thus nonexcludable. It is not advantageous for an individual to reveal his preference for public goods, as he may enjoy benefits from these types of goods regardless of how much he contributes toward them in the form of taxes. (Specific goods, on the other hand, can be purchased, and consumed individually; therefore, their price is an indicator of their value.) However, recent theoretical advances make it possible to estimate the distribution of public goods benefits among income classes.

There have been no studies of the distributional impact of government fiscal action on households in Arizona. This study estimates this impact on metro and nonmetro Arizona households. (The U. S. Bureau of the Census [1973b] definition of metro and nonmetro is used in this

research. Metro Arizona consists of Pima and Maricopa Counties. All other areas of the state are considered nonmetropolitan.)

Purpose of the Study

This study determines the initial (pre-tax, pre-benefit) distribution of income and the distribution of state-local and federal government taxes and expenditure benefits among income classes of metro and nonmetro Arizona households in 1974. The post-fiscal income distribution is then determined and compared with the initial, pre-fiscal, income distribution in order to determine the net effect of all levels of government fiscal activity on households in metro and nonmetro Arizona. More specifically, the following hypotheses are tested for the year 1974:

1. The Federal Government tax burden was progressively distributed among all Arizona households.
2. The state-local government tax burden was progressively distributed among all Arizona households.
3. The total tax burdens from all levels of government were progressively distributed among all Arizona households.
4. All levels of government specific expenditure benefits were progressively distributed among all Arizona households.
5. Public goods expenditure benefits from all levels of governments were progressively distributed among all Arizona households.
6. Metro households received a proportionately larger share of all government expenditures benefits in relation to their incomes than nonmetro households in Arizona.

7. Metro households received a greater share of net government benefits, proportionate to their incomes, than nonmetro households.
8. Net benefits from federal government fiscal action were progressively distributed among all Arizona households.
9. Net benefits from state-local government fiscal action progressively distributed among all Arizona households.
10. Net government fiscal action resulted in a more even distribution of income in both metro and nonmetro Arizona.

The results of this study are compared with a previous study of the Western United States that used the same procedures. This comparison shows whether the income distributional effects of fiscal activity in Arizona are more or less effective than those of the entire region. These results could be useful to state, local and federal policymakers in determining what income households are bearing the burdens and receiving the benefits of government fiscal action. If the results are not in line with expressed policy, adjustments can be made in either the tax structure or expenditure programs to bring distributional effects in line with the stated policy.

CHAPTER II

PREVIOUS EMPIRICAL STUDIES

Traditionally, studies concerned with the impact of government fiscal action have dealt primarily with taxation or expenditure policies rather than with both fiscal policies combined. It has only been in the post-1950 period that total government fiscal activities have been studied with reference to their effect on income redistribution.

A general methodology has been built from these recent studies. Usually, an estimate is made of what private incomes would be without government taxes and expenditures. Tax burdens and expenditure benefits are then allocated to income groups by making assumptions about their incidence. The algebraic summation of the initial income minus taxes plus benefits then determines the post-fiscal income distribution, and thus the net effect of government fiscal action.

This chapter briefly reviews the major empirical studies which have been used as a basis for the methodology of this study. The important differences in these studies are the way income is defined and the way public goods benefits are allocated.

Public goods are defined as those goods for which the consumption by an individual does not diminish the total good available to others and thus they are nonexcludable. Specific goods, by contrast, are goods which are apportioned and exhausted among individuals.

Income may be defined in various ways. Disposable income represents gross income minus taxes; initial income is income minus all government transfer payments plus the imputed value of corporate taxes. The basic definition of income can make a difference in the analysis and is therefore one of the important points to look for in comparing various studies.

The first study to analyze the effect of state and local government total fiscal action on a single state was by Brownlee (1960). Brownlee estimated current 1954 income distribution for Minnesota using data from a University of Michigan consumer survey. He then allocated public goods in three ways: on a per capita basis, in proportion to income and a combination of the two in equal parts. He discovered " . . . that different suppositions about how much general governmental expenditures benefit everybody or benefit property lead to quite similar conclusions as to the distribution of total Minnesota governmental expenditures among income classes (Brownlee, 1960, p. 3)." Brownlee concluded that the total Minnesota tax burden was regressive in the lowest income classes and progressive for the two highest income groups. Benefits from state-local governments were distributed progressively. The net effect was progressive with the Minnesota fiscal system contributing to greater income equity.

Eapen and Eapen (1973) estimated the income redistributive effects of state and local fiscal action for Connecticut utilizing 1967 data. Three alternative definitions of income were used: the first used money income as defined by the U. S. Bureau of the Census (1973a); the second added nonmoney income, capital gains and retained earnings of

corporations attributable to Connecticut shareholders; the third used the first two plus all Connecticut state and local expenditures, other than transfer payments, minus state and local taxes. Public goods benefits were allocated by three alternative methods: according to the distribution of money income; according to the distribution of families; and by allocating one-half to families and one-half to money income.

Basically, all methods produced a regressive tax distribution and a progressive distribution of expenditure benefits. Interestingly, the three assumptions concerning the distribution of public good benefits made few significant changes in the resulting estimated distributions. The net fiscal benefits were found to be quite progressively distributed under all assumptions.

The Tax Foundation (1967) estimated the distribution of federal and state-local government tax burdens and expenditure benefits for the entire United States in 1961 and 1965. Incomes were derived from 1961 and 1965 net national product and the U. S. Bureau of Labor Statistics (1965). Income classes were computed using money income after taxes as a basis. Pure public goods were defined as national defense, international affairs, general government, transportation (excluding highways), commerce and finance, housing and community development, health and sanitation and civilian safety. These were allocated by two methods: on a per capita basis; or one-half on the basis of family money income before taxes and one-half on population. Both of these allocative methods produced similar results, differing slightly in the lower and higher income ranges. As would be expected, the per capita basis favored the lower income families at the expense of the higher income families.

The Tax Foundation estimated the state-local tax burden to be regressively distributed in both 1961 and 1965. Federal tax burdens were progressively distributed in both years. The combined tax burden of federal and state-local governments was slightly regressive at lower income levels and progressive for income greater than $7,500 per year. Property, sales, social insurance contributions from employers and excise taxes allocated on total consumption were all found to be regressive. Government expenditure benefits were estimated to be progressively distributed at all levels of government.

The net redistribution of income from all levels of government fiscal activity was found to be progressive. Federal fiscal action resulted in a larger and more progressive redistribution of income than from state-local government fiscal action.

An alternative method of determining the benefits from public goods expenditures was presented by Aaron and McGuire (1970). They proposed that " . . . to each household should be imputed a fraction of the total value of the public good, proportional to the reciprocal of its marginal utility of private good expenditure (Aaron and McGuire, 1970, p. 911)."

A model was proposed where the value of public goods to each household equals:

$$Y_p^i = tp^* \frac{MRS^i}{\Sigma i MRS^i} = tp^* \frac{R/f_y^i}{\Sigma R/f_y^i} = tp^* \frac{1/f_y^i}{\Sigma_i \, 1/f_y^i}$$

where: Y_p^i = the income value of public goods to household i

tp^* = total tax collections, equal to total expenditures on public goods (Yp)

f_y^i = the marginal utility of income for household i

MRS^i = the marginal rate of substitution between public goods and income for household i

R = a constant

This model is based on eight assumptions:

1. Each household's marginal rate of substitution between public goods and other goods is known, or assumed.

2. The total and marginal cost of public and specific goods is known for all relevant outputs of these goods.

3. All utility functions are identical.

4. All of each public goods enters every household's utility function.

5. All households in each income bracket can be represented by the average income level and expenditure mix in that bracket.

6. The marginal cost of public goods equals the average cost for the amount supplied.

7. The actual output of public and specific goods is allocatively efficient, so that marginal cost equals the sum of marginal rates of substitution (MC = ΣMRS).

8. The utilities of public goods and of other goods are independent (Aaron and McGuire, 1970, pp. 910-911).

Aaron and McGuire (1970) then reestimated the distributive impact of government fiscal action presented by the Tax Foundation (1967). Two utility functions were estimated, one with total utility rising without limit as income rises and the other with total utility decreasing with rising income. Also, two definitions of public goods were utilized. The

first was identical to the Tax Foundation's definition and the second, expanded definitions included the Tax Foundation definition plus proportions of the following government expenditures: higher education (0.5), elementary and secondary education (0.7), streets and highways (0.5), agriculture (0.3), public assistance and welfare (0.3) and veterans' benefits (0.3).

Their analysis indicated that the net effect of government fiscal action was less progressive than the Tax Foundation's estimate. The second utility function with decreasing marginal utility showed a net redistribution of government benefits from the middle income groups to both the high and low income groups. The "high" quantity of public goods resulted in fewer net benefits, compared with the low quantity of public goods. However, both alternatives showed a similar shaped distribution of benefits among income classes.

Aaron and McGuire (1970) concluded that the allocation of government public goods expenditure benefits is extremely sensitive to the utility function which is selected. However, the shape of the utility function chosen is somewhat arbitrary.

In 1973, Maital reviewed Aaron and McGuires' study and presented a simplified version of it. Like Aaron and McGuire, Maital assumed . . . "that preference maps of all individuals for private goods (henceforth regarded as synonymous with disposable income) and public goods are known (Maital, 1973, p. 561)."

Figure 2 illustrates Maital's graphical analysis. Income (private goods) are represented on the vertical axis and units of public goods on the horizontal axis. The graph shows one individual's

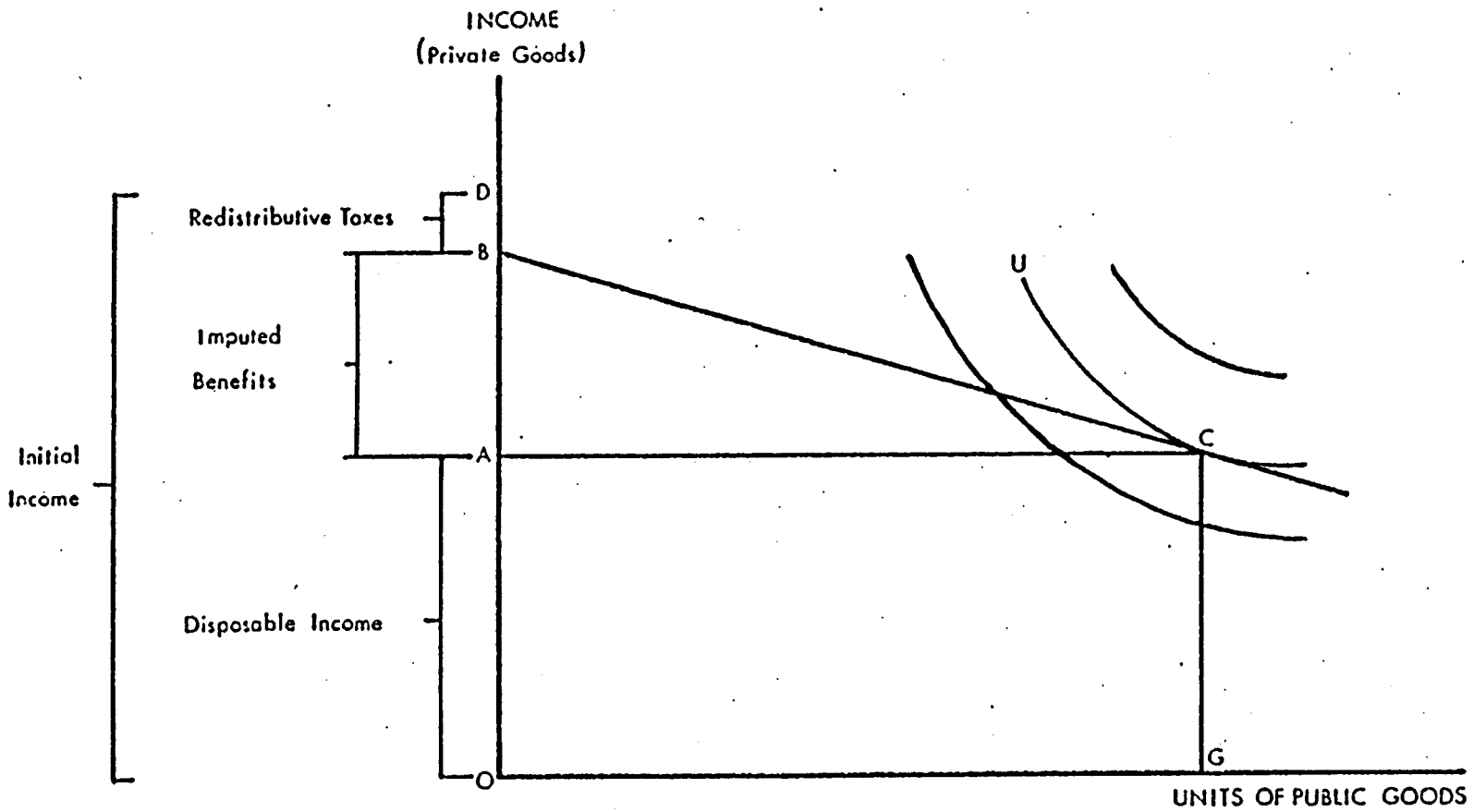


Figure 2. Imputed Income Value of Public Goods, Maital Approach.

Source: Maital, 1973, p. 563.

indifference curves for public and private goods. The individual has an initial (pre-tax, pre-benefit) income of OD and pays taxes (less transfers) of AD, leaving a disposable income of OA. He consumes OG units of public goods (pure public goods by definition enter the utility function of all individuals in equal amounts) and therefore is on indifference curve U at point C, the intersection of OG public goods and OA disposable income (private goods). A straight line tangent to U at C intersects the ordinate at B. The slope of this line is equal to the individual's marginal rate of substitution between public goods and private goods. AB is the value of OG units of public goods measured in terms of income or private goods.

The individual has received OG units of public goods which he values at AB in terms of income and has paid AD in taxes. On balance, he has paid BD in taxes more than the AB benefits he has received from government public goods.

By considering two individuals (J and K), the analysis can be taken further. If the tangent BC is drawn for each individual then each individual's value (AB) of OG units of public goods is:

(1) $AB_J = (\text{slope } BC_J) \cdot OG$, and

(2) $AB_K = (\text{slope } BC_K) \cdot OG$.

Dividing equation (2) by (1),

(3) $AB_K/AB_J = (\text{slope } BC_K) / (\text{slope } BC_J)$.

For both J and K, by definition

(4) slope BC = (marginal utility of OG) / (marginal utility of income).

Substituting equation (4) into (3),

$$(5) \qquad AB_K/AB_J = \frac{(\text{marginal utility of OG})_K}{(\text{marginal utility of income})_K} \Big/ \frac{(\text{marginal utility of OG})_J}{(\text{marginal utility of income})_J}$$

If it is now assumed that all individuals have identical preference maps and that the utility derived from public and private goods are independent, then the marginal utility of public goods (OG) for both J and K will be equal (Maital, 1973, p. 563):

$$(6) \qquad (\text{marginal utility of OG})_K = (\text{marginal utility of OG})_J.$$

Equation (6) can then be used to simplify (5):

$$(7) \qquad AB_K/AB_J = \frac{(\text{marginal utility of income})_J}{(\text{marginal utility of income})_K}$$

The income values of OG units of public goods for K and J can now be written as:

$$(8) \qquad AB_K = AB_J \ (MU_J/MU_K) \text{ and}$$

$$(9) \qquad AB_J = AB_K \ (MU_K/MU_J), \text{ where } MU_j \text{ and } MU_K \text{ represent the respective marginal utilities of income of individuals J and K.}$$

Assuming that the total income value of OG units of public goods to J and K equals the total expenditures on OG units of public goods, then

$$(10) \qquad AB_J + AB_K = OG.$$

By definition, it follows that:

$$(11) \qquad AB_J = AB_J \ (MU_J/MU_J).$$

Using equations (8) and (11), (10) can be rewritten as:

$$(12) \qquad AB_J \left(\frac{MU_J}{MU_J}\right) + AB_J \left(\frac{MU_J}{MU_K}\right) = OG, \text{ or as}$$

$$(13) \qquad AB_J \left(\frac{MU_J}{MU_J} + \frac{MU_J}{MU_K}\right) = OG.$$

The income value of OG units of public goods to J can now be written as:

$$(14) \qquad AB_J = OG \;/\; \left(\frac{MU_J}{MU_J} + \frac{MU_J}{MU_K}\right)$$

Referring to the marginal utility of income schedules hypothesized by Aaron and McGuire (1970), the marginal utility of income for an individual can be written in the general form:

$$(15) \qquad MU_i = c/x_i, \text{ where}$$

$$(16) \qquad x_i = (Y_D^i + Y_S^i)^{-\phi} \text{ and c is a constant.}$$

"ϕ" represents the inverse of the elasticity of substitution between public and private goods and reveals the relationship between utility and income so that a specific utility function can be determined (Maital, 1973, pp. 561 and 564). Y_D^i is disposable income and Y_S^i is the income value of government specific goods benefits and transfer payments.

Equation (14) can now be rewritten, using (15), as:

$$(17) \qquad AB_J = OG \;/\; \left(\frac{X_J}{X_J} + \frac{X_K}{X_J}\right) = OG \;/\; \frac{\Sigma_i X_i}{X_J} = OG \;(X_J \;/\; \Sigma_i X_i),$$

Substituting (16) into (17), we find:

$$(18) \qquad AB_J = OG \left[(Y_D^J + Y_S^J)^{-\phi} \;/\; \Sigma_i \;(Y_D^i + Y_S^i)^{-\phi}\right.$$

The preceding analysis is from Plath (1975, pp. 47-49).

All items with the exception of the value of ϕ are observable. Aaron and McGuire (1970) used two values for ϕ (-1 and -2) and found their results were very sensitive to the value selected.

Maital has reduced some of the arbitrariousness of selecting a value for ϕ. He reviewed three studies (Fellner, 1967; Powell, Van Hoa, and Wilson, 1968; and Mera, 1969) which all independently estimated the value of ϕ to be about -1.5.

Maital used this value of ϕ to recompute the distribution of public goods benefits using the same data as Aaron and McGuire, the Tax Foundation's 1967 study. Using the same marginal utility function of Aaron and McGuire, with the -1.5 value for ϕ, Maital found the benefits of public goods expenditures to be between the two Aaron and McGuire estimates. He also found, along with Aaron and McGuire, that a lower quantity of public goods resulted in a greater amount of income redistribution than occurred with a higher quantity of public goods.

Plath (1975) applied the Maital analysis to the U. S. Bureau of Labor Statistics (1965) data for the urban and rural sectors of the western United States. Plath found a regressive state-local tax structure along with a federal tax burden which was regressive in the lowest income classes. He also found specific goods benefits to be progressively distributed while public goods benefits were basically regressively distributed. Plath's methods and results were consistent with both the Aaron and McGuire (1970) and the Maital (1973) studies.

CHAPTER III

PROCEDURES AND DATA

This study determined the net effect of government fiscal action on the distribution of income among income classes of Arizona households. Tax burdens and government expenditure benefits were allocated to income classes on the basis of assumptions regarding the incidence of these taxes and benefits. The initial (pre-tax, pre-benefit) income distribution was determined. Tax burdens and expenditure benefits were then allocated to income classes in the initial income distribution. The resulting post-fiscal income distribution was then compared with the initial (pre-fiscal) distribution to determine the net effect of government fiscal policies.

In making these estimates, theory developed by Aaron and McGuire (1970) and Maital (1973) as discussed in Chapter II was employed. Also, an improved measure of income equity was developed and utilized.

In this chapter, the data and methods of allocation used, as well as methods of measuring income inequities, are discussed. The limitations of this study are also reviewed.

Sources of Data

Primary data were collected from Arizona households using a detailed seven page questionnaire (see Appendix A). The questionnaire was sent to a random sample of 1,516 Arizona households taken from the Arizona Motor Vehicle Registration list. The questionnaire requested

information on family size, income by sources, expenditures of various types and amounts and types of taxes paid, all for 1974. Techniques from Buse (1973) and Dillman et al. (1974) were employed to elicit a high response rate. This technique entailed using personalized letters with three follow-up mailings as well as a final certified mailing to the sample group. Four-hundred and seventy-four usable questionnaires were returned, 39% of the potential respondents. (Of the 1,516 questionnaires, only 1,196 were delivered to valid Arizona households, the others were returned because the addressees had moved out of state, left no forwarding address, or were deceased.) The response rate was much lower than anticipated from the results of Buse (1973) and Dillman et al. (1974). However, the questionnaire was extremely long and required confidential information which many people refused to reveal. The complexity of the questionnaire caused some people to return it with the notation that they did not understand the questionnaire or know the required information.

The sampling methods introduced several biases in the study. Although the sample was drawn from the most complete listing of households in Arizona available, it excluded about 12% of Arizona households (Carpenter, 1974, p. 615). These excluded households undoubtedly contained a high proportion of extremely poor and, to a lesser extent, aged Arizonans. The complex nature of the questionnaire made it very difficult for poorly educated people to complete. These factors resulted in an undersampling of those people who tend to make up the lower income households. This bias was reflected in the income distribution of the respondents. Over half of all respondents were from the highest income

class. Also, the two lowest income classes in nonmetro Arizona were insufficiently sampled to draw generalizable conclusions.

All data from the completed questionnaires were analyzed by computer using the SPSS program for descriptive statistics. The computer sorted the data from each questionnaire into an appropriate Bureau of Labor Statistics income class. Mean values for each item in the questionnaire were computed along with the range and 95 percent confidence interval for each mean value. Where sample sizes were insufficient, the confidence interval was examined to determine the reliability of the mean value. If the confidence intervals were judged to be too large, on the basis of the known data, the mean values were considered insignificant and therefore not used. The mean values with reasonably narrow confidence intervals were considered significant. The significant mean values were considered to be the representative value for each income class.

Because of the sample bias toward higher income households, the income distributions for metro and nonmetro Arizona were determined from U. S. Bureau of the Census (1973a) data. The 1969 income classes from the census were first inflated to approximate 1974 incomes. This inflation was accomplished by increasing 1969 incomes by the percentage increase in the consumer price index from 1969 to 1974. The inflated census income classes were then reallocated to the five Bureau of Labor Statistics income classifications. The number of households in each census income class were assumed to be evenly distributed throughout the class; therefore, simple interpolation was used to reallocate households to the BLS income classes. Having determined the number of households in each BLS income category, it was assumed that the growth in Arizona's

population was proportionate for each income category. Therefore, the number of households in each category was increased by the percentage change in Arizona's population between 1969 and 1974. This adjusted number of households in each income class was the basis for determining the allocation of tax burdens and expenditure benefits.

Data for federal government expenditures were taken from the U. S. Office of Economic Opportunities (1975). State expenditures were determined from the Arizona Department of Administration (1974). County expenditures were obtained from the Arizona Tax Research Association (1974). Local city expenditures were estimated from the U. S. Bureau of the Census (1975).

Revenue data were determined from the Arizona Department of Revenue (1975) and the Valley National Bank (1975) for the state-local sector. Federal revenues were obtained from the Commissioner of Internal Revenue (1974).

The survey data were for the calendar year 1974, thus encompassing the last half of fiscal 1974 and the first half of fiscal 1975. Because of the lack of complete data for fiscal 1975, all tax and expenditure data were for fiscal 1974. Thus, taxes and expenditure benefits were slightly less than the actual figures for calendar 1974. However, this problem was common to many other studies and was assumed to have little effect on the final results.

Methods of Allocation

Allocation of Income

In this study, the initial income distribution was determined using inflated and adjusted 1969 U. S. Census data (U. S. Bureau of the Census, 1973a and 1973b) as previously described. The average income for each income class was represented by the mean income from the survey data. This income included wages, salaries, dividends, imputed value of home grown and consumed food, rental income, capital gains, gifts, child support, etc., but excluded all government transfer payments such as social security, unemployment comepnsation and welfare. Because this initial income represented what incomes would have been without government fiscal action, corporate taxes were assigned to each income class on the basis of its proportion of total consumption. This allocation assumes that all corporate taxes are passed on to the consumer in the form of higher prices. The Tax Foundation (1967) and Plath (1975) assigned half of corporate taxes on the basis of total consumption and half on the basis of dividend income. However, lack of significant dividend income data for Arizona made such an allocation impossible. Had it been done, initial income probably would have been slightly greater for both low and high income households and slightly less for middle income households because dividends seemed to be distributed more to retired low income households and to high income households.

Allocation of Tax Burden

After the initial income distribution was determined for both metro and nonmetro Arizona, the tax burden was allocated to the various

income classes (see Table 2). Using survey data, the mean federal and state-local tax burdens were determined for each income class. These mean values were multiplied by the estimated number of households in each income class to produce an estimate of the total of each type of tax payment made by each class. These estimated tax payments for each tax were summed over all income classes. This summation was used to determine the relative share of each income class for each tax. Relative shares were then multiplied by the known total revenue for each tax item to obtain an estimate of the amount of each type of tax by each income class. For example, the state income tax burden was estimated by multiplying the average state income tax payment of each income class by the number of households in the class. Relative percentages of total state income tax paid were then determined for each class and multiplied by the actual total state income tax collected in 1974. The resulting figures were estimates of each classes' state income tax burden.

Excise taxes were allocated on the basis of each income classes' expenditures for the taxed item such as alcohol or tobacco. Sales, other excise taxes, and miscellaneous taxes were simply allocated on the basis of each classes' relative share of total consumption expenditures.

Because of a lack of sufficient data, the estate and gift taxes were arbiyrarily assigned to the highest income class. This same allocation was also made by the Tax Foundation (1967) and Plath (1975). Total state-local property taxes were allocated one-half on current consumption and one-half on property tax payments. This allocation is based on the assumption that property taxes for businesses, renters, etc. are pased on to the consumer, who thus bears the burden of the tax. Corporate income

Table 2. Bases for the Allocation of the Tax Burden by Income Class.

Tax	Basis of Allocation
Individual income	Personal income taxes
Corporate income	Total current consumption
Estate and gift	To the highest income class
Excises, customs, and sales:	
Alcoholic beverage	Alcoholic beverage expenditures
Tobacco	Tobacco expenditures
Telephone and telegraph	Telephone and telegraph expenditures
Auto operation	Automobile operation expenditures
Other excises, etc.	Total current consumption
Property	Half housing expenditures and half total current consumption
Personal insurance:	
Personal contributions	Social security, railroad and government retirement contributions
Employer contributions	Total current consumption

Source: Tax Foundation, 1967.

taxes were allocated on the basis of total current consumption, reflecting the same assumption of taxes being passed on to the consumer. Plath (1975) and the Tax Foundation (1967) allocated corporate taxes on the basis of one-half to total current consumption and one-half to dividend income assuming part of the tax was passed back to stockholders. However, the survey's dividend income data were not significant and, therefore, were not used. Allocated all corporate taxes to current consumption made little difference in the final results as these taxes were a small part of the total tax burden.

Social security taxes were allocated one-half to social security contributions (employee share) and one-half to total current consumption (employer's share). Again, this allocation assumes employers pass the tax forward to the consumer.

Although it is recognized that taxes can be "exported" (shifted out of state) or "imported" (shifted from other states to Arizona residences), there are little data available concerning the magnitude of such shifts. Therefore, following Plath (1975), it was assumed that "imported" and "exported" taxes offset each other.

Allocation of Benefits

Government expenditures fall into two categories, those for public and for specific goods. Pure public goods are those goods which are not diminished by another's consumption. The Tax Foundation (1967, p. 12) defines public goods as national defense, civilian safety, postal service, international affairs, general government (excluding interest), commerce and finance, health and sanitation, natural resources, public utilities,

transportation (excluding highways) and other miscellaneous expenditures. Other government expenditures such as those for education, welfare, social security, veterans benefits, agriculture, highways, labor and manpower, etc., were defined as specific goods. Each individual's consumption diminishes these goods.

Such definitions are arbitrary to an extent. Many goods such as highways, education or even agriculture may be either public or specific or a combination of each. Because of this problem, two definitions of public goods were used in this study. These definitions are identical to those for the high and low total quantity of public goods as defined by Aaron and McGuire (1970). See Tables 3 and 4 for exact definitions. Alternative A (the low total quantity of public goods) uses the Tax Foundation definition of public goods. Alternative B (the high total quantity of public goods) consists of all goods in Alternative A plus a portion of government expenditures for elementary and secondary education (0.7), higher education (0.5), veterans' benefits (0.3), highways (0.5), public assistance and welfare (0.3), and agriculture (0.3). These expenditure goods were included under the alternative definition of public goods because they "generated significant externalities" although the exact proportion classified as public goods was arbitrary (Aaron and McGuire, 1970, p. 915).

Benefits from government expenditures for public goods were allocated among income classes by the method outlined by Aaron and McGuire (1970) and Maital (1973) as presented in Chapter II of this study. The value of public goods to an income class (J) equals:

Table 3. Bases for the Allocation of Government Expenditure Benefits by Income Class, Alternative A.[a]

Expenditures	Basis of Allocation
PUBLIC GOOD EXPENDITURES:	Marginal utility of income: $AB_J = OG\left[\frac{(Y_D^J + Y_S^J)^{-\phi}}{\Sigma_i (Y_D^i + Y_S^i)^{-\phi}}\right]$
National defense and international affairs	
Other general benefit expenditures	
General government	
Postal service	
Civilian safety (police, fire, etc.)	
Transportation (excluding highways)	
Commerce and finance	
Health and sanitation	
Other and miscellaneous	
Natural resources	
Public utilities	
SPECIFIC GOOD EXPENDITURES:	
Education:	
Elementary and secondary	Number of children under 18
Higher education	Higher education expenditures of families
Public assistance relief and other welfare	Income from public social assistance and private relief
Labor and manpower	Wages and salaries
Veterans benefits and services	Military allotments and pensions
Highways	Half auto operation expenditures and half total current consumption
Agriculture	Farm money income before taxes
Net interest	Interest income
Social insurance benefits	Public unemployment and social security benefits

a. Alternative A is low total quantity of public goods.

Sources: Tax Foundation (1967) and Maital (1973).

Table 4. Bases for the Allocation of Government Expenditure Benefits by Income Class, Alternative B.[a]

Expenditures	Basis of Allocation
PUBLIC GOOD EXPENDITURES:	Marginal utility of income: $AB_J = OG \frac{(Y_D^J + Y_S^J)^{-\phi}}{\Sigma_i (Y_D^i + Y_S^i)^{-\phi}}$
National defense and international affairs	
Other general benefits expenditures:	
General government	
Postal service	
Civilian safety (police, fire, etc.)	
Transportation (excluding highways)	
Commerce and finanae	
Health and sanitation	
Other and miscellaneous	
Natural resources	
Public utilities	
Education:	
Elementary and secondary (70%)	
Higher education (50%)	
Public assistance and other welfare (30%)	
Veterans benefits and services (30%)	
Highways (50%)	
Agriculture (30%)	
SPECIFIC GOOD EXPENDITURES:	
Education:	
Elementary and secondary (30%)	Number of children under 18
Higher education (50%)	Higher education expenditures of families
Public assistance relief and other welfare	Income from public social assistance and private relief
Labor and manpower (50%)	Wages and salaries
Veterans benefits and services (70%)	Military allotments and pensions
Highways (50%)	Half auto operation expenditures and half total current consumption
Agriculture (70%)	Farm money income before taxes
Net interest	Interest income
Social insurance benefits	Public unemployment and social security benefits

a. Alternative B is high total quantity of public goods.

Sources: Tax Foundation (1967) and Maital (1973).

$$AB_J = OG\ [(Y_D^J + Y_S^J)^{-\phi} / \Sigma_i (Y_D^i + Y_S^i)^{-\phi}]$$

where: AB_J = the dollar value to income class i of public goods

OG = total expenditures on all public goods provided by the government

Y_D^J = the disposable income of income class J

Y_S^J = government transfer payments and specific goods benefits to income class

ϕ = the inverse of the elasticity of substitution between public and private goods (-1.5 in this study).

Specific goods benefits were allocated on the basis of each income classes' relative share of expenditures for or receipts of the specific good in question. See Tables 3 and 4. Thus, benefits from government expenditures for higher education were allocated to income classes on the basis of each classes' relative share of total expenditures for higher education. Elementary and secondary education expenditure benefits were allocated on the basis of the relative number of children under 18 in each income class, as determined from the survey data.

Public assistance and other welfare benefits were distributed on the basis of estimated income from these sources. These estimates were based on 1970 U. S. Census income source data and incomplete data from the survey (U. S. Bureau of the Census, 1973a and 1973b). Social security benefits were apportioned to income classes on the basis of each classes' relative share of social security incomes.

Net interest payments by governments were distributed on the basis of each income classes' relative share of total interest income. Because of lack of significant data from the survey, veterans benefits

and services were allocated on the basis of the relative number of veterans in each income class using adjusted 1970 U. S. Census data. Labor and manpower expenditures were distributed on the basis of total wages and salaries of households in each income class (U. S. Bureau of the Census, 1973a).

Expenditures for agriculture were allocated on the basis of farm money income before taxes, from adjusted 1970 U. S. Census data (U. S. Bureau of the Census, 1973a). This method of allocation fails to take any externalities from specific goods expenditures into account. However, externalities were taken into account in the allocation of highway expenditure benefits. These benefits were allocated one-half on the basis of auto operations expenditures and one-half on total current consumption. This allocation reflects the externalities attributed to highway expenditures in the form of lower transportation costs and thus lower prices of transported items to consumers.

Although it was recognized that benefits from government expenditures are shifted into or out of Arizona from other states, no adjustments were made for such shifting of benefits. Because of the lack of data in this area, it was assumed that all shifts of benefits would cancel each other. This assumption was also employed by Plath (1975).

Income Concentration Ratios

As previously stated, the inequality of income distribution may be represented by the index of income concentration (Gini Ratio). This ratio indicates how far the actual distribution of incomes is from perfect equality.

Paglin (1975) has offered a revision of the traditional Gini Ratio. Paglin argues that age or generational difference should be taken into account when determining income equity. This argument is based on the fact that wealth is normally accumulated with age. Also, incomes tend to follow a trend over an individual's life cycle: lower in younger age levels, peaking in middle age, and then dropping off at retirement age. Because of this trend, Paglin argues that lifetime incomes should be used to judge income equality. Cross generational income comparisons are not appropriate due to inflation and normal income differences due to age. Therefore, Paglin suggests modifying the line of perfect equality (see Chapter I, Figure 1) to take into account generational income differences. He does this by calculating cumulative frequency distributions of families and incomes based on age groups. The resulting graph becomes the age adjusted line of equality. The area between the line of perfect equality and the age equality curve is subtracted from the Lorenz-Gini Ratio to arrive at the Paglin-Gini Ratio. This age adjustment results in a marked decline of inequality of incomes measured by the Gini Ratio.

An alternative refined measurement of income equity can be made. Here is is suggested that "need" rather than age is a better standard by which to judge equity. Larger families require more income to maintain a given level of living that smaller families. However, there are economies of size in families (i.e., a family of four requires less than twice the income of a family of two to maintain the same level of living). The traditional Lorenz Curve does not take these economies of size into account. The horizontal axis lumps together families of all sizes and thus of different income needs. If the horizontal axis is changed from

families to a direct population basis, the economies of size in families is still overlooked. (Family members have less income requirements than single persons, ceteris paribus.)

To rectify this situation, we can determine an adjustment factor to place all families, households, or individuals on an equal needs basis. This can be done roughly by utilizing U. S. Census "threshold of poverty" figures for various size households. Letting the average poverty threshold for a single individual equal one, all other households sizes are compared to the single individual by dividing their respective poverty threshold figures by that of the single individual to arrive at an adjustment ratio. This adjustment ratio multiplied by the number of households in each income class will give a new value of "adjusted households" or "consuming units" for each income class. These values, then, become the basis for the horizontal axis of the Lorenz curve and the cumulative frequency distribution of "adjusted households" used to determine the Lorenz Curve.

Utilizing this method, the line of equality is left as a straight 45° line, and the "consuming units" on the horizontal axis all represent units of roughly equal income needs. Though not perfect, this alternative is a better measure of inequality than Paglin's age adjustment. Much of his argument for including like age groups together is based on the idea of similar accumulated wealth. However, productive wealth shows up in income, as interest, dividends, rental income, rental value of home, etc. Nonproductive (nonincome generating) wealth does not show in current income and represents no actual claim on current production. If it is converted to money, it is shown as capital gains and is thus

included in income. Thus, accumulated wealth is reflected in current income insofar as it represents a claim on current production and the ability to satisfy current needs. Paglin's argument loses much of its force when accumulated wealth is accounted for by income. His argument of income differences due to age is still true, but fails to take into account the variation in needs between family units. When measuring income inequities, a needs basis seems more appropriate than Paglin's age basis.

In this study, the traditional indices of income concentrations are compared with the new indices of adjusted households or consuming units. Both these indices are approximated by the method utilized by Phares (1973, p. 101) where:

$$R = \frac{1/2 \; \Sigma \; [(X \; Y - i) - (Y \; X - i)]}{5000}$$

where: X = percent of total households or adjusted households

Y = percent of total income

R = Gini Ratio or index of income concentration

5000 = the area (in percent^2) under the line of equality.

Limitations of the Study

This study has several limitations which concern the data used and assumptions regarding the analysis and methods of allocation.

The study suffers from a small sample size in nonmetro lower income households. Also, certain categories of incomes, taxes and expenditures on the questionnaire were insufficiently sampled in order to derive generalizable conclusions. However, as the results seem reasonably consistent with other studies, it may be assumed that these data errors are within acceptable limits.

There are several assumptions which are necessary to allocate public goods expenditure benefits. These eight assumptions, as enumerated by Aaron and McGuire (1970, pp. 910-911), are outlined in Chapter II. The first two assumptions (regarding knowledge of each households' marginal rate of substitution between public and other goods and knowledge of the marginal and total cost of all public and specific goods) are necessary for their analysis. All other assumptions are made solely to simplify exposition. Any or all of them could be dropped if the appropriate information were available. However, all of these assumptions are necessary here in view of the lack of available data.

There are also problems with the exact definition of "pure" public goods. These problems are compensated for by using two different definitions. The assumption is also made that all benefits from expenditures occurred in the year in which they were made. This assumption neglects the fact that a capital expenditure for a building or new highway produces benefits for its entire life, not just for the year it was built. However, other government capital expenditures from previous years are still giving benefits in the study year. Thus, for purposes of simplicity, all expenditures are assumed to produce all these benefits in the year in which they were made.

The multiplier effect of government expenditures is also ignored as was done in all previous studies. Also, the exportation and importation of tax burdens and expenditure benefits is assumed to cancel each other and then to be of no effect. Again, lack of data makes these assumptions necessary.

Basically, these data problems and simplifications of reality are common to all studies of this type. The fact that these limitations do exist means that all results are estimates of reality. Better, more complete or accurate data and more refined methodology would result in better estimates. However, these results represent the best estimates which can reasonably be attained from the available data.

Limitations also exist in the use of the Gini Ratio as a measure of income inequity. The Gini Ratio fails to reflect the nature of the skewness or bias in income distributions. Thus, two different income distributions with different income skews could both be represented by the same Gini ratio.

In this study, the cumulative distributions of incomes and households reflect a similar higher income skew. Thus, the Gini Ratios calculated in this study do measure inequity relative to each other. This internal consistency makes possible the evaluation of the effects of government fiscal policies on income distributions.

CHAPTER IV

RESULTS OF THE ANALYSIS

In this chapter, the procedures outlined in Chapter III were applied to the study data. The results were then analyzed to determine the effects of government fiscal actions on income distributions in Arizona. These effects were divided into three categories (regressive, neutral, and progressive) as defined in the introduction.

Initial Income Distribution

The initial (pre-tax, pre-benefit) income distribution was determined utilizing survey and adjusted 1970 census data as described in the last chapter. (This distribution is shown in Table 5.) In the metro areas of Arizona, the number of households increased with increasing income. The lowest income group ($0 - 3,499) represented about 10% of all Arizona households while the highest group ($15,200+) consisted of over 25% of all Arizona households. The nonmetro areas had a more even distribution of households with the four lowest income groups each accounting for 3.8% to 4.5% of all Arizona households, while the highest income group represented 6% of all households. However, this highest income group claimed over 20 times the initial income of the lowest group. The overall initial income distribution proved to be more equal for metro areas than for nonmetro areas. The Gini index of income concentration was .3472 for metro households versus .3977 for nonmetro households. When differences in household sizes were taken into account, the index

Table 5. Initial Income Distribution per Arizona Household, 1974.

Income Class ($)	Average ($)	Class Income (% of Total)	Number of Households	Households (% of Total)
METRO				
0 - 3,499	1,766	1.2	68,270	10.2
3,500 - 6,899	5,508	4.6	76,483	11.4
6,900 - 10,499	9,142	8.9	87,776	13.1
10,500 - 15,199	13,239	15.2	102,663	15.3
15,200 +	24,949	50.3	178,632	26.7
NONMETRO				
0 - 3,499	1,742	.5	30,504	4.6
3,500 - 6,899	4,428	1.2	25,655	3.8
6,900 - 10,499	8,683	2.9	30,036	4.5
10,500 - 15,199	13,419	4.5	29,878	4.5
15,200 +	23,649	10.7	40,203	6.0

of income concentrations both showed greater equality, .2840 for metro households and .3318 for nonmetro households.

Tax Burden

The tax burden to income classes was estimated by the methods previously described. Basically, total taxes were allocated to each income class based on the percentage each class paid of the total tax or on the percentage of total expenditures for the taxed item. The estimated tax burden is summarized in Table 6.

From Table 7, it can be seen that the individual income tax and social security contributions represent the largest segment of federal revenues in 1974. On the state-local level, property and sales taxes are the two largest producers of revenue, with the individual income tax a distant third.

From Table 8, it can be seen that the overall tax structure is regressive (i.e., favors higher income households more than lower income households) except in the highest income class. The total federal tax structure is very regressive in nonmetro households and slightly progressive in higher income metro households. The state-local tax system is regressive throughout all metro and nonmetro income classes.

The federal income tax was progressive, except in the lowest income class, in metro areas but was regressive in all but the highest income class in nonmetro areas. The use of initial income instead of money income may have caused the apparently regressive effect of this supposedly progressive tax. (Money incomes are much higher for lower income classes due to the exclusion of transfer payments, etc., from the

Table 6. State-Local Tax Burden per Arizona Household, 1974 (Percent of Initial Income).

Income Class ($)	Property Tax	Total Sales Tax	Sales Tax (Food Only)	State Income Tax	Total State-Local Taxes
METRO					
0 - 3,499	19.0	23.5	5.2	2.2	61.3
3,500 - 6,899	9.2	8.2	2.0	.7	23.7
6,900 - 10,499	5.0	5.3	1.3	1.1	15.1
10,500 - 15,199	4.0	4.2	1.0	1.4	12.7
15,200 +	3.6	3.1	.7	2.0	11.0
NONMETRO					
0 - 3,499	44.7	21.4	5.8	3.9	87.4
3,500 - 6,899	17.7	9.2	2.7	2.7	37.2
6,900 - 10,499	8.7	5.1	1.3	1.3	19.8
10,500 - 15,199	5.4	3.8	.9	2.1	14.2
15,200 +	5.6	3.2	.7	1.5	12.9

Table 7. Federal and State-Local Taxes Collected in Arizona (1974).

Taxes	Tax Revenue ($ Millions)	Percent of Revenue
FEDERAL TAXES		
Individual Income Tax	1,034.51	58.1
Corporate Income Tax	200.27	11.2
FICA Tax	427.90	24.0
Motor Fuel Taxes	64.83	3.6
Estate and Gift Taxes	42.92	2.4
Miscellaneous Taxes	10.91	.6
TOTAL FEDERAL TAXES	1,781.34	99.9
STATE-LOCAL TAXES		
Individual Income Tax	151.94	11.9
Corporate Income Tax	58.70	4.6
Property Tax	459.50	36.1
Sales Tax	380.63	29.9
Motor Fuel Tax	87.24	6.9
Tobacco Tax	27.15	2.1
Alcohol Tax	13.69	1.1
Miscellaneous Taxes	93.22	7.3
TOTAL STATE-LOCAL TAXES	1,272.07	99.9

Sources: Valley National Bank (1975) and Arizona Department of Revenue (1975)

Table 8. Federal and Total Tax Burden per Arizona Household, 1974 (Percent of Initial Income).

Income Class ($)	FICA Tax	Federal Income Tax	Total Federal Taxes	Total All Taxes
METRO				
0 - 3,499	16.3	17.5	50.3	111.6
3,500 - 6,899	7.0	6.8	19.6	43.3
6,900 - 10,499	5.7	8.4	17.8	32.9
10,500 - 15,199	5.1	9.7	17.9	30.6
15,200 +	3.8	13.2	19.9	30.9
NONMETRO				
0 - 3,499	18.3	14.4	50.1	137.5
3,500 - 6,899	9.1	13.8	30.6	67.8
6,900 - 10,499	5.8	9.5	19.5	39.3
10,500 - 15,199	5.0	8.7	16.7	30.9
15,200 +	4.3	12.2	20.2	33.1

definition of "initial" income.) Social security contributions (see Table 8) were found to be very regressive, with the lowest income classes' burden over four times the proportion of initial income as the highest income households in both metro and nonmetro areas.

State income taxes proved to be progressive in all but the lowest income class in metro Arizona. The income tax had a mixed, but essentially regressive impact on nonmetro households. Property tax represented not only the largest single state-local tax, but also was the most regressive. Part of its regressiveness in nonmetro households was probably due to allocating one-half of these taxes to total consumption. Much of these taxes were paid by large mining companies and were, in all probability, "exported" out of the state. However, due to lack of data, no allowance was made for this export; hence, the overstatement of property tax impact. Sales taxes were also extremely regressive, as were the portion of these taxes on food (see Table 6). Most other state-local taxes were regressive, but represented an insignificant amount of the total tax burden.

Expenditure Benefits

Government expenditure benefits were divided into two categories, public and specific. Because of the problems involved in precisely defining public goods, two methods of allocating benefits were used. Alternative A, with a low total quantity of public goods is a limited definition of public goods. Alternative B is a broader definition including portions of expenditures that were considered specific goods under

Alternative A. (Both Alternatives are described in more detail in Chapter III.)

Public Goods Expenditure Benefits

Alternative A

Under Alternative A, about 60% of all federal expenditures and 37% of all state-local expenditures were for public goods. These expenditures were progressively allocated among lower income households (see Table 9). However, households with initial incomes of over $10,500 received an increasing relative share of these benefits. This overall "U" shaped distribution applied for all public goods, both federal and state-local for metro and nonmetro households. Nonmetro households received a slightly higher level of benefits (13.7% to 22.5%), relative to their incomes, than metro households (8.3% to 17.1%). In every case, the lowest and highest income households received an almost identical proportion of their initial incomes in public goods benefits, while middle income households ($6,900 to $10,499) received the smallest relative share of public goods benefits.

Alternative B

For Alternative B, public goods were almost 69% of total federal spending, and 70% of total state-local spending. The distribution of these expenditure benefits was slightly greater than those under Alternative A, but was also "U" shaped. Overall, metro households received benefits from public goods expenditures amounting to 10.7% to 22.1% of their initial incomes depending on income class. Nonmetro households

Table 9. Public Goods Expenditure Benefits per Arizona Household, 1974 (Percent of Initial Income).

Income Class ($)	Alternative A			Alternative B		
	Federal	State-Local	Total	Federal	State-Local	Total
METRO						
0 - 3,499	12.3	4.1	16.4	13.8	7.3	21.1
3,500 - 6,899	9.5	3.2	12.7	10.7	5.6	16.3
6,900 - 10,499	6.2	2.1	8.3	7.0	3.7	10.7
10,500 - 15,199	7.4	2.5	9.9	8.5	4.4	12.9
15,200 +	12.8	4.3	17.1	14.5	7.6	22.1
NONMETRO						
0 - 3,499	18.4	4.0	22.4	20.8	9.4	30.2
3,500 - 6,899	11.0	3.0	14.0	12.4	5.7	18.1
6,900 - 10,499	11.2	2.5	13.7	12.6	5.7	18.3
10,500 - 15,199	11.9	2.6	14.5	13.5	6.1	19.6
15,200 +	18.5	4.0	22.5	20.9	9.5	30.4

received public goods benefits of 18.1% to 30.4% of their initial incomes. The highest and lowest income households in all cases received benefits amounting to almost the same percentage of their initial incomes.

Specific Goods Expenditure Benefits

Overall, specific goods benefits were progressively distributed except to the highest income class (see Table 10). This progressive distribution was due, in part, to the inclusion of such government transfer payments as social security, public assistance, etc. in the definition of specific goods. These payments make up a large share of low income households' total incomes.

Alternative A

Federal specific goods expenditure benefits were very progressively distributed under Alternative A (see Table 10). Lower income metro households benefitted by almost 200% of initial icnomes while the highest income households benefitted by only 5% of their initial incomes. Social security payments represented the largest proportion of these benefits, almost one-half of all specific goods benefits (see Table 11). Veterans benefits were also progressively distributed from 15.3% to .9% of initial incomes for the lowest and highest income households, respectively. Nonmetro households benefitted similarly from federal specific goods benefits.

State-local specific expenditure benefits were also progressively distributed (see Table 10). Metro lower income households were estimated to receive welfare benefits of 41.2% of their initial income (see Table 11). These benefits rapidly decreased to 2.2% for the next lowest income

Table 10. Government Specific Goods Expenditure Benefits per Arizona Household, 1974 (Percent of Initial Income).

Income Class ($)	Alternative A			Alternative B		
	Federal	State-Local	Total	Federal	State-Local	Total
METRO						
0 - 3,499	195.6	77.0	272.6	170.1	45.7	215.8
3,500 - 6,899	58.4	16.7	75.1	52.6	9.3	61.9
6,900 - 10,499	14.0	11.2	25.2	10.7	4.8	15.5
10,500 - 15,199	7.1	8.4	15.5	4.8	3.4	8.2
15,200 +	5.0	7.0	12.0	3.7	3.4	7.1
NONMETRO						
0 - 3,499	159.0	75.1	234.1	135.5	38.3	173.8
3,500 - 6,899	61.5	33.6	95.1	48.7	13.1	61.8
6,900 - 10,499	14.8	17.4	32.2	10.8	8.4	19.2
10,500 - 15,199	8.8	10.3	19.1	6.1	4.1	10.2
15,200 +	6.2	10.0	16.2	4.1	4.5	8.6

Table 11. Government Specific Goods Expenditure Benefits (Alternative A) per Arizona Household, 1974 (Percent of Initial Income).

Income Class ($)	Federal Welfare	State Welfare	Elementary Secondary Education	Social Security	Federal Veterans	Federal Agriculture
METRO						
0 - 3,499	48.4	41.2	14.9	115.8	15.3	6.0
3,500 - 6,899	2.6	2.2	6.0	39.6	4.8	6.0
6,900 - 10,499	.5	.4	5.3	5.2	3.7	1.6
10,500 - 15,199	--	--	5.0	1.6	2.5	.3
15,200 +	--	--	2.7	1.2	.9	.7
NONMETRO						
0 - 3,499	27.5	23.4	31.4	93.4	10.2	11.1
3,500 - 6,899	2.4	2.1	23.0	36.7	5.1	14.8
6,900 - 10,499	.4	.3	5.1	14.9	3.3	3.9
10,500 - 15,199	--	--	6.3	2.4	2.4	.7
15,200 +	--	--	2.9	.5	1.2	2.5

households and were estimated to be of no benefit to the $10,000 plus income households. Benefits from expenditures for elementary and secondary education (the largest item in state and local budgets) were also very progressively distributed, ranging from 14.9% down to 2.7% for low and high income metro households and from 31.4% to 2.9% for low and high income nonmetro households.

Overall, state-local and federal specific goods were distributed progressively. However, state-local benefits represented a relatively smaller proportion of initial income in lower income households and relatively larger proportion of initial income in higher income households than federal specific goods. Thus, the state and local specific goods distribution was progressive, but less so than for federal specific goods.

Alternative B

With a more limited definition of specific goods under Alternative B, the level of benefits was a little lower to all income households. However, the benefits were progressively distributed in the same manner as Alternative A.

Federal specific goods showed only a small decline because social security payments were included totally just as under Alternative A. Social security payment benefits represented 45% of all federal specific goods benefits under Alternative A and 56% under Alternative B. The overall distribution of federal specific goods benefits was similar for metro and nonmetro areas ranging from 170% of initial income to 3.7% to

metro households and 135% to 4.1% of initial income to nonmetro households (see Table 10).

State and local specific goods benefits had a similar but smaller range of variation. Here public assistance payments and elementary and secondary education expenditures represented the bulk of the benefits to the lowest income group. These education expenditures were the largest single item in state and local specific goods expenditures and were progressively distributed to both metro and nonmetro households.

Net Government Benefits

Total government benefits minus total government taxes for each income group equals net government benefits for that income group. This net figure, divided by initial income, can be used to determine the net progressiveness regressiveness of all government fiscal action.

Alternative A

Net government fiscal benefits were progressively distributed to all but the highest income households (see Table 12). The lowest income metro households received relatively more benefits than their nonmetro counterparts (177.4% versus 119.0%). However, the middle and upper income nonmetro households benefitted relatively more than metro households. Interestingly, all nonmetro households received positive net government benefits under Alternative A. The two highest income metro households groups, however, received benefits less than their total tax burden, with the second highest income group more heavily taxed than the highest (-5.2% versus -1.8%).

Table 12. Net Government Benefits per Household, 1974 (Percent of Initial Income).

Income Class ($)	Alternative A			Alternative B		
	Federal Benefits	State-Local Benefits	Total Net Benefits	Federal Benefits	State-Local Benefits	Total Benefits
METRO						
0 - 3,499	157.6	19.8	177.4	133.6	- 8.3	125.3
3,500 - 6,899	48.3	- 3.8	44.5	43.7	- 8.8	34.9
6,900 - 10,499	2.4	- 1.8	0.6	- 0.1	- 6.6	- 6.7
10,500 - 15,199	- 3.4	- 1.8	- 5.2	- 4.6	- 4.9	- 9.5
15,200 +	- 2.1	.3	- 1.8	- 1.7	0.0	- 1.7
NONMETRO						
0 - 3,499	127.3	- 8.3	119.0	106.2	-39.7	66.5
3,500 - 6,899	41.9	- 0.6	41.3	30.5	-18.4	12.1
6,900 - 10,499	6.5	0.1	6.6	3.9	- 5.7	- 1.8
10,500 - 15,199	4.0	- 1.3	2.7	2.9	- 4.0	- 1.1
15,200 +	4.5	1.1	5.6	4.8	1.1	5.9

The regressiveness in the highest income groups (both metro and nonmetro) is due to the regressiveness of the state-local tax structure and to the high level of public goods benefits which were allocated on an income related basis.

Alternative B

In spite of the higher level of public goods benefits allocated under this alternative, total net benefits were less than Alternative A (see Table 12). Thus, higher public goods benefits were more than compensated for by a much lower level of specific goods benefits.

Under this alternative, net benefits were again allocated progressively except in the highest income households of metro and nonmetro Arizona. These benefits ranged from 125.3% to -9.5% of initial incomes for metro households and from 66.5% to -1.8% of initial incomes of nonmetro households. In the higher income classes, the public goods benefits from the state and local governments were high enough to compensate for specific goods benefits losses. This situation occurred because of the high percentage of education expenditures which were shifted to the public goods sector. These goods were then essentially allocated on an income basis. Because the highest income households received approximately half of all income within their respective areas, they received a much larger share of the total public goods benefits.

Post-Fiscal Income Distribution

The post-fiscal income distribution was determined by adding net government benefits to the initial income distribution. The resulting income distribution (Table 13) shows more equality of income than

Table 13. Post Fiscal Income Distribution per Arizona Household, 1974.

Income Class ($)	Initial Income	Alternative A		Alternative B	
		Net Government Benefits	Post Fiscal Income	Net Government Benefits	Post Fiscal Income
METRO					
0 - 3,499	$ 1,766	$3,133	$ 4,899	$2,213	$ 3,979
3,500 - 6,899	5,508	2,451	7,959	1,928	7,436
6,900 - 10,499	9,142	50	9,192	- 621	8,521
10,500 - 15,199	13,239	- 670	12,569	-1,247	11,992
15,200 +	24,949	- 431	24,518	- 398	24,551
NONMETRO					
0 - 3,499	$ 1,742	$2,072	$ 3,814	$1,158	$ 2,900
3,500 - 6,899	4,428	1,831	6,259	536	4,964
6,900 - 10,499	8,683	572	9,255	- 148	8,535
10,500 - 15,199	13,419	363	13,782	- 153	13,266
15,200 +	23,649	1,329	24,978	1,408	25,057

the initial (pre-government fiscal action) income distribution. Under Alternative A, the index of income concentration for metro Arizona was .2873 and .3436 for nonmetro Arizona (see Table 14). Both are smaller than the .3472 and .3977 respective indices of the initial income distribution, thus indicating a more even distribution of incomes. Alternative B produces indices less than the initial income distribution but greater (less equality) than Alternative A.

After adjusting the Gini ratios for family size, all the post-fiscal income distributions showed more equality of income than the initial distribution. However, from Table 14, it can be seen that the differences in the indices were not as great as with the traditional Gini ratios. In all cases, Alternative B with its high quantity of public goods shows less reduction in the inequality of incomes than Alternative A with its larger amount of specific goods benefits.

Table 14. Income Concentration (Gini) Ratios, Arizona Households, 1974.

Income Ratio	Metro	Nonmetro
Initial Income		
Gini Ratio	.3472	.3977
Adjusted Gini[a]	.2840	.3318
Post Fiscal Income		
Alternative A		
Gini Ratio	.2873	.3436
Adjusted Gini[a]	.2255	.3160
Alternative B		
Gini Ratio	.3086	.3806
Adjusted Gini[a]	.2469	.3161

a. Adjusted for differences in family size.

CHAPTER V

SUMMARY AND POLICY IMPLICATIONS

Summary of Results

The data indicate that the state-local tax structure in both metro and nonmetro Arizona is very regressive, due to their heavy reliance on sales and property taxes for revenues. The federal tax burden is "U" shaped, being regressive to lower income households, neutral to middle income households and progressive to the highest income groups. The regressiveness is primarily due to social security contributions while the progressiveness at higher income levels is due to the graduated income tax. Overall, the total tax burdens for all levels of government are regressively distributed.

Mitigating this regressiveness, federal, and state-local specific goods expenditures are very progressively distributed. This situation is primarily due to public assistance, social security and other welfare type transfer payments which make up a large share of total income for households in the low income category.

Public goods benefits are "U" shaped for both federal and state-local government expenditures. The regressiveness in the highest income households appears to result from the large share of total income which is claimed by that class. These benefits are allocated on the basis of relative disposable income, albeit modified by the inverse of the marginal rate of substitution between public and private goods. Using disposable

income rather than initial income for allocation also appears to cause the progressiveness to the lower income households. This progressiveness is because disposable income is much greater than initial income in these households due to the magnitude of government transfer payments which are not included in initial income.

The net impact of all levels of government fiscal action is progressive except in the highest income households. This result is because of the decreasing importance of specific goods benefits and increasing importance of public goods benefits as incomes increase. Thus, the lower two income classes and the highest class receive more benefits, relative to their initial incomes, than the middle income households.

Tests of the Hypotheses

From the results of the analysis, the ten original hypotheses of this study are tested.

The first hypothesis that the federal government tax burden was progressively distributed is refuted by the data. Likewise, the second hypothesis that the state-local tax burden was progressively distributed is also refuted by the data. The hypothesis that the total government tax burden is progressively distributed also is shown to be false.

The fourth hypothesis that specific goods expenditure benefits from all levels of government fiscal action were distributed progressively is confirmed by the data. However, the fifth hypothesis that public goods expenditure benefits were progressively distributed is partially refuted. Public goods benefits were progressively distributed at lower

income levels, but were regressively distributed to the highest income households.

The sixth hypothesis that metro households received a higher amount of all government benefits, relative to their income, than nonmetro households is almost completely refuted. In all but the lowest income level, the nonmetro households received a higher level of benefits relative to their initial incomes.

The seventh hypothesis that the net benefits (expenditures on benefits minus taxes) of all levels of government were greater for metro households than for nonmetro households is confirmed by the data.

The eighth hypothesis that the net benefits of federal fiscal action were progressively distributed is confirmed except for the highest income classes in both metro and nonmetro areas. However, the ninth hypothesis that state-local net benefits were progressively distributed was refuted. To metro households, these benefits were distributed regressively except to the lowest income class. A completely regressive distribution of net benefits was received by nonmetro households.

The final hypothesis that net government fiscal action results in a more even distribution of income was not refuted by either the traditional Gini Ratios or by the Gini Ratios adjusted for family size. All these ratios for both metro and nonmetro households indicate that net government fiscal action redistributes income more equally than the initial distribution.

Comparisons with Former Studies

All of these results are in basic agreement with the findings of Plath (1975). The Plath study used the same methodology as this study to examine the effects of federal policy in the western United States. Utilizing 1961 data, Plath found an essentially similar shaped distribution of benefits, taxes, and net fiscal benefits to those of this study. However, the present study generally estimated benefits as a higher proportion of initial income than in the Plath study. Tax burdens were found higher in the lowest income classes and slightly lower in the highest income classes than in the Plath study.

The higher relative benefits of the present study seem to be due to the higher level of government spending in 1974 versus 1961 as well as to the fact that federal expenditures in Arizona exceeded tax revenues by 75% ($1.283 billion) in fiscal 1974 (Valley National Bank, 1975, pp. 25-30).

The differences in tax rates in the lowest and highest income classes is explained by the utilization of a pre-tax income for the present study versus an after tax income in the Plath study. The Tax Foundation noted that such a change of income classification would, except for the lowest and highest income classes, change the effective tax rates very little (Tax Foundation, 1967, p. 55).

Despite these small differences in the magnitude of benefits and taxes, Plath came to the same basic conclusions regarding the regressiveness and progressiveness of government fiscal action as the present study. Thus, in spite of increased government fiscal activity, the basic

regressiveness or progressiveness of this activity appears to be unchanged over time.

Policy Implications

If a more even distribution of income within Arizona is desired, present fiscal policy should be modified.

State and local governments are aggravating income inequities by their heavy reliance on the regressive sales and property taxes for revenues. Increased use of more progressive taxes such as the graduated income tax would reduce this problem.

The federal tax structure contains a heavy regressive element in social security contributions of workers which must be matched by their employers. However, social security payments to the retired, disabled, orphaned, etc. represent the most progressive element of all government benefits. These payments more than offset the regressive impact of social security taxes, due to the relatively large population of retired workers in Arizona.

Due to a large welfare component, specific goods benefits are progressively distributed. Public goods benefits, however, have a "U" shaped distribution which is regressive at higher income levels. If increased income equity is a goal, more specific goods expenditures to help low income households and less public goods expenditures would be in order. However, fewer public goods would hurt the lower as well as the higher income groups. It is the middle income classes that would be helped by decreased expenditures on public goods.

Expenditure benefits from all levels of government fiscal activity are somewhat greater for nonmetro households than for metro households, except in the lowest income class. However, state-local taxes are a relatively larger burden to nonmetro households than to metro households. For greater income equity between regions, this nonmetro tax bias should be reduced.

The results of this study indicate that government fiscal action does redistribute income. However, redistribution sometimes results in less rather than greater income equality. Changes in the state-local tax structure as well as expenditure policies are necessary to bring about a more even distribution of income.

APPENDIX A

DATA COLLECTION MATERIAL

Cover Letter

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL ECONOMICS

May 26, 1975

Mr Wesley Bohner
460 N. Hall St
Mesa, Az 85203

Dear Mr Bohner:

Taxes and what the taxpayer receives for the taxes he pays are topics that concern us all. These topics are being discussed more frequently in light of recent economic events. It is discomforting to learn that little is known about how government taxes and expenditures affect our incomes.

The Department of Agricultural Economics at the University of Arizona is doing a study to determine just how taxes and government expenditures do affect peoples' incomes in Arizona. To finish this study, it is crucial that we have reliable information on incomes and consumer expenditure patterns of Arizona residents. You are one of a number of Arizona residents being asked to provide information on these matters. Your name was drawn in a random sample of all households in the state. In order that the results will truly represent the financial position of the people of Arizona, it is important that each questionnaire be completed and returned as soon as possible.

You may be assured of complete confidentiality. Each questionnaire contains an identification number for mailing purposes only. This permits us to check your name off the mailing list when your questionnaire is returned. Your name will not be placed on the questionnaire and once all questionnaires have been returned, mailing lists and identification numbers will be destroyed. Furthermore, all results of this study will be published in such a way that answers on any single questionnaire cannot be identified.

We ask that the adult member of your family most familiar with the family finances fill out the questionnaire, but feel free to have other members of your family assist. Please combine the incomes and expenditures of all the family members living at home, plus those members who may not live at home but are financially supported by the family, to determine the income and expenditures of your entire family.

Please fill in the answers to the best of your knowledge and return the questionnaire to us in the enclosed self-addressed envelope as soon as possible. Your contribution to this study is very greatly appreciated.

Sincerely yours,

Harry W. Ayer
Associate Professor
Phone: 884-3228

Joel C. Plath
Research Assistant

Questionnaire

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL ECONOMICS

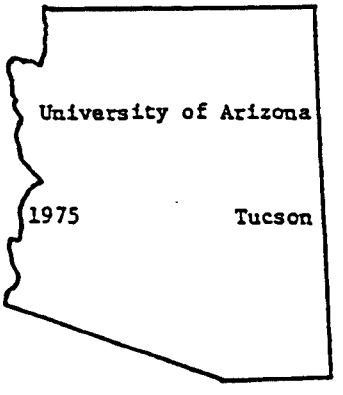
HOW WELL ARE WE DOING?

A study of the effect of government taxation and spending on Arizonans

Please have an adult member of your family answer these questions.

Please answer all questions.

Thank you for your cooperation.



I. GENERAL INFORMATION

1. Governments provide various services to citizens (police and fire protection, education, regulation of businesses, etc.) and also provide benefits to the disadvantaged (health services, welfare, Social Security, etc.).

Do you feel that the level of such services and benefits provided by governments are too high, too low, or about right?

	Too High	Too Low	About Right
a. National defense	____	____	____
b. International affairs	____	____	____
c. Health	____	____	____
d. Education	____	____	____
e. Welfare (Social Security, etc.)	____	____	____
f. Civilian safety (police, fire, etc.)	____	____	____
g. Transportation	____	____	____
h. Public utilities	____	____	____
i. Agriculture	____	____	____
j. Natural resources	____	____	____
k. Other (specify)			
(1) _____	____	____	____
(2) _____	____	____	____
(3) _____	____	____	____
(4) _____	____	____	____
(5) _____	____	____	____

2. Governments pay for the benefits and services they provide from tax and nontax revenues. Do you feel that you get your "money's worth" from:

	Definitely Yes	Yes	Uncertain	No	Definitely No
Federal Government	____	____	____	____	____
State Government	____	____	____	____	____
Local Government	____	____	____	____	____

INSTRUCTIONS FOR PART II:

The following questions relate to how much your family spends for various items. We would appreciate the most accurate answers you can give. If exact amounts are unknown, please give your best estimate.

We realize that some of the expenditure items are most easily tabulated on an annual basis while others are more frequent and are more easily determined on a monthly basis. Please feel free to fill in the amounts on either a monthly average or on an annual basis, but please circle "monthly" or "annual" in the right-hand column to indicate what time period you use for each item.

II. FAMILY CONSUMPTION EXPENDITURES — (Family includes all members living at home and all members financially supported by the family but not living at home.) How much did your family spend for the following items in 1974:

	Dollar Amount	Circle One	
1. Food, tobacco, and alcohol expenditures			
a. Food purchased for home consumption:	$_____	MONTHLY	ANNUAL
b. Meals and beverages purchased in restaurants or other commercial places:	$_____	MONTHLY	ANNUAL
c. Food furnished to governmental (including military) and commercial employees:	$_____	MONTHLY	ANNUAL
d. Food produced and consumed on farm:	$_____	MONTHLY	ANNUAL
e. Tobacco products:	$_____	MONTHLY	ANNUAL
f. Alcoholic beverages:	$_____	MONTHLY	ANNUAL
2. Clothing, accessories and jewelry expenditures such as shoes, clothing, dry cleaning, value of military clothing issued, jewelry and watches, etc.	$_____	MONTHLY	ANNUAL
3. Personal care expenditures such as cosmetics, shaving equipment, soaps, haircuts, expenditures at beauty parlors, etc.:	$_____	MONTHLY	ANNUAL
4. Housing expenditures:			
a. If you rent, how much rent do you pay?	$_____	MONTHLY	ANNUAL
b. If you own or are buying your own home, what do you estimate its rental value to be?	$_____	MONTHLY	ANNUAL

	Dollar Amount	Circle One	
5. Household expenditures such as:			
a. Furniture, kitchen and household appliances, china and tableware, etc.	$_____	MONTHLY	ANNUAL
b. Cleaning supplies, stationary, etc.	$_____	MONTHLY	ANNUAL
c. Household utilities (electricity, water, gas, sewage, etc.)	$_____	MONTHLY	ANNUAL
d. Telephone and telegraph	$_____	MONTHLY	ANNUAL
e. Domestic service (maid, butler, etc.)	$_____	MONTHLY	ANNUAL
6. Medical care expenditures such as for doctors, dentists, drugs and prescriptions, pharmaceutical supplies, corrective appliances (glasses, braces, etc.), hospital care, health insurance premiums, etc.	$_____	MONTHLY	ANNUAL
7. Personal business expenditures such as brokerage charges, bank service charges, life insurance premiums, legal services, funeral expenses, etc.	$_____	MONTHLY	ANNUAL
8. Transportation expenditures:			
a. User-operated transportation:			
1. Purchase of new or used cars (purchase price)	$_____	MONTHLY	ANNUAL
2. Operating expenditures (gas, oil, repairs, storage, insurance premiums, car rental, etc.)	$_____	MONTHLY	ANNUAL
b. Purchased local transportaion (local bus, taxis, car pool, etc.)	$_____	MONTHLY	ANNUAL
c. Purchased long distance transportation (railway, intercity bus, airline, etc.)	$_____	MONTHLY	ANNUAL
9. Recreational expenditures such as magazines, newspaper, reading material, toys and sport supplies, radios, television, records, admission and expenditures for amusements, club dues, etc.	$_____	MONTHLY	ANNUAL
10. Educational expenditures (other than taxes):			

	Dollar Amount	Circle One	
a. Higher education (college tuition, books, dorm expenses, etc.)	$_____	MONTHLY	ANNUAL
b. Elementary and secondary schools	$_____	MONTHLY	ANNUAL
c. Other (special courses, adult education, etc.)	$_____	MONTHLY	ANNUAL
11. Religious and welfare activities expenditures, contributions and gifts	$_____	MONTHLY	ANNUAL
12. Foreign travel expenditures	$_____	MONTHLY	ANNUAL
13. Taxes paid in 1974:			
a. Federal			
1. Income	$_____	MONTHLY	ANNUAL
2. Estate and gift	$_____	MONTHLY	ANNUAL
3. Customs duties	$_____	MONTHLY	ANNUAL
4. Other	$_____	MONTHLY	ANNUAL
b. State and local			
1. Income	$_____	MONTHLY	ANNUAL
2. Property	$_____	MONTHLY	ANNUAL
3. Death and gift	$_____	MONTHLY	ANNUAL
4. Motor vehicle	$_____	MONTHLY	ANNUAL
5. Other	$_____	MONTHLY	ANNUAL

INSTRUCTIONS FOR PART III:

The following questions relate to how much your family earns from various sources. We would appreciate the most accurate answers you can provide. If exact amounts are unknown, please give your best estimate.

We realize, like expenditure items, that some of these items are more easily tabulated on a monthly basis and others on an annual basis. Please follow the same procedure as above, using a monthly average amount or annual amount, circling "monthly" or "annual" in the right-hand column to indicate the time period you are using for each item.

III. INCOME	Dollar Amount	Circle One	
1. How much did your family earn in 1974 in wages, salaries, commissions, bonuses, or tips from all jobs, before deductions for taxes, bonds, dues, Social Security, retirement, or other payments? (This amount is on your 1974 income tax returns under "Gross Income.")	$_____	MONTHLY	ANNUAL

	Dollar Amount	Circle One	
2. How much did your family receive in 1974 from:			
a. Receipts based on military service?			
(1) Mustering-out pay, bonuses, war insurance, refunds	$_____	MONTHLY	ANNUAL
(2) Veterans' pensions and compensations	$_____	MONTHLY	ANNUAL
(3) Dependency allotments	$_____	MONTHLY	ANNUAL
(4) Quarters and subsistence allotments	$_____	MONTHLY	ANNUAL
b. Workmens' compensation?	$_____	MONTHLY	ANNUAL
c. Lump-sum settlements from casualty insurance?	$_____	MONTHLY	ANNUAL
d. Private pensions and retirement pay from private employers, labor unions and other private sources?	$_____	MONTHLY	ANNUAL
e. Periodic payments received from private insurance annuities and trust funds?	$_____	MONTHLY	ANNUAL
3. How much did your family receive in 1974 from:			
a. Your own nonfarm business, professional practice, or partnership after business expenses? If business lost money, write "Loss" above amount.	$_____	MONTHLY	ANNUAL
b. Your own farm or a farm that you rent after operating expenses? Include earnings as a tenant farmer or sharecropper. If farm lost money, write "Loss" above amount.	$_____	MONTHLY	ANNUAL
4. How much did your family receive in 1974 from:			
a. The rental of real property, royalties on patents, copyrights, and rights on national resources?	$_____	MONTHLY	ANNUAL
b. Interest from bonds, savings accounts, mortgages, loans, etc.?	$_____	MONTHLY	ANNUAL
c. Dividends from stocks and cooperatives?	$_____	MONTHLY	ANNUAL

	Dollar Amount	Circle One	
d. Capital gains? (If you lost, write "Loss" above amount.)	$_____	MONTHLY	ANNUAL
5. How much did your family receive in 1974 from:			
a. Social Security and Railroad Retirement?	$_____	MONTHLY	ANNUAL
b. Public assistance or welfare payments? Include aid for dependent children, old age assistance, general assistance, aid to the blind or totally disabled.	$_____	MONTHLY	ANNUAL
c. Unemployment insurance benefits?	$_____	MONTHLY	ANNUAL
d. Gifts of cash from persons not in the household?	$_____	MONTHLY	ANNUAL
e. Regular contributions for support (alimony, etc.)?	$_____	MONTHLY	ANNUAL
f. Private disability income insurance?	$_____	MONTHLY	ANNUAL
g. Tax and insurance refunds?	$_____	MONTHLY	ANNUAL
h. Bequests and inheritances?	$_____	MONTHLY	ANNUAL
i. All other sources not reported elsewhere (Sale of property, receipts from roomers and boarders, etc.)?	$_____	MONTHLY	ANNUAL
6. How much did your family contribute for social insurance in 1974? (Old-age and survival insurance; state unemployment insurance; railroad retirement insurance; cash sickness compensation; federal, state and local public employee retirement systems; and premium payments for government life insurance):	$_____	MONTHLY	ANNUAL
7. How much did your family have in personal savings at the end of 1974?	$_____	MONTHLY	ANNUAL

IV. BACKGROUND INFORMATION

1. What is the name of your community? By community we mean the town or city in or near which you reside and depend upon most for goods, services, or other possible needs such as school, church, and recreational facilities.

_____
(Name of town or city)

PLEASE GO TO NEXT PAGE!!

2. (a) Do you live on a farm or ranch? Yes _____ No _____

   (b) If yes, is your principal source of income from the farm or ranch?
   Yes _____ No _____

3. How many members are there in your family? _____

4. How many full-time wage-income earners are there in your family? _____

5. How many members of your family are under 18 years of age? _____

THANK YOU! THESE ARE ALL OF THE QUESTIONS. YOUR CONTRIBUTION TO THIS EFFORT IS VERY GREATLY APPRECIATED. IF YOU WOULD LIKE A SUMMARY OF RESULTS, PLEASE PRINT YOUR NAME AND ADDRESS ON THE BACK OF THE RETURN ENVELOPE (NOT ON THIS QUESTIONNAIRE). WE WILL SEE THAT YOU GET IT.

Follow-up Letter

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL ECONOMICS

June 17, 1975

Mr Albert A. Barr
1215 3rd Av
Safford, Az 85546

Dear Mr Barr:

About three weeks ago we wrote to you seeking income and expenditure information from your family. As of today, we have not yet received your completed questionnaire.

We have undertaken this study because of the importance of determining just how taxes and government expenditures do affect people's net income in Arizona.

We are writing to you again because of the significance each questionnaire has to the usefulness of this study. Your name was drawn through a scientific sampling process in which every household in Arizona had an equal chance of being selected. In order for the results of this study to be truly representative of the financial positions of all Arizona residents, it is essential that each person in the sample return their questionnaire. Thus, we would like to encourage you to complete and return yours today.

Because of the nature of the information we need, please have the adult member of the family most familiar with the family finances fill out the questionnaire. But do not hesitate to have several members assist.

We ask again that expenditures and incomes of all family members living at home be included, plus those members who may not live at home but who are financially supported by the family.

In the event that your questionnaire has been misplaced, a replacement is enclosed along with a postage paid reply envelope. Your cooperation is greatly appreciated.

Sincerely yours,

Harry W. Ayer
Associate Professor

Joel C. Plath
Research Assistant

Phone: 884-3228
pt
Enclosures

P.S. There has been some question as to whether or not some of these mailings have actually been delivered. Therefore, if we do not receive a response from you shortly, a replacement questionnaire will be sent by certified mail in a few weeks.

Final Reminder, Sent by Certified Mail

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL ECONOMICS

July 8, 1975

Mr Sam E. Doyle
134 N. May St
Mesa, Az 85201

Dear Mr Doyle:

We are writing to you about our study of Arizona incomes and expenditures. We have not yet received your completed questionnaire.

The large number of questionnaires returned is very encouraging. But, whether we will be able to describe accurately the distribution of incomes and expenditures in Arizona depends upon you and the others who have not yet responded.

This is the first study of this type that has ever been done in Arizona. Therefore, the results are of particular importance to the many citizens, planners, and lawmakers now considering what kinds of changes should be made in government fiscal policy so as to best meet the needs of persons like yourself.

It is for these reasons that we are sending this by certified mail to insure delivery. In case our other correspondence did not reach you or has been lost, a replacement questionnaire is enclosed. May we urge you to complete and return it as quickly as possible.

We ask that the adult member in your family most familiar with the family finances complete the questionnaire. Because of the information needed, however, we encourage the cooperation of other members of the family in its completion. Please include the expenditures and incomes of all members living at home, plus those members who are supported financially by the family but may not live at home.

Your contribution to the success of this study will be appreciated greatly.

Sincerely yours,

Harry W. Ayer
Associate Professor

Joel C. Plath
Research Assistant

Phone: 884-3228
pt
Enclosures

P.S. This letter is addressed to the person we assume to be head of household. In a few cases, we have been told that the person is no longer considered head of the household. In such cases, the wife or other person who is presently the head of household should complete the questionnaire. If you are no longer an Arizona resident, please let us know using the enclosed envelope.

Final Reminder, Sent by Certified Mail

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL ECONOMICS

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Mesa, Az 85201

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Your contribution to the success of this study will be appreciated greatly.

Sincerely yours,

Harry W. Ayer
Associate Professor

Joel C. Plath
Research Assistant

Phone: 884-3228
pt
Enclosures

P.S. This letter is addressed to the person we assume to be head of household. In a few cases, we have been told that the person is no longer considered head of the household. In such cases, the wife or other person who is presently the head of household should complete the questionnaire. If you are no longer an Arizona resident, please let us know using the enclosed envelope.

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