THE NATIONAL INSURANCE INSTITUTE
BUREAU OF RESEARCH AND PLANNING

REDISTRIBUTION THROUGH NATIONAL INSURANCE IN ISRAEL BY INCOME AND DEMOGRAPHIC GROUPS

by
Jack Habib

Comments Invited

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[1] Replaced the "Monthly Statistics" and includes statistics on years since the establishment of the Institute.

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Jack Habib

This study was carried out at the Bureau of Research and Planning of the National Insurance Institute. The author was formerly Director of Long-Range Research at the National Insurance Institute. He is presently associated with the Brookdale Institute of Gerontology and Adult Human Development and with the School of Social Work and the Department of Economics at the Hebrew University.

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CONTENTS

LIST OF TABLES AND FIGURES

INTRODUCTION

National insurance (also referred to as social security or social insurance) has established itself as one of the most politically acceptable and popular social programs. In most countries raising benefits under national insurance has proved far easier than under other social programs.[1]

The popularity of national insurance among politicians and the public has not entirely been shared by economists and other academicians. There have been diverse proposals, ranging from a demand for a far-reaching reform in the structure of benefits and contributions, to a call for the replacement of the benefits by a negative income tax and the integration of contributions into the progressive income tax. The major argument is that national insurance is not sufficiently progressive or redistributive, and that with the same expenditures much more could be achieved. It is also argued that there are too many income maintenance programs and the elimination of national insurance could solve difficult problems of consistency and coordination.[2]

What complicates the resoltuion of the progressivity issue is the fact that social insurance is designed to meet objectives which are not related directly to preventing poverty or reducing inequality. It is designed first of all as a substitute or supplement to certain forms of private insurance and private savings, through which the individual provides for contingencies or reallocates his resources over the life-cycle. As such, national insurance programs are designed to enable the individual to maintain his normal or customary income rather than to reduce inequality or poverty. For example, retirement or disability benefits are often linked to previous income, and thus tend to preserve the distribution of permanent income rather

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[1] This is possibly the reason for the rapid growth of national insurance over the past years. In the U.S.A., for example, social insurance transfers grew by 120 per cent between 1968–73 *(Lerman and Townsend 1974).*
In Israel national insurance benefits rose from 3.5 per cent of the gross national product in 1968/69, to 5.7 per cent in the 1975/76 proposed budget.

[2] For proposals to reform the benefit structure, see *Pechman, Aaron and Taussig 1968* and *Atkinson 1970B.* For reform of the structure of contributions, see *Brittain 1972A.*

than redistribute it. The evaluation of this goal raises the question of the role of public versus private programs in providing for such contingencies.[3]

A further constraint on progressivity is the fact that any tax or transfer involves incentive or disincentive effects, such as on savings, labor force participation; investment in safey precautions, family stability and fertility. The availability of old-age pensions, for example may affect private savings towards retirement, the age of retirement, and subsequent living arrangements (i.e., whether the aged person will live with an offspring or alone). Disability insurance may reduce safety precautions taken by employers or employees. Minimization of such behavioral effects often conflicts with the desire to achieve a more progressive redistribution. Thus a supplementary old-age benefit that is linked to post-retirement income tends to discourage continued employment.

The desire to maintain the popularity of social insurance may also conflict with an increase in its progressivity. The programs derive their popularity, to a large extent, from their resemblance to insurance and benefit taxation. Eligibility is acquired through contribution and the level of benefits is linked to the rate of contributions.

Another reason for the popularity of national insurance is its universality; that is, eligibility is not confined to any particular income groups by a means test. The desire to maintain universality is yet another constraint on progressivity. It is necessary, however, to distinguish between universality of eligibility and of benefit levels. A transfer may be universal in that both the fact of eligibility and the amount of benefit are unrelated to current family income. Such a system makes no distinction whatsoever between families on the basis of their income. Alternatively, all members of a demographic group may be eligible, while the benefit level is income-conditioned. For example, the child allowance provided in Israel for the first two children was until recently taxed at progressive marginal rates. Thus, while the benefit was available to any family with children, its amount varied with income. The Israeli old-age benefit consists of a flat-rate pension, for which all insured aged families are eligible, and a

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[3] For opposing views on this issue, see *Friedman 1962* and *Cohen and Friedman 1972.*

supplementary, income-related, benefit designed to ensure a minimum income to those without other resources.

These principles find different degrees of expression in the national insurance systems of different countries, and a different balance is struck. The set of compromises should be evaluated, first of all, in terms of the priorities that were adopted. However, even if reducing inequality is not the primary goal of national insurance, it is still necessary to know its redistributive effect, if only to determine what is left for the other income support programs to do. Furthermore, if the ability to achieve redistributive goals through other programs is limited, this must be taken into account in designing the social insurance system.

The estimation of the redistributive effect of social insurance involves several conceptual problems. Its effect is often concentrated in particular population groups, since social insurance programs are, to a large extent, geared to demographic groups. Hence, the redistributive effects of these programs depend on the economic position of the various groups.[4] Furthermore, these demographic factors in themselves have economic implications. Traits such as family size, age of family members, disability or widowhood influence the family's needs. How does one go about comparing the economic status of a disabled family head with three children, a middle aged family head with six children and an elderly retired couple, all of whom have the same cash income, but quite different needs. The problem is further complicated in that traits such as age or family size are related to the family life-cycle.

National insurance may redistribute income in three ways: (1) redistribution of the income of one individual over different stages of his life-cycle, (2) redistribution of life-time income between families of the same generation and (3) redistribution of life-time income between generations. Each of these redistributions has a different welfare significance. Some believe that programs which are linked to traits such as age must redistribute income mainly over the individual's life cycle. Furthermore, to the extent that they do redistribute incomes among different persons of the same generation, this redistribution is not necessarily

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[4] For demographic effects, see *Bridges 1967, 1971 and 1972.*

progressive.[5] Others claim that their main effect is in redistributing income between different generations.

Redistributive effects have been measured in two principal ways: (1) on the basis of the life-time rate of return in relation to life-time earnings and (2) on the basis of the distribution of national insurance contributions and benefits among income groups on an annual cross-section basis.[6]

The life-time rate of return approach attempts to measure the effect of social insurance on life-time income. However, its empirical basis is rather shaky. It makes use of age-income profiles estimated from cross-section data and requires the use of arbitrary assumptions about the growth pattern of these profiles over time. A further limitation is that the computations are made for hypothetical family types, which are often difficult to apply to actual current data on the distribution of income.

The annual cross-section approach, on the otherhand, does not require the construction of hypothetical income data. Moreover, while the limitations of the one year view are well recognized, it is not at all clear that the life-time is in fact the appropriate time unit for all purposes. In all events, it is possible to weave life-cycle considerations into the annual cross-section approach, by distinguishing between redistribution between age groups and redistribution within age groups.

Between-group distribution is not necessarily consistent with a reduction in inequality of life-time incomes. If all persons, for example, had the same income at a given age and there were no trend increase (economic growth) in income from generation to generation, then reducing income differences between age groups would only create inequality. In reality, however, there has been economic growth over the years, so that the average per capita

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[5] For criticism of this kind, see *Aaron 1967.* A study carried out in Israel found that the overall effect of national insurance is progressive *(Melnich 1975).* The rates of return in the Histadrut and private insurance pension systems are presently being analysed by Haim Factor, at the Brookdale Institue.

[6] For discussion of these alternatives, see *Musgrave and Musgrave 1973*, Ch. 28.

life-time income is higher the younger the person. This would justify some amount of redistribution to older age groups.

Redistribution within an age cohort is easier to interpret. As inter-generational factors do not exist here, income differences within the cohort are more likely to reflect differences in life-time income. Thus, if present relative status is found to closely correlate with life-time status, a consistent policy of reducing inequality within age groups should reduce life-time income inequality. True, there are differences in the income profiles of different occupations or educational achievement groups -- for instance, at younger ages people with low education may sometimes earn more than those with a higher education, a situation which is reversed at later ages. However, except for the lowest age group, this phenomenon may be of minor significance and only slightly affect the overall probability that a person whose present income is low in comparison to his age group will have a low life-time income.

This study is concerned with the current redistributive effects of national insurance in Israel, adressing itself to a number of specific questions: How progressive is the redistributive effect of national insurance and how progressive are the individual programs? Does national insurance redistribute incomes mainly between age and family-size groups or within these groups? What is the weight of national insurance in the total redistribution due to all direct taxes and transfers? How is its total redistributive effect related to the progressivity of the specific programs and their weight in total benefits? And how is it related to the assumptions on the shifting of the employers contribution to employees or to consumers?

The following section reports the distribution of direct taxes and transfers by income groups. The third section reports the effect of national insurance on the distribution of income; this effect is broken down by family size and by age. The fourth section estimates the role of national insurance in the total redistribution of income due to all taxes and transfers. We conclude with a short review of the developments which have taken place in recent years.

Before proceeding, we briefly summarize the main findings. It should be borne in mind that these findings refer to 1969 and that since then national insurance has undergone major changes.

Summary of Findings

The total reduction in inequality due to national insurance benefits in 1969 was 5.7 per cent, according to the Gini index. The various national insurance programs differ considerably in the degree of progressivity.

Contributions are regressive. The degree of regressivity, and in particular the burden borne by the bottom income group, is highly sensitive to the manner in which the employers' share is shifted. Regressivity is greatest under the assumption that the employers' share is shifted to consumers in the form of price rises.

The net effect of national insurance benefits and contributions is progressive, in spite of the regressivity of contributions. Deducting contributions, national insurance benefits still reduce inequality by 4 per cent, as measured by the Gini index.

A decomposition of the Atkinson inequality measure, shows that the reduction in inequality is greatest within age and family-size groups. The redistribution between demographic groups is very small. Hence, national insurance does not merely redistribute resources over the life cycle or between generations, as has often been claimed.

THE DISTRIBUTION OF DIRECT TAXES AND TRANSFERS

The distribution of the direct taxes and transfers is analysed on the basis of the 1968/69 Family Expenditure Survey, which covered a sample of 2,431 urban families.[7] Direct taxes include income taxes and national insurance contributions and direct cash transfers include benefits paid by the National Insurance Institute, the Ministry of Welfare, and other ministries and public agencies.

The population is divided into deciles on the basis of pre-transfer income adjusted for family size. Pre-transfer income is defined as income and pensions from work, support from other households and income from property. To relate the needs of the family and the

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[7] See *Central Bureau of Statistics 1970.*

number of persons in it, an empirically estimated equivalence scale is used.[8] In this scale it is assumed that an increase in the number of persons makes possible economies in family consumption (e.g. buying in bulk, hand-me-downs, sharing consumer durables such as a television set); thus the need for additional income is not proportional to the rise in family size, and therefore is not a constant per capita sum.[9] Instead, the family's relative needs are expressed in units of standard persons with a two-person family as base. The actual living standard of a given family is defined in terms of income per standard person (p.s.p), that is family income divided by the number of standard persons. It should be noted that the progressivity of transfers and taxes is likely to be sensitive to the measure of economic status employed. Had we employed different measures, such as income per family or per person or a measure which includes the imputed value of assets and liabilities, we may have obtained different results.[10]

Direct Transfers

National insurance benefits were received in 1969 by approximately 67.5 per cent of the families. These transfers totalled IL 21.1 million per month and were 4 per cent of total personal income. National insurance benefits are of a number of types: old age and survivors – 53.6 per cent of the total, child allowances, composed of large family allowances and employees' children allowances – 44 per cent, and work-related disability insurance – 2.4

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[8] The scale was developed at the National Insurance Institute and later adopted by the Committee on Income Distribution and Social Inequality. See *Report of the Committee on Income Distribution and Social Inequality, 1970.*

[9] This assumption can be criticized on empirical and theoretical grounds. See *Habib 1973* and *Habib and Tawil 1974.*

[10] Empirical evidence of this point is presented for Israel, in *Gabbay 1975* and for the U.S.A., in *Bridges 1971*. The importance of the way income is defined is stressed by *Musgrave and Musgrave 1973* and *Reviglio 1974.*

Table 1. Transfers: Average Rate per Decile,[a] by Type of Transfer, 1969

Deciles	Total Transfers	National Insurance Benefits							Welfare	
		Total	Old-age	Survivors	Child allowances			Disability and others	Total	Old-age grant
					Total	Large family	Employees' children			
Lowest	144.3	90.7	66.7	9.6	11.9	7.0	4.9	2.3	39.9	6.2
2	18.9	15.4	5.2	0.5	9.2	4.3	4.9	0.7	2.9	0.7
3	11.6	10.3	4.2	0.5	5.2	1.7	3.5	0.3	1.3	0.2
4	8.9	7.6	2.6	0.5	4.5	1.6	2.9	(–)[b]	0.8	0.3
5	5.3	4.4	1.3	0.1	2.8	0.5	2.3	0.3	0.3	(–)
6	4.0	3.3	1.0	0.3	1.9	0.1	1.8	0.1	0.4	(–)
7	2.5	2.3	0.7	0.1	1.3	(–)[b]	1.3	0.2	0.1	(–)
8	2.8	2.2	0.8	0.3	1.0	(–)	0.9	0.2	(–)	(–)
9	2.2	1.6	0.7	0.1	0.8	(–)	0.8	0.1	0.1	(–)
Highest	1.2	0.9	0.4	0.1	0.4	(–)	0.3	0.1	0.1	(–)
Total	5.2	4.0	1.8	0.3	1.7	0.4	1.3	0.2	0.8	0.1

[a] Average transfer in decile as percentage of average pre-transfer income in decile. Incomes are ranged by pre-transfer income. We have not taken into account that some types of transfers are subject to tax.

[b] (–) amounts which are statistically insignificant.

per cent. National insurance benefits comprised 76.3 per cent of total transfers as reported in the survey.[11]

Table 1 reports the distribution of benefits by income groups. National insurance benefits are progressive in that their rate declines as income rises; they comprise 90.7 per cent of pre-transfer income in the bottom decile, 15.4 per cent in the second, and in the top decile they are less than one per cent. On the other hand, there is a significant number of national insurance recipients in all deciles. The share of the bottom decile in total benefits is only 26.8 per cent while the top six deciles receive between 6 to 8 per cent each.

The progressivity of total benefits is a function of the progressivity of the various programs. We find that the individual programs are also progressive over most income deciles. Old-age and survivors benefits and large family allowances are progressive in the bottom deciles, but in the top deciles their pattern is irregular. This is to a large extent a result of the small and statistically insignificant number of recipients in these deciles. Employees' children allowances rise in rate between the first and second decile, but subsequently are progressive.

The degree of progressivity is compared on the basis of the cumulative distribution of benefits in Figures 1 and 2. If the distribution of one benefit is higher than that of another benefit throughout, the first benefit can be said to be unambiguously more progressive. If the distributions intersect, the one benefit is more progressive in the income range before the intersection point and the other benefit is more progressive beyond this point. Old-age benefits and family allowances are unambiguously the most progressive benefits. The share of the bottom decile is highest with old-age benefits, reaching 43 percent of the total benefit, as compared to 20 percent for large family allowances (Table A1). In subsequent deciles, however, large family allowances are more progressive. The least progressive are employees'

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[11] The number of recipients and total amount of transfers is as reported in the survey with the exception of employees' children allowances that have been imputed. The analysis does not include national insurance benefits of a one-time nature, such as reserve army payments, maternity benefits, one-time injury grants and rehabilitation expenditures, and some of the payments made by the Institute via the employer such as grants to low-income workers.

children allowances. Moreover, as employees' children allowances are greater in amount than large family allowances, the progressivity of total child allowances is well below that of old age or even disability benefits. Finally, total transfers are more progressive than national insurance benefits. This is due primarily to the progressivity of welfare benefits, 61.3 per cent of which are received by the bottom decile.

Figure 1. The Cumulative Distribution of Transfers by Income Deciles

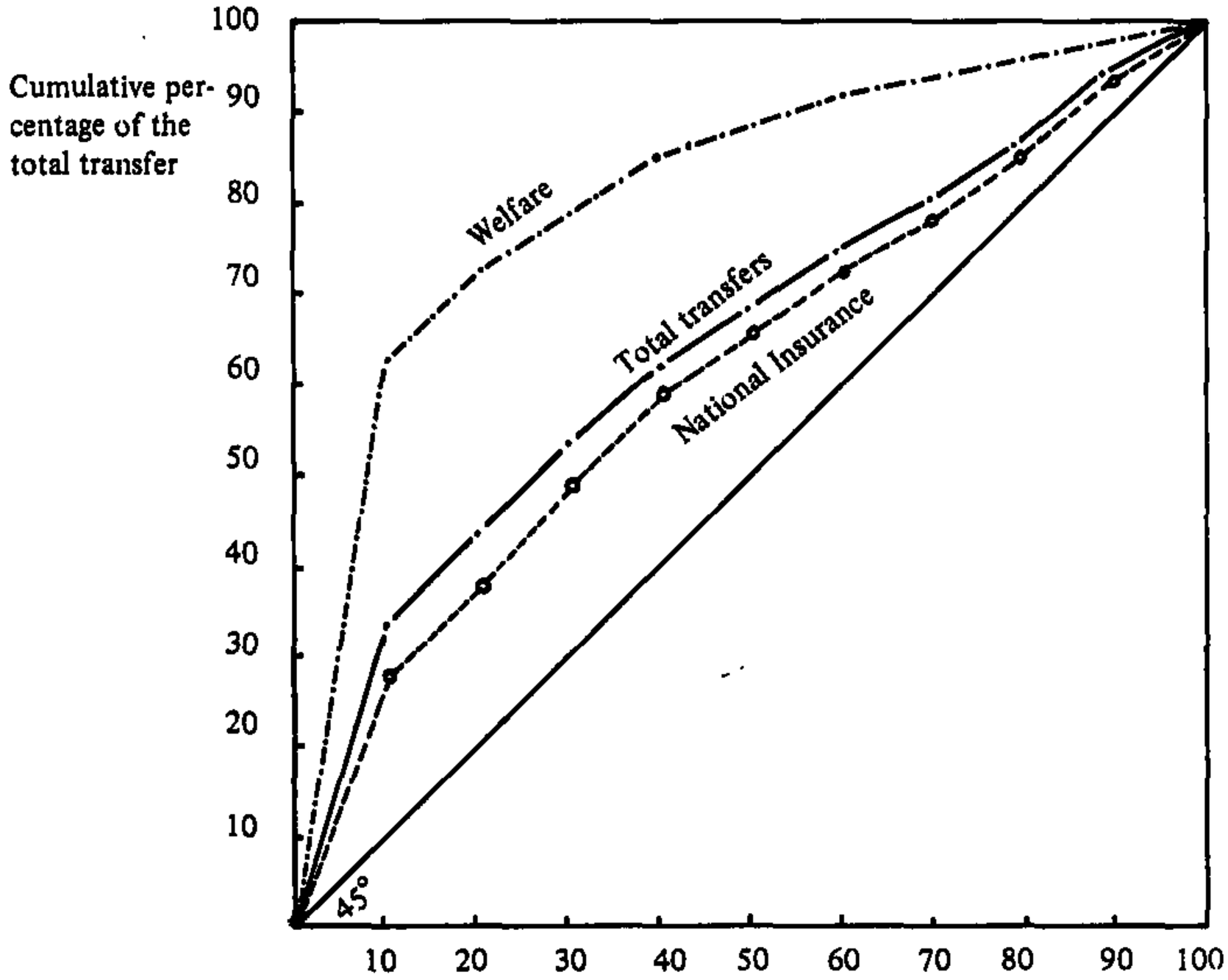
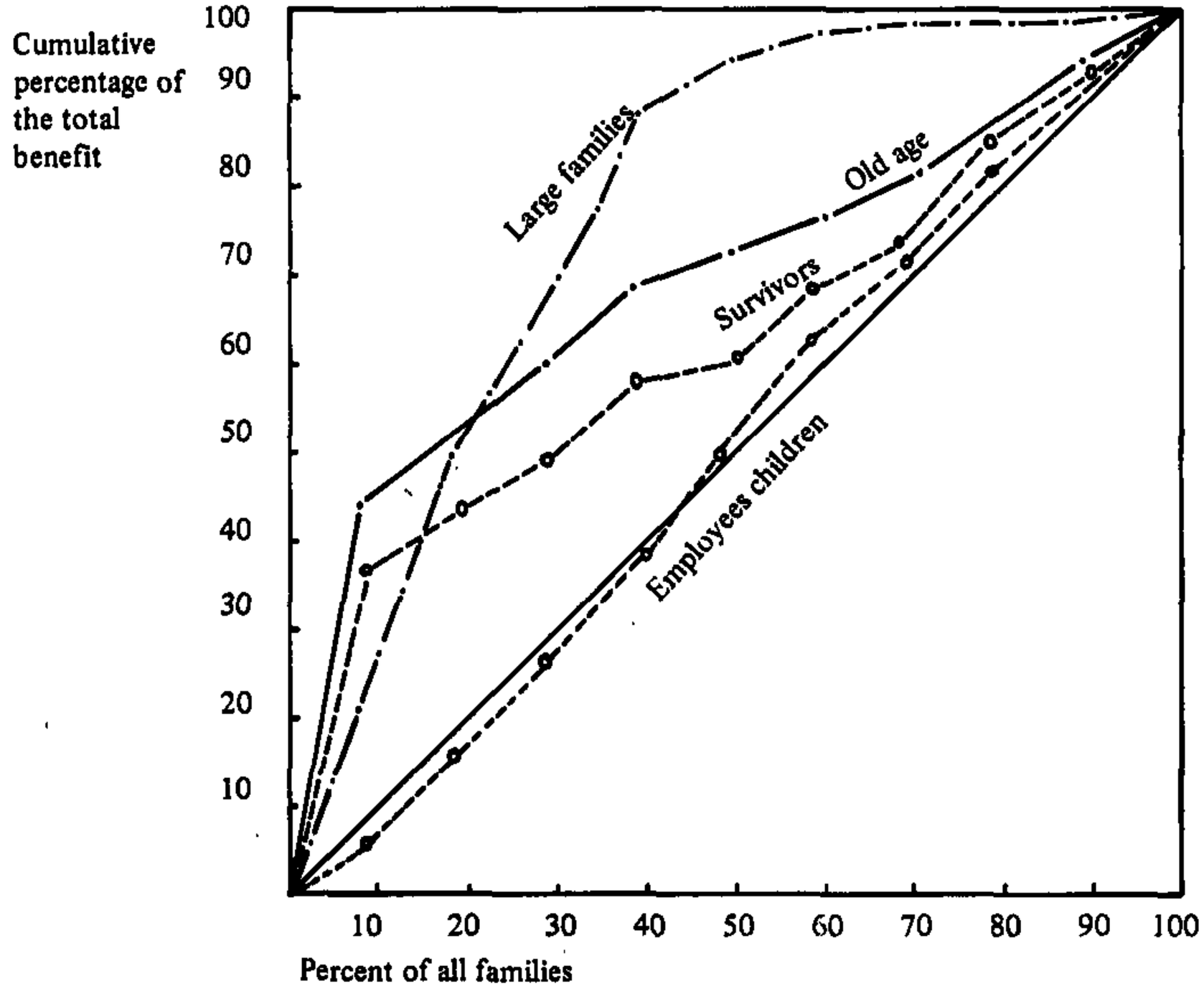


Figure 2. The Cumulative Distribution of National Insurance Benefits by Income Deciles



Source: Table A.1

Direct Taxes

Total direct taxes in 1969 were IL117.4 million a month. Of this sum, income taxes comprised 79.4 per cent and national insurance contributions 29.6 per cent.[12] National insurance contributions are comprised of an employers' share, accounting for 72.3 per cent, and a share of employees and the self-employed comprising 27.7 per cent. This statutory division of the contributions does not necessarily reflect the effective distribution of the burden between employers and employees. In effect, employees may bear a greater burden, since employers, it is argued, tend to shift their own share either to wages by reducing them or to prices by raising them.[13] We examine how the alternative assumptions on the incidence of the employers' share effect the redistributive pattern and consider whether national insurance contributions and income taxes, when combined, are progressive.

National insurance contributions, in contrast to income taxes, are independent of family size and have a ceiling. In 1969 employees were required to pay 1.9 per cent of their wages up to a ceiling of IL 700 and the self-employed 5.5 per cent up to the same ceiling. Excluded from the tax base are various fringe benefits, such as work-related travel allowances, vacation allowances, expenses for car maintenance and telephone maintenance. There are other types of income, such as income from property, which are subject to income tax but not to national

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[12] The estimates of taxes were obtained by simulating hypothetical tax payments for each earner in the sample. This imputation disregards several special tax reductions, such as reductions for approved overtime pay. These reductions are concentrated in the upper income groups and thus we may have overestimated considerably the actual progressivity of the tax structure. Gabbay, for example, estimates that 60 per cent of the total tax relief arising from the reduced tax rates on approved overtime are concentrated in the top decile. *See Gabbay 1973.*

[13] As *Brittain* (1972A, p.52) points out "the concept of the incidence of a tax refers to its impact on the distribution of real income among economic groups. This impact has two components: the effect on the distribution of income among groups and the effect on the relative prices paid by each group". Brittain argues that the payroll tax is shifted backward to employees. The theoretical and empirical basis of this argument is criticized by *Feldstein 1972* and defended by *Brittain, 1972B.* For a summary of the issue see *Musgrave and Musgrave, 1973,* Ch. 16.

insurance contributions. Thus the effective tax rate which the family pays depends on how much of its income is in these non-taxable forms. Because of the ceiling, the tax rate also depends on the number of earners in the family and on the number of jobs per earner; it increases with the number of earners and jobs.[14]

Table 2. Direct Taxes: Average Rate per Decile,[a] under Alternative Assumptions on the Incidence of National Insurance Contributions, 1969

Deciles	Income Tax	National Insurance Contributions				Total Income Tax and NI[c]	
		Statutory	Effective burden[b]			NI shifted to wages	NI shifted to prices
			Shifted to wages	Shifted to prices	Shifted evenly to wages and prices		
Lowest	3.7	3.1	8.0	21.8	15.8	11.7	25.5
2	0.9	2.3	7.5	9.6	8.7	8.4	10.5
3	2.6	2.5	7.7	8.8	8.3	10.3	11.4
4	4.2	2.3	7.5	7.8	7.7	11.7	12.0
5	7.4	2.3	7.9	7.5	7.8	15.3	14.9
6	9.7	2.1	7.1	6.9	7.1	16.8	16.6
7	12.3	2.1	6.8	6.7	6.8	19.1	19.0
8	14.9	2.0	7.0	6.2	6.6	21.9	21.1
9	19.3	1.6	5.9	5.5	5.8	25.2	24.8
Highest	24.2	1.3	4.5	4.3	4.4	28.7	28.5
Total	14.7	1.6	6.2	6.2	6.2	20.9	20.9

[a] Average tax obligation in decile as percentage of average pre-transfer income in decile.

[b] Decile's rate under the assumption that employers shift their share to employees or consumers or both, as explained above.

[c] NI—National Insurance

[14] Although Employees who have more than one job are entitled to a refund of payments in excess of the ceiling, they often fail to claim it.

The average tax rate in a particular income group will, therefore, depend on the ratio of employees to self-employed in this group, the average number of jobs and earners per family and the weight of taxable income in total family income. When all these factors have been taken into account, the pattern of contributions is found to be regressive. As reported in Table 2, the average contribution in the bottom decile is 3.1 per cent of the deciles average wages, as compared to only 1.3 per cent in the top decile.

The contribution that employers were obliged to pay in 1969 was 6.7 per cent of taxable wages, which is almost 3.5 times the rate paid by employees. This means that the assumptions made about the effective incidence of the employers' share are of great significance. We find that total contributions are regressive both on the assumption of shifting to wages and of shifting to prices; the bottom decile pays the highest rate and the top decile – the lowest rate.[15] The only significant difference between these assumptions is in the rate paid by the bottom decile. On the assumption of forward shifting, the average tax rate in the bottom decile is almost 22 per cent, as compared to approximately 16 per cent with backward shifting.[16] When assuming that the employers' contributions are shifted evenly to wages and prices, the degree of regressivity falls between the two extremes. Following a number of previous studies, the latter assumption will be used in subsequent sections.[17]

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[15] In shifting the tax forward, we assume that prices are increased so as to preserve the real share of profits. Hence, the increase in prices is equal in rate to the employer's contribution. For a discussion of this point, see *Brittain 1972A*, Ch. 2.

[16] *Musgrave and Musgrave 1973* also found that there is little difference between the two assumptions in the regressivity of tax rates with the exception of the lowest decile in which the tax rate with forward shifting is much higher. The results are similar, despite the fact that Musgrave and Musgrave used a broader definition of income which included imputed rent, the stockholder's corporate profits before tax and other capital gains, whether realized or not, and that they made no allowance for family size. In a study confined to Israeli employees in 1974, Tawil finds a similar pattern. He reports that by 1974 the burden of the bottom decile had reached 18.7 per cent. See *Tawil 1974*.

[17] *Bridges 1971* and *Gillespie 1965*, for example, also assume that the employers share is shifted half forward and half backward.

Does the regressivity of national insurance contributions offset the progressivity of income taxes? [18] Income taxes are progressive from the second decile upward. However, the tax rate of the bottom decile exceeds that of the three successive deciles. This may be due to the ranking of families by income per standard person, as the allowance made for family size in the income tax system is not necessarily equal to that implied by the equivalence scale. The higher tax rate in the bottom decile may therefore reflect the failure to provide for horizontal equity with respect to family size; i.e. large families in the bottom decile pay a higher tax rate than small families in the second, third or fourth deciles. Another possible reason is the ranking of families by the sum of the incomes of all family members. In contrast to national insurance contributions, the income tax rate on a given sum is lower when supplied by several earners. As the proportion of two-earner families rises as one moves up the income scale, this factor tends to moderate the rise in tax rates. Adding national insurance contributions reduces the progressivity of taxes without altering the basic pattern. Tax rates still begin to rise from the second decile. For income taxes alone, the top decile rate is 24.2 per cent as compared to 3.7 per cent in the bottom decile, and 0.9 per cent in the second decile. The combined tax rate, on the assumption of shifting contributions to prices, is only slightly higher in the top decile, 28.5 per cent, but reaches as much as 25.5 per cent in the bottom decile and 10.5 per cent in the second decile.

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[18] Various authors have cited the effect of regressive national insurance contributions on the progressivity of overall taxes. For example, *Webb and Sieve 1971* (p.214) claim that in Britain " . . . because of flat rate national insurance contributions, direct taxation is only mildly progressive." *Brittain 1972A* (p.87) finds that in the U.S.A. payroll tax regressivity swamps income tax progressivity over a large range of incomes. *Musgrave and Musgrave 1973* and *Bridges 1971*, on the otherhand, find that the effect is less severe.

THE EFFECT OF NATIONAL INSURANCE BENEFITS AND CONTRIBUTIONS

This section considers the effect of national insurance benefits and contributions on the distribution of income by deciles. We first examine the effect of benefits alone and then the net effect of benefits and contributions. The results are summarized in two inequality indices: the Gini index and the Atkinson index.[19] The advantage of the latter is that it allows for systematic variation in the weight assigned to redistribution in different ranges of the income distribution. This weight is represented by the parameter ϵ. By raising ϵ we assign a greater weight to inequality and redistribution at lower income levels.

Table 3 shows that national insurance benefits reduced overall inequality as measured by both indices. When the benefits are added to pre-transfer income, the Gini index declines by 5.7 per cent. The value of ϵ affects the magnitude of the change in the Atkinson index, but not its direction. The reduction in the Atkinson index varies between 25.1 and 4.1 per cent. As ϵ rises, i.e. more weight is given to redistribution at the bottom, the effect of national insurance declines. The reduction in the Gini index corresponds, more or less, to the reduction in the Atkinson index in the range $\epsilon \approx 2$–2.5.

In the previous section we reported that the various national insurance programs differ in their distribution by income deciles. To compare their effects on inequality, we add each benefit to pre-transfer income and calculate the resulting decline in the Gini index. This change in inequality is divided by the total amount of benefits distributed under each program, to obtain the change per Lira of benefit. In this way we compare the efficiency of the various benefits in reducing inequality.

Consistent with our previous findings, large family allowances have the greatest effect per Lira on inequality, but when combined with employees' children allowances, their effect is less progressive than that of old age benefits. Total national insurance benefits are less progressive than total welfare, although individual programs, such as large family allowances, are more progressive (see Table 4).[20]

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[19] See *Atkinson 1970*.

[20] Nicholson finds that in Britain unemployment insurance is the most progressive and child allowances the least progressive. See *Nicholson 1973*, Table 2.

Table 3. The Effect of National Insurance and of All Taxes and Transfers on Inequality, by Selected Inequality Indices, 1969

	Level of Inequality					Percentage Reduction in Inequality				
	Atkinson index				Gini index	Atkinson index				Gini index
	$\epsilon = 1.2$	$\epsilon = 1.5$	$\epsilon = 2.0$	$\epsilon = 2.5$		$\epsilon = 1.2$	$\epsilon = 1.5$	$\epsilon = 2.0$	$\epsilon = 2.5$	
Pre-transfer income	.411	.594	.869	.953	.402					
Income after NI benefits	.318	.445	.746	.914	.379	22.6	25.1	14.2	4.1	5.7
Post-transfer income	.261	.327	.497	.765	.370	36.5	44.9	42.8	19.7	8.0
Income after benefits and contributions	.335	.475	.768	.927	.386	18.5	20.0	10.0	2.7	4.0
Income after all transfers and taxes	.220	.283	.458	.739	.338	46.5	52.4	47.3	22.5	15.9

Table 4. The Effect of Different Transfer Programs on Inequality, as Measured by the Gini Index, 1969.

	Level of Inequality	Per Cent Reduction in Inequality	Per Cent Reduction per IL Million of transfers
Pre transfer income	.428		
Income after all transfers	.392	8.3	0.300
Income after NI benefits	.405	5.3	0.250
After old-age and survivors	.412	3.8	0.333
After all child allowances	.419	2.1	0.234
After large family	.424	0.9	0.426
After employees' children	.422	1.3	0.187
After disability	.427	0.2	0.190
Income after Welfare	.421	1.5	0.379

When contributions are deducted (using the assumption that the employers' contribution is shifted evenly to wages and prices), inequality rises according to all the measures. Still, the net effect of national insurance is a reduction in inequality. The Gini index now declines by 4 instead of 5.7 per cent (Table 3).

The change in the inequality index provides only a limited aspect of the pattern of redistribution. A given change in the index is consistent with a wide range of shifts in the share of the various income or demographic groups. The effect of national insurance on the distribution of income by deciles is reported in Table 5. We find that national insurance benefits uniformly shift up the cumulative distribution. The share of the first five deciles rises and that of the top four falls. Contributions, on the otherhand, reduce the share of the three bottom deciles. But their effect is much smaller than that of benefits and does not alter

Table 5. The Effect of National Insurance and of All Taxes and Transfers on the Distribution of Income among Deciles, 1969

Deciles	Decile's Share of Total Income Before Transfers (%)		Decile's Share of Total Income After National Insurance (%)		Decile's Share of Total Income After All Taxes and Transfers (%)	
	Unadjusted	Adjusted[a]	After benefits only	After benefits and contributions	After transfers only	After taxes and transfers
Bottom	1.2	1.2	1.8	1.7	2.2	2.2
2	2.7	2.8	3.2	3.1	3.3	3.8
3	4.1	4.1	4.4	4.3	4.5	5.0
4	5.3	5.3	5.4	5.4	5.4	6.0
5	6.7	6.8	6.9	6.8	6.9	7.3
6	8.5	8.6	8.5	8.5	8.5	8.9
7	10.6	10.5	10.4	10.3	10.3	10.5
8	13.2	13.3	12.9	12.9	12.8	12.9
9	17.5	17.4	17.1	17.3	17.0	16.1
Top	30.2	30.0	29.4	29.7	29.1	27.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Income of bottom decile as % of top decile's income	4.0	4.0	6.1	5.7	7.6	8.1

[a] Adjusted for the effect of shifting the employers share of national insurance contributions onto wages.

Table 6. The Effect of National Insurance and of All Taxes and Transfers on Average Income per Decile, 1969

Deciles	Decile's Average as % of Overall Average Before Transfers				Decile's Average as % of Overall Average After National Insurance				Decile's Average as % of Overall AverageAfter AllTaxes and Transfers			
	Unadjusted		Adjusted [a]		After benefits only		After benefits and contributions		After transfers only		After taxes and transfers	
	P.s.p	Per family	P.s.p	Per family	P.s.p	Per family	P.s.p	Per family	P.s.p	Per family	P.s.p	Per family
Bottom	12	10	13	10	19	18	19	17	23	23	24	22
2	30	37	32	36	35	38	35	38	37	38	42	44
3	44	49	45	49	48	52	47	51	48	51	55	59
4	56	65	58	67	60	68	60	67	60	68	67	74
5	69	77	72	77	72	73	72	73	72	73	78	82
6	85	87	88	86	87	85	87	84	87	84	91	89
7	103	103	107	104	105	101	105	100	104	100	106	102
8	127	120	132	120	129	120	128	118	128	118	127	115
9	167	152	171	153	167	147	168	148	166	145	158	144
Top	275	234	283	233	276	226	280	232	274	225	252	199
Total	100	100	100	100	100	100	100	100	100	100	100	100
Income of bottom decile as % of top decile's income	4.4	4.3	4.6	4.3	6.9	8.0	6.8	7.3	8.4	10.2	9.6	11.3

[a] Adjusted to the effect of shifting the employers share of national insurance contributions onto wages.

Table 7. Inequality in Pre-transfer Income by Family Size and by Sex and Age of the Family Head, for Selected Inequality Measures, 1969

	Inequality Indices			Share of Bottom and Top Deciles in Total Income (%)		Group's Average Income as % of Overall Average	
	Atkinson index		Gini	Bottom	Top	Per	P.s.p
	$\epsilon = 1.2$	$\epsilon = 2.5$	index	decile	decile	family	
Total	.411	.953	.402	1.2	30.2	100.0	100.0
Family Size							
Unrelated individuals	.837	.987	.565	0.0	34.3	35.8	86.8
Childless families	.550	.978	.426	0.5	29.3	96.5	130.8
Families with children:							
1–3 children	.259	.910	.327	2.1	24.9	121.1	111.1
4–5 children	.262	.833	.313	2.0	24.4	88.9	57.9
6 or more children	.240	.859	.282	2.3	22.2	72.9	37.7
Sex & Age of Family Head							
Males:							
Up to 64	.314	.891	.378	1.5	29.9	116.9	104.2
18–34	.301	.913	.364	1.9	27.5	105.0	102.2
35–54	.300	.810	.379	1.5	30.4	123.9	99.8
55–64	.371	.950	.384	1.1	30.9	113.1	124.1
65 and over	.590	.979	.513	0.0	33.0	58.2	79.2
Females:							
Up to 59	.572	.970	.439	0.2	33.4	65.6	83.2
60 and over	.851	.983	.581	0.0	33.7	24.2	53.5

the pattern of gains and losses. The redistribution of income among deciles can also be expressed in relation to overall average income (Table 6). For example, before national insurance the average income p.s.p. in the bottom decile is 13 per cent of the overall average rising to 19 per cent after. It is 4.6 per cent of the average income of the top decile before national insurance and 6.9 per cent after.

Inequality by Age and Family Size

We now consider the effect of national insurance by age and family size: which groups improve their position and is between-group inequality reduced; what are the effects on inequality within age and family size groups; and what is the weight of these two effects in the total reduction in inequality?

We begin by considering the pattern of inequality before transfers. There is obviously a relationship between the age of the family head and family size; young and elderly family units tend to have fewer members. Yet each characteristic represents a different aspect of the family life-cycle. Because of statistical limitations we are unable to consider the joint distribution of these two characteristics and we therefore treat each separately.

Table 7 reports the inequality in pre-transfer income by age and family size. Inequality varies both with age and family size, rising with age and declining with family size. The differences are considerable. For families with male heads aged 18–24 the Gini index is .322, as compared to .513 for families with heads of 65 or more. For families with six children or more the index is .282 and for families with 1–3 children it is .327.

The magnitude of within- group inequality is also reflected in the relative shares of the bottom and top deciles in total income. The bottom decile of aged families and of single individuals has a negligible share, whereas the top decile, in each case, has about one third of total income before transfers. Among younger families, the difference is smaller, 1.5 per cent in the bottom decile versus 29.9 per cent in the top decile.

If within-group inequality were low, we might have presumed that inequality is related primarily to life-cycle differences. However, in no groups is inequality lower than 80 per cent of overall inequality and in some groups it exceeds it by as much as 144 per cent. Thus,

Table 8. The Effect of National Insurance and of All Taxes and Transfers on Selected Inequality Indices, by Family Size and by Sex and Age of the Family Head, 1969

	Percentage Reduction in Inequality After National Insurance						Percentage Reduction in Inequality After All Taxes and Transfers					
	After benefits only			After bene. & contrib.			After transfers only			After taxes & transfers		
	Atkinson index		Gini index	Atkinson index		Gini index	Atkinson index		Gini index	Atkinson index		Gini index
	$\epsilon = 1.2$	$\epsilon = 2.5$		$\epsilon = 1.2$	$\epsilon = 2.5$		$\epsilon = 1.2$	$\epsilon = 2.5$		$\epsilon = 1.2$	$\epsilon = 2.5$	
Total	22.7	4.1	5.8	19.4	1.1	4.0	36.6	19.8	8.0	46.3	22.1	15.8
Family Size												
Unrelated individuals	29.9	1.2	16.7	29.1	1.2	16.2	51.0	4.1	22.5	55.0	4.9	27.6
Childless families	31.1	2.4	6.7	29.5	2.3	5.3	47.1	17.9	8.8	52.1	14.2	12.2
Families with children:												
1–3 children	6.8	1.3	2.6	2.0	1.2	0.1	20.8	17.8	3.7	25.2	23.6	14.7
4–5 children	19.5	14.5	8.0	11.1	–2.6	5.6	43.7	66.3	13.4	54.7	70.3	24.1
6 or more children	44.3	64.2	13.5	37.1	56.8	10.7	59.9	79.7	21.6	64.8	81.6	25.8
Sex and Age of Family Head												
Males:												
Up to 64	10.3	4.7	3.3	5.0	1.7	1.2	19.8	16.2	4.7	32.5	18.1	13.3
18–34	7.1	2.3	2.9	4.1	–2.9	0.8	16.2	7.5	4.0	31.4	11.5	14.7
35–54	11.0	8.8	4.0	4.5	–5.0	1.9	20.1	46.3	5.3	34.2	52.7	15.6
55–64	11.2	3.0	1.6	7.3	3.2	–0.8	23.3	9.0	3.4	29.5	7.4	5.0
65 and Over	28.4	2.6	16.3	37.9	2.7	15.4	51.8	51.8	20.1	63.4	55.4	25.1
Females:												
Up to 59	25.2	1.9	7.3	22.7	1.7	6.2	50.8	14.3	11.9	54.8	16.9	16.1
60 and over	26.9	1.0	22.6	26.7	1.1	21.4	61.0	7.9	32.8	61.1	8.4	33.3

Table 9. The Effect of National Insurance and of All Taxes and Transfers on the Share of the Bottom and Top Deciles in Total Income, by Family Size and by Sex and Age of the Family Head, 1969

	Share of Bottom and Top Income Deciles after National Insurance (%)				Share of Bottom and Top Income Deciles after all Taxes and Transfers (%)			
	After benefits only		After benefits and contributions		After transfers only		After taxes and transfers	
	Bottom decile	Top decile	Bottom decile	Top decile	Bottom decile	Top decile	Bottom decile	Top decile
Family Size								
1–3 children	2.3	24.6	2.2	25.0	2.6	24.5	2.9	22.3
6 or more children	3.6	19.9	3.4	20.2	5.0	19.3	5.2	17.8
Sex and Age of Family Head								
Males								
Up to 64	1.8	29.4	1.7	29.7	2.0	29.2	1.9	27.0
65 and over	1.6	29.9	1.4	30.4	2.5	29.2	2.7	29.1
Females								
Up to 59	0.1	31.9	1.0	27.8	2.2	30.6	2.3	29.1
60 and over	0.1	27.6	0.0	27.8	2.2	25.4	2.2	27.2
Total	1.8	29.4	1.7	29.7	2.2	29.2	2.2	27.3

Table 10. The Effect of National Insurance and of All Taxes and Transfer on Average Income in Group, by Family Size and by Sex and Age of the Family Head, 1969

	Group's Average Income as % of Overall Average After National Insurance				Group's Average Income as % of Overall Average After All Taxes and Transfers			
	After benefits only		After benefits and contributions		After transfers only		After taxes and transfers	
	Per family	P.s.p.	Per family	P.s.p.	Per family	P.s.p.	Per family	P.s.p.
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Family Size								
Unrelated individuals	39.2	94.9	39.2	95.1	40.2	97.4	42.0	101.4
Childless families	96.94	130.6	96.6	130.9	96.3	130.4	95.4	128.9
Families with Children:								
1–3 Children	119.4	109.6	119.4	109.6	119.0	109.2	117.5	107.8
4–5 Children	91.7	59.7	91.1	59.3	92.6	60.3	98.5	64.0
6 or more children	80.0	41.4	79.0	40.9	81.7	42.3	90.6	46.8
Sex and Age of Family Head								
Males:								
up to 64	122.5	103.0	115.1	103.0	114.6	102.6	113.5	101.8
18–34	110.1	100.8	103.4	100.8	102.7	100.2	107.7	100.0
35–54	130.5	99.1	122.7	99.2	122.2	98.8	121.4	98.5
55–64	117.0	120.8	109.8	120.7	109.6	121.7	106.1	117.0
65 and over	68.9	87.4	64.8	87.3	65.7	88.7	69.9	93.4
Females:								
up to 59	71.6	85.7	66.9	85.3	68.9	88.0	71.1	90.7
60 and over	31.5	64.4	29.9	64.8	32.0	69.3	34.6	74.5

inequality is considerable even when allowing for life-cycle differences and irrespective of the way family size is treated in the measurement of economic status.

Inequality between demographic groups is also substantial. The magnitude of the gaps is sensitive to the treatment of family size. Thus in terms of income per family, the income of families with six or more children is 72.9 per cent of the average, but in terms of p.s.p. it is only 37.7 per cent. For the aged the reverse occurs: the relative income of aged males rises from 58.2 per cent on the basis of family income to 79.2 per cent on the basis of income p.s.p .

National Insurance benefits reduce inequality both between age and family size groups and within them. Their effect in some groups is far greater than the average effect in the entire population (Table 8). In fact after deducting contributions, several groups even experience a slight rise in inequality, but on the whole inequality still declines. Among family size groups, the decline is particularly great in families with six or more children: the Gini index declines by 10.7 per cent and the Atkinson index by as much as 56.8 per cent for high values of ϵ. There is also a large reduction for childless families and unrelated individuals. This corresponds to the fact that among age groups the reduction is greatest for aged families. For aged males the decline in the Gini index is 15.4 per cent. The decline in the Atkinson index is highly sensitive in the group to the value of ϵ. As weight is added to the redistribution in the lower ranges, the percentage decline drops sharply from 37.9 (ϵ = 1.2) to 2.7 (ϵ = 2.5).

National Insurance also reduces inequality between groups. From Tables 7 and 10 it can be seen that almost all groups with below average incomes improve their position, and the position of those above the average declines, both in terms of income per family and per standard person. However, with the exception of the aged who improved their position significantly, the effect tends to be small. The average income p.s.p. of aged males rises from

Table 11. The Effect of National Insurance and of All Taxes and Transfers on Inequality Within and Between Family Size Groups and the Role of National Insurance in Each Effect as Measured by the Atkinson Index, 1969.

Value of ϵ	Reduction in Inequality After National Insurance					Reduction in Inequality After All Taxes and Transfers					Role of National Insurance	
	Total	Within groups		Between groups		Total	Within groups		Between groups		Within groups	Between groups
		Absolute	Per cent	Absolute	Per cent		Absolute	Per cent	Absolute	Per cent		
A. Income after Transfers Alone												
1.2	–0.112	–0.105	93.4	–0.007	6.7	–0.188	–0.179	95.0	–0.009	5.0	58.7	77.8
1.5	–0.210	–0.203	96.3	–0.008	3.7	–0.444	–0.434	97.8	–0.009	2.2	46.8	88.9
2.0	–0.156	–0.152	97.5	–0.004	2.5	–0.606	–0.601	99.2	–0.005	0.8	25.3	80.0
2.5	–0.053	–0.052	97.3	–0.001	2.7	–0247	–0.245	99.2	–0.002	0.8	21.2	50.0
B. Income after Taxes and Transfers												
1.2	–0.098	–0.092	93.9	–0.006	6.1	–0.230	–0.209	90.9	–0.021	9.1	44.0	28.6
1.5	–0.192	–0.185	96.4	–0.007	3.6	–0.496	–0.476	96.0	–0.020	4.0	38.9	35.0
2.0	–0.144	–0.140	97.2	–0.004	2.8	–0.616	–0.607	98.5	–0.009	1.5	23.1	44.4
2.5	–0.049	–0.047	95.9	–0.002	4.1	–0.228	–0.225	98.7	–0.003	1.3	20.9	66.7

Table 12. The Effect of National Insurance and of All Taxes and Transfers on Inequality Within and Between Age Groups and the Role of National Insurance in Each Effect as Measured by the Atkinson Index, 1969.

Value of ϵ	Reduction in Inequality After National Insurance					Reduction in Inequality After All Taxes and Transfers					Role of National Insurance	
	Total	Within groups		Between groups		Total	Withing groups		Between groups		Within groups	Between groups
		Absolute	Per cent	Absolute	Per cent		Absolute	Per cent	Absolute	Per cent		
A. Income after Transfers Alone												
1.2	–0.120	–0.114	95.2	–0.006	4.8	–0.217	–0.210	96.7	–0.007	3.3	54.3	85.7
1.5	–0.228	–0.217	95.3	–0.011	4.7	–0.580	–0.566	97.6	–0.014	2.4	38.3	78.6
2.0	–0.154	–0.144	93.5	–0.010	6.5	–0.921	–0.907	98.5	–0.014	1.5	15.9	71.4
2.5	–0.041	–0.037	89.3	–0.004	10.7	–0.543	–0.537	98.9	–0.006	1.1	6.9	66.7
B. Income after Taxes and Transfers												
1.2	–0.108	–0.102	94.4	–0.006	5.6	–0.261	–0.247	94.6	–0.014	5.4	39.1	42.9
1.5	–0.215	–0.204	94.9	–0.011	5.1	–0.643	–0.618	96.1	–0.026	4.0	33.0	42.3
2.0	–0.150	–0.140	93.3	–0.010	6.7	–1.005	–0.981	97.6	–.0024	2.4	14.3	41.7
2.5	–0.041	–0.036	87.8	–0.005	12.2	–0.594	–0.584	98.3	–0.010	1.7	6.2	50.0

79.2 to 87.3 per cent of the average income, and that of aged females rises from 53.5 per cent of the average to 64.8 per cent.[21]

As shown elsewhere, the change in the Atkinson index can be separated into a within-group and between-group component.[22] Thus it can be used to quantify the between- and within-group components of the overall change in inequality. The breakdown of the effect of national insurance for family size and age groups is presented in Tables 11 and 12 respectively. Over 90 per cent of the reduction in inequality due to national insurance benefits can be attributed to a decline within age and family size groups.

In conclusion, it may be said that the national insurance system has a substantial effect on income differences that are not related to the family life-cycle. This suggests that the programs as presently structured bring about reductions not only in current differences, but also in life-time differences in economic status.

THE ROLE OF NATIONAL INSURANCE IN TOTAL REDISTRIBUTION

National insurance benefits and contributions, yield a pattern of gains and losses similar to total taxes and transfers. The five bottom deciles gain and the four top ones lose.

How much of the total redistribution can we attribute to the national insurance system? As reported in Table 3, the reduction in the Gini index after transfers alone is 8 per cent and after total taxes and transfers 15.8 per cent. Comparing the redistributive effect of national insurance to that of all taxes and transfers, we find that national insurance accounts for the greater part of the reduction due to transfers alone; but it accounts for only 25 per cent of the total redistribution after all taxes and transfers.

The role of national insurance is highly sensitive to the value of ϵ. For transfers alone, the role varies between 62 per cent of the total redistribution for $\epsilon = 1.2$ and 21 per cent for $\epsilon = 2.5$. The reason for the great decline in the role of national insurance is that these

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[21] This calculation is sensitive to the equivalence scale that is used. For an examination of the sensitivity of relative economic status to the equivalence scale, see *Habib and Tawil 1974A*, Tables 7 and 8.

[22] See *Bruno and Habib (forthcoming 1976).*

benefits are less concentrated in the bottom deciles than other transfers. Thus, as ϵ rises, i.e., more weight is assigned to redistribution at the bottom of the income scale, the role of national insurance benefits decreases. With total taxes and transfers, the proportion of the total reduction attributed to the national insurance system varies between 40 to 12 per cent.

When the redistributive effect is separated into a within- and between-group component, we again find that most of the decline is in within-group inequality. In fact the within-group effect is even more dominant with total transfers than with national insurance. National insurance contributes to both effects. From Tables 7 and 10 it can be seen that the relative income p.s.p of families with six or more children is 37.7 per cent of overall average income before transfers, rising to 46.8 per cent after all taxes and transfers. Forty per cent of this increase can be attributed to national insurance benefits. The relative income of aged males rises from 79.2 to 93.4 per cent after all taxes and transfers. Here the national insurance system is responsible for as much as 56 per cent of the increase. Its contribution to within-group effects is also greatest for the large families and the aged. Among the aged, it accounts for more than 60 per cent of the total decline in the Gini index and among large families – for 41.2 per cent (Tables 7 and 8).[23]

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[23] The analysis here is confined to inequality. The effects of national insurance benefits on poverty have been examined elsewhere. We found that of all national insurance beneficiaries 20 per cent were poor prior to the receipt of any transfers. For 34 per cent of poor national insurance beneficiaries, these transfers alone were sufficient to remove them from poverty. Another 6 per cent of national insurance beneficiaries, for whom these benefits were inadequate in themselves, were removed from poverty with the addition of other transfers. Thus national insurance benefits could in themselves have accounted for 85 per cent of the reduction due to total transfers. Calculated as a percentage of the reduction in poverty among all families, whether national insurance beneficiaries or not, the contribution of national insurance is 73 per cent of the total reduction in poverty. See *Habib 1975*.

FURTHER DEVELOPMENTS

Since 1969, the national insurance system has undergone important changes.[24] Old age benefits and large family allowances were raised relative to average wages. Furthermore, benefit levels were linked to wages and new programs introduced, the most important of which are unemployment and disability insurance. To finance these measures, contributions were raised. Along with the general expansion of national insurance, changes were introduced in the structure of the programs and in the allocation of resources between the various programs.

The expansion of national insurance may have increased its effect on inequality as the structural reforms within the programs were generally of a progressive nature. However, the effect of changes in the weight of the various programs is difficult to estimate. The increase in large family allowances, for instance, had a progressive effect; but the newly introduced schemes, in which benefits are related to previous earnings, are probably less progressive. It is, therefore, not easy to predict the net redistributive effect of these changes. It can, nontheless, be said with assurance that national insurance now plays a much greater role in the total redistribution of income. Consequently, the need for a system which will predict and regularly report changes in the redistributive effect of national insurance programs has become all the more vital. Viewed in this perspective, the research presented here provides little more than a benchmark. In addition the redistributive effect of each program deserves a far more detailed examination. This means that data sources must be improved and made more readily available. We are farther still from the development of a comprehensive framework that would take an integrated view of the effects of the various programs and the various roles assigned to the national insurance system.

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[24] See *Roter 1973* and *Habib 1974*.

APPENDIX

Table A. 1: Share of Each Income Decile in Transfers by Type of Transfer, 1969

Deciles	Total Transfers	National Insurance Benefits							Welfare	
		Total	Old-age	Survivors	Child allowances			Disability and others	Total	Old-age grant
					Total	Large family	Employees' children			
Lowest	32.4	26.8	43.0	37.5	8.2	20.4	4.4	16.4	61.3	41.1
2	9.8	10.5	7.8	4.6	14.7	29.0	10.3	12.3	10.4	18.7
3	9.2	10.6	9.5	6.8	12.6	16.9	11.2	7.8	7.3	9.5
4	8.9	10.1	7.7	8.4	13.9	20.9	11.7	0.6	5.7	17.4
5	6.8	7.4	4.9	3.1	11.1	7.6	12.2	11.3	2.3	(–)
6	6.5	7.0	4.5	7.4	9.5	1.9	11.9	7.6	4.4	6.6
7	5.1	6.1	3.9	5.2	8.0		10.4	11.2	2.1	(–)
8	7.0	7.5	5.6	12.7	7.7	3.3	9.7	12.6	0.3	(–)
9	7.2	6.9	6.4	3.5	8.0		10.3	6.5	1.5	3.8
Highest	7.1	7.1	6.7	10.8	6.3		7.9	13.7	4.7	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table A. 2: Share of Each Income Decile in Taxes by Type of Tax, 1969

Deciles	Total Taxes	Income Tax	National Insurance Contributions				Property Tax	Union Dues (Histadrut) and Health Insurance
			Statutory	Effective burden				
				Shifted to wages	Shifted to consumption	Shifted evenly to wages and prices		
Lowest	1.6	0.3	2.0	1.5	4.2	3.0	5.0	3.1
2	1.8	0.2	3.5	3.4	4.3	3.8	3.4	4.4
3	2.7	0.7	5.8	5.2	5.9	5.6	5.1	5.8
4	3.5	1.4	6.6	6.4	6.6	6.5	5.6	7.0
5	5.5	3.2	8.7	8.8	8.2	8.5	8.0	9.1
6	7.2	5.2	9.8	9.7	9.3	9.5	10.4	10.4
7	9.8	8.4	12.4	11.9	11.6	11.8	11.5	11.8
8	13.2	12.7	14.4	15.1	13.3	14.1	13.4	13.6
9	19.0	21.3	15.4	16.5	15.4	15.9	16.4	15.7
Highest	35.7	46.6	21.4	21.5	21.2	21.3	21.2	19.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] Decile's share under the assumption that employers shift their share to employees, consumers, or both.

Table A. 3. The Effect of National Insurance Benefits and of All Transfers on Average Income by Deciles, 1969

Deciles	Average Income (IL per month)								
	Before transfers			After national insurance benefits			After all transfers		
	P.s.p.	Per family	Per person	P.s.p.	Per family	Per person	P.s.p.	Per family	Per person
Lowest	35	84	25	57	156	50	71	207	64
2	89	314	75	104	341	91	109	346	95
3	128	422	109	141	467	119	144	463	123
4	165	560	137.	178	607	146	180	616	148
5	203	658	170.	213	655	184	215	660	186
6	248	746	213	257	756	223	259	763	225
7	302	881	261	310	901	270	311	905	271
8	372	1031	331	380	1071	334	381	1068	337
9	484	1305	435	492	1315	444	495	1313	448
Highest	807	2008	765	815	2017	772	819	2035	775
Total	293	858	277	295	893	290	298	904	294

Table A. 4. The Effect of National Insurance Contributions and Benefits and of All Taxes and Transfers on Average Income by Deciles, 1969

Deciles	Average Income (IL per month)								
	Before transfers, adjusted[a]			After national insurance contributions and benefits			After all taxes and transfers		
	P.s.p.	Per family	Per person	P.s.p.	Per family	Per person	P.s.p.	Per family	Per person
Lowest	36.8	86.1	25.8	52.4	144.1	45.4	58.6	163.5	47.0
2	92.1	319.6	77.4	97.7	321.7	84.9	100.6	321.0	89.0
3	132.0	431.9	112.7	132.6	432.1	112.3	131.4	433.0	111.0
4	169.8	584.5	140.5	167.8	568.4	138.8	161.5	541.3	134.1
5	209.6	677.4	174.2	201.5	621.6	173.8	188.0	600.2	159.0
6	254.7	753.5	221.7	243.2	715.0	211.6	219.4	649.7	191.2
7	310.6	916.7	266.4	293.7	849.8	257.0	256.6	745.7	223.5
8	382.5	1052.8	340.6	360.6	1004.2	320.9	305.3	836.0	274.5
9	495.5	1343.4	445.3	472.1	1261.6	426.7	381.3	1045.1	342.2
Highest	820.6	2043.3	778.6	788.0	1972.1	747.2	607.4	1451.9	584.5
Total	290.4	878.3	283.0	281.0	850.8	276.9	241.0	728.1	237.7

[a] Adjusted to the effect of shifting employers share of national insurance contributions onto wages.

Table A. 5. The Effect of National Insurance Benefits and of All Transfers on Average Income by Deciles: Indices, 1969.

Deciles	Index:Average Income P.s.p.			Index: Average Family Income		
	Before transfers	After national insurance benefits	After all transfers	Before transfers	After national insurance benefits	After all transfers
Lowest	100	160.1	199.3	100	186.1	246.1
2	100	116.9	121.9	100	108.6	110.3
3	100	110.1	112.3	100	110.7	109.9
4	100	107.9	109.1	100	108.4	110.0
5	100	104.9	105.8	100	99.6	100.3
6	100	103.5	104.3	100	101.3	102.2
7	100	102.4	102.9	100	102.3	102.7
8	100	102.1	102.5	100	103.9	103.7
9	100	101.7	102.2	100	100.7	100.6
Highest	100	101.0	101.5	100	100.4	101.4
Total	100	100.4	101.7	100	104.0	105.3

Table A. 6. The Effect of National Insurance Benefits and Contributions and of All Taxes and Transfers on Average Income by Deciles: Indices, 1969.

Deciles	Index: Average Income P.s.p.			Index: Average Family Income		
	Before transfers adjusted [a]	After national insurance contributions and benefits	After all taxes and transfers	Before transfers adjusted[a]	After national insurance contributions and benfits	After all taxes and transfers
Lowest	100	142.6	159.4	100	167.3	189.7
2	100	106.1	109.3	100	100.7	100.5
3	100	100.4	99.6	100	100.0	100.3
4	100	98.9	95.2	100	97.2	92.6
5	100	96.2	89.7	100	91.8	88.6
6	100	95.5	86.1	100	94.9	86.2
7	100	94.6	82.6	100	92.7	81.3
8	100	94.3	79.8	100	95.4	79.4
9	100	95.3	77.0	100	93.9	77.8
Highest	100	96.0	74.0	100	96.5	71.1
Total	100	96.7	83.0	100	96.9	82.9

[a] Adjusted to the effect of shifting the employer's share of national insurance contributions onto wages.

Table A. 7. Sdected Inequality Indices after National Insurance Benefits and All Transfers, 1969

	Income after National Insurance Benefits					Income after All Transfers				
	Atkinson index				Gini index	Atkinson index				Gini index
	ϵ = 1.2	ϵ = 1.5	ϵ = 2.0	ϵ = 2.5		ϵ = 1.2	ϵ = 1.5	ϵ = 2.0	ϵ = 2.5	
Family size										
Unrelated individuals	.587	.785	.943	.976	.471	.410	.566	.844	.947	.438
Childless families	.379	.554	.859	.955	.398	.291	.366	.547	.804	.389
Families with children:										
1 3 children	.241	.353	.680	.898	.318	.205	.266	.444	.748	.314
4 5 children	.211	.292	.494	.713	.287	.148	.180	.231	.280	.271
6 or more children	.134	.168	.233	.308	.244	.096	.116	.146	.174	.221
Sex and age of family head										
Males:										
Up to 64	.282	.373	.614	.850	.366	.252	.315	.476	.747	.361
18 34	.279	.388	.683	.892	.353	.253	.334	.580	.845	.349
10 24	.195	.241	.312	.377	.315	.186	.229	.296	.357	.309
25 34	.287	.402	.705	.901	.356	.259	.345	.601	.857	.352
35 54	.267	.340	.509	.738	.364	.240	.289	.366	.435	.359
35 44	.247	.318	.484	.701	.349	.222	.268	.339	.402	.345
45 54	.287	.363	.538	.775	.376	.257	.311	.394	.471	.370
55 64	.329	.456	.757	.922	.378	.285	.371	.617	.864	.372
65 and over	.422	.603	.871	.953	.430	.284	.338	.413	.472	.410
Females:										
Up to 59	.427	.612	.871	.951	.407	.281	.361	.579	.831	.387
60 and over	.622	.815	.946	.974	.450	.333	.462	.746	.906	.390
Total	.318	.445	.746	.914	.379	.261	.327	.497	.764	.370

Table A. 8. The Effect of National Insurance Contributions and Benefits and of all Taxes and Transfers on Selected Inequality Measures by Family Size and by Sex and Age of the Family Head, 1969.

	Adjusted Pre-transfer Income[a]					Income After National Insurance Contributions and Benefits					Income After All Taxes and Transfers				
	Atkinson index				Gini index	Atkinson index				Gini index	Atkinson index				Gini index
	ϵ =1.2	E=1.5	ϵ =2.0	ϵ =2.5		ϵ =1.2	ϵ =1.5	E=2.0	ϵ = 2.5		ϵ =1.2	E=1.5	ϵ = 2.0	ϵ = 2.5	
Family size															
Unrelated undividuals	.836	.936	.979	.988	.565	.593	.789	.943	.976	.474	.376	.534	.825	.939	.409
Childless families	.551	.771	.946	.979	.425	.388	.566	.865	.956	.403	.264	.346	.579	.840	.373
Families with children															
1 3 children	.257	.381	.718	.912	.325	.252	.369	.695	.900	.325	.167	.221	.387	.696	.277
4 5 children	.262	.373	.634	.837	.311	.233	.345	.642	.859	.293	.119	.148	.199	.249	.236
6 or more children	.235	.361	.667	.862	.280	.148	.190	.273	.373	.250	.083	.101	.131	.158	.208
Sex and age of family head															
Males:															
up to 64	.311	.420	.694	.892	.376	.296	.397	.662	.877	.372	.210	.270	.441	.730	.326
18 34	.300	.425	.739	.915	.362	.288	.397	.683	.889	.359	.206	.281	.520	.810	.309
10 24	.202	.249	.322	.387	.320	.201	.248	.322	.387	.313	.169	.208	.270	.327	.294
25 34	.310	.422	.760	.922	.365	.296	.411	.705	.898	.362	.210	.289	.540	.823	.310
35 54	.297	.383	.586	.812	.377	.284	.375	.620	.853	.370	.195	.239	.311	.384	.318
35 44	.280	.369	.592	.823	.364	.267	.367	.650	.875	.354	.181	.220	.284	.346	.304
45 54	.313	.397	.572	.787	.387	.300	.382	.560	.780	.383	.211	.260	.341	.427	.329
55--64	.365	.530	.840	.949	.382	.339	.465	.755	.919	.385	258	.354	.644	.878	.363
65 and over	.692	.857	.958	.979	.513	.429	.610	.872	.953	.434	.253	.303	.376	.436	.385
Females:															
up to 59	.573	.770	.933	.970	.439	.443	.633	.881	.954	.412	.259	.335	.545	.807	.368
60 and over	.851	.937	.975	.984	.580	.624	.813	.944	.973	.456	.331	.458	.738	.901	.387
Total	.410	.594	.870	.954	.401	.330	.464	.655	.920	.385	.220	.283	.460	.743	.338

[a] Adjusted for the effect of shifting the employers share of national insurance contributions onto wages.

Table A. 9. The Effect of National Insurance Benefits and of All Transfers on Average Income by Family Size and by Sex and Age of the Family Head, 1969.

(IL per month)

	Income Before Transfers			Income After National Insurance Benefits			Income After All Transfers		
	Per family	P.s.p.	Per person	Per family	P.s.p.	Per person	Per family	P.s.p.	Per person
Family size									
Unrelated individuals	307	246	307	350	280	350	363	290	363
Childless families	828	371	346	861	385	351	870	389	365
Families with children									
1–3 children	1040	315	265	1066	323	271	1075	326	274
4–5 children	763	164	112	819	176	121	837	180	123
6 or more children	625	106	65	714	122	75	738	126	77
Sex and age of family head									
Males:									
Up to 64	1003	295	297	1028	303	302	1036	306	304
18 -34	902	290	285	923	297	291	928	299	292
18 24	615	246	267	629	252	272	638	256	275
25 -34	952	295	288	978	302	294	978	304	295
35 -54	1063	283	282	1095	292	287	1104	295	290
35--44	1028	265	250	1063	275	256	1072	278	258
45 -54	1103	305	318	1129	313	323	1140	317	325
55--64	970	224	352	982	356	355	990	359	358
65 and over	500	224	206	578	257	244	594	264	250
Females:									
Up to 59	563	236	291	600	253	306	622	262	315
60 and over	207	151	167	264	189	221	289	206	242
Total	858	283	277	839	295	290	904	298	294

Table A. 10. The Effect of National Insurance Contributions and Benefits and of All Taxes and Transfers on Average Income by Family Size and by Sex and Age of the Family Head, 1969

(IL per month)

	Income Before Transfers, Adjusted[a]			Income After All Taxes and Transfers			Income After National Insurance Contributions and Benefits		
	Per family	P.s.p.	Per person	Per family	P.s.p.	Per person	Per family	P.s.p.	Per person
Family size									
Unrelated individuals	313	250	313	314	251	314	333	267	333
Childless families	845	378	353	693	310	291	822	367	345
Families with children									
1–3 children	1064	322	271	852	258	216	1015	308	259
4–5 children	784	168	116	725	155	107	775	166	114
6 or more children	643	109	67	673	115	70	672	114	70
Sex and age of family head									
Males:									
Up to 64	1027	302	304	821	244	238	979	288	289
18–34	925	297	293	741	239	232	879	283	277
18–24	634	254	275	535	215	228	592	237	256
25–34	975	302	296	777	242	233	929	288	280
35–54	1088	290	288	880	236	227	1043	278	274
35–44	1052	271	256	866	225	206	1013	262	244
45–54	1129	312	325	895	250	252	1077	298	308
55–64	992	360	359	769	281	273	934	339	339
65 and over	508	229	209	516	228	221	550	245	233
Females:									
Up to 59	576	241	297	531	225	266	569	239	290
60 and over	209	153	168	272	193	231	254	182	212
Total	878	290	283	728	241	237	850	281	276

[a] Adjusted to the effect of shifting employers share of national insurance contributions onto wages.

Table A. 11. The Effect of National Insurance Benefits and of All Transfers on Income of Highest and Lowest Decile by Family Size and by Sex and Age of the Family Head, 1969.

	Pre-Transfer Income				Income After National Insurance Benefits				Post-Transfer Income			
	Lowest decile		Highest decile		Lowest decile		Highest decile		Lowest decile		Highest decile	
	Average p.s.p. (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %	Average p.s.p (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %
Family size												
Unrelated individuals	0	0.0	842	34.3	15	0.6	854	30.2	53	1.8	864	29.1
Childless families	19	0.5	1076	29.3	59	1.6	1085	28.5	77	2.1	1087	28.2
Families with children												
1–3 children	69	2.1	769	24.9	77	2.3	777	24.6	86	2.6	783	24.5
4–5 children	32	2.0	410	24.4	46	2.6	420	23.7	63	3.5	783	24.5
6 or more children	25	2.3	228	22.1	44	3.6	243	19.9	62	5.0	245	19.3
Sex and age of family head												
Males:												
Up to 64	54	1.5	826	29.9	65	1.8	831	29.4	74	2.0	834	29.2
18–34	60	1.9	764	27.5	67	2.0	769	26.9	72	2.2	770	26.8
18–24	66	2.4	566	25.0	69	2.5	568	23.9	73	2.6	576	24.0
25–34	60	1.8	782	27.4	67	2.0	787	27.2	73	2.1	787	27.0
35–54	53	1.8	789	30.4	66	1.9	795	29.4	76	2.1	800	29.3
35–44	55	1.7	719	29.1	69	2.1	726	28.2	76	2.3	730	28.1
45–54	51	1.3	869	31.6	63	1.6	875	30.6	76	1.9	878	30.5
55–64	49	1.1	1040	30.9	58	1.4	1042	30.5	72	1.7	1044	30.3
65 and over	0	0.0	718	33.0	40	1.6	754	29.9	65	2.5	766	29.2
Females:												
Up to 59	5	0.2	712	33.4	33	1.2	731	31.9	61	2.2	740	30.6
60 and over	0	0.0	531	33.7	2	0.1	553	27.6	43	2.2	557	25.4
Total	35	1.2	807	30.2	57	1.8	815	29.4	71	2.2	819	29.2

Table A. 12. The Effect of National Insurance Contributions and Benefits and of All Taxes and Transfers on Income of Highest and Lowest Decile by Family Size and by Sex and Age of the Family Head. 1969.

	Income After National Insurance Contributions and Benefits					Income After All Taxes and Transfers				
	Lowest decile		Highest decile		Ratio between average income of lowest and highest deciles	Lowest decile		Highest decile		Ratio between average income of lowest and highest deciles
	Average p.s.p. (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %		Average p.s.p. (IL)	Share of total income %	Average p.s.p. (IL)	Share of total income %	
Family size										
Unrelated individuals	10	0.4	813	30.5	0.013	45	1.8	666	26.5	0.069
Childless families	54	1.6	1052	28.8	0.052	38	1.3	821	26.7	0.047
Families with children										
1–3 children	71	2.2	752	25.0	0.094	78	2.9	561	22.3	0.139
4–5 children	41	2.5	403	24.1	0.103	56	3.6	312	19.9	0.180
6 or more children	39	3.4	232	20.2	0.170	58	5.2	206	17.8	0.281
Sex and age of family head										
Males:										
Up to 64	59	1.7	803	29.7	0.074	60	1.9	606	27.0	0.099
18–34	61	1.9	741	27.2	0.083	66	2.5	544	24.1	0.121
18–24	63	2.4	537	24.2	0.118	67	2.8	468	22.8	0.145
25–34	61	1.9	760	33.7	0.081	66	2.4	551	24.2	0.120
35–54	61	1.8	769	29.8	0.080	69	2.4	583	27.1	0.119
35–44	63	2.1	701	28.5	0.091	69	2.6	54	26.0	0.129
45–54	58	1.5	847	31.1	0.068	68	2.2	626	27.8	0.110
55–64	53	1.3	1010	30.9	0.053	16	0.0	764	28.4	0.022
65 and over	36	1.4	728	30.4	0.050	60	2.7	635	29.1	0.096
Females:										
Up to 59	29	1.0	700	32.3	0.043	55	2.3	608	29.1	0.091
60 and over	- 0	– 0.0	536	27.8	0.001	40	2.2	521	27.2	0.077
Total	52	1.7	78	28.7	0.066	58	2.2	607	27.3	0.096

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