EFFECTS OF MAJOR SOCIAL INSURANCE PROGRAMS ON INCOME DISTRIBUTION, INVESTMENT AND GROWTH

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PREFACE

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CHAPTER I

INTRODUCTION

Throughout the history the common man has sought economic security through governing authorities. The experience of the United States has been no exception. The Great Depression of the 1930's brought widespread public pressure on the federal government to consolidate and strengthen the many fragmented state and local public assistance programs. This pressure culminated in the Social Security Act of 1935 which remains the major public economic security mechanism in the United States today. The act provides cash payments to three groups of people: the poor, the unemployed, and the aged. There are also several smaller programs which provide similar benefits for special groups. Such programs include those for railroad workers, federal civilian employees, and state and local government employees. There are two common characteristics of such programs which are of concern to this study. First, the programs constitute a transfer of income toward lower income groups; and second, the transfer payment is neither the result of, nor directly contributory to the production process.

To the individual, existence of income transfer[1] programs means security from circumstances beyond his control; but to society as a whole, such a program represents a means of income redistribution

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[1]The term "income transfer" will henceforth be used only in reference to transfer payments which meet the two criteria listed in the previous paragraph.

toward lower income groups. Thus, the Social Security Act of 1935 marked a significant milestone in government policy with respect to social structure in that it institutionalized, on a permanent basis, large scale income transfers toward lower income groups.

Though an equitable distribution of income is desirable, standards representative of such a distribution are difficult to formulate. Thus there have never been specific long-run goals for income redistribution programs. Social Insurance and Public Aid expenditures increased from $7.4 billion in 1935 to $60.6 billion in 1969 (constant dollars; 1961 base). Per capita expenditures increased from $58.24 in 1935 to $250.58 in 1969, an increase of more than 300 percent. Justification for increased expenditures has always been a need to provide an "adequate" income for the needy but precisely what constitutes an "adequate" income has never been specified, either in absolute or relative terms.

Another generally accepted goal of society is maintenance of an "acceptable" level of productivity and economic growth. A major component of economic growth is investment spending. Since marginal investment increases as personal disposable income increases, income transfers to low income groups decrease investment. Such changes in investment would then be expected to affect long run productivity and economic growth.

Income transfers to low income groups result in less distributional inequality by their equalizing effects on income but the poor are not made "better-off" simply through equality. A more rapid rate of growth of total income might result in the poor having more money to spend in spite of greater distributional inequality. Thus welfare cannot be

measured solely in terms of distribution equality but must also consider absolute income levels.

The long run desires of society to provide the disadvantaged an "adequate" living standard and, at the same time, to enjoy an "acceptable" level of national productivity and economic growth can be maximized at some "optimal" level of income. Such a distribution would be "optimal" in the sense that total social utility for income through time would be at a maximum. Determination of the optimal distribution of income would require statistical determinations of utility not presently available.

The objectives of this study were:

(1) To simulate the effects of various levels of income transfers on investment and economic growth during the period 1960-69 by income class and by sector (urban, rural nonfarm and farm); and

(2) To make alternative assumptions concerning social utility and to then determine results of income redistribution in terms of utility.

Procedural steps were:

(1) To determine the distribution of income transfer payments among income classes by sectors.

(2) To determine the distribution of sources of income transfer revenue among income classes by sectors.

(3) To specify alternative investment functions and combine the distributions obtained in steps one and two to determine the effects of income transfers on investment spending.

(4) To develop alternative utility functions and combine the distributions obtained in steps one and two to determine the effects of income transfers on investment spending.

(5) To develop alternative utility functions and economic growth functions.

(6) To determine the utility of income distributions for various combination of utility functions and growth functions developed in step (4).

Related Studies and Data Sources

The subject of this study can be conveniently divided into three categories; costs, benefits and the effects of income transfers on economic growth through changes in private investment spending. Related studies (which often overlap the above categorization) include studies on the development, structure and operation of the welfare system, tax structure and incidence, income redistribution, economic growth, and investment decision making.

The development and current status of welfare programs is documented by Wedemeyer and Moore.[2] Specific undated regulations by states are presented periodically in various publications of The U.S. Department of Health, Education and Welfare (see Selected Bibliography, page 88).

Methodology in studying income redistributions has received considerable attention in recent years. Studies by Bishop[3] and Lampman[4] discuss incidence of various type taxes, assumptions in allocating benefits and various income bases.

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[2] J.M. Wedemeyer and Percy Moore, "The American Welfare System", California Law Review, Vol. LIV (July, 1966), pp. 326-344.

[3] George A. Bishop, "Income Redistribution in the Framework of the National Income Accounts", National Tax Journal, Vol. XIX (December, 196-), pp. 237-248.

[4] Robert J. Lampman, "Transfer Approaches to Distributional Policy", American Economic Review, Vol. LX (May, 1970), pp. 211-237.

The relationship between taxes, and investment and growth has been studied by Tanzi[5] and The Tax Institute.[6] Tanzi emphasized the relationship between tax structure and personal savings while the Tax Institute investigated the effects of tax structure on corporate decision making.

The effects of tax structure on tax yield from income classes were investigated by Okner.[7] He gave considerable attention to such items as liabilities, progressiveness, deductions, exemptions and exclusions in the federal income tax system.

In addition to transfer effects discussed above, income transfers to lower income classes would also be expected to affect productivity through changes in labor supply. Such "labor effects" have received considerably more research attention than have "investment effects." Concern about the effects of proposed welfare reforms on work incentive has been a major cause of the emphasis on labor relative to production. Indications are that the effects of income transfers are relatively small. A preliminary report on results from the Urban Negative Income Tax Experiment states "at this point... it seems fair to say that evidence for a (labor) disincentive is lacking--except, possibly, for secondary wage-earners."[8] The present study disregards labor effects and concentrates on investment effects.

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[5]Vito Tanzi, The Individual Income Tax and Economic Growth (Baltimore, 1969), pp. 18-73.

[6]Income Tax Differentials (Princeton, 1968), p. 21.

[7]Benjamin A. Okner, Income Distribution and the Federal Income Tax (Ann Arbor, 1966), pp. 47-94.

[8]David Elesh and others. After 15 months: Preliminary Results From The Urban Negative Income Tax Experiment (Wisconsin, 1971), p. 21. Also see David H. Greenberg and Marvin Kosters, The Impact of Income Maintenance Programs On Hours of Work and Incomes of the Working Poor: Some Empirical Results (Washington, 1970), p. 13.

Two studies of particular relevance to the present study were conducted by Gillespie[9] and the Tax Foundation.[10] The Brookings Institute study by Gillespie estimated transfer effects of public expenditures for the nation in 1960. He included all taxes (federal, state and local) and allocated all government expenditures by income class. His findings indicated that the overall pattern of fiscal incidence (i.e., the distribution of taxes less the distribution of expenditures) generally favored low income groups, burdened high income groups and was mainly neutral over a wide middle income range. The state and local pattern also favored low income groups but was neurtal over both middle and upper ranges while the federal pattern was more burdensome to upper income ranges.

A similar study was conducted for 1960 by the Tax Foundation. Like Gillespie's study, the Tax Foundation study allocated all taxes (federal, state and local) and all governmental expenditures. Their results showed generally more progression in tax rates than Gillespie reported, and thus more income was transferred to lower income groups.

Some portion of the inconsistent results of the two studies (Gillespie and the Tax Foundation) can be attributed to different assumptions of incidence, bases of allocation and, in determining effective rates, the income base used. Different assumptions in tax incidence occurred in allocation of corporate profits taxes and federal

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[9]Irwin W. Gillespie, "Effect of Public Expenditures on the Distribution of Income," Essays in Fiscal Federalism, ed. Robert A. Musgrave. (Washington, D.C., 1965), p. 47.

[10]Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965 (New York, 1967), pp. 1-30.

social security contributions by employers. The Tax Foundation assumed that half of the corporate income tax was paid by stockholders and half was passed on to consumers. Gillespie assumed that two-thirds was paid by stockholders and one-third passed on to consumer.[11] The Tax Foundation assumed that all employer social insurance contributions were passed on to the consumer while Gillespie assumed that only half such contributions were passed on to the consumer; the other half was assumed shifted back to the employee.[12]

More significant differences in the two studies resulted from the use of different allocation bases. Gillespie used data from a 1958 study[13] reflecting consumption expenditures by income classes for 1955-56. He then extrapolated the data to get a 1960 series. The Tax Institute used Bureau of Labor Statistics data[14] reflecting consumer expenditures by income classes for 1960-61. The distribution of consumption expenditures relative to income in Gillespie's study resulted in a more regressive tax burden for those taxes allocated by consumption

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[11] Corporate tax shifting was studies in 1960 by Schlesinger in Schlesinger, Eugene R., "Corporate Income Tax Shifting and Fiscal Policy," National Tax Journal, Volume XIII (June, 1960, pp. 217-230. He concluded that corporate tax shifting is not a major factor to be considered in fiscal policy. However, other studies have concluded that corporate treatment of taxes depends on how the structure of tax regulations affects the corporation in question. See Bibliography: (4), (14), (27), (46).

[12] A study by Brittain concluded that a payroll tax is shifted by various means to labor. "In any case, whichever shifting mechanism dominates, the real burden of the tax falls on labor." John A Brittain, "The Incidence of Social Security Payroll Taxes," American Economic Review, Volume LXI (March, 1971), pp. 47-61.

[13] Life Study of Consumer Expenditures (New York, 1957), pp. 1-14.

[14] U.S. Bureau of Labor Statistics, Consumer Expenditures and Income, Survey of Consumers Expenditures 1960-61, (Washington, D.C. 1965 and 1966), pp. 4-17.

expenditures than did the distribution of consumption expenditures in the Tax Foundation study.

Differences in effective rates reported in the two studies were due primarily to the different income bases used. Gillespie's "broad income concept" excluded government transfer payments, resulting in low incomes to those income classes which benefit most from such transfers. The Tax Foundation's "standard case" was based on Net National Production distributed according to the distribution of personal income (which includes government transfer payments).

The present study is similar to Gillespie's and the Tax Foundation's in that it measured transfer effects of government expenditures. The present study differs in that only a portion of government expenditures were included. It was the purpose of this study to look at the transfer effects of selected programs which have wide tax bases but whose expenditures are aimed at specific groups. Most social welfare programs fall into this category. Income transfers are not incidental to such programs but are one of the specific aims of the programs. The direct benefits and costs of such programs have been well documented. This study considered the costs in terms of foregone investment and growth.

General Outline of the Study

This study centered on development of a simulation model to determine the effects of income transfer payments on investment spending. These effects were determined by allocating the costs and benefits of a given level of transfer payments, determining the net

transfer effects and the investment changes due to these net transfers. Since different programs are funded differently and have different criteria for payment of benefits, allocations under each program were first treated separately and then aggregated within income classes.

Chapter II discusses the structure and dimensions of the three major social security programs; Old Age, Survivors, Disability and Health Insurance (OASDHI), Public Assistance (PA), and Unemployment Insurance (UI). Also discussed in Chapter II are five other major systems which are at least partially financed by the federal government or are recognized by the government as being supplementary to federal programs. These include programs for veterans, railroad workers, federal civil servants, state and local employees, and individuals receiving aid under the general assistance programs. Funding methods, payment policies and administrative costs of each program are discussed. Number of recipients, level of expenditures and size of trust funds are documented.

In Chapter III, the simulation model is developed. Bases of allocation of costs and benefits of transfer programs are documented. Investment functions and an economic growth model are developed. Summary measures of utility and income (in)equality are developed and the structure of the standard case and alternative models are developed.

Chapter IV then presents the results of the standard case while Chapter V summarizes the results of alternative models. In the final

chapter the implications of the models are summarized and the usefulness and limitations of the study are discussed.

CHAPTER II

STRUCTURE OF MAJOR SOCIAL INSURANCE PROGRAMS

The Social Security Act of 1935 was intended to provide financial assistance and/or security to three groups; the aged, the unemployed and the needy. The original act has been amended many times and a variety of programs have been developed under each of the original three categories. In addition to programs organized under the Social Security Act, there are several supplementary programs which offer similar services to special groups. Such programs include retirement pensions, unemployment insurance and/or health and disability insurance for railroad workers, veterans, state and local government employees, federal civilian employees and persons receiving aid from state General Assistance programs. Since different programs are funded differently and utilize different criteria in making benefit payments, it is necessary to examine the structure of each program individually. This chapter discusses the coverage and financial aspects of each program during the decade 1960-69.

Public Assistance

The Social Security Act authorizes federal subsidies to approved state assistance programs in six general categories; Aid to the Blind (AB), Aid to the Permanently and Totally Disabled (APTD), Old Age Ass-

istance (OAA), Aid to Families with Dependent Children (AFDC), Medical Assistance[1] (MA) and an "other"category which includes Medical Assistance for the Aged and programs for intermediate care facilities and emergency assistance. States may participate in all programs or only in selected ones. As of 1969, all states had federally assisted OAA, AFDC and AB programs; forty-nine states had approved AD programs; forty-one states had MA programs; and thirty-six states paid benefits under the "other" category. Each program must relate only to the category indicated and all recipients must be classified as "needy".

Among the general requirements which state programs must meet in order to qualify for federal aid are the following:

1. The program must be statewide.
2. The state must share the costs of the program.
3. Assistance must be in cash form except for medical vendor payments.
4. All recipient income and resources must be considered in determining need.

Benefit payments are made only to the needy and recipients pay none of the program costs directly. Federal subsidies from general revenue sources average more than half the total costs of the programs with the remainder funded by state and local revenues. The federal share is determined by a sliding scale based on the level of payments to recipients made by the state.

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[1]Program initiated in 1967.

Old Age, Survivors, Disability and Health Insurance (OASDHI)

The OASDHI program is intended to insure the individual against old age indigence. Under OASDHI, workers pay a set percentage of their wages up to a certain specified level into permanent government trust funds. These payments are matched 100 percent by the employer. The self-employed also pay into the OASDHI trust fund. Once a worker has contributed to the fund a specified length of time, he becomes fully insured and eligible to receive four types of benefit payments:

1. The worker himself may receive old age benefits after retiring at age 62 or later or he may get disability benefits if he is permanently and totally disabled before age 62.
2. Benefits may be paid to certain dependents of retired or disabled workers.
3. Benefits may be paid to certain survivors of deceased workers.
4. A lump sum payment may be made upon the death of a worker.

In addition to these general benefit payments, special provisions apply to the partially insured. More than 90 percent of U.S. workers are either fully or partially covered by OASDHI.

The OASDHI program shifts income distributions toward lower income groups in several ways. While benefit payments are not explicitly dependent upon need or poverty of the recipient, the payments are weighted toward lower income groups. This weighting is increased by reducing payments to those over 65 years of age who have not fully retired.

On the financing side, the employer who pays into the OASDHI

trust fund on behalf of the employee receives none of this money back in direct form. However, he may be able to shift his contribution to the employee through lower wages or shift it to the consumer through higher prices. Increases in the taxable base during the mid sixties further shifted the burden of financing toward upper income groups.

The financing of OASDHI is not intended to meet the actuarial soundness standards of private insurance companies. At no time during the sixties did the assets of OASDHI trust funds exceed twice the current level of expenditures. Thus OASDHI expenditures represent a transfer of income from the young to the old and toward lower income classes in the short run; not a transfer of income from an individual's working years to his retirement years.

Unemployment Insurance (UI)

The major U.S. system for aiding the unemployed developed from the Social Security Act of 1935. This act did not set up a national UI program but contained enabling legislation which encouraged the states to create statewide UI programs. All 50 states currently have UI programs as does Washington D.C.. The federal act sets minimum standards for coverage and financing which the states must meet and can exceed if they so desire.

It is not the purpose of general UI programs to provide long term income maintenance for the hard core unemployed, but rather to stabilize worker income by providing temporary financial relief during short periods of unemployment. Maximum length of time for a worker to

receive benefits is 39 weeks or less, depending on the state involved.

Currently more than 80 percent of the workforce is covered by state UI programs. Major groups of workers excluded from coverage include members of the Armed Forces, Federal civilian employees, state and local government employees, railroad workers, domestic servants, agricultural workers, employees of non-profit organizations and employees of small firms. Many of the workers who are excluded from general coverage are covered by one of the special programs discussed later in this chapter.

Financing of UI programs is through a payroll tax on employers. While the federal act does not prohibit employee contributions, only three states collected such contributions during the 1960's.

Technically, all monies collected by the state are forwarded to the U.S. Treasury's Unemployment Trust Fund. This is merely an operational procedure to safeguard the system. Separate accounts are maintained for each state and no general revenue funds are involved.[2] Thus UI programs constitute for the most part a transfer payment from employers to employees.

Programs For Special Groups

In addition to programs created by the Social Security Act of 1935, there are five major programs[3] which provide forms of economic

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[2]Exception to this has occurred when Congress has appropriated support funds to UI programs during periods of high unemployment.

[3]There are other special group programs, such as those for seamen and longshore workers, which are omitted from this study because coverage and expenditures in such programs are small relative to major programs.

security to special groups. Included in this category are programs for veterans, railroad workers, federal civilian employees, state and local government employees, and persons receiving aid under state General Assistance programs.

Veterans Programs

Veterans programs provide benefit payments for disability and death, retirement for career members[4] and readjustment aid such as educational assistance, credit facilities, and unemployment. Though some of the readjustment expenditures are related to investment in human capital, more than 95 percent of total veterans expenditures are transter payments not related to production. The veterans programs are non-contributory and thus constitute a transfer of income from federal government general revenue sources to lower income groups.

Railroad Workers

Programs for railroad workers include retirement pensions, unemployment insurance, accident and disability insurance, and sick pay. Under the railroad retirement plan, workers employed less than ten years are covered under OASDHI. Workers employed more than ten years are covered by a railroad pension plan which is closely coordinated with OASDHI. The Railroad Retirement Fund is maintained by equal contributions from employers and employees. Transfers

[4] In some cases, the Armed Forces retirement program for career members is in addition to OASDHI, which also covers some Armed Forces personnel.

between the OASDHI trust fund and the Railroad Retirement trust fund are allowed with the stipulation that the latter be self supporting in the long run. The transfer effects of the railroad retirement program are identical to transfer effects of OASDHI.

Railroad unemployment benefits are financed by a payroll tax with the provision that funds may be borrowed from the retirement fund if the unemployment fund is insufficient to meet demands of temporary high unemployment. The railroad unemployment program constitutes a transfer of income from employers to low income workers.

The railroads have an employer liability law dealing with accidents and disabilities. Though operational aspects of the railroad accident program differ from those of state worker compensation programs, the principle is the same; viz, work related accidents are considered costs of production to be borne by the employer. Such payments are thus omitted from consideration in this study.

The railroad industry also provides benefit payments for non-work related employee sickness. Payments are made from the unemployment fund which is financed by a payroll tax. Thus sickness payments constitute a transfer of income from employer to employee.

Federal Civilian Employees (FCE)

Several special programs protect FCE against the risks of death, old age, occupational illness and unemployment. The occupational illness program (Federal Employee's Compensation Act) is similar to state workmen's compensation programs and does not represent the type of transfer payment relevant to this study.

FCE were originally excluded from coverage under state unemployment compensation programs. In 1955 coverage of state programs was extended to include FCE, thereby providing them with the same status as employees of private industry. Unemployment payments to FCE thus constitute a transfer of income from federal government sources to low income groups.

While there are several different retirement plans covering different groups of FCE, the largest of these is the Civil Service Retirement System (CSRS) which covers more than 90 percent of all FCE. Four types of benefits are paid under the CSRS program; retirement pensions, disability benefits, survivorship benefits, and health benefits for retired workers. The federal CSRS program is financed by employee contributions which are matched by the federal government and, when necessary, supplemented by Congressional appropriations. Thus, more than half the money involved in CSRS payments represents a transfer of income from federal government sources to lower income groups.

State and Local Government Employees

Like federal civilian employees, state and local government employees were originally excluded from coverage under the Social Security Act. Amendments to the act allowed states to enter into voluntary agreement with the federal government to accept OASDHI coverage for state and local employees. In 1961, more than 60 percent of such employees were covered by OASDHI.

There are many other economic sucurity programs operated by

the states. Some of these replace OASDHI, others supplement it. In general, only retirement benefits are paid, most programs are contributory, and benefit payments are somewhat lower than under OASDHI. There is a trend to make state and local programs comparable to OASDHI in coverage and financing. In 1968, more than 85 percent of all state and local government employees were covered by one or more retirement programs.

All retirement programs for state and local employees involve income transfers to lower income groups. The degree of transfer effect is dependent on the method of financing involved.

General Assistance

Public Assistance under the Social Security Act provides financial aid for six categories of needy persons. However, some needy people do not fit into any one of the six specified categories. General Assistance (GA) programs are intended to provide aid to these needy. GA programs are organized, operated and funded entirely by state and local government units. Thus, they vary widely in purpose and criteria for making benefit payments. However, since all are non-contributory, GA programs constitute income transfers from state and local revenue sources to lower income groups.

Summary

This chapter has examined the structure of major economic security programs which transfer income to lower income groups. The criterion for program consideration has been that such transfers must not be related to the production process. In general, four types

of payments meet the standard; retirement pensions, unemployment compensation, health and disability benefits, and public assistance payments to the needy. The extent of the transfer effect is directly related to the funding involved. Programs partially financed by employee contributions involve a lower level of transfer effect than do programs funded entirely by the government or by the employer. Since the federal tax structure is more progressive than state and local tax structures, payments from federal monies involve a higher level of transfer effect than do payments from state and/or local funds.

CHAPTER III

SIMULATION MODEL AND THE STANDARD CASE

A simulation model was constructed to process the data and derive summary measures reflecting the effects of public transfer program expenditures. Input into the model included data reflecting distributions of population, income, investment, consumption, and benefits and costs of social insurance expenditures. Output from the model included net transfer effects of program expenditures, investment effects, income growth and summary measures of distributional (in)equalities.

The population was divided into three residence sectors: urban, rural nonfarm, and farm. Each sector was divided into ten income classes (after taxes): below $1,000, $1,000-$2,000, $2,000-$3,000, $4,000-$5,000, $5,000-$6,000, $6,000-$7,500, $7,500-$10,000, $10,000-$15,000, and above $15,000.[1]

Three base years were utilized for allocation of income, benefits from social insurance programs, and taxes necessary to pay for such programs. Data for base year 1961 were derived from the Survey of Consumer Expenditures (SCE).[2]

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[1] All dollar amounts (including income classifications) are in constant 1961 dollars. The index of purchasing power of the dollar (retail) was used for adjustment of dollar amounts.

[2] U.S. Bureau of Labor Statistics, Consumer Expenditures and Income, Survey of Consumer Expenditures 1960-61, (Washington, D.C., 1965 and 1966).

Data for base years 1965 and 1966 were derived from the Survey of Economic Opportunity (SEO).[3] Distributions for the remaining years were linearly interpolated from base year data. The model covered 1960-1969 inclusive.

Expenditures under social insurance programs considered in the study are presented in Table I. Two income distributions were determined by the model (by class and by sector). Pre-transfer income represented the income distribution in the absence of income from social insurance expenditures and in the absence of taxes needed to pay for such. Thus the first part of the model (a) subtracted social insurance benefits from income, and (b) added costs of transfers to income. Post-transfer income represented the distribution of income including benefits from social insurance programs and the corresponding taxes. Thus the second part of the model simply allocated income by sector and class. The difference in the two final distributions represented the net transfer effects of the programs listed in Table I.

Personal Income from the National Income and Products Accounts was allocated among the income classes by sectors. The basis of allocation in base year 1961 (SCE) was "Money Income Before Taxes." This included net income from wages and salaries, self employment, roomers and boarders, rents, stocks and bonds, interest, dividends, transfer programs listed in Table I, private pensions, private insurance annuities and trust funds, gifts, and other money income. The basis for allocation in base years 1965 and 1966 (SEO) was "Total Family Income." This

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[3]The Survey of Economic Opportunity included more than 30,000 families conducted in 1966 and 1967 by the U.S. Bureau of the Census. Survey data were obtained from the University of Wisconsin.

TABLE I

EXPENDITURES UNDER SELECTED SOCIAL INSURANCE PROGRAMS, 1960-1969[a]

Program	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	(million dollars)									
OASDHI	11,153	12,161	13,831	14,975	15,578	16,114	18,692	22,025	24,695	27,212
Railroad Retirement	935	992	1,022	1,048	1,064	1,069	1,116	1,145	1,217	1,264
Railroad Unemployment	217	213	161	120	89	73	48	35	40	37
Railroad Disability	70	58	56	52	47	44	40	34	31	47
Public Employment Retirement	2,598	2,870	3,155	3,508	3,856	4,286	4,739	5,289	5,654	6,108
Unemployment	2,860	4,310	3,804	3,291	3,162	2,847	2,452	2,467	2,515	2,407
State Temporary Disability	347	382	403	435	463	458	467	475	493	528
Public Assistance	4,145	4,441	4,877	5,148	5,365	5,957	6,724	7,920	9,528	10,773
Health and Medical	4,390	4,757	3,261	3,315	3,456	3,656	4,007	3,988	4,220	4,212
Other Welfare	1,174	1,248	1,602	1,719	1,864	1,956	2,159	2,605	2,828	3,127
Veterans Pensions	3,464	3,690	3,733	3,852	3,869	3,940	4,075	4,043	4,051	4,050
Total	31,354	35,122	35,905	37,464	38,804	40,400	44,517	50,025	55,271	59,765

Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1960-1970, (Washington, D.C.).

[a]Expenditures are adjusted to constant dollars by the index of purchasing power of the dollar (1961=1.00)

included net income from wages and salaries, businesses, farms, dividends, interest, rents, private pensions, workmens compensation, transfer payments listed in Table I, and other income. Net income transfers from social insurance programs were subtracted from the distribution of income before taxes as it would have existed in the absence of the social insurance expenditures listed in Table I (i.e. pre-transfer income).

Allocation of Social Insurance Benefits

Expenditures of major income transfer programs were allocated among the three residence sectors (farm, rural nonfarm, and urban) by income classes. Total expenditures (Table I) were grouped into 5 categories: unemployment insurance, social security, public employee retirement, welfare and military allotments. The components of each category and the bases for allocation are presented in Table II.

Allocation of Social Insurance Costs

Allocation of the social insurance expenditures in Table I to income classes as costs involved several intermediary steps (see Figure I). Expenditures were first allocated to four transient funds: state general revenue fund, federal general revenue fund, employer fund, and employee fund. This first allocation assumes that government contributions to social insurance programs come from general revenue (federal or state) and that employer contributions are not entirely shifted elsewhere.

Contributions from state general revenue were then allocated among four major sources of state revenue: property taxes, state income taxes, state corporate taxes and excise taxes. These four revenue sources

TABLE II

COMPONENTS OF SOCIAL INSURANCE CATEGORIES AND BASES OF ALLOCATION

Category	Components (from Table I)	Base of Allocation	
		1961-SCE	1965-66-SEO
Unemployment Insurance	Unemployment Railroad Unemployment Railroad Disability	Public Unemployment and Social Security Benefits[a]	Unemployment Insurance[d]
Social Security	OASDHI	Public Unemployment and Social Security Benefits[a]	Social Security, Railroad Retirement[e]
Public Employee Retirement	Public Employee Retirement State Temporary Disability	Public Unemployment and Social Security Benefits[a]	Government Pensions[f]
Welfare	Public Assistance Health and Medical Other Welfare	Public Social Assistance and Private Benefits[b]	Public Assistance and Welfare
Military Allotments	Veterans Pensions	Military Allotments, Pensions, etc,[c]	Government Pensions[f]

[a]Includes amounts received from social security pensions and survivor's benefits, and permanent disability insurance payments made by the Social Security Administration; railroad retirement and civil service retirement benefits (including payments by Federal, State, and local governments); unemployment benefits paid by government agencies, employers, labor unions, or other organizations; and periodic workmen's compensation payments received by persons injured on the job.

[b]Cash payments (or vouchers for the purchase of food at retail) through public programs such as old-age assistance, aid to dependent children, aid to the blind, or through private welfare agencies as church or community chest organizations.

[c]All money receipts based on military service other than pay received while on active or reserve duty. Include mustering-out pay; reenlistment and State bonuses; war insurance refunds; dividends on veterans' insurance whether paid to the family or applied to premiums; retirement, survivor, and service-connected disability pay; educational benefits and other allowances; dependency allotments (excluding deduction from family member's pay); and quarters and subsistence allowances for housing, cost of living, separate rations, and clothing.

[d]Includes money received from government unemployment insurance agencies or private companies during periods of unemployment. Also includes strike benefits received from union funds.

[e]Includes social security payments made under retirement, survivors, and disability insurance (OASDHI) programs to retired persons, to dependents of deceased insured workers, or to disabled workers. Also includes retirement, disability, and survivor benefit payments made under the railroad retirement act.

[f]Includes money received from retirement pensions paid by federal, state, county or other governmental agencies to former employees or their survivors.

[g]Includes money received from local or state public assistance programs, including old age assistance, aid to the blind or totally disabled, or other public assistance.

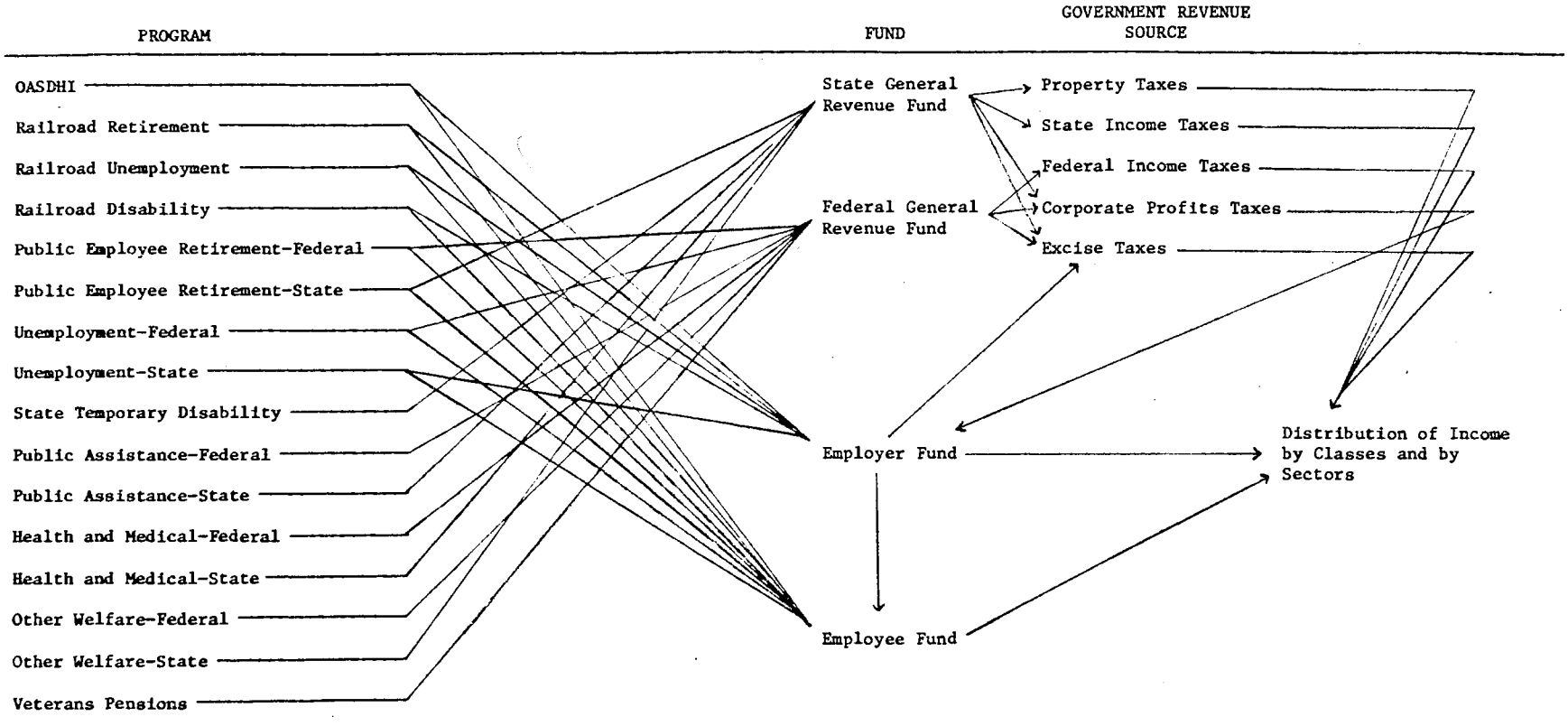

Figure 1. Flow of Social Insurance Expenditures as Costs from Programs to Individual Income Classes.

accounted for 80-85 percent of the total state general revenue (excluding trust fund revenue) during the study period.

Contributions from federal general revenue were allocated among three major sources of federal revenue: income taxes, corporate profits taxes and excise taxes. These three revenue sources accounted for 96-98 percent of the total federal general revenue (excluding trust fund revenue) during the study period.

Since corporate profits taxes are paid by the same individuals who pay employer contributions to social insurance programs, corporate profits taxes were added to the employer contributions fund. Then, to account for shifting of corporate taxes in the form of higher prices and/or lower wages, a percentage of the employer contribution fund was transferred to the employee contributions fund and a percentage was transferred to the excise taxes fund.

Expenditure funds classified in six categories (property taxes, state income taxes, federal income taxes, federal and state excise taxes, employer contributions and employee contributions) were then allocated among income classes by sector. Property taxes were allocated according to the distribution of income received from businesses involving real property (i.e. farm income, business income, rent received, income from roomers and boarders, etc.). Federal and state income taxes were allocated on the basis of the distribution of total income adjusted by federal and state tax rates. Excise taxes were allocated on the basis of the distribution of consumption expenditures as reported in the 1961 BLS study. Employer contributions to social insurance programs were allocated on the basis of the distribution of income received from stock ownership. Employee contributions to social insurance programs were

allocated on the basis of the distribution of total money income.

Investment Functions

Five investment schedules were developed (see Table III). Four of these schedules consisted of marginal investment rates by income classes for the population as a whole. One schedule consisted of marginal investment rates by income classes for the population by sectors (urban, rural nonfarm and farm).

Negative investment in lower income classes was common to each of the data sources from which investment schedules were derived. As income increased, negative investment decreased, yielding a high marginal propensity to invest at low income levels. Marginal investment then decreased in mid-income levels and increased at higher income levels. Negative investment in lower income levels was accompanied by consumption levels which equalled or exceeded income.

For an individual, negative investment cannot occur for extended periods but is possible for shorter periods if the individual temporarily experiences low income. Dissavings while in that category are offset by positive savings either before entering or after leaving the low income category. Thus it can be argued that income transfers to low income groups (with high marginal investment rates) tends not to be spent on productive investment opportunities but rather is used to offset negative investment used for consumption purposes. Where negative investment occurred, marginal investment rates were assumed to be zero.

Simulation runs were made for each of the five investment schedules using the investment schedules presented in Table III.

TABLE III

INVESTMENT SCHEDULES[a]

Income Class	Time[b]	Friend[c]	Goldsmith[d]	BLS-T[e]	BLS-URBAN[f]	BLS-RNF[f]	BLS-FARM[f]
			-Percent-				
below $1000	-	-	-	-	-	-	-
$ 1000 - $ 2000	-	-	-	-	-	-	-
$ 2000 - $ 3000	-	5.14	15.91	-	-	-	-
$ 3000 - $ 4000	-	11.25	8.53	-	-	-	-
$ 4000 - $ 5000	48.22	12.15	21.21	-	-	4.76	40.31
$ 5000 - $ 6000	54.67	13.40	27.97	6.54	7.48	11.24	18.53
$ 6000 - $ 7500	57.20	19.29	23.17	9.70	9.76	17.70	38.32
$ 7500 - $10000	59.19	32.24	36.99	11.80	12.41	16.96	65.84
$10000 - $15000	64.91	55.11	63.59	16.17	14.94	21.69	65.02
above $15000	77.35	75.00	75.00	30.74	24.41	38.40	90.93

[a]Figures represent percent of marginal income invested (or saved). Horizontal lines indicate negative investment.

[b]Derived from: Life Study of Consumer Expenditures (New York, 1957), pp. 9-11.

[c]Derived from: Irwin Friend and Vito Natrella, Individuals' Saving, Volume and Composition (New York, 1954), pp. 71-84.

[d]Derived from: Raymond Goldsmith, A Study of Saving In the United States (Princeton, 1955.)

[e]Derived from: U.S. Bureau of Labor Statistics, Consumer Expenditures and Income, Survey of Consumers Expenditures 1960-61 (Washington, D.C., 1965 and 1966).

[f]Derived from: U.S. Bureau of Labor Statistics, Consumer Expenditures and Income, Survey of Consumers Expenditures 1960-61 (Washington, D.C. 1965 and 1966).

Economic Growth

One objective of this study was to estimate the effect of income transfers on the growth of private income accruing to individuals. During the study period, personal income (in constant dollars) increased at an average annual rate of 5.06 percent. Net investment (i.e. Gross Private Domestic Investment less Capital Consumption) increased at an average annual rate of 4.78 percent. An average return on net investment of 57.75 percent is necessary to explain the growth in personal income.

Several adjustments are needed in both the income figures and in the investment figures to give the measure desired. A portion of "return on investment" is retained by corporations in the form of undistributed corporate profits and inventory valuation adjustments. Thus corporate profits (total) and inventory valuation adjustments were added to personal income and dividends were subtracted (to avoid double counting). On the investment side, not all investment comes from private sources. The government finances investment in the form of industrial infrastructure, educational expenditures and research activities, each of which contributes to growth in income. To remove the influence of such government investment, personal income was adjusted to reflect a 10 percent return on schooling investment and a 50 percent return on research expenditures.[4]

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[4]Estimates of returns on investment in education, and research and development vary widely. For further reading, see: Zvi Griliches, "Research Costs and Returns," Journal of Political Economy, Volume LXVI (August, 1958), pp. 419-431; Fred K. Hines, L.G. Tweeten, and M. Redfern, "Social and Private Rates of Return to Investment in Schooling by Race-Sex Groups and Regions," Journal of Human Resources, Volume V (Summer, 1970); and Edwin Mansfield, "Rates and Returns from Industrial Research and Development," American Economic Review, Volume LV (May, 1965, pp. 310-323).

Finally, a portion of the increase in aggregate personal income was due to population increases which increased the labor force. The population increased at an average annual rate of 1.26 percent during the 1960's while the civilian labor force increased at an annual rate of 1.74 percent.

After making adjustments for the foregoing factors, an average annual return on investment of approximately 50 percent (49.74 percent) was required to account for the growth in real income.[5] It was assumed that investors receive a 15 percent return (before taxes) on their investments. The remaining 35 percent return on investment was distributed among income classes according to their consumption expenditures as indicated by the theory of consumer surplus. Investment to classes and sectors was cummulative over time.

Measures of Inequality

Two summary measures of income inequality were utilized, the Gini ratio[6] and Atkinson's "Social Welfare Function."[7] Atkinson's measure is presented as follows. Let the utility of per capita income take the form

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[5]This figure is in line with estimates from other studies. For example Doeksen found a return on marginal investment in Oklahoma of 44 percent in the first year. The long run return would be expected to be higher. See: Gerald A. Doeksen, "A Social Accounting System and Simulation Model Projecting Economic Variables and Analyzing the Structure of the Oklahoma Economy," (unpublished Ph.D. thesis, Oklahoma State University, 1971).

[6]The Standard definition of Gini ratio was used; i.e., the ratio of (a) the area between a Lorenz curve and the line of perfectly equal distribution (45^{o} line) and (b) the area under the line of perfectly equal distribution.

[7]Anthony B. Atkinson, "On the Measurement of Inequality," Journal of Economic Theory, Volume II (1970), pp. 244-263.

$$U(y) = A + B \frac{y^{1-\varepsilon}}{1-\varepsilon} \qquad \varepsilon \neq 1$$

$$U(y) = \log_e (y) \qquad \varepsilon = 1$$

where

y = per capita income and A and B are arbitrary.

When $\varepsilon = 0$, marginal utility is constant; as ε increases, marginal utility falls more rapidly. The value of is restricted to a non-negative number for concavity.

This is the utility measure for an individual. To find the utility of all persons within a given income class, individual utility is multiplied by the population of the class. This gives the welfare measure:

$$W_0 = nA + \frac{B}{1-\varepsilon} \sum_i y_i^{1-\varepsilon} n_i$$

where

n = population,

i = income class.

This assumes that there is no inequality within classes and that the utility of each individual within a class counts equally in the welfare of that class.

Equally distributed equivalent income (y_{ede}) is defined as the amount of per capita income required to produce the same total utility as the present income, if equally distributed. Thus welfare from y_{ede} takes the form:

$$W_1 = nA + \frac{B}{1-\varepsilon} y_{ede}^{1-\varepsilon} n$$

Setting $W_0 = W_i$,

$$y_{ede} = \left[\sum_i y_i^{1-\varepsilon} \frac{n_i}{n} \right]^{\frac{1}{1-\varepsilon}}$$

Then a measure of inequality can be defined as:

$$I = 1 - \frac{y_{ede}}{\mu}$$

where

μ = mean income.

This measure is similar to a Gini ratio in that it is bounded by zero and one, zero corresponding to perfect equality and one to all income belonging to one person. The measure is defined relative to the mean and is thus invariant with respect to proportional shifts.

The Standard Case

The simulation model was run (by years) for a 10 year period, 1960-69. Yearly data were utilized for program expenditures, allocation of government revenue among sources and bases of allocation of expenditures to individuals (as either costs or benefits). The employer contribution fund included direct contributions through such programs as OASDHI, Railroad Retirement, etc., and indirect payments through corporate profits taxes. To allow for shifting of corporate costs through higher prices and/or lower wages, the standard case allocated 25.0 percent of corporate social insurance costs to the employee contributions fund and 25.0 percent to the excise taxes fund. The remaining costs were assumed paid by stockholders through reduced profits.

The standard case utilized the 3 sector investment schedule derived from 1961 BLS data. Where net investment (savings) was negative, an investment rate of zero was used.

CHAPTER IV

SIMULATION RESULTS AND SUMMARY MEASURES OF DISTRIBUTIONAL INEQUALITIES - STANDARD CASE

Income Transfers - Standard Case

During the study period total expenditures involved ranged from $31,354 million in 1961 to $59,765 million in 1969.[1] It is relevant to note changes in composition of expenditures over the study period (see Table I, p. 23). The largest category throughout the period (OASDHI) increased by 144 percent. OASDHI increased from 36 percent of all expenditures in 1960 to 46 percent of the 1969 total. Other large categories which increased markedly included public assistance and public employee retirement. Expenditures in these categories increased by 160 percent and 135 percent, respectively (from 1960-69). OASDHI, public assistance and public employee retirement accounted for $26, 196 million (92 percent) of the $28,411 million increase in total social insurance expenditures over the time period involved.

Transfers of income due to social insurance expenditures are summarized in Table IV. For all sectors combined, the breakeven point in transfers occurred between the fifth and sixth income classes in all years. On the average, families earning below $5,000 per year

[1] All dollar figures including income classes are in constant dollars, 1961=100.0.

TABLE IV

NET TRANSFER EFFECTS OF SOCIAL INSURANCE PROGRAM EXPENDITURES BY SECTOR[a]

All Sectors Combined

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	759	1716	1289	1636	2025	2534	3261	4025	4926	5797
$ 1000 - $ 2000	6986	7511	7215	7295	7328	7458	8124	9023	9960	10744
$ 2000 - $ 3000	5292	5769	5663	5711	5714	5758	6213	6839	7452	7910
$ 3000 - $ 4000	3003	3243	3201	3107	2957	2787	2774	2799	2777	2664
$ 4000 - $ 5000	606	649	754	789	807	808	850	934	1040	1106
$ 5000 - $ 6000	-312	-346	-285	-339	-406	-503	-673	-840	-976	-1126
$ 6000 - $ 7500	-1548	-1865	-1836	-1986	-2144	-2360	-2786	-3271	-3734	-4165
$ 7500 - $10000	-3899	-4414	-4286	-4358	-4352	-4331	-4538	-4956	-5393	-5707
$10000 - $15000	-3287	-3997	-4112	-4492	-4889	-5359	-6262	-7404	-8608	-9725
Above $15000	-7597	-8266	-7605	-7361	-7045	-6791	-6962	-7139	-7452	-7493

TABLE IV (Continued)

Urban Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	654	885	991	1173	1871	1612	2024	2564	3203	1844
$ 1000 - $ 2000	4750	5190	5045	5178	5283	5461	6050	6828	7643	8385
$ 2000 - $ 3000	3012	4033	4008	4131	4229	4364	4824	5431	6041	6547
$ 3000 - $ 4000	2272	2505	2458	2413	2331	2238	2285	2364	2394	2338
$ 4000 - $ 5000	386	452	506	551	590	625	694	791	902	981
$ 5000 - $ 6000	-201	-182	-195	-244	-300	-376	-508	-658	-796	-943
$ 6000 - $ 7500	-1268	-1512	-1599	-1749	-1895	-2075	-2425	-2853	-3268	-3650
$ 7500 - $10000 -	-3329	-3711	-3651	-3710	-3744	-3806	-4132	-4583	-5029	-5371
$10000 - $15000	-2771	-3342	-3581	-3937	-4285	-4664	-5402	-6417	-7497	-8517
Above $15000	-7125	-7623	-7145	-6897	-6570	-6285	-6397	-6573	-6862	-6871
Total	-3021	-3306	-3160	-3089	-2991	-2906	-2988	-3105	-3269	-3262

TABLE IV (Continued)

Rural Nonfarm Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	25	737	196	344	518	759	1023	1177	1355	1500
$ 1000 - $ 2000	1981	2043	1893	1832	1751	1685	1711	1765	1810	1783
$ 2000 - $ 3000	1517	1565	1494	1430	1349	1276	1279	1308	1325	1298
$ 3000 - $ 4000	648	649	661	625	578	526	499	488	473	437
$ 4000 - $ 5000	242	213	256	243	220	190	167	160	154	135
$ 5000 - $ 6000	-37	-92	-36	-51	-71	-104	-153	-189	-215	-244
$ 6000 - $ 7500	-112	-197	-107	-124	--153	-202	-285	-347	-405	-465
$ 7500 - $10000	-414	-556	-501	-524	-502	-444	-351	-337	-336	-318
$10000 - $15000	-370	-510	-404	-438	-492	-583	-731	-834	-940	-1019
Above $15000	-308	-473	-284	-284	-302	-347	-422	-458	-507	-551
Total	3171	3377	3170	3053	2896	2756	2736	2731	2715	2556

TABLE IV (Continued)

Income Class	Farm Sector									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	79	94	101	117	136	161	213	283	367	452
$ 1000 - $ 2000	254	277	275	284	294	311	361	430	506	575
$ 2000 - $ 3000	162	170	160	149	134	117	109	99	85	64
$ 3000 - $ 4000	83	88	81	67	47	22	-9	-53	-89	-111
$ 4000 - $ 5000	-22	-16	-8	-4	-4	-7	-11	-17	-17	-11
$ 5000 - $ 6000	-73	-71	-54	-44	-33	-22	-10	7	35	66
$ 6000 - $ 7500	-167	-156	-130	-112	-95	-82	-75	-70	-60	-49
$ 7500 - $10000	-155	-145	-134	-122	-105	-80	-53	-35	-27	-17
$10000 - $15000	144	-144	-127	-117	-112	-112	-128	-152	-171	-187
Above $15000	-163	-168	-176	-179	-172	-158	-142	-107	-82	-69
Total	-147	-71	-12	38	90	150	252	384	545	711

[a]Column totals equal zero plus/minus rounding error.

received a net benefit from social insurance expenditures while families earning above $5,000 per year incurred a net cost from such expenditures. Of the classes receiving a net benefit, the lowest class ($1000 and below) received both an increased absolute amount of transfer income and an increased percentage of total funds transferred (over time). The other four income classes received increases in absolute terms over time but three classes received decreases in their percentage share of total transfers.

Of the income classes which incurred a net loss of income due to social insurance transfers, the highest income class ($15000 and above) tended to pay less into such programs over time, both in dollar amounts and in the percentage of total transfers. The other four income classes incurring losses due to transfers experienced heavier burdens over time in dollar amounts and in their percentage share of total transfer costs.

Transfers of income among sectors decreased from $3171.5 million in 1960 to $2906.3 million in 1965, and then increased to $3262.1 million in 1969. In percentage terms, transfers among sectors decreased throughout the study period from 10.12 percent of total expenditures in 1960 to 5.46 percent of total expenditures in 1969.

The urban sector experienced a net loss of income in each year of the study. This loss tended to decrease through 1965 but then increased through the remaining years to a maximum loss of $3262.1 million in 1969. The average annual loss to the urban sector was $3110.2 million.

The rural nonfarm sector enjoyed a net gain of income throughout the study period. However, the net gain decreased yearly (except in 1961) from $3171.5 million in 1960 to $2556.6 million in 1969.

Though the farm sector had a net loss of income during the first

three years of the study, the position of the farm sector improved continuously throughout the 10 year period from a net loss of $147.5 million in 1960 to a net gain of $711.4 million in 1969.

To get a better perspective on the relative positions of sectors, total net transfers were divided by total sectoral income (see Table V). The rural nonfarm sector received 4-5 percent of its total income from social insurance programs. While the farm sector was a contributor to social insurance programs in 1960, by 1969 the farm sector was even more dependent on such programs than was the rural nonfarm sector. The urban sector essentially financed social insurance programs throughout the study period. Though urban losses of income due to transfers increased from 1965 through 1969, increases in total urban income more than compensated for transfer burdens. The urban sector tended to pay a continuously smaller percentage of total income into social insurance programs. The rural nonfarm and farm sectors also improved their positions relative to total income during the study period. While total net transfers among sectors and income classes portend changes in investment and growth, they indicate little about the role of social insurance programs in income redistribution. This is because the distribution of population among sectors and income classes changed continuously during the study period. Per capita costs and benefits are more relevant to issues of equity and social welfare. Per capita transfers in each year were divided by the 1960 transfer to illustrate the trend of relative effects over time (see Table VI). In terms of per capita costs, the burden of increasing social insurance programs fell almost entirely on upper middle income classes. Per capita costs in the $5000-$6000 income class increased by more than 300 percent during the study period; and per capita costs in the

$6000-$7500 income class increased by more than 180 percent. In contrast, per capita costs in the highest income class in 1969 were less than half such costs in 1960.

TABLE V

NET INCOME TRANSFERS AS A PERCENTAGE OF TOTAL INCOME BY SECTORS - STANDARD CASE

Year	Urban	Rural Nonfarm	Farm
		-percent-	
1960	-0.98	4.21	-0.71
1961	-1.02	4.63	-0.35
1962	-0.91	4.27	-0.06
1963	-0.85	4.43	0.20
1964	-0.76	4.30	0.49
1965	-0.68	4.18	0.83
1966	-0.65	4.30	1.45
1967	-0.64	4.55	2.35
1968	-0.63	4.81	3.55
1969	-0.60	4.99	5.13

Among classes receiving net benefits, the largest increase in per capita benefits occurred in the $4000-$5000 income class. While the lowest income class (below $1000) showed an increase of 66 percent over the study period, the <u>average</u> increase of the other four classes which received net benefits was greater than the increase in the lowest class.

TABLE VI

PER CAPITA NET TRANSFER EFFECTS - INDEXED[a]

Income Class	Year 1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
below $1000	1.00	1.04	0.97	1.00	1.05	1.13	1.28	1.41	1.56	1.66
$ 1000 - $ 2000	1.00	1.04	0.96	0.94	0.92	0.91	0.97	1.05	1.13	1.19
$ 2000 - $ 3000	1.00	1.10	1.09	1.12	1.13	1.16	1.28	1.44	1.60	1.74
$ 3000 - $ 4000	1.00	1.12	1.19	1.17	1.17	1.16	1.23	1.32	1.41	1.46
$ 4000 - $ 5000b	1.00	1.10	1.33	1.44	1.54	1.63	1.81	2.12	2.53	2.90
$ 5000 - $ 6000	1.00	1.12	0.94	1.15	1.40	1.79	2.47	3.20	3.85	4.62
$ 6000 - $ 7500	1.00	1.20	1.19	1.29	1.40	1.55	1.85	2.19	2.53	2.86
$ 7500 - $10000	1.00	1.09	1.02	1.01	0.98	0.94	0.96	1.02	1.08	1.12
$10000 - $15000	1.00	1.06	0.97	0.95	0.94	0.94	1.00	1.10	1.18	1.24
above $15000	1.00	0.97	0.81	0.71	0.62	0.55	0.52	0.49	0.47	0.44

[a]Per capita costs or benefits indexed; 1960 = 1.0.

[b]Persons with incomes below $5000 per year had net gains from transfer payments while those with incomes above $5000 per year had net losses from transfer payments in all years.

Thus, although total expenditures in social insurance programs increased markedly over the study period, they became less cost-effective in transferring income from the rich to the poor. Instead, most of the increased expenditures were transferred from upper middle income classes to lower middle income classes. This result stems largely from the changes in the composition of social insurance programs noted earlier. OASDHI and public employee retirement accounted for 68.9 percent of the increase in expenditures during the study period. Both the costs and the benefits of these programs accrue mainly to middle income classes.

Investment Differentials and Growth-Standard Case

Income transfers from upper income classes to lower income classes decreased individual investment in all three sectors (see Table VII). The urban and rural nonfarm sectors experienced larger decreases over time while investment decreases in the farm sector were of lesser magnitude over time. Total investment decreases ranged from $3.4 billion in 1960 to $4.8 billion in 1969 and were highly concentrated in the urban sector.

In general, investment losses to individual income classes increased over time. Two exceptions to the trend were the highest income class (above $15000) in the urban sector and the $4000-$5000 income class in the rural nonfarm sector. Investment losses in the above $15000 urban class decreased by $32.66 million in 1965. No other class experienced relative positive investment changes of similar magnitude. The $4000 to $5000 rural nonfarm class enjoyed a net gain in investment throughout the study period. However, the gain, which averaged $9.45 million, was small compared to investment losses in other classes and sectors.

TABLE VII

INVESTMENT DIFFERENCES DUE TO INCOME TRANSFERS
FROM MAJOR SOCIAL INSURANCE
PROGRAM EXPENDITURES BY
SECTOR-STANDARD CASE

All Sectors Combined

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	0	0	0	0	0	0	0	0	0	0
$ 1000 - $ 2000	0	0	0	0	0	0	0	0	0	0
$ 2000 - $ 3000	0	0	0	0	0	0	0	0	0	0
$ 3000 - $ 4000	0	0	0	0	0	0	0	0	0	0
$ 4000 - $ 5000	2	3	8	9	8	6	3	0	0	1
$ 5000 - $ 6000	-32	-37	-28	-32	-36	-44	-57	-69	-77	-86
$ 6000 - $ 7500	-207	-242	-225	-235	-248	-269	-316	-366	-414	-457
$ 7500 - $10000	-585	-651	-626	-630	-619	-600	-608	-649	-699	-731
$10000 - $15000	-575	-690	-693	-749	-809	-886	-1037	-1225	-1419	-1598
Above $15000	-2005	-2194	-2012	-1954	-1875	-1810	-1852	-1876	-1943	-1950
Total	-3404	-3812	-3577	-3592	-3581	-3605	-3867	-4186	-4553	-4823

TABLE VII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					Urban Sector					
					-million dollars-					
Below $1000	0	0	0	0	0	0	0	0	0	0
$ 1000 - $ 2000	0	0	0	0	0	0	0	0	0	0
$ 2000 - $ 3000	0	0	0	0	0	0	0	0	0	0
$ 3000 - $ 4000	0	0	0	0	0	0	0	0	0	0
$ 4000 - $ 5000	0	0	0	0	0	0	0	0	0	0
$ 5000 - $ 6000	-15	-13	-14	-18	-22	-28	-38	-49	-59	-70
$ 6000 - $ 7500	-123	-147	-156	-170	-185	-202	-236	-278	-319	-356
$ 7500 - $10000	-413	-460	-433	-460	-464	-472	-512	-568	-624	-666
$10000 - $15000	-414	-499	-535	-588	-640	-696	-807	-958	-1120	-1272
Above $15000	-1739	-1860	-1744	-1683	-1603	-1534	-1561	-1604	-1657	-1677
Total	-2705	-2982	-2902	-2921	-2916	-2934	-3156	-3459	-3797	-4043

TABLE VII (Continued)

Rural Nonfarm Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	0	0	0	0	0	0	0	0	0	0
$ 1000 - $ 2000	0	0	0	0	0	0	0	0	0	0
$ 2000 - $ 3000	0	0	0	0	0	0	0	0	0	0
$ 3000 - $ 4000	0	0	0	0	0	0	0	0	0	0
$ 4000 - $ 5000	11	10	12	11	10	9	7	7	7	6
$ 5000 - $ 6000	-4	-10	-4	-5	-8	-11	-17	-21	-24	-27
$ 6000 - $ 7500	-19	-34	-19	-22	-27	-35	-50	-61	-71	-82
$ 7500 - $10000	-70	-94	-84	-89	-85	-75	-59	-57	-57	-53
$10000 - $15000	-80	-110	-87	-95	-106	-126	-158	-180	-203	-221
Above $15000	-117	-180	-108	-108	-115	-132	-160	-174	-193	-209
Total	-280	-420	-291	-308	-331	-372	-438	-487	-542	-588

TABLE VII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					Farm Sector					
					-million dollars-					
Below $1000	0	0	0	0	0	0	0	0	0	0
$ 1000 - $ 2000	0	0	0	0	0	0	0	0	0	0
$ 2000 - $ 3000	0	0	0	0	0	0	0	0	0	0
$ 3000 - $ 4000	0	0	0	0	0	0	0	0	0	0
$ 4000 - $ 5000	-9	-7	-3	-1	-1	-2	-4	-7	-6	-4
$ 5000 - $ 6000	-13	-13	-10	-8	-6	-4	-2	1	6	12
$ 6000 - $ 7500	-64	-59	-50	-43	-36	-31	-28	-26	-23	-18
$ 7500 - $10000	-102	-96	-88	-80	-69	-53	-35	-23	-18	-11
$10000 - $15000	-81	-80	-71	-65	-62	-62	-71	-85	-95	-105
Above $15000	-148	-153	-160	-162	-157	-144	-129	-97	-75	-63
Total	-418	-409	-383	-362	-333	-298	-272	-238	-212	-191

In order to get a perspective on investment losses relative to sector income, sector investment differences were divided by sector income (see Table VIII). Throughout the study period, the farm sector was burdened with heavier relative investment losses than were the urban and rural nonfarm sectors. This resulted from higher marginal investment schedules in the farm sector. Investment losses in the farm sector would have been even greater had the farm sector not received increases in net income transfers over time.

The urban sector had heavier relative investment losses than did the rural nonfarm sector for the first six years of the study; but for the last three years, relative losses in the rural nonfarm sector exceeded those of the urban sector. In the three sectors in general, relative investment losses tended to decrease during the first half of the study period and increase during the last half. This resulted mainly from the increasing rate of growth of total transfer expenditures during the late 1960's.

Income[2] growth which would have occurred in the absence of social insurance programs is included in Table IX. During the study period, total income increased by $204.7 billion. Had there been no social insurance transfers, simulated income would have increased by $226.9 billion. Thus there was a loss of $22.2 billion in income due to social insurance transfers. This loss amounted to 3.63 percent of actual 1969 income.

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[2]Henceforth the term 'post-transfer income' will refer to earned income plus social insurance transfer payments. This is the equivalent of 'income before taxes'. Post-transfer income minus net transfer effects of social insurance expenditures is hereafter referred to as 'pre-transfer income'. Pre-transfer income plus income from investment (from net transfers) is referred to as 'simulated income'. Simulated income is income which would have occurred in the absence of social insurance programs.

TABLE VIII

INVESTMENT LOSSES AS A PROPORTION OF PRE-TRANSFER INCOME-BY SECTOR[a]

Year	Urban	Rural Nonfarm	Farm	Total
1960	.0087	.0038	.0202	.0084
1961	.0092	.0058	.0204	.0091
1962	.0084	.0041	.0195	.0082
1963	.0080	.0045	.0192	.0079
1964	.0074	.0049	.0180	.0075
1965	.0069	.0057	.0166	.0071
1966	.0069	.0069	.0156	.0072
1967	.0071	.0081	.0146	.0074
1968	.0073	.0096	.0138	.0077
1969	.0074	.0115	.0138	.0079
Average	.0077	.0065	.0172	.0078

[a]BLS sectoral investment schedules utilized. See text for definition of functions.

TABLE IX

DISTRIBUTION OF INCOME-STANDARD CASE

Income Class	Post-Transfer Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	1135	1419	1925	2355	2973	3525	4161	4788	5442	5981
$ 1000 - $ 2000	9932	10481	11157	11731	12661	13691	14591	15493	16505	17150
$ 2000 - $ 3000	19378	19689	19749	20238	20238	20843	21347	21522	21888	21789
$ 3000 - $ 4000	30405	29566	29183	28219	27960	27587	26968	25803	24610	22888
$ 4000 - $ 5000	44919	43680	42922	41445	40765	40001	38695	36452	34253	31005
$ 5000 - $ 6000	51852	51239	51366	50641	50932	5o343	41071	49804	48688	46325
$ 6000 - $ 7500	75498	75710	77137	77501	79276	81586	83174	83214	83710	82336
$ 7500 - $10000	84041	87194	91969	101816	108816	115438	115438	120624	126896	130981
$10000 - $15000	54041	61428	70530	79539	91217	104780	119005	132681	148548	162964
Above $15000	34297	37542	41784	46020	51747	58597	65933	72904	81225	88806
Total	405491	417599	437664	452915	479589	510774	540388	563291	491770	610230

TABLE IX (Continued)

Income Class	Pre-Transfer Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	376	296	635	719	947	990	900	763	516	184
$ 1000 - $ 2000	2946	2970	3942	4436	5332	6232	6467	6544	6544	6406
$ 2000 - $ 3000	14085	13565	14025	14037	14524	15085	15134	14683	14436	13879
$ 3000 - $ 4000	27402	26322	25982	25112	25002	24800	24193	23004	21832	20224
$ 4000 - $ 5000	44313	43031	42167	40656	39957	39192	37845	35518	33213	29899
$ 5000 - $ 6000	52164	51586	51652	50980	51338	51846	51745	50645	49664	47452
$ 6000 - $ 7500	77035	77476	78973	79487	81420	83947	85960	86486	87445	86501
$ 7500 - $10000	87941	91608	96255	100068	106169	113148	119976	125581	132289	135688
$10000 - $15000	57328	65426	74643	84032	96107	110140	125267	140086	157157	172589
Above $15000	41894	45808	49390	53382	58793	65389	72896	80043	88678	96299
Total	405488	417599	437667	452913	479593	510773	540388	563218	591779	610224

TABLE IX (Continued)

Income Class	Simulated Income 1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	376	290	671	805	1107	1249	1283	1300	1242	1140
$ 1000 - $ 2000	2946	3003	4034	4610	5615	6652	7053	7257	7574	7724
$ 2000 - $ 3000	14085	13631	14171	14269	14855	15527	15698	15389	15304	14933
$ 3000 - $ 4000	27402	26413	26168	25388	25372	25265	24757	23672	22611	21124
$ 4000 - $ 5000	44313	43126	42368	40962	40378	39736	38519	36335	34191	31054
$ 5000 - $ 6000	52164	51699	51893	51353	51855	52519	52589	51681	50914	48942
$ 6000 - $ 7500	77035	77759	79371	80112	82301	85113	87443	88336	89715	89251
$ 7500 - $10000	87941	91879	96848	101008	107500	114915	122228	128385	135722	140838
$10000 - $15000	57328	65711	75270	85026	97516	112014	127664	143089	160863	177202
Above $15000	41894	46368	50526	55028	60914	67935	75816	83316	92278	100183
Total	405488	419302	441322	458565	487417	520928	553055	578764	610419	632395

The effects of social insurance programs on distribution of income were much greater. In 1969, the lowest income class (below $1000) had a pre-transfer income of $184.30 million; transfer payments to this class increased its income to $6.0 billion. In the absence of transfer programs, simulated income in the lowest class would have been $1.1 billion. While this figure is many times the pre-transfer income, it is less than 20 percent of post-transfer income. Clearly the poorest were better off with social transfer programs than without them. All classes with income less than $4000 per year benefited from the existence of social insurance programs.

The $4000-$5000 income class would have had about the same income in 1969, with or without transfer payments. For all classes above $5000 simulated income exceeded post-transfer income in all years. Income in the higher classes would have been considerably greater in 1969 in the absence of social insurance programs. Simulated income for the highest class (above $15000) was 12.81 percent higher than 1969 post-transfer income.

In terms of sectoral total income differences, more than 88 percent of the 1969 potential income gain (simulated income) occurred in the urban sector, 7 percent in the rural nonfarm sector and 4 percent in the farm sector. The concentration of increased growth in the urban sector resulted from the net loss of transfer income which the urban sector experienced throughout the study period.

Measures of Distributional Inequalities-Standard Case

The extent to which social insurance programs redistributed income

is suggested in Table X. The proportion of total pre-transfer income accruing to the lowest income class (below $1000) averaged 0.13 percent. After transfers, the lowest class had an average of 6.41 percent of post-transfer income. Had there been no social insurance programs, the lowest class would have had an average of 0.18 percent of total simulated income. At the top end of the income scale, the highest class (above $15,000) had 12.79 percent of pre-transfer income on the average. Social insurance programs reduced this percentage to an average of 11.28 percent of post-transfer income. Had there been no such programs, the highest income class would have enjoyed an average of 12.95 percent of total simulated income.

These figures disregard the effects of population distribution changes. Gini ratios (based on per capita income) are presented in Table X1. The Gini ratios for post-transfer income averaged 0.2858 while those of pre-transfer income averaged 0.3451. There was little difference between Gini ratios of pre-transfer income and simulated income. Gini ratios for all three income types increased during the study period by about 0.0076. These results suggest that social insurance programs have a significant "equalizing" effect on income distributions. In the absence of such programs, the additional investment (stemming from net transfer effects) and increased growth would have little effect on the income distribution.

While the Gini ratio allows for changes in population distributions, it does not take into account differences in utility of money. Although simulated income in 1969 was $22,166 million higher than actual income, the Gini ratio for simulated income was considerably higher than that for post-transfer income. Atkinson's Index of Inequality assumes that

TABLE X

PROPORTIONAL DISTRIBUTION OF INCOME-STANDARD CASE

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Below $1000	0.0028	0.0034	0.0044	0.0052	0.0062	0.0069	0.0077	0.0085	0.0092	0.0098
$ 1000 - $ 2000	0.0245	0.0251	0.0255	0.0259	0.0264	0.0268	0.0270	0.0275	0.279	0.281
$ 2000 - $ 3000	0.0478	0.463	0.0450	0.0436	0.0422	0.0408	0.0895	0.0382	0.0370	0.0257
$ 3000 - $ 4000	0.0750	0.0708	0.0557	0.0623	0.0583	0.0540	0.0499	0.0458	0.0416	0.0375
$ 4000 - $ 5000	0.1108	0.1046	0.0981	0.0915	0.0850	0.0783	0.0716	0.0647	0.0579	0.0508
$ 5000 - $ 6000	0.1279	0.1227	0.1174	0.1118	0.1062	0.1005	0.0945	0.0884	0.0823	0.0759
$ 6000 - $ 7500	0.1862	0.1813	0.1762	0.1711	0.1653	0.1497	0.1539	0.1477	0.1415	0.1349
$ 7500 - $10000	0.2073	0.2088	0.2101	0.2113	0.2123	0.2130	0.2136	0.2141	0.2144	0.2146
$10000 - $15000	0.1333	0.1471	0.1612	0.1756	0.1902	0.2051	0.2202	0.2355	0.2510	0.2671
Above $15000	0.0846	0.0899	0.0955	0.1016	0.1079	0.1147	0.1220	0.1294	0.1373	0.1455

TABLE X (Continued)

Income Class	Pre-Transfer Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Below $1000	0.009	0.007	0.0015	0.0016	0.0020	0.0019	0.0017	0.0014	0.0009	0.0003
$ 1000 - $ 2000	0.0073	0.0071	0.0090	0.0098	0.0111	0.0122	0.0120	0.0115	0.0111	0.0105
$ 2000 - $ 3000	0.0347	0.0325	0.0320	0.0310	0.0303	0.0295	0.0280	0.0261	0.0244	0.0227
$ 3000 - $ 4000	0.0676	0.0630	0.0594	0.0554	0.0521	0.0486	0.0448	0.0408	0.0369	0.0331
$ 4000 - $ 5000	0.1093	0.1030	0.0963	0.0898	0.0833	0.0767	0.0700	0.0631	0.0561	0.0490
$ 5000 - $ 6000	0.1286	0.1235	0.1180	0.1126	0.1070	0.1015	0.0958	0.0899	0.0839	0.0778
$ 6000 - $ 7500	0.1900	0.1858	0.1804	0.1755	0.1698	0.1644	0.1491	0.1535	0.1478	0.1418
$ 7500 - $10000	0.2169	0.2194	0.2199	0.2209	0.2214	0.2215	0.2220	0.2229	0.2235	0.2240
$10000 - $15000	0.1414	0.1567	0.1705	0.1855	0.2004	0.2156	0.2318	0.2487	0.2656	0.2830
Above $15000	0.1033	0.1097	0.1128	0.1179	0.1226	0.1280	0.1349	0.1421	0.1499	0.1578

TABLE X (Continued)

	Simulated Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Below $1000	0.0009	0.0007	0.0015	0.0018	0.0023	0.0024	0.0023	0.0022	0.0020	0.0018
$ 1000 - $ 2000	0.0073	0.0072	0.0091	0.0101	0.0115	0.0128	0.0128	0.0125	0.0124	0.0122
$ 2000 - $ 3000	0.0347	0.0325	0.0321	0.0311	0.0305	0.0298	0.0284	0.0266	0.0251	0.0236
$ 3000 - $ 4000	0.0676	0.0630	0.0593	0.0554	0.0521	0.0485	0.0448	0.0409	0.0370	0.0334
$ 4000 - $ 5000	0.1093	0.1029	0.0960	0.0893	0.0828	0.0763	0.696	0.0628	0.0560	0.0491
$ 5000 - $ 6000	0.1286	0.1233	0.1176	0.1120	0.1064	0.1008	0.0951	0.893	0.0834	0.0774
$ 6000 - $ 7500	0.1900	0.1854	0.1708	0.1747	0.1689	0.1634	0.1581	0.1526	0.1470	0.1411
$ 7500 - $10000	0.2169	0.2191	0.2195	0.2203	0.2206	0.2206	0.2210	0.2218	0.223	0.2227
$10000 - $15000	0.1414	0.1567	0.1706	0.1854	0.2001	0.2150	0.2308	0.2472	0.2635	0.2802
Above $15000	0.1033	0.1106	0.1145	0.1200	0.1250	0.1340	0.1371	0.1440	0.1512	0.1584

TABLE XI

GINI RATIOS - THREE SECTORS COMBINED-
STANDARD CASE

Year	Post-Transfer Income	Pre-Transfer Income	Simulated Income
1960	0.2404	0.3139	0.3138
1961	0.2514	0.3193	0.3200
1962	0.2620	0.3232	0.3243
1963	0.2724	0.3315	0.3326
1964	0.2820	0.3374	0.3382
1965	0.2921	0.3444	0.3446
1966	0.3014	0.3544	0.3537
1967	0.3101	0.3652	0.3634
1968	0.3184	0.3753	0.3720
1969	0.3279	0.3860	0.3808

as income rises, marginal utility falls. Thus the Index weights income transfers toward lower income groups.

With an epsilon of 0.5 (indicating slightly declining marginal utility for money), the distribution of simulated income became "less unequal" than the distribution of pre-tranfer income in 1963 (see Table XII). By 1969, the index of inequality for simulated income was 0.2351, 0.184 lower than the index of inequality for pre-transfer income. Thus the index of inequality, by weighting transfers to low income groups, suggests the simulated income distribution if preferable to the pre-transfer distribution of income (the Gini ratios for the two distributions were approximately equal). With an epsilon of 1.5, the simulated income distribution is preferred to the pre-transfer distribution in all years. However, in no year was the distribution of simulated income preferred to that of post-transfer income.

In terms of the equally distributed equivalent income measure (Y_{ede}), with an epsilon of 0.5, a 1969 per capita income of $2526.18, if equally distributed, would have produced the same utility as the actual per capita income of $3031.36. A 1969 per capita simulated income of $2402.85, if equally distributed, would have been sufficient to produce the same utility as the per capita simulated income of $3143.43.

With an epsilon of 1.5, the Y_{ede} figures are still lower, emphasising the increased importance of transfers to low income groups as epsilon increases.

Summary

During the 10 years included in the study period, expenditures from social insurance programs increased from $31.4 billion to $59.7 billion.

TABLE XII

ATKINSONS'S EQUALLY DISTRIBUTED INCOME MEASURE AND INDICES OF INEQUALITY FOR THREE INCOME BASES

Income Base		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					- dollars - per capita -						
Post-Transfer Income[a]	Mean	2261	2282	2356	2403	2509	2640	2764	2853	2969	3031
Pre-Transfer Income[b]	Mean	2261	2283	2356	2403	2509	2640	2764	2853	2969	3031
Simulated Income[c]	Mean	2261	2293	2376	2433	2550	2692	2828	2932	3062	3141
					- dollars - per capita - epsilon = 0.5 -						
Post-Transfer Income	Y_{ede}[d]	2017	2021	2073	2100	2178	2273	2361	2419	2497	2526
Pre-Transfer Income	Y_{ede}	1889	1859	1940	1963	2041	2129	2196	2229	2273	2262
Simulated Income	Y_{ede}	1889	1865	1956	1989	2077	2178	2260	2311	2379	2402
					- index - epsilon = 0.5 -						
Post-Transfer Income	I[e]	0.107	0.114	0.120	0.126	0.132	0.138	0.145	0.152	0.158	0.166
Pre-Transfer Income	I	0.164	0.186	0.176	0.182	0.186	0.193	0.205	0.218	0.234	0.253
Simulated Income	I	0.164	0.186	0.176	0.182	0.185	0.190	0.200	0.211	0.223	0.235
					- dollars - per capita - epsilon = 1.5 -						
Post-Transfer Income	Y_{ede}	1536	1490	1493	1471	1493	1513	1533	1533	1539	1507
Pre-Transfer Income	Y_{ede}	1023	995	976	936	959	929	835	709	532	253
Simulated Income	Y_{ede}	1023	1000	994	972	1014	1014	963	895	815	713
					- index - epsilon = 1.5 -						
Post-Transfer Income	I	0.320	0.347	0.366	0.387	0.404	0.426	0.445	0.462	0.481	0.502
Pre-Transfer Income	I	0.547	0.564	0.585	0.610	0.617	0.647	0.697	0.751	0.820	0.916
Simulated Income	I	0.547	0.563	0.581	0.600	0.602	0.623	0.659	0.694	0.733	0.772

[a] Per capita income including income transfers from social insurance programs.

[b] Per capita income minus net transfers from social insurance programs.

[c] Per capita income in the absence of social insurance programs.

[d] Atkinson's equally distributed equivalent income measure. Per capita income necessary to have the same level of utility as the present income if income were equally distributed.

[e] Atkinson's index of inequality.

Program effectiveness in redistributing income decreased over the study period as transfers became increasingly concentrated in the middle income classes.

The urban sector bore most of the burden of increasing expenditures. Net transfers in the rural nonfarm sector were positive but decreasing throughout the study period while net transfers in the farm sector went from (-)$147.5 million to $711.4 million in 1969.

In the absence of social insurance programs, total income in 1969 would have been $22.2 billion higher than it was with the programs (an increase of 3.64 percent). However, there would have been more distributional inequality in absolute terms, in terms of Gini ratios and by Atkinson's inequality measures. Thus while total income was decreased by social insurance programs, the poor benefited from their existence.

CHAPTER V

SIMULATION RESULTS AND SUMMARY MEASURES OF DISTRIBUTIONAL INEQUALITIES UNDER ALTERNATIVE ASSUMPTIONS

Results of the standard case presented in Chapter IV were based on a three sector model of the economy (urban, rural nonfarm and farm). Three income bases were considered: post-transfer income (income including social insurance program transfers), pre-transfer income (income minus social insurance transfers) and simulated income (income with net social insurance expenditures treated as investment). The investment function used was derived from data in the 1961 BLS study.

In the present chapter, three alternative models were considered.[1] All social insurance program expenditures during the study period were held constant at the 1960 level (constant expenditure model). Then the 1960 level of expenditures was allowed to increase at the same rate as population (increasing rate model). Finally, costs and benefits of actual social insurance expenditures were allocated among classes and sectors on the basis of utility (tax model) on the basis of utility for money implied by the 1971 nominal federal income tax rates.

Results-Constant Expenditure Model

In the standard case, all social insurance expenditures were halted

[1]The results of the standard case using alternative investment functions are presented in Appendix C.

in 1960. While this approach is useful in estimating the effects of such expenditures on distribution and growth of income, such action would be unrealistic from a policy point of view. The constant expenditure model projects results of halting the increase in social insurance expenditures.

Simulation with constant 1960 expenditures utilized the three sector model (urban, rural nonfarm and farm) with 10 income classes as did the standard case. The investment schedule was also the same as in the standard case. The only difference between the constant expenditure model and the standard case of Chapter IV was that total expenditures were held to the 1960 level.

Income transfers and investment differences followed the pattern established in the standard case except that total dollar amounts involved were constant. Since total expenditures increased from $31.4 billion in 1960 to $59.8 billion in 1969, holding the expenditures constant at the 1960 level caused 1969 expenditures to be only 52.5 percent of actual expenditures. Net transfer effects and investment differences were reduced accordingly.

Simulated income in 1969 was $628.0 billion, $17.8 billion more than income including social insurance programs (see Table XIII). This represented an increase of 2.91 percent (compared to 3.64 percent in the standard case).

Differences between the constant expenditure model and the standard case were also evident in the distribution of income among classes (see Table XIV). Lower income classes tended to receive a smaller portion of post-transfer income under the constant expenditure model. While the lowest income class (below $1000) received the same portion of income in 1960 under both models, holding expenditures constant resulted in

TABLE XIII

DISTRIBUTION OF INCOME-CONSTANT EXPENDITURE MODEL

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	1135	1235	1761	2088	2584	2957	3197	3286	3310	3225
$ 1000 - $ 2000	9932	9675	10242	10541	11254	12021	12189	12125	12195	12043
$ 2000 - $ 3000	19378	18715	18971	18817	19141	19554	19510	18969	18664	18029
$ 3000 - $ 4000	30405	29218	28777	27712	27392	26963	26197	24759	23408	21621
$ 4000 - $ 5000	44919	43611	42826	41317	40610	39820	38444	36103	33803	30480
$ 5000 - $ 6000	51852	51276	51402	50696	51010	51455	51270	50118	49110	46861
$ 6000 - $ 7500	75487	75918	77369	77825	79581	82115	83997	84435	85326	84316
$ 7500 - $10000	84041	87668	92512	96421	102652	109785	116780	122474	129230	133694
$10000 - $15000	54041	61857	71051	80272	92156	105980	120856	135445	152274	167587
Above $15000	34297	38429	42748	47221	53100	60118	67997	75569	84450	92368
Total	405491	417599	437664	452915	479590	510774	540387	563287	591773	610227

TABLE XIII (Continued)

Income Class	Simulated Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
below $1000	376	290	668	798	1092	1219	1234	1221	1116	950
$ 1000 - $ 2000	2946	3003	4028	4596	5587	6604	6978	7140	7396	7462
$ 2000 - $ 3000	14085	13631	14162	14251	14823	15477	15626	15284	15154	14724
$ 3000 - $ 4000	27402	26413	62157	25367	25337	25213	24685	23573	22476	20945
$ 4000 - $ 5000	44313	43126	42356	40938	40338	39675	38433	36215	34023	30827
$ 5000 - $ 6000	52164	51699	51879	51324	51805	52444	52481	51528	50699	48648
$ 6000 - $ 7500	77035	77759	79349	80064	82216	84982	87254	88061	89321	88702
$ 7500 - $10000	97941	91879	96815	100936	107372	114716	121941	127971	135134	140024
$10000 - $15000	57328	65711	75235	84948	97378	111799	127352	142633	160202	176271
Above $15000	41894	46368	50463	54902	60712	67652	75449	82843	91678	99448
Total	405488	419301	44118	458128	486663	519786	551438	576473	607205	628006

TABLE XIV

PERCENT DISTRIBUTION OF INCOME-CONSTANT EXPENDITURE MODEL

Income Class	Post-Transfer Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-percent-									
Below $1000	0.28	0.30	0.40	0.46	0.54	0.58	0.59	0.58	0.56	0.53
$ 1000 - $ 2000	2.45	2.32	2.34	2.33	2.35	2.35	2.26	2.15	2.06	1.97
$ 2000 - $ 3000	4.78	4.48	4.33	4.15	3.99	3.83	3.61	3.37	3.15	2.95
$ 3000 - $ 4000	7.50	7.00	6.58	6.12	5.17	5.28	4.84	4.40	3.96	3.54
$ 4000 - $ 5000	11.08	10.44	9.79	9.12	8.47	7.80	7.11	6.41	5.71	4.99
$ 5000 - $ 6000	12.79	12.28	11.74	11.19	10.64	10.07	9.49	8.90	8.30	7.68
$ 6000 - $ 7500	18.62	18.18	17.68	17.18	16.62	16.08	15.54	14.99	14.42	13.82
$ 7500 - $10000	20.73	20.99	21.14	21.29	21.40	21.49	21.61	21.74	21.84	21.91
$10000 - $15000	13.33	14.81	16.23	17.72	19.22	20.75	22.36	24.05	25.73	27.46
Above $15000	8.46	9.20	9.77	10.43	11.07	11.77	12.58	13.42	14.27	15.14

TABLE XIV (Continued)

Income Class	Simulated Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-percent-									
Below $1000	0.09	0.07	0.15	0.17	0.22	0.23	0.22	0.21	0.18	0.15
$ 1000 - $ 2000	0.73	0.72	0.91	1.00	1.15	1.27	1.27	1.24	1.22	1.19
$ 2000 - $ 3000	3.47	3.25	3.21	3.11	3.05	2.98	2.83	2.65	2.50	2.34
$ 3000 - $ 4000	6.76	6.30	5.93	5.54	5.21	4.85	4.48	4.09	3.70	3.34
$ 4000 - $ 5000	10.93	10.29	9.60	8.94	8.29	7.63	6.97	6.28	5.60	4.91
$ 5000 - $ 6000	12.86	12.33	11.76	11.20	10.65	10.09	9.52	8.94	8.35	7.75
$ 6000 - $ 7500	19.00	18.54	17.99	17.48	16.89	16.35	15.82	15.28	14.71	14.12
$ 7500 - $10000	21.69	21.91	21.95	22.03	22.06	22.07	22.11	22.20	22.26	22.30
$10000 - $15000	14.14	15.67	17.06	18.54	20.01	21.51	23.09	24.74	26.38	28.07
Above $15000	10.33	11.06	11.44	11.98	12.48	13.02	13.68	14.37	15.10	15.84

that class receiving only 0.53 percent of total income in 1969 as opposed to 0.98 percent under the standard case. Likewise the highest income class (above $15,000) received 15.14 percent of constant expenditures compared to 14.55 percent under the standard case.

In terms of Gini ratios, inequalities in the distribution of post-transfer income increased over time (see Table XV). The Gini ratios for the constant expenditure model were higher than those of the standard case and the difference increased over time. By 1969, the Gini ratio of income had increased to 0.3555, 0.0276 higher than in the 1969 income Gini ratio in the standard case.

Gini ratios for post-transfer income were lower than those for pre-transfer income. In 1969 pre-transfer income had a Gini ratio of 0.391 compared to a ratio of 0.366 for post-transfer income. There was little difference in Gini ratios for pre-transfer income and simulated income. Likewise there was little difference between Gini ratios for the two income bases and similar ratios under the standard case.

Atkinson's index of inequaility (1) indicated generally more inequality in the distribution of simulated income in the constant expenditure model than in the standard case (see Table XVI). However, the loss in distributional equality was small (I = 0.2379 for the constant expenditure model; I = 0.2351 for the standard case; 1969, epsilon = 0.5).

The relationship between the standard case results and those of the constant expenditure model (using Atkinson's measures) with an epsilon of 1.5 are similar but more pronounced than results using an epsilon of 0.5.

TABLE XV

GINI RATIOS FOR THREE INCOME BASES UNDER CONSTANT EXPENDITURE MODEL-THREE SECTORS COMBINED

Year	Post-Transfer Income	Pre-Transfer Income	Simulated Income
1960	0.2404	0.3039	0.3039
1961	0.2588	0.3193	0.3199
1962	0.2698	0.3221	0.3242
1963	0.2821	0.3315	0.3325
1964	0.2926	0.3374	0.3382
1965	0.3038	0.3444	0.3446
1966	0.3137	0.3544	0.3538
1967	0.3307	0.3652	0.3636
1968	0.3431	0.3753	0.3725
1969	0.3555	0.3850	0.3818

TABLE XVI

ATKINSON'S EQUALLY DISTRIBUTED INCOME MEASURE AND INDICES OF INEQUALITY FOR THREE INCOME BASES-- CONSTANT EXPENDITURE MODEL

Income Base	Measure	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					- dollars - per capita -						
Post-Transfer Income[a]	Mean	2261	2282	2396	2403	2509	2640	2764	2853	2969	3031
Pre-Transfer Income[b]	Mean	2261	2283	2356	2403	2509	2640	2764	2853	2969	3031
Simulated Income[c]	Mean	2361	2293	2374	2431	2546	2686	2820	2920	3046	3119
					- dollars - per capita - epsilon = 0.5 -						
Post-Transfer Income	Y_{ede}[d]	2017	2008	2050	2082	2156	2246	2321	2361	2420	2431
Pre-Transfer Income	Y_{ede}	1889	1859	1940	1963	2041	2129	2196	2229	2273	2262
Simulated Income	Y_{ede}	1889	1865	1955	1987	2074	2173	2252	2299	2362	2377
					- index - epsilon = 0.5 -						
Post-Transfer Income	I[e]	0.107	0.119	0.125	0.133	0.140	0.149	0.160	0.172	0.184	0.197
Pre-Transfer Income	I	0.164	0.186	0.176	0.182	0.186	0.193	0.205	0.218	0.234	0.253
Simulated Income	I	0.164	0.186	0.176	0.182	0.185	0.191	0.201	0.212	0.224	0.237
					- dollars - per capita epsilon = 1.5 -						
Post-Transfer Income	Y_{ede}	1536	1441	1446	1408	1418	1418	1387	1320	1253	1155
Pre-Transfer Income	Y_{ede}	1023	1001	976	936	959	929	835	709	532	253
Simulated Income	Y_{ede}	1023	1008	993	970	1009	1005	948	871	776	651
					- index - epsilon = 1.5 -						
Post-Transfer Income	I	0.320	0.368	0.386	0.413	0.435	0.462	0.498	0.537	0.577	0.618
Pre-Transfer Income	I	0.547	0.561	0.585	0.610	0.617	0.647	0.697	0.751	0.820	0.916
Simulated Income	I	0.547	0.560	0.581	0.601	0.603	0.625	0.663	0.701	0.745	0.791

[a]Per capita income including transfers from social insurance programs.

[b]Per capita income minus net transfers from social insurance programs.

[c]Per capita income in the absence of social insurance programs.

[d]Atkinson's equally distributed equivalent income measure. Per capita income necessary to have the same level of utility as the present income if income were equally distributed.

[e]Atkinson's index of inequality.

Results-Increasing Rate Model

One alternative to holding social insurance expenditures constant at the 1960 level would be to allow expenditures to increase at the same rate as population increases. This was the approach of the increasing rate model. Population increased at an average annual rate of 1.19 percent during the study period. Since this rate of increase is small compared to the rate of increase in total social insurance expenditures, the results of the increasing rate model were much closer to those of the constant rate model than to the standard case. Because there were no great differences in results between the constant expenditure model and the increasing rate model, only cursory attention will be given to the increasing rate model results. Tables presenting the results are included in Appendix B.

Simulated income in 1969 under the increasing rate model was 3.05 percent higher than post-transfer income. This compares to a 3.64 percent differential under the standard case and a 2.91 percent differential under the constant rate model. Thus if 1960 per capita expenditures had been held constant, average per capita income would have been 3.05 percent higher in 1969 than it was.

The distributional effects of the increasing rate model differed little from those of the constant expenditure model. Lower income classes had less income than under the standard case while higher income classes had more income. These results are reflected in both the Gini ratios and in Atkinson's measures.

Results-Tax Model

Total social insurance programs increased more than 90 percent during the study period. However net transfers constituted a decreasing portion of total expenditures. Under the tax model, social insurance programs were perfectly discriminating; that is, the needy did not pay into the programs and the wealthy received no benefits. Thus, net transfers equalled total expenditures. The basis for allocating costs and benefits was the 1971 nominal tax rate schedule of the Internal Revenue Service. The utility of per capita money paid (costs) or received (benefits) was equalized throughout the population using the schedule of utility of money implied by federal tax rates. Marginal utility for money was considered constant for given income classes before and after transfer payments and over time.

The model utilized actual total social insurance expenditures during the study period. Three sectors (urban, rural nonfarm and farm), 10 income classes and BLS investment functions of the standard case were used.

Since net transfers equalled total expenditures under the tax model, transfers between sectors were expected to be higher. However, sectoral transfers were much higher than indicated by increased net expenditures. Under the standard case, the urban sector incurred an annual net loss of income of about $3 billion per year throughout the study period. Under the tax model, urban losses ranged from $4.1 billion per year in 1960 to $9.6 billion in 1969 (see Table XVII). Net gains in the rural nonfarm sector of $2.6 billion ($532 million less than the 1960 gain of the standard case) more than doubled to

TABLE XVII

INCOME TRANSFERS AMONG SECTORS-
TAX MODEL[a]

Year	Urban Sector	Rural Nonfarm Sector	Farm Sector
		-million dollars-	
1960	-4081	2639	1442
1961	-4663	2981	1684
1962	-4883	3066	1819
1963	-5180	3253	1928
1964	-5504	3419	2086
1965	-5857	3630	2226
1966	-6587	4114	2467
1967	-7553	4777	2780
1968	-8567	5424	3142
1969	-9572	6021	3550

[a]Negative signs indicate a loss of income.

$6.0 billion in 1969. While the farm sector under the standard case had a 1960 net loss of income of $147.5 million which increased to a gain of $711.4 million in 1969, under the tax model the farm sector had a net gain of income in 1960 of $1.4 billion. This gain increased to $3.6 billion by 1969. Thus transfers among sectors were considerably larger under the tax model than under the standard case. Losses to the urban sector were larger with the farm sector receiving much of the increased transfers.

In 1969, total simulated income was 3.9 percent higher than post-transfer income (see Table XVIII). The differential was larger than that of the standard case because of higher net transfers under the tax model.

The breaking point between income classes receiving benefits and those incurring costs occurred in the $5000-$6000 income class in each year under the tax model. The lowest income class (below $1000) received a larger percentage of post-transfer income than under the standard case throughout the study (see Table XIX). Similarly, social insurance programs lowered the percentage share of income to upper income classes except in the highest income class (above $15000). As in the standard case, the highest income class increased its share of post-transfer income throughout the study period.

Gini ratios for post-transfer income under the tax model were lower than those of the standard case throughout the study period (see Table XX). The 1969 Gini ratio for post-transfer income was 0.2922 compared to a ratio of 0.3279 for the standard case. Lower Gini ratios resulted from increased transfers to lower income classes.

TABLE XVIII

DISTRIBUTION OF INCOME UNDER THE TAX MODEL

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
below $1000	1818	1884	3445	4248	5223	6085	7207	8629	10070	11467
$ 1000 - $ 2000	9051	9932	11194	12122	13437	14812	16064	17417	18833	19901
$ 2000 - $ 3000	21073	21183	21607	21731	22273	22924	23514	23814	24210	24120
$ 3000 - $ 4000	35140	34540	33931	32913	32613	32220	31819	30954	29929	28242
$ 4000 - $ 5000	52952	52262	51138	49529	48632	47676	46595	44656	42544	39164
$ 5000 - $ 6000	44844	44508	45542	45856	47291	48974	50126	50581	51540	51476
$ 6000 - $ 7500	67359	66920	68273	68514	70270	72556	73638	72906	72753	70961
$ 7500 - $10,000	79508	81982	86234	89410	94933	101240	106610	110291	115111	117823
$10,000 - $15,000	53305	60374	68917	77459	88674	101750	115288	128047	142941	156351
above $15,000	40434	44012	47384	51110	56243	62531	69519	75986	83844	90716
Total	405489	417601	437668	452914	479593	510773	540384	563284	591780	610225

TABLE XVIII (Continued)

Income Class	Simulated Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
below $1,000	376	288	676	817	1129	1283	1332	1362	1310	1207
$ 1000 - $ 2000	2946	3010	4047	4635	5654	6708	7129	7347	7670	7816
$ 2000 - $ 3000	14085	13646	14192	14302	14901	15587	15772	15470	15386	15006
$ 3000 - $ 4000	27402	26432	26194	25428	25424	25328	24830	23749	22684	21187
$ 4000 - $ 5000	44313	43097	42298	40860	40243	39567	38315	36088	33891	30692
$ 5000 - $ 6000	52164	51816	52101	51649	52225	52950	53066	52180	51409	49405
$ 6000 - $ 7500	77035	77947	79724	80644	83009	85996	88500	89546	91056	90696
$ 7500 - $10000	87941	92033	97131	101445	108096	115681	123176	129505	136996	142241
$10000 - $15000	57328	65779	75377	85201	97761	112337	128066	143546	161338	176653
above $15,000	41894	46195	50104	54388	60046	66837	74482	81718	90399	98002
Total	4-5488	419670	441849	459374	488492	522279	554672	580517	712145	633908

TABLE XIX

PERCENT DISTRIBUTION OF INCOME
UNDER THE TAX MODEL

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-percent-									
Below $1000	0.45	0.45	0.79	0.94	1.09	1.19	1.33	1.53	1.70	1.88
$ 1000 - $ 2000	2.23	2.38	2.56	2.68	2.80	2.90	2.97	3.09	3.18	3.26
$ 2000 - $ 3000	5.20	5.07	4.94	4.80	4.64	4.49	4.35	4.23	4.09	3.95
$ 3000 - $ 4000	8.67	8.27	7.75	7.27	6.80	6.31	5.89	5.50	5.06	4.63
$ 4000 - $ 5000	13.06	12.51	11.68	10.94	10.14	9.33	8.62	7.93	7.19	6.42
$ 5000 - $ 6000	11.06	10.66	10.41	10.21	9.86	9.59	9.28	8.98	8.71	8.44
$ 6000 - $ 7500	16.61	16.02	15.60	15.13	14.65	14.21	13.63	12.94	12.29	11.63
$ 7500 - $10000	19.61	19.63	19.70	19.74	19.79	19.82	19.73	19.58	19.45	19.31
$10000 - $15000	13.15	14.46	15.75	17.10	18.49	19.92	21.33	22.73	24.15	25.62
Above $15000	9.97	10.54	10.83	11.28	11.73	12.24	12.86	13.49	14.17	14.87

TABLE XIX (Continued)

Income Class	Simulated Income 1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-percent-									
Below $1000	0.09	0.07	0.15	0.18	0.23	0.25	0.24	0.23	0.21	0.19
$ 1000 - $ 2000	0.73	0.72	0.92	1.01	1.16	1.28	1.29	1.27	1.25	1.23
$ 2000 - $ 3000	3.47	3.25	3.21	3.11	3.05	2.98	2.84	2.66	2.51	2.37
$ 3000 - $ 4000	6.76	6.30	5.93	5.54	5.20	4.85	4.48	4.09	3.71	3.34
$ 4000 - $ 5000	10.93	10.27	9.57	8.89	8.24	7.58	6.91	6.22	5.54	4.84
$ 5000 - $ 6000	12.86	12.35	11.79	11.24	10.69	10.14	9.57	8.99	8.40	7.79
$ 6000 - $ 7500	19.00	18.57	18.04	17.56	16.99	16.47	15.96	15.43	14.87	14.31
$ 7500 - $10000	21.69	21.93	21.98	22.08	22.13	22.15	22.21	22.31	22.38	22.44
$10000 - $15000	14.14	15.67	17.06	18.55	20.01	21.51	23.09	24.73	26.36	28.03
Above $15000	10.33	11.01	11.34	11.84	12.29	12.80	13.43	14.08	14.77	15.46

TABLE XX

GINI RATIOS FOR THREE INCOME BASES UNDER TAX MODEL-THREE SECTORS COMBINED

Year	Income[a]	Pre-Transfer Income[b]	Simulated Income[c]
1960	0.2272	0.3039	0.3039
1961	0.2373	0.3193	0.3197
1962	0.2428	0.3232	0.3237
1963	0.2509	0.3315	0.3317
1964	0.2589	0.3374	0.3369
1965	0.2679	0.3444	0.3430
1966	0.2750	0.3544	0.3518
1967	0.2799	0.3652	0.3611
1968	0.2858	0.3753	0.3694
1969	0.2922	0.3860	0.3780

[a]Income including social insurance expenditures.

[b]Income minus net transfer effects of social insurance expenditures.

[c]Income with transfer effects treated as investment.

Atkinson's measure of distributional inequalities also indicated an improvement in the relative position of the poor. The index of inequality (I) for 1969 income under the tax model was I = 0.1363 (epsilon = 0.5) compared to a similar figure of I = 0.1666 for the standard case (see Table XXI).

Summary

Chapter V has reviewed the results of three alternative simulation models: the constant expenditure model, the increasing rate model and the tax model. In the first of these models, expenditures of social insurance programs were held constant at the 1960 level. The increasing rate model allowed 1960 expenditures to increase at the same rate as population increased.

The constant rate model and the increasing rate model differed from the standard case only in the level of expenditures. The results of the two models were as expected. Transfer effects, both among classes and among sectors were smaller. The poor benefited less than under the standard case and the differential between simulated total income and income including transfers was smaller. Summary measures of distributional inequalities indicated less equality of post-transfer income under the two models than under the standard case.

While the standard case, the constant expenditure model and the increasing rate model decreased total social insurance expenditures, the tax model considered actual total expenditures and improved the efficiency of transfers by perfectly discriminating with respect to costs and benefits. This resulted in net transfers being equal to

TABLE XXI

ATKINSON'S EQUALLY DISTRIBUTED INCOME MEASURE AND INDICES OF INEQUALITY FOR THREE INCOME BASES--TAX MODEL

Income Base	Measure	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					- dollars - per capita -						
Post-Transfer Income[a]	Mean	2261	2282	2356	2403	2590	2640	2764	2853	2969	3031
Pre-Transfer Income[b]	Mean	2261	2283	2356	2403	2509	2640	2764	2853	2969	3031
Simulated Income[c]	Mean	2261	2295	2378	2437	2556	2700	2837	2941	3071	3148
					- dollars - per capita - epsilon = 0.5 -						
Post-Transfer Income	Y_{ede}[d]	2021	2028	2096	2131	2216	2319	2416	2487	2576	2618
Pre-Transfer Income	Y_{ede}	1889	1859	1940	1963	2041	2129	2196	2229	2273	2262
Simulated Income	Y_{ede}	1889	1868	1959	1994	2084	2187	2271	2323	2392	2415
					- index - epsilon = 0.5 -						
Post-Transfer Income	I[e]	0.105	0.111	0.110	0.113	0.116	0.121	0.125	0.128	0.132	0.136
Pre-Transfer Income	I	0.164	0.186	0.176	0.182	0.193	0.193	0.205	0.218	0.234	0.253
Simulated Income	I	0. 64	0.181	0.176	0.181	0.189	0.189	0.199	0.210	0.221	0.233
					- dollars - per capita - epsilon = 1.5 -						
Post-Transfer Income	Y_{ede}	1586	1545	1621	1629	1675	1719	1768	1808	1852	1857
Pre-Transfer Income	Y_{ede}	1023	990	976	936	959	929	835	709	532	253
Simulated Income	Y_{ede}	1023	1006	998	978	1022	1025	979	913	836	734
					- index - epsilon = 1.5 -						
Post-Transfer Income	I	0.298	0.323	0.311	0.322	0.332	0.348	0.360	0.366	0.376	0.387
Pre-Transfer Income	I	0.547	0.566	0.585	0.610	0.617	0.647	0.697	0.751	0.820	0.916
Simulated Income	I	0.547	0.561	0.580	0.598	0.599	0.620	0.654	0.689	0.727	0.766

[a]Per capita income including transfers from social insurance programs.

[b]Per capita income minus net transfers from social insurance programs.

[c]Per capita income in the absence of social insurance programs.

[d]Atkinson's equally distributed equivalent income measure. Per capita income necessary to have the same level of utility as the present income if income were equally distributed.

[e]Atkinson's index of inequality.

total expenditures. Under the tax model, sectoral transfers were increased considerably, the urban sector losing more income and the farm sector gaining more. The tax model was more expensive than the standard case in terms of foregone income growth. Distributional inequalities were reduced with lower income classes receiving a larger share of post-transfer income.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Expenditures under major social insurance programs increased from $31.4 billion in 1960 to $59.8 billion in 1969, an increase of more than 90 percent. Expenditures in 1960 represented 7.8 percent of total personal income while 1969 expenditures represented 9.8 percent of total personal income. Income transfers toward lower income groups was a common feature of social insurance programs. Since marginal investment increased as incomes increased, transfers of income to lower income groups decreased gross investment. Decreased investment then affected capital formation and growth.

The objectives of this study were (1) to estimate the costs of major social insurance programs in terms of foregone income growth, and (2) to examine the distributional effects of social insurance programs. A simulation model was used to allocate costs and benefits of social insurance expenditures among three sectors and ten income classes. Investment differences due to income losses to upper income classes were determined using alternative investment functions.

The study employed four models representing alternative levels of social insurance expenditures. The first model (the standard case) assumed that all social insurance expenditures were terminated in 1960. The second model held social insurance expenditures to the 1960 level in order to determine effects of expenditure increases over the study period (constant expenditure model). In a variation of the constant

expenditure model, the increasing rate model held per capita social insurance expenditures constant at the 1960 level. This allowed total expenditures to increase at the same rate as population increased. Finally the tax model assumed the utility for money implied by Federal income tax schedules and equalized the utility of costs and benefits in all income classes. The tax model was perfectly discriminating (i.e. no person both paid costs and received benefits). This had the effect of increasing net transfers, since it made net transfers equal to total expenditures.

Under the standard case transfers of income between sectors resulted in a net loss of income to the urban sector of about three billion dollars each year throughout the study period. Net transfers of income to the rural nonfarm sector decreased from a gain of $3.2 billion in 1960 to a gain of $2.6 billion in 1969. The farm sector experienced the greatest relative change in net transfers over the study period. The farm sector went from a net loss of $148 million in 1960 to a net gain of $711 million in 1969.

In general, classes with incomes below $5,000 experienced net gains in transfer income while those above $5,000 experienced net losses. Social insurance programs tended to become less cost effective (over time) in terms of transferring income from the wealthy to the poor. Much of the $28.4 billion increase in expenditures during the study period was transferred from upper middle income classes to lower middle income classes.

If all social transfer expenditures had been terminated in 1960, there would have been an estimated 3.6 percent increase in 1969 total income. On the average, families with 1969 incomes below $4,000 per

year would have had less income, families in the $4000-$5000 income class would have had about the same income with or without social insurance programs and families earning above $5,000 per year would have had increased incomes. Both the Gini ratio and Atkinson's index of inequality indicated considerably more inequality without social insurance programs than with such programs throughout the study period.

Compared to the standard case, income transfers and investment differences were smaller under the constant expenditure model and the increasing rate model. The Gini ratios and inequality measures suggest that income distributions under the two models would be less equal than the distribution of actual post-transfer income but not as unequal as the distribution of simulated income under the standard case.

Under the tax model, sectoral income transfers increased considerably. Income losses to the urban sector ranged from $4.1 billion in 1960 to $9.6 billion in 1969. The rural nonfarm sector increased its income gain from $2.6 billion in 1960 to $6.0 billion in 1969. Under the standard case, the farm sector lost income in 1960, but under the tax model the farm sector enjoyed a $1.4 billion gain in 1960 and a gain of $3.6 billion in 1969.

The tax model was more costly to the economy in terms of foregone income growth than was the standard case. Whereas the standard case showed a forfeit of a 3.6 percent gain in income in 1969, 1969 post-transfer income under the tax model would have had a foregone income increase of 3.9 percent. Thus had social insurance expenditures been transferred as specified by the tax model, there would have been a loss of 0.3 percent more income than there was lost with existing transfer patterns. However, there would have been a gain in distributional

equality. The Gini ratio of the 1969 income distribution under existing social insurance programs was 0.3279 and Atkinson's index of inequality (epsilon = 0.5) was 0.1666. Corresponding figures for the tax model were 0.2922 and 0.1363. This suggests that an approximate doubling of net transfers would have benefitted the poor but at an additional cost of $183 million (in 1969) in foregone total income.

Policy Implications and Limitations of the Study

Social insurance expenditures had a significant equalizing effect on income distribution during the study period. But by the end of a ten year period, the cost of such expenditures was the yearly forfeit of a 3.6 percent increase in total income. In efforts to improve the status of the needy, expenditures almost doubled during the study period. Due to loss in program efficiency much of the increase did not reach the poor (nor did it come from the wealthy). This resulted from the concentration of additional expenditures in programs which serve mainly middle income classes.

The tax model suggests that a different structuring of transfer patterns would improve the efficiency of social insurance programs considerably. Under the tax model, net transfers were doubled. Yet the cost in foregone income increased by only 0.3 percent over similar original costs. The gain in distributional equality lowered the Gini ratio by 0.0938 whereas original expenditures lowered the Gini ratio by 0.0581. This indicates that the poor would benefit more from steeper transfer patterns than from increasing total social insurance expenditures and that the costs (in terms of foregone growth) of restructured transfer

patterns would be relatively small.

Limitations to the study include difficulties in data sources and necessary assumptions. Three base years for data reflecting costs and benefits of social insurance expenditures were utilized. The program groupings were not strictly comparable. However, grouping of larger programs was similar. Data from which investment functions were derived left much to be desired. While alternative investment functions followed a similar pattern (with respect to income), there were significant differences in the absolute level of investment schedules.

The assumption concerning the shifting of corporate taxes was made in the absence of empirical determination. While there are many studies on tax shifting related to specific taxes and specific industries, gross effects of tax shifting are much more difficult to quantify.

Future studies of this type can derive additional information by maintaining separate accounts for each program rather than pooling all expenditures. Another useful device would be to use an index of income-relative-to-need. Such treatment would lend itself to more meaningful interpretation of net transfer effects.

Finally, the present study considered only a ten year study period. Results of the study thus must be considered short run. The long run costs (in terms of foregone income) of social insurance expenditures would likely be considerably higher while Atkinson's measure of inequality for simulated income would show less inequality as percapita incomes increased.

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APPENDIX A

DISTRIBUTIONS OF COSTS AND BENEFITS OF SOCIAL INSURANCE EXPENDITURES BY SECTOR AND BY CLASS

TABLE XXII

BENEFITS FROM SOCIAL INSURANCE PROGRAMS - STANDARD CASE

Urban Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	678	938	1119	1384	1669	2007	2538	3231	4028	4836
$ 1000 - $ 2000	5065	5614	5592	5864	6112	6445	7249	8311	9399	10425
$ 2000 - $ 3000	4379	4909	4990	5239	5461	5729	6405	7297	8162	8921
$ 3000 - $ 4000	3494	3851	3876	3919	3915	3905	4133	4445	4665	4769
$ 4000 - $ 5000	2252	2518	2583	2661	2713	2761	2956	3224	3438	3574
$ 5000 - $ 6000	1897	2127	2198	2256	2288	2306	2426	2607	2741	2796
$ 6000 - $ 7500	1778	2033	2154	2258	2341	2412	2595	2862	3088	3253
$ 7500 - $10000	1401	1687	1880	2067	2249	2437	2759	3186	3595	3982
$1000 - $15000	1023	1318	1557	1829	2112	2433	2905	3487	4063	4673
Above $15000	127	210	308	419	540	679	869	1103	1348	1619
Total	22099	25209	26259	27900	29404	31119	34840	39758	44533	48852

TABLE XXII (Continued)

Rural Nonfarm Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	661	768	788	856	922	1005	1150	1327	1522	1680
$ 1000 - $ 2000	2115	2217	2078	2042	1989	1958	2037	2141	2221	2226
$ 2000 - $ 3000	1798	1877	1777	1710	1627	1558	1583	1630	1655	1632
$ 3000 - $ 4000	1086	1119	1056	996	926	860	841	834	811	766
$ 4000 - $ 5000	725	761	731	703	667	631	628	635	626	598
$ 5000 - $ 6000	486	514	495	473	447	418	404	395	376	343
$ 6000 - $ 7500	643	669	640	609	571	528	495	469	424	361
$ 7500 - $10000	275	349	401	441	470	490	519	557	576	571
$10000 - $15000	161	194	212	225	232	235	243	252	248	233
Above $15000	61	51	37	26	14	5	0	0	0	0
Total	8016	8523	8220	8085	7870	7692	7905	8245	8462	8415

TABLE XXII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					Farm Sector					
					-million dollars-					
Below $1000	83	110	129	158	189	226	293	381	477	573
$ 1000 - $ 2000	305	344	351	372	393	423	492	585	678	760
$ 2000 - $ 3000	269	287	277	270	260	251	259	271	272	264
$ 3000 - $ 4000	238	241	219	196	168	137	108	72	39	19
$ 4000 - $ 5000	116	131	135	139	141	142	153	168	182	199
$ 5000 - $ 6000	78	91	103	113	122	134	155	188	224	259
$ 6000 - $ 7500	46	59	68	76	83	90	103	120	136	149
$ 7500 - $10000	64	76	82	86	89	92	99	107	110	110
$10000 - $15000	21	30	43	56	68	82	99	118	135	150
Above $15000	15	13	11	9	7	6	7	9	12	15
Total	1240	1388	1421	1480	1526	1586	1773	2024	2271	2501

TABLE XXIII

COSTS FROM SOCIAL INSURANCE PROGRAMS - STANDARD CASE

Urban Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	24	53	128	210	298	394	514	667	825	992
$ 1000 - $ 2000	314	423	546	685	828	983	1199	1483	1756	2039
$ 2000 - $ 3000	767	876	918	1107	1231	1365	1581	1865	2121	2373
$ 3000 - $ 4000	1222	1346	1417	1505	1583	1667	1848	2081	2270	2431
$ 4000 - $ 5000	1865	2066	2077	2110	2122	2136	2262	2433	2536	2593
$ 5000 - $ 6000	2099	2310	2393	2500	2589	2683	2934	2365	3538	3744
$ 6000 - $ 7500	3046	3545	3753	4007	4236	4488	5021	5716	6357	6903
$ 7500 - $10000	4731	5399	5531	5778	5993	6244	6892	7770	8624	9353
$10000 - $15000	3795	4661	5138	5766	6398	7097	8308	9905	11561	13191
Above $15000	7252	7834	7453	7317	7111	6965	7267	7676	8210	8491
Total	25120	28516	29420	30990	32395	34025	37829	42864	47802	52114

TABLE XXIII (Continued)

Rural Nonfarm Sector

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-million dollars-					
Below $1000	636	31	591	512	403	245	127	150	166	179
$ 1000 - $ 2000	134	173	184	210	238	272	325	376	410	443
$ 2000 - $ 3000	280	312	282	279	278	282	303	322	329	333
$ 3000 - $ 4000	438	469	395	370	348	334	341	345	337	329
$ 4000 - $ 5000	482	547	474	460	446	440	461	475	472	463
$ 5000 - $ 6000	523	606	531	524	519	523	558	584	591	587
$ 6000 - $ 7500	755	866	747	734	724	730	781	817	830	827
$ 7500 - $10000	690	906	903	966	973	934	871	895	912	890
$10000 - $15000	532	704	616	663	725	819	975	1086	1188	1253
Above $15000	370	524	322	310	316	352	422	458	507	551
Total	4845	5145	5049	5032	4974	4935	5169	5513	5747	5858

TABLE XXIII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					Farm Sector					
					-million dollars-					
Below $1000	4	15	27	40	52	65	80	97	110	121
$ 1000 - $ 2000	51	67	76	88	99	111	130	155	171	185
$ 2000 - $ 3000	106	117	116	121	126	133	149	172	187	199
$ 3000 - $ 4000	154	153	138	128	120	114	118	126	129	131
$ 4000 - $ 5000	139	147	143	144	145	149	164	186	2000	210
$ 5000 - $ 6000	152	162	158	157	156	156	166	180	189	192
$ 6000 - $ 7500	213	215	198	188	179	172	179	190	196	198
$ 7500 - $10000	220	222	216	209	194	173	153	142	138	127
$10000 - $15000	166	175	170	174	180	194	227	271	307	337
Above $15000	179	182	187	188	180	164	149	116	94	84
Total	1388	1459	1434	1441	1435	1436	1520	1640	1725	1790

APPENDIX B

SUPPLEMENTAL TABLES--INCREASING RATE MODEL

TABLE XXIV

DISTRIBUTION OF INCOME-INCREASING RATE MODEL

Income Class	Post-Transfer Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
below $1,000	1135	1261	1797	2152	2685	3104	3395	3530	3611	3586
$ 1000 - $ 2000	9932	9787	10444	10828	11619	12455	12683	12672	12802	12711
$ 2000 - $ 3000	19378	18801	19129	19042	19426	19889	19887	19383	19118	18520
$ 3000 - $ 4000	30405	29266	28867	27834	27539	27125	26316	24928	23577	21787
$ 4000 - $ 5000	44919	43620	42847	41348	40650	39867	38496	36160	33866	30548
$ 5000 - $ 6000	51852	51271	51394	50683	50990	51426	51229	50067	49051	46791
$ 6000 - $ 7500	75487	75883	77318	77747	79580	81978	83828	84237	85098	84057
$ 7500 - $10000	84041	87602	92392	96249	102435	109534	116504	122174	128901	133339
$10000 - $15000	54041	61798	70936	80095	91912	105669	120476	134996	151749	166982
above $15000	34297	38306	42535	46932	52749	59723	67569	75136	83996	91902
Total	405491	417599	437664	452915	479589	510774	540387	563288	591773	610227

TABLE XXIV (Continued)

Income Class	Simulated Income									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
below $1000	376	290	669	799	1095	1226	1245	1238	1143	987
$ 1000 - $ 2000	2946	3003	4029	4598	5593	6615	6995	7166	7433	7513
$ 2000 - $ 3000	14085	13641	14163	14254	14829	15488	15643	15307	15185	14764
$ 3000 - $ 4000	27402	26413	26159	25371	25344	25224	24701	23595	22504	20980
$ 4000 - $ 5000	44313	43126	42358	40943	40346	39689	38453	36242	34058	30871
$ 5000 - $ 6000	52154	51699	51881	51329	51815	52461	52506	51562	50744	48705
$ 6000 - $ 7500	77035	77759	79352	80073	82233	85011	87297	88123	89403	88808
$ 7500 - $10000	87941	91879	96820	100949	107398	114760	122007	128064	135257	140182
$10000 - $15000	57328	65711	75239	84963	97407	111847	127424	142735	160339	176450
Above $1500	41894	46368	50472	54925	60753	67714	75533	82948	91804	99592
Total	405488	419301	441146	458207	486817	520037	551809	576984	607875	628857

TABLE XXV

PERCENT DISTRIBUTION OF INCOME =
INCREASING RATE MODEL

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-percent-					
Below $1000	0.28	0.30	0.41	0.48	0.56	0.61	0.63	0.63	0.61	0.59
$ 1000 - $ 2000	2.45	2.34	2.39	2.39	2.42	2.44	2.35	2.25	2.16	2.08
$ 2000 - $ 3000	4.78	4.50	4.37	4.20	4.05	3.89	3.68	3.44	3.23	3.04
$ 3000 - $ 4000	7.50	7.01	6.60	6.15	5.74	5.31	4.87	4.43	3.98	3.57
$ 4000 - $ 5000	11.08	10.45	9.79	9.13	8.48	7.81	7.12	6.42	5.72	5.01
$ 5000 - $ 6000	12.79	12.28	11.74	11.19	10.63	10.07	9.48	8.89	8.29	7.67
$ 6000 - $ 7500	18.62	18.17	17.67	17.17	16.59	16.05	15.51	14.95	14.38	13.77
$ 7500 - $10000	20.73	20.98	21.11	21.25	21.36	21.44	21.56	21.69	21.78	21.85
$10000 - $15000	13.33	14.80	16.21	17.68	19.16	20.69	22.29	23.97	25.64	27.36
Above $15000	8.46	9.17	9.72	10.36	11.00	11.69	12.50	13.34	14.19	15.06

TABLE XXV (Continued)

Income Class	Simulated Income 1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					-percent-					
Below $1000	0.09	0.07	0.15	0.17	0.22	0.24	0.23	0.21	0.19	0.16
$ 1000 - $ 2000	0.73	0.72	0.91	1.00	1.15	1.27	1.27	1.24	1.22	1.19
$ 2000 - $ 3000	3.47	3.25	3.21	3.11	3.05	2.98	2.83	2.65	2.50	2.35
$ 3000 - $ 4000	6.76	6.30	5.93	5.54	5.21	4.85	4.48	4.09	3.70	3.34
$ 4000 - $ 5000	10.93	10.29	9.60	8.94	8.29	7.63	6.97	6.28	5.60	4.91
$ 5000 - $ 6000	12.86	12.33	11.76	11.20	10.64	10.09	9.52	8.94	8.35	7.75
$ 6000 - $ 7500	19.00	18.54	17.99	17.48	16.89	16.35	15.82	15.27	14.71	14.12
$ 7500 - $10000	21.69	21.91	21.95	22.03	22.06	22.07	22.11	22.20	22.25	22.29
$10000 - $15000	14.14	15.67	17.06	18.54	20.01	21.51	23.09	24.74	26.38	28.06
Above $15000	10.33	11.06	11.44	11.99	12.48	13.02	13.69	14.38	15.10	15.84

TABLE XXVI

GINI RATIOS FOR THREE INCOME BASES - INCREASING RATE MODEL

Year	Post-Transfer Income[a]	Pre-Transfer Income[b]	Simulated Income[c]
1960	0.2404	0.3039	0.3039
1961	0.2577	0.3193	0.3200
1962	0.2680	0.3232	0.3242
1963	0.2797	0.3315	0.3326
1964	0.2899	0.3374	0.3382
1965	0.3008	0.3444	0.3446
1966	0.3139	0.3544	0.3538
1967	0.3273	0.3653	0.3636
1968	0.3396	0.3753	0.3724
1969	0.3519	0.3860	0.3816

[a]Income including social insurance expenditures.

[b]Income minus net transfer effects of social insurance expenditures.

[c]Income with transfer effects treated as investment.

TABLE XXVII

ATKINSON'S EQUALLY DISTRIBUTED INCOME MEASURE AND INDICES OF INEQUALITY FOR THREE INCOME BASES--INCREASING RATE MODEL

Income Base	Measure	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					- dollars - per capita -						
Post-Transfer Income[a]	Mean	2261	2282	2356	2403	2509	2640	2764	2853	2969	3031
Pre-Transfer Income[b]	Mean	2261	2283	2356	2403	2590	2640	2764	2853	2969	3031
Simulated Income[c]	Mean	2261	2293	2375	2431	2547	2688	2822	2923	3049	2123
					- dollars - per capita - epsilon = 0.5 -						
Post-Transfer Income	Y_{ede}[d]	2017	2010	2063	2086	2162	2254	2330	2372	2432	2445
Pre-Transfer Income	Y_{ede}	1889	1859	1940	1963	2041	2129	2196	2229	2273	2262
Simulated Income	Y_{ede}	1889	1965	1955	1987	2074	2174	2254	2301	2365	2382
					- index - epsilon = 0.5 -						
Post-Transfer Income	I[e]	0.107	0.119	0.124	0.131	0.138	0.146	0.157	0.168	0.180	0.193
Pre-Transfer Income	I	0.164	0.186	0.176	0.182	0.186	0.193	0.205	0.218	0.234	0.253
Simulated Income	I	0.164	0.186	0.176	0.182	0.185	0.191	0.201	0.212	0.224	0.237
					- dollars - per capita - epsilon = 1.5 -						
Post-Transfer Income	Y_{ede}	1536	1448	1457	1424	1438	1444	1419	1359	1300	1211
Pre-Transfer Income	Y_{ede}	1023	1000	976	936	959	929	835	709	532	253
Simulated Income	Y_{ede}	1023	1008	994	970	1010	1007	952	876	784	664
					- index - epsilon = 1.5 -						
Post-Transfer Income	I	0.320	0.365	0.381	0.407	0.426	0.452	0.486	0.523	0.562	0.600
Pre-Transfer Income	I	0.547	0.561	0.585	0.610	0.617	0.647	0.697	0.751	0.820	0.916
Simulated Income	I	0.547	0.560	0.581	0.600	0.603	0.625	0.662	0.700	0.742	0.787

[a]Per capita income including transfers from social insurance programs.

[b]Per capita income minus net transfers from social insurance programs.

[c]Per capita income in the absence of social insurance programs.

[d]Atkinson's equally distributed equivalent income measure. Per capita income necessary to have the same level of utility as the present income if income were equally distributed.

[e]Atkinson's index of inequality.

APPENDIX C

INCOME DISTRIBUTIONS UTILIZING ALTERNATIVE INVESTMENT FUNCTIONS

APPENDIX C

INCOME DISTRIBUTIONS UTILIZING ALTERNATIVE INVESTMENT FUNCTIONS

Four data sources were utilized in deriving the investment functions in the study (See Table III, p. 29). The functions utilized in the standard case were derived from the BLS Survey of Consumer Expenditure. Separate functions were utilized in each of the three sectors (urban, rural nonfarm and farm). These functions were selected for use in the standard case because of the extensive data base from which they were derived. A fourth investment function was derived from the BLS data by aggregating the sectoral data (BLS-Total function).

The BLS-Total function produced results similar to those of the standard case (See Table XXVIII). Under the standard case there was a cost of 3.63 percent income growth foregone due to social insurance expenditures. Using the same assumptions but substituting the BLS-Total investment function, the cost of such expenditures in foregone income growth was 3.69 percent. There was a slight shift of income toward lower income classes using the BLS-Total function.

Using the other three investment functions (Friend, Goldsmith and Time) in conjunction with standard case assumptions resulted in significantly different results. These alternative investment functions suggested that the 1969 cost (in terms of foregone income) of social insurance programs ranged from 13.59 percent of actual 1969 income

(Friend) to 22.10 percent of actual 1969 income (Time). The reason for the higher cost estimates was the higher investment rates of the alternative investment schedules. The alternative rates for the highest income class were higher, but more important the alternative rates for the upper middle-income classes were also higher than similar BLS rates. Funds for social insurance programs were derived primarily from upper middle income classes. Thus high investment rates in these classes caused cost estimates to shift upwards.

In terms of distributional (in)equality, the Time investment schedule yielded a 1969 income distribution with a Gini ratio of 0.3547 (compared to a post-transfer Gini ratio of 0.3279 and a standard case simulated income Gini ratio of 0.3808). Use of the other two alternative investment functions effected little change in the distributional (in)equality of the standard case.

TABLE XXVIII

DISTRIBUTION OF INCOME UTILIZING ALTERNATIVE INVESTMENT FUNCTIONS

	Post-Transfer Income									
Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	1135	1419	1925	2355	2973	3524	4161	4788	5442	5981
$ 1000 - $ 2000	9932	10481	11157	11731	12661	13691	14591	15493	16505	17150
$ 2000 - $ 3000	19378	19334	19689	19749	20238	20843	21347	21522	21888	21789
$ 3000 - $ 4000	30405	29566	29183	28219	27960	27587	26968	25803	24610	22888
$ 4000 - $ 5000	44919	43680	42922	41445	40765	40001	38695	36452	34253	31005
$ 5000 - $ 6000	51852	51239	51366	50641	50932	51343	51071	49804	48688	46325
$ 6000 - $ 7500	75487	75710	77137	77501	79276	81586	83174	83214	83710	82336
$ 7500 - $10000	84041	87194	91969	95710	101816	108816	115438	120624	126896	130981
$10000 - $15000	54041	61428	70530	79539	91217	104780	119005	132681	148548	162964
Above $15000	34297	37542	41784	46020	51747	58597	65933	72904	81225	88806
Total	405491	417599	437664	452015	479589	510774	540388	563291	591770	610230

TABLE XXVIII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	Simulated Income--Total BLS Investment Function									
	-million dollars									
Below $1,000	376	289	671	807	1111	1255	1291	1311	1255	1156
$ 1000 - $ 2000	2946	3004	4036	4614	5622	6662	7066	7272	7592	7746
$ 2000 - $ 3000	14085	13633	14174	14275	14864	15538	15711	15403	15320	14951
$ 3000 - $ 4000	27402	264152	26173	25396	25382	25277	24770	23685	22625	21139
$ 4000 - $ 5000	44313	43129	42374	40973	40393	39754	38540	36358	34214	31078
$ 5000 - $ 6000	52164	51700	51895	51357	51861	52526	52596	51688	50921	48948
$ 6000 - $ 7500	77035	77754	79362	80101	82287	85095	87422	88309	89681	89210
$ 7500 - $10000	87941	91865	96819	100966	107443	114842	122141	128283	135606	140707
$10000 - $15000	57328	65710	75268	85025	97517	112015	127664	143086	160856	177189
Above $15000	41894	46425	50641	55198	61133	68197	76117	83655	92657	100604
Total	405488	419348	441417	458716	487616	521167	553322	579054	610732	632732

TABLE XXVIII (Continued)

Income Class	Simulated Income--Time Investment Function									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	376	275	751	1018	1551	2051	2615	3391	4395	5760
$ 1000 - $ 2000	2946	3077	4243	5042	6399	7954	9092	10321	12043	14089
$ 2000 - $ 3000	14085	13780	14502	14845	15773	16899	17664	18138	19075	20025
$ 3000 - $ 4000	27402	26617	26590	26077	26400	26712	26720	26273	25994	25473
$ 4000 - $ 5000	44313	43298	42753	41640	41471	41389	40911	39698	38810	37274
$ 5000 - $ 6000	52164	51964	52487	52387	53495	54962	56088	56562	57577	57882
$ 6000 - $ 7500	77035	78202	80388	81894	85128	89332	93497	96818	101366	104992
$ 7500 - $10000	87941	92549	89386	103681	111695	121113	131057	140675	152525	163476
$10000 - $15000	57328	66392	76850	87803	101909	118544	136998	156113	178687	201208
Above $15000	41894	47533	53008	58964	66470	75229	84918	94317	105214	114908
Total	405488	423140	449962	473355	510294	554189	599564	642309	695691	745093

TABLE XXVIII (Continued)

Income Class	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	Simulated Income--Goldsmith Investment Function									
	-million dollars-									
Below $1000	376	280	724	944	1396	1766	2133	2617	3199	3962
$ 1000 - $ 2000	2946	3052	4171	4893	6125	7492	8353	9186	10347	11611
$ 2000 - $ 3000	14085	13603	14126	14250	14925	15758	16177	16221	16619	16892
$ 3000 - $ 4000	27402	26509	26368	25726	25896	26026	25817	25103	24495	23563
$ 4000 - $ 5000	44313	43249	42635	41419	41091	40780	39982	28329	36846	34524
$ 5000 - $ 6000	52164	51867	52263	51985	52836	53951	54595	54416	54560	53720
$ 6000 - $ 7500	77035	78006	79921	81060	83785	87296	90527	92583	95442	96840
$ 7500 - $10000	87941	92278	97752	102452	109915	118446	127200	135216	144925	153039
$10000 - $15000	57328	66232	76486	87145	100832	116882	134526	162528	173587	194073
Above $15000	41894	47306	52546	58233	65436	73871	83236	92317	102932	112467
Total	405488	421824	446997	468222	502241	542273	582550	618516	662952	700691

TABLE XXVIII (Continued)

Income Class	Simulated Income--Friend and Schor Investment Function									
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	-million dollars-									
Below $1000	376	280	723	941	1385	1740	2078	2513	3019	3666
$ 1000 - $ 2000	2946	3046	4170	4887	6107	7450	8269	9035	10092	11204
$ 2000 - $ 3000	14085	13688	14302	14512	15264	16163	16631	16707	17115	17366
$ 3000 - $ 4000	27402	26496	26341	25679	25824	25922	25671	24902	24223	23200
$ 4000 - $ 5000	44313	43256	42647	41426	41083	40740	39889	38158	36564	34091
$ 5000 - $ 6000	52164	51860	52239	51932	52734	53773	54306	53974	53908	52791
$ 6000 - $ 7500	77035	77995	79894	81003	83677	87110	90225	92116	94743	95825
$ 7500 - $10000	87941	92248	97681	102430	109692	118-90	126656	134407	143749	151364
$10000 - $15000	57328	66189	76373	86930	100465	116298	133637	151212	171692	191401
Above $15000	41894	47304	52539	58210	65384	73781	83103	92141	102722	112248
Total	405488	446913	467954	501618	541070	580471	615167	615167	657831	693160

VITA

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