

REFERENCES

- Bruno, Michael (1986). "External Shocks and Domestic Response: Macro-Economic Performance, 1965-1982." In *The Israeli Economy: Maturing through Crises*. Edited by Yoram Ben-Porath. Cambridge, Mass., and London: Harvard University Press. Pp. 276-301.
- , and Leora (Rubin) Meridor (1991). "The Costly Transition From Stabilization to Sustainable Growth: Israel's Case." In *Lessons of Stabilization and its Aftermath*. Edited by Michael Bruno, Stanley Fisher, Elhanan Helpman and Nissan Liviatan with Leora (Rubin) Meridor. The M.I.T. Press. Cambridge, Massachusetts; London, England.
- Burns, A.F., and W.C. Mitchell (1946). *Measuring Business Cycles*. New York: NBER.
- Dickey, David, and Wayne A. Fuller (1981). "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root," *Econometrica*, 49 (No. 4, July), 1057-1072.
- Elkayam, David and Itzhak Tal (1990). "Monetary Aggregates and the Balance of Payments: Israel 1970-1988." Discussion Paper 90.02. Research Department, Bank of Israel, Jerusalem, Israel.
- Hendry, F. David, Adrian R. Pagan, and J. Denis Sargan (1984). "Dynamic Specification." In *Handbook of Econometrics*. Vol. II. Edited by Z. Griliches and M. D. Intriligator. Amsterdam: North-Holland. Pp. 1025-1100.
- Lahiri, Kajal and Geoffrey H. Moore (eds.) (1991). *Leading Economic Indicators—New Approaches and Forecasting Records*. Cambridge University Press. Cambridge, New York; Port Chester, Melbourne, Sydney.
- Melnick, Rafi and Yehudit Golan (1991). *Measurement of Business Fluctuations in Israel*. Discussion Paper 91.01. Research Department, Bank of Israel, Jerusalem, Israel.
- Meridor (Rubin), Leora and Shula Pessach (1991). "The Balance of Payments Offset to Monetary Policy: An Examination of the Israeli Case." In *Aspects of Central Bank Policy Making*. Edited by Zvi Eckstein. Springer-Verlag, Berlin.
- Stock, J.H., and M.W. Watson (1989). "New Indices of Coincident and Leading Economic Indicators," *NBER Macroeconomics Annual 1989*, 351-394.
- (1991). "A Probability Model of the Coincident Economic Indicators." In *Leading Economic Indicators—New Approaches and Forecasting Records*. Edited by Kajal Lahiri and Geoffrey H. Moore. Cambridge, New York; Port Chester, Melbourne, Sydney: Cambridge University Press.

THE EFFECT OF MACROECONOMIC VARIABLES ON INCOME DISTRIBUTION IN ISRAEL

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This study shows that a rise in the unemployment rate increases income inequality between employees. This effect is greater than the inflation effect, which operates in the same direction. It is also shown that the Kuznets curve, according to which income inequality increases in the initial stages of economic development and contracts in the later stages, applied in Israel from 1950 to 1991. We show that, as expected, transfer payments generally serve to increase income equality among employees. Finally, no evidence was found to support the hypothesis that the Minimum Wage Law has improved income distribution.

This study examines the effect on income inequality in Israel of macroeconomic variables such as the unemployment rate, the inflation rate, and the degree of government intervention. It also investigates whether the Kuznets hypothesis, according to which income inequality increases in the initial stages of economic development and contracts in the later stages, applies in Israel. The effect of these variables is not confined to a particular theoretical model, and the current study should be seen as a search for empirical regularity in Israel's economy. The latter provides an interesting case for examining Kuznets' hypothesis, as Israel has undergone a process of accelerated economic development in comparison with other economies.

Empirical studies of the effects of macroeconomic variables on income distribution have focused mainly on the Kuznets hypothesis, and developed along two paths: econometric estimates using cross-sectional data from several countries, and others using time-series data relating to individual countries. Both methods explain income inequality by means of the natural logarithm of per capita output (in squared form), which serves as an indicator of economic development. However, since cross-sectional econometric estimates yield inter-country differences in per capita output that reflect factors specific to each economy in addition to differences in economic development, it is doubtful whether such data help to explain the historical link between economic development and income inequality. The econometric expression of this weakness in the studies is the small part of the variance of the income inequality index explained by the index of economic development. Nonetheless, due to data limitations, cross-sectional data analyses are

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carried out in most of the studies, and support for the Kuznets curve is found in all of them, e.g., Chenery and Syrquin (1975), Ahluwalia (1976a and b), Adelman and Morris (1973), and Bacha (1977) (see Adelman and Robinson (1989) for a review of the literature). The results of some of the studies, however, are sensitive to sample selection. In Ahluwalia (1976), for example, the removal of 14 developed countries from the sample destroys the basis of the Kuznets hypothesis.

Beyond testing the Kuznets hypothesis, the stylized facts which emerge from Paukert (1973) are that there is no statistically significant link between the rate of economic growth and the index of income inequality. In addition, extending education to a larger section of the population increases income equality, and government intervention has only a small effect on the degree of gross-income inequality (Papanek and Kyn, 1986). Recent studies of the effects of unemployment and inflation on income distribution will be referred to below.

Theoretical research on income distribution and economic development has received a renewed impetus in recent years, as is indicated by several fascinating studies.¹ Most of these show a monotonic relationship between income inequality and economic development (or growth), in contrast to Kuznets' finding. On the other hand, Greenwood and Jovanovic (1990) and Galor and Tsiddon (1992) propose an endogenous mechanism which leads to the Kuznets curve. In the former this takes the form of financial institutions' endogenous development, while in the latter it is the development of human capital alongside growth.

1. DATA AND METHODOLOGY

Surveys of employees' income and of family expenditure from 1950 to 1991 provide the basis for calculating the GINI index, which reflects inequality in income distribution. The economic unit on which the calculation is based is the household, whose gross income² comprises wage income of the members of the family—before deductions such as income tax and national insurance contributions—income from self-employment, property, interest, dividends, subsidies, private or institutional benefits, pensions, etc.³

¹ The latest studies in this field can be divided into three main approaches: that of the imperfect capital market, as in Galor and Zeira (1993), Aghion and Bolton (1991), and Banerjee and Newman (1991); the political economy approach (government intervention), as in Alesina and Rodrick (1991), Perotti, Persson and Tabellini (1991), and Glomm and Ravikumar (1992); and the geographical approach, as in Durlauf (1992), and Benabu (1993).

² During the period under review the system of child benefits was changed from one of credits, which affected net income, to one of allowances, which affected gross income. The transition creates discontinuity in the GINI index series, as it improves the distribution of gross income even if there is no change in the distribution of net income, and is neutral from a budget point of view. In our case, however, this administrative change resulted in an improvement in the distribution of net income (Sharon, 1988). A dummy variable for 1976, the year of transition, was found to be insignificant, hence the break in the series is negligible.

³ Nonrecurring receipts such as an inheritance or severance pay are excluded, as are imputed incomes

Income surveys relate to employees only, but this is not a serious limitation regarding the development of income inequality, as it is reasonable to assume that the salaries of the upper deciles contain an element which is correlated with profits, so that to a certain extent the development of income distribution among employees reflects changes in that of the population as a whole, which includes the self-employed. This limitation is more relevant to the level of income inequality, which rises when the self-employed are included. Since the proportion of self-employed in the population is endogenous to economic activity, it is more difficult to study the effects of development on income equality.

According to an initial analysis based on the incomes survey, the share of salaried households is not significantly dependent on the level of economic activity. The sample in the incomes survey represents 80 percent of the population of employees. The income inequality index was calculated only for households whose head was employed. Hence, the demographic composition is almost constant, and does not contribute to changes in income distribution. The inclusion of the non-working population could be expected to make the distribution of income more unequal, but it is not clear how its path is affected over time. In any event, there are no long-term data on the income distribution of a population which includes households whose heads are unemployed.⁴ Furthermore, data limitations prevent the calculation of an income inequality index which takes the number of family members into account, and in any event this cannot be done for a standard individual over the long term, as the present study would require.

In addition to sampling errors, the survey—which is based on reports from households—also contains wrong answers by participants. These may arise from failure to note all places of employment, one member of the family reporting on another's income, data being based on memory rather than salary slips, the desire to avoid disclosure, etc. Income level may be less reliable, but income distribution is less likely to be affected, unless the degree of error changes significantly with income. Data from the 1965–67 income surveys were checked for reliability, and the bias among wage-earners was found to be 15 percent, but this did not affect the distribution. This limitation hardly applies with regard to the development of income distribution over time, unless there are far-reaching changes in the degree of error.

Changes in the definitions and methods used in the income surveys present another problem (see Report of the Committee on Income Distribution and Social Inequality, 1966 and 1971). For example, the 1950 GINI index, which shows a low level of income inequality, was based on a sample consisting solely of wage-earners in eight towns whose families consisted of two or more members, thus overstating the homogeneity of urban wage-earners in general. The austerity policy of that period, together with rationing and price- and wage-control, also reduced income inequality and encouraged

rising from the use of an owner-occupied apartment, and various types of income in kind.

⁴ Kuznets (1955) maintains that it is better to concentrate on understanding the development of inequality in income derived from economic activity, and exclude families whose main current income derives from transfer payments (pensioners) or part-time employment (students).

the freezing or narrowing of wage differentials.⁵ The data base includes the GINI indices of income distribution for 1950–64, based on family expenditure survey data.⁶ In addition, the method of collecting data for the income survey changed in 1985. Hitherto, families had been asked to report their incomes for the year ending one month prior to the interviewer's visit. The data were processed and presented on an annual basis. Since 1985, families have been asked to record their incomes for the three months prior to the interviewer's visit, and monthly data are published. These differences hamper comparisons of income for 1985–91 with those of earlier years, although comparing income distribution over time is less problematic.

Table 1
GINI Index 1968/69–1986/7

Year	Gross income	Private consumption
1968/69	0.312	0.248
1975/76	0.289	0.207
1979/80	0.320	0.241
1986/87	0.323	0.250

Although income distribution is relevant to an examination of the Kuznets hypothesis, it is more appropriate to use utility to study inequality between individuals. However, there are no indices which reflect the utility distribution. Private consumption may be used as a proxy, but it does not include public consumption or take production for oneself or leisure into account. Nevertheless, it reflects income quite accurately, and its distribution is fairly close to that of income. Random fluctuations in income due to sickness, natural disasters, etc., do not significantly affect consumption patterns, which thus reflect permanent income. Full data on consumption distribution by deciles for 1950–68 are un-available, so for those years the GINI index for income distribution cannot be compared with that for private consumption. Table 1, which gives the comparison for 1968/9 to 1986/7, shows that the two GINI indices are quite close, with that for private consumption lower than that for income—consistent with falling marginal propensity to consume. In addition, the distribution of private consumption reflects that of disposable income, i.e., net of direct taxes, which tend to reduce income inequality.

⁵ Hanoch (1961) and Ben-Shahar (1961) show that despite the reservations, the data may be used. Note also that inequality indices for 1926 and 1939 were 0.191 and 0.224 respectively (Ginor, 1983).

⁶ The limitations of comparing income distribution derived from family expenditure surveys with that from wage-income surveys are discussed in the Committee's 1966 report.

2. RESULTS

The results of this study, presented in the tables and diagrams, will be considered in the light of reservations regarding the data which are common to such statistics throughout the world. The first part of this section deals with the effect of other macroeconomic variables on income inequality, and the second discusses an empirical estimate of the Kuznets hypothesis. This reflects an attempt to distinguish variables whose empirical estimate represents the long-term trend (economic development) from those which indicate deviation from the trend (cyclical changes).

Cyclical fluctuations, fiscal policy, and income inequality

This section focuses on the effect of cyclical variables, such as unemployment and inflation. Various attempts have been made to determine the most functional regression equation; common to all is the combination of a variable which reflects the long-term trend with cyclical ones which indicate deviations from it. The following were used as the trend variable: the Kuznets curve (explained below), the square of the natural logarithm of output (Tables 2a, 2b, 2c), the natural logarithm of output alone (Tables 3a, 3b, 3c), time (also in squared form), and a moving four-year average of per capita output. To simplify the presentation of the results, the first two functional forms are both shown here, as the qualitative results are very similar.

In contrast to the Kuznets hypothesis, which provides a null hypothesis, the variables examined below have not been the subject of a null-hypothesis theory. Hence, the following estimate takes the form of letting the figures speak for themselves, as it were, in an attempt to learn about the stylized facts regarding the Israeli economy via the data and regressions, even though these facts do not necessarily prove a causal relationship between the variables.

To combine the trend (the Kuznets hypothesis) with the estimate of the effect of the cyclical macroeconomic variables and the policy variables, the following equation was estimated:

$$(1) \quad GINI = a + b \ln GDP + (\ln GDP)^2 + \sum d_i X_i,$$

where GDP is output per capita, X_i is the vector of other independent variables, and d_i the vector of coefficients.

The two independent variables which have attracted most attention in the literature are the rates of unemployment and inflation. Note that any connection between them, for instance the Phillips curve, may increase the variance of the regression coefficients; if these are significant, however, this problem may be ignored. Nevertheless, the correlation between these two variables is quite low (0.01).

Table 2a
Estimated Effect of Macroeconomic Variables on Income Inequality
(Dependent variable: GINI)^a

	1	2	3	4	5	6
<i>C</i>	-10.35 0.0005	-8.65 0.0046	-4.74 0.4700	-10.36 0.0007	-8.89 0.2580	-10.42 0.0086
<i>ln GDP</i>	2.21 0.0004	1.82 0.0052	1.04 0.4406	2.21 0.0006	1.93 0.2556	2.23 0.0085
<i>ln GDP2</i>	-0.115 0.0005	-0.092 0.0079	-0.055 0.4345	-0.115 0.0006	-0.101 0.2674	-0.116 0.0101
<i>UNEMP</i>	0.0075 0.0000	0.0080 0.0000	0.0065 0.0000	0.0075 0.0000	0.0073 0.0000	0.0075 0.0000
<i>INF</i>	9.1E-05 0.0043	8.1E-05 0.0098	8.8E-05 0.0011	9.09E-05 0.0065	8.90E-05 0.0053	9.12E-05 0.0052
<i>CTR</i>		-0.005 0.1394				
<i>CG</i>			0.004 0.1458			
<i>GROWTH</i>				-2.7E-05 0.9700		
<i>FW</i>					0.0001 0.7840	
<i>MINWAGE</i>						9.99E-06 0.9770
$\overline{R^2}$	0.67	0.69	0.72	0.65	0.65	0.65
<i>F</i>	15.63	13.64	14.62	12.01	11.61	12.01
<i>D.W.</i>	1.68	1.90	1.35	1.68	1.07	1.67
No. of obs.	30	30	27	30	30	30

^a The numbers in small print under the coefficients are significance levels. For definitions of variables, see Table 8.

Changes in the unemployment rate may adversely affect all income levels, although it may seem that employees in the lower deciles would be the ones to suffer during employment crises. Theoretically, if unemployment stems from a fall in demand for human-capital-intensive products, high-income employees will be affected more severely, and income inequality will contract. If demand for unskilled-labor-intensive goods falls, however, the lower deciles will suffer more. Zeira (1992) proposes an economic mechanism in which unskilled labor is endogenously replaced by machinery during growth, so that unemployment affects only the lower income deciles. This process of substitution is, however, essentially long term.

The series of tables 2 and 3 show a significant and positive connection between the rate of unemployment and income inequality. This means that in employment crises, the relative situation of the lower deciles will deteriorate further. The tables also show that

Table 2b
Estimated Effect of Macroeconomic Variables on Income Inequality
(Dependent variable: UP2)^a

	1	2	3	4	5	6
<i>C</i>	-581.6 0.0086	-446.9 0.0393	-26.7 0.9542	-584.6 0.0115	-560.2 0.3288	-576.5 0.0516
<i>ln GDP</i>	128.9 0.0060	97.3 0.0359	14.2 0.8829	126.6 0.0084	126.8 0.3060	127.8 0.0438
<i>ln GDP2</i>	-6.72 0.0065	-4.86 0.0489	-0.81 0.8706	-6.75 0.0090	-6.74 0.3130	-6.66 0.0485
<i>UNEMP</i>	0.5425 0.0000	0.5939 0.0000	0.4649 0.0000	0.5421 0.0000	0.5380 0.0000	0.5416 0.0000
<i>INF</i>	0.0059 0.0097	0.0050 0.0219	0.0058 0.0016	0.0059 0.0148	0.0056 0.0111	0.0059 0.0112
<i>CTR</i>		-0.046 0.0669				
<i>CG</i>			0.21547 0.2844			
<i>GROWTH</i>				-0.00388 0.9481		
<i>FW</i>					0.0144 0.6453	
<i>MINWAGE</i>						-7.1E-04 0.9783
$\overline{R^2}$	0.63	0.67	0.75	0.62	0.66	0.62
<i>F</i>	12.66	12.07	15.42	9.70	11.31	9.69
<i>D.W.</i>	1.83	2.20	1.45	1.83	1.13	1.83
No. of obs.	28	28	25	28	27	28

^a The numbers in small print under the coefficients are significance levels.

unemployment reduces the share in income of the four lowest deciles, while that of the top two deciles increases. Similar results were obtained in the US (Blinder and Esaki, 1978), Britain (Nolan, 1988), the Philippines (Blejer and Guerrero, 1990), and Sweden (Bjorklund, 1991). In line with the results of earlier research (Ahluwalia, 1976b), we did not find a significant link between the growth rate and the degree of income inequality (Tables 2). Several recent studies (e.g., Persson and Tabellini, 1991) have shown a negative link between the two. The commonly held view is that in a boom the distribution of income becomes more equal, and during recession the reverse occurs; the above results show that the validity of this claim depends on the terms used to define boom and recession, i.e., the rates of growth and unemployment.

Table 2c
Estimated Effect of Macroeconomic Variables on Income Inequality
 (Dependent variable: LOW4)^a

	1	2	3	4	5	6
<i>C</i>	664.3 0.0040	589.5 0.0143	431.7 0.3678	672.4 0.0054	387.5 0.5233	671.0 0.0292
<i>ln GDP</i>	-133.2 0.0058	-115.6 0.0230	-84.5 0.3935	-135.0 0.0076	-75.6 0.5632	-134.6 0.0391
<i>ln GDP2</i>	6.91 0.0064	5.87 0.0301	4.40 0.3896	7.00 0.0084	3.91 0.5791	6.9840 0.0443
<i>UNEMP</i>	-0.433 0.0001	-0.462 0.0001	-0.383 0.0003	-0.432 0.0002	-0.407 0.0004	-0.435 0.0003
<i>INF</i>	-0.006 0.0105	-0.005 0.0210	-0.005 0.0031	-0.006 0.0170	-0.006 0.0097	-0.006 0.0125
<i>CTR</i>		0.2535 0.3356				
<i>CG</i>			-0.4253 0.0463			
<i>GROWTH</i>				0.0104 0.8650		
<i>FW</i>					0.0017 0.9594	
<i>MINWAGE</i>						-0.0009 0.9729
$\overline{R^2}$	0.61	0.61	0.68	0.59	0.56	0.59
<i>F</i>	11.372	9.27	11.06	8.72	7.71	8.70
<i>D.W.</i>	1.61	1.72	1.13	1.62	0.90	1.61
No. of obs.	28	28	25	28	27	28

^a The numbers in small print under the coefficients are significance levels.

Any discussion of the effect of the unemployment rate on inequality in wage income would be incomplete without reference to the unemployed. As their number increases, more people will have virtually no income before the implementation of the Unemployment Benefit Law, and reduced income after it. A rise in unemployment will increase income inequality if most of the unemployed are from low-income groups. The Labour Force Survey does in fact show that the correlation between the unemployment rate among those with a low educational level and the average rate is higher than that between unemployment among the highly educated and the average rate. Moreover, people with a low educational level (which correlates with income) account for a large proportion of the unemployed. Hence, the increase in income inequality caused by a rise in the unemployment rate is even more pronounced if the unemployed are included.

Table 3a
Estimated Effect of Macroeconomic Variables on Income Inequality
 (Dependent variable: GINI)^a

	1	2	3	4	5	6
<i>C</i>	-0.24 0.3495	-0.24 0.3070	-0.20 0.4313	-0.22 0.3886	-0.38 0.3551	-0.20 0.4520
<i>ln GDP</i>	0.05 0.0627	0.05 0.0541	0.05 0.0806	0.05 0.0919	0.07 0.1291	0.05 0.0958
<i>UNEMP</i>	0.0068 0.0000	0.0051 0.0005	0.0069 0.0000	0.0068 0.0000	0.0069 0.0000	0.0069 0.0000
<i>INF</i>	7.3E-05 0.0022	7.9E-05 0.0008	11E-04 0.0092	7.99E-05 0.0017	7.5E-05 0.0026	7.2E-05 0.0034
<i>CTR</i>	-0.007 0.015	-0.007 0.0105	-0.006 0.0226	-0.006 0.00426	-0.007 0.0182	-0.007 0.0183
<i>CG</i>	0.0051 0.038	0.0064 0.0115	0.0044 0.0815	0.0066 0.0273	0.0053 0.039	0.0050 0.048
<i>UNEMP(-1)</i>		0.0023 0.0801				
<i>INF(-1)</i>			-0.000 0.2588			
<i>GROWTH</i>				6.26E-04 0.3437		
<i>FW</i>					-9.2E-05 0.6527	
<i>MINWAGE</i>						1.38E-04 0.5988
$\overline{R^2}$	0.79	0.81	0.79	0.79	0.78	0.78
<i>F</i>	20.2	19.30	17.31	16.92	16.21	16.28
<i>D.W.</i>	1.66	1.93	1.62	1.62	1.69	1.63
No. of obs.	27	27	27	27	27	27

^a The numbers in small print under the coefficients are significance levels.

The rate of inflation is another cyclical variable likely to affect income distribution. I am not aware of any theory linking income inequality with the inflation rate, but a theoretical paper which touched on this subject (Dahan, 1989) showed a positive connection between inflation tax and inequality, due to the fact that the lower deciles are less able than the upper deciles to protect their money from erosion by inflation.

The series of tables 2 and 3 show a significant positive relationship between the inflation rate and the income inequality index,⁷ indicating the inability of the lower

⁷ A dummy variable for 1984 was not significant. We also tried to examine whether the change in the inflation rate, in addition to the actual rate itself, affects income distribution, as an indicator of the

Table 3b
Estimated Effect of Macroeconomic Variables on Income Inequality
 (Dependent variable: UP2)^a

	1	2	3	4	5	6
<i>C</i>	-1.96 0.8928	-1.89 0.8997	0.48 0.9732	-2.17 0.8845	8.92 0.7089	4.06 0.7814
<i>ln GDP</i>	4.00 0.0175	4.00 0.0209	3.79 0.0222	4.06 0.0206	2.86 0.2643	3.41 0.0391
<i>UNEMP</i>	0.5430 0.0000	0.5521 0.0000	0.5454 0.0000	0.5442 0.0000	0.5366 0.0000	0.5670 0.0000
<i>INF</i>	0.0045 0.0016	0.0045 0.0026	0.0071 0.0055	0.0045 0.0037	0.0044 0.0031	0.0043 0.0023
<i>CTR</i>	-0.567 0.0011	-0.567 0.0014	-0.535 0.0017	-0.580 0.0022	-0.573 0.0012	-0.679 0.0005
<i>CG</i>	0.3149 0.0449	0.31212 0.0112	0.25547 0.1065	0.2990 0.0923	0.3091 0.0534	0.3022 0.0473
<i>UNEMP(-1)</i>		-0.012 0.8985				
<i>INF(-1)</i>			-0.003 0.1968			
<i>GROWTH</i>				-0.009 0.8342		
<i>FW</i>					0.007 0.5617	
<i>MINWAGE</i>						0.022 0.1412
$\overline{R^2}$	0.86	0.85	0.87	0.85	0.85	0.87
<i>F</i>	30.44	24.06	26.73	24.10	24.56	27.59
<i>D.W.</i>	2.23	2.22	2.19	2.27	2.28	2.41
No. of obs.	25	25	25	25	25	27

^a The numbers in small print under the coefficients are significance levels.

deciles to avoid the relative erosion of their income. This result accords with that of Artstein and Sussman (1991), who found that the standard deviation of changes in wages rose as inflation accelerated in 1984–85 and fell after the Economic Stabilization Program, and also with that of Sussman and Zakai (1983), who showed that the wage structure in the public sector became more unequal as the rate of inflation rose.

This result gives rise to an interesting point regarding wage agreements signed during the period under review. Wage agreements had long included an upper limit to wages

unexpected component of inflation. This variable was not significant either.

Table 3c
Estimated Effect of Macroeconomic Variables on Income Inequality
 (Dependent variable: LOW4)^a

	1	2	3	4	5	6
<i>C</i>	57.06 0.0044	58.32 0.0024	55.50 0.0066	56.09 0.0057	72.92 0.0208	55.42 0.0086
<i>ln GDP</i>	-3.33 0.0943	-3.38 0.0723	-3.20 0.1149	-3.09 0.1277	-4.99 0.1180	-3.17 0.1305
<i>UNEMP</i>	-0.392 0.0000	-0.242 0.0022	-0.394 0.0000	-0.387 0.0000	-0.401 0.0000	-0.398 0.0000
<i>INF</i>	-0.005 0.0069	-0.005 0.0022	-0.006 0.0429	-0.005 0.0062	-0.005 0.0066	-0.005 0.0099
<i>CTR</i>	0.4144 0.0331	0.4034 0.028	0.3945 0.0474	0.3549 0.0882	0.4049 0.0404	0.4452 0.0462
<i>CG</i>	-0.5228 0.0092	-0.5691 0.0036	-0.4848 0.0208	-0.595 0.0090	-0.5311 0.0095	-0.51929 0.0112
<i>UNEMP(-1)</i>		-0.1993 0.0699				
<i>GROWTH</i>			0.002 0.5095			
<i>FW</i>				-0.03943 0.4360		
<i>MINWAGE</i>					0.010 0.4906	
$\overline{R^2}$	0.74	0.77	0.73	0.73	0.73	0.72
<i>F</i>	14.44	14.38	11.77	11.92	11.80	11.49
<i>D.W.</i>	1.31	1.45	1.29	1.21	1.34	1.29
No. of obs.	25	25	25	25	25	25

^a The numbers in small print under the coefficients are significance levels.

which benefited from cost-of-living increases, so that the actual rate of indexation for high wages was lower than announced (Liviatan, 1982). This was because the unions ensured that the cost-of-living agreements had a progressive bias in order to reduce income inequality as the inflation rate rose. The current study indicates that this bias was not translated into practice, and inflation acted in effect as a regressive tax. One possible explanation for this is that among the lower-wage-earners, cost-of-living agreements played a pivotal role in wage increases—which only partially prevented the erosion of real wages—whereas wage increases of those in the upper brackets were determined rather by personal contracts, which afforded better protection against price rises.

Another explanation is that wages in the less unionized industries, such as construction, and trade and services, are lower than in the unionized ones. This reflects the limited bargaining power of the former, whose ability to protect their wages against erosion through inflation and against wage cuts at times of high unemployment is limited. This contention is less relevant for those in the upper income brackets, who are not normally union members.

Note that the method employed in the survey of incomes has an inherent tendency to create a positive relationship between inflation and income inequality. Each annual survey comprises four quarterly ones. Participants are asked about their income for the year ending one month before the interviewer's visit. Every three months, one quarter of the total number of participants are asked, so that the survey covers incomes over a total period of 23 months. When nominal changes in income occur, there is greater inequality even if the distribution of real income does not change. In the surveys for 1965–74, incomes were given in nominal terms, but from 1975, following the surge in inflation, the figures were adjusted and incomes were shown at constant prices. Table 7 shows that as long as the annual nominal change in income is less than 30 percent—as was the case in 1955–73—the inherent methodological bias in the survey is negligible. Adjusting for price changes does not afford a complete solution, as real changes in income also cause an artificial bias. These changes were well below 30 percent in 1975–91, however, and may thus be ignored. To remove all doubt, the hypothesis that inflation had a different effect before and after 1974 was examined, and rejected.

The effect of inflation on net value wealth is not discussed here. Clearly, in inflationary periods there may be capital gains and losses which affect the distribution of real assets. A feature unique to Israel's economy in the period under review was the granting of government housing and business loans in which the imputed subsidy component depended positively on the inflation level. With higher inflation, borrowers clearly benefited from an income which was not covered by the incomes survey. To date, no study has been made of the effect of subsidized government credit on income distribution, but it is certainly worth examining. Inflation also affects tax revenues through the lag between the transaction of business and the payment of tax. No study has been carried out to date to determine the main beneficiaries of this delay.

The effect of government policy on the redistribution of income—by means of transfer payments—is crucial to the issue of income distribution. Unlike the analyses carried out by the National Insurance Institute, which focus on the effect of transfer payments (and taxes) on income inequality, we deal here mainly with their effect on inequality over time. Table 3a shows that the share of transfer payments in output has a significant, negative effect on the income inequality of households headed by a wage-earner. This result is not obvious, because the GINI index is calculated from the population of wage-earners, whereas most transfer payments are made to those who are not working—senior citizens, the disabled, etc.⁸ This result, however, is sensitive to the functional

⁸ Unemployment benefit generally accounted for a marginal share of total transfer payments, and the

form of the estimated equation and, as Table 2a shows, the effect of transfer payments on income inequality is not significant. Hence, this paper does not provide an unequivocal conclusion regarding this effect. According to National Insurance Institute findings, which are based on data for the entire population, transfer payments (in the 1980s) had a considerable effect on income inequality.

The government also affects the distribution of income—albeit incidentally—through its consumption, which comprises wages paid to employees in the public sector and purchases from the private sector. We examined this effect in terms of the share of total public consumption in output, and found no statistically significant connection between this variable and income inequality. This is surprising in the light of the research by Gabbai and Lifschitz (1992), who found a low level of income inequality among public-sector employees in 1990, and in view of the aspiration of those responsible for determining wage scales in the public sector to avoid large wage differentials, by means of automatic linkage of wages in different occupations. Similar results were obtained when the calculations were based on the proportion of total employees in the public sector. By contrast, the share of public civilian consumption in GDP was found to have a significant positive effect on income inequality (Table 3a). This result is sensitive to the functional form, and Table 2a shows that the share of public civilian consumption in GDP is neutral in its effect on income inequality.

The minimum wage is yet another policy tool intended to reduce income inequality. The collective agreement signed in 1972 by the employers' organizations and the General Federation of Labour guaranteed every employee in Israel a minimum wage equal to about 44 percent of the average wage per employee post. With time, the minimum income relative to the average wage was eroded, as it was updated mainly in line with cost-of-living increases. In April 1987 the agreement became law, with the minimum wage set at 45 percent of the average wage. The aim of both the agreement and the law was to reduce income inequality among wage-earners. After the introduction of the minimum wage agreement, attention focused mainly on its effect on the labor market. Yaniv (1986) examined the extent of employers' compliance with the agreement (before the introduction of the Minimum Wage Law), and found that 30 percent of them fulfilled its terms. Weinblatt and Luski (1993) studied the effect of the Minimum Wage Law on industrial firms in Israel, and found that it significantly increased the probability of their running into difficulties.

One aspect of the Minimum Wage Law which has not hitherto been examined is whether it achieved its objective of reducing income inequality. In theory, this could be achieved by cutting off the left tail of the distribution curve and by changing the wage scale of employees whose wage previously was close to the minimum. The current study—which treats the minimum wage under the 1972 agreement and that set in the

correlation between the share of transfer payments and the unemployment rate is not high, a fact which allays fears of multicollinearity. Unemployment benefit, moreover, is by definition paid to the jobless, whereas this discussion relates to wage earners.

1987 law in the same way—shows that the minimum wage variable has no significant effect on income inequality among wage-earners (Tables 2). When the minimum wage prior to the enactment of the law was taken as zero, or as a dummy variable in the year it was passed, the result was the same.

The introduction of the Minimum Wage Law caused problems in industry (Weinblatt and Luski, 1989), without achieving a significant improvement in the distribution of wage-earners' income; the main reason, apparently, was the low level of compliance with both the agreement (Yaniv, 1986) and the law (Flug and Kasir, 1993). The effect of the law on the unemployment rate has not yet been examined, but if there is a positive connection between the two, a higher degree of compliance accompanied by increased unemployment will probably increase income inequality.

We examined the hypothesis that making Israel open to workers from Judea, Samaria, and the Gaza Strip affected income inequality among wage-earners in Israel, and found that the participation of the former at the lower end of the wage distribution caused changes throughout it. Low-income earners were affected directly and negatively, while at the same time the return on capital increased. It is thus reasonable to assume that this variable widened income inequality. The current study shows that this effect, measured by the number of workers from Judea, Samaria and the Gaza Strip, is not statistically significant. Although it cannot be concluded from this that it had no effect on income inequality, the indication is that its effect was negligible.

In order to assess the relative importance of each independent variable in explaining changes in the income inequality index, the normalized regression of equation (3) was estimated (Regression 1 in Tables 2): the difference between each variable and the average was divided by the standard deviation of that variable, and the correlation coefficients obtained in the regression are known as β coefficients.⁹ The results of the estimate show that the β coefficient of the index of economic development is 32, and that of the square of this index is -32. This means that if time is regarded as an indicator of economic development, the latter is found to play a major role in explaining income inequality in Israel. Another interesting result is that the β coefficient of the unemployment rate was 0.77, and that of the inflation rate was 0.37. In other words, the negative effect of the rate of unemployment on the GINI index is far greater than that of the rate of inflation. If these relationships are stable, the results may be used to determine economic policy when faced with a choice between unemployment and inflation. Note, however, that the unemployment rate is bounded by zero and 1, and its effective upper limit is 20 percent, whereas the inflation rate is unbounded. Hence, inflation probably has a greater absolute effect on inequality, although unemployment has a greater marginal effect. Similar results—a positive relationship between unemployment and inequality, and between inflation and inequality, with the former stronger than the

⁹ The β coefficients measure the changes in the GINI index resulting from a unit change in each of the independent variables. As the variables are all expressed in terms of standard deviations, the β are independent of the units of measurement, so that the relative sizes of the regression coefficients may be compared directly in order to establish the relative importance of each variable.

latter—were found in a study of the Philippines (Blejer and Guerrero, 1990). Research carried out in other countries, however, found that inflation had a progressive effect on inequality (Blinder and Esaki, 1978; Molae, 1988).

Table 4 shows the marginal contribution of the independent variables by secondary periods. In 1955–70 economic development accounted for a major part of the increase in income inequality, while the decline in unemployment partly offset it. In the 1970s the acceleration in inflation was largely responsible for greater income inequality. This trend continued throughout the 1980s; in the first half of the decade inflation increased income differentials, and following the stabilization program it reduced them. During the latter period, changes in the unemployment rate, which matched those in the inflation rate, intensified the increase or decrease in income inequality. The rise in unemployment of recent years has played a major role in increasing income inequality.

Table 4
Marginal Contribution of Each Independent Variable to Changes in the GINI Index^a

	1955–59	1959–70	1970–80	1980–85	1985–88	1988–91
<i>ln GDP</i>	0.437	1.197	0.540	0.130	0.166	0.043
<i>ln GDP</i> ²	-0.409	-1.164	-0.547	-0.134	-0.172	-0.045
Economic devel.	0.029	0.033	-0.007	-0.004	-0.006	-0.002
<i>INF</i> ^b	0.000	0.001	0.011	0.016	-0.026	0.000
<i>UNEMP</i> ^c	-0.013	-0.013	0.008	0.014	-0.002	0.031
Total	0.015	0.020	0.012	0.026	-0.034	0.030

^a The calculations in this table are based on the coefficients of Regression 1 in Table 3a.

^b Inflation.

^c Unemployment.

The Kuznets hypothesis

The Kuznets hypothesis that income inequality expands in the initial stages of economic development and contracts thereafter, may be tested by the following model:¹⁰

$$(2) \quad GINI = \alpha + \beta \ln GDP + \gamma (\ln GDP)^2,$$

¹⁰ Equation (2), which has mean income on the right, prevents the validity of the Kuznets hypothesis being determined by the results of the regression, if the income distribution is log-normal. The properties of such a distribution teach us that variance is a function of the mean, and that there is a direct relationship between the GINI index and variance. Thus it is clear that the GINI index is a function of the mean (Aitchison and Brown, 1957). A positive relationship between the two does not therefore prove an economic link. However, most recent studies in this field do not support the assumption of a log-normal distribution.

where the GINI index is the dependent variable, the independent variables include the squared form of the natural logarithm of per capita GDP, and as is customary in the literature, $\ln GDP$ serves as an index of economic development. Graphically, the Kuznets curve has the shape of an inverted U, with the index of inequality along the vertical axis, and that of economic development along the horizontal. The Kuznets hypothesis will not be rejected if the sign of β is positive, the sign of γ is negative, and the regression coefficients are significant.

The picture that emerges from the results shown in equation (2) and Table 5 is quite clear. The estimate of the equation yields a positive, significant coefficient of the index of economic development, and a negative, significant coefficient of this index in squared form. In other words, Kuznets' hypothesis applies to Israel in 1950-91, refuting the existence of a monotonic connection—supportive or contradictory—between income equality and economic development. The regression suffers from serial correlation, however, since DW is much less than 2 (Table 5). Although a serial correlation in this regression does not affect the estimated coefficients, it does affect their efficiency, as it

Table 5
Estimate of the Kuznets Hypothesis for Israel^a

	1	2	3	4	5
<i>C</i>	-8.05 0.0039	0.16 0.0012	0.22 0.0000	-435.8 0.0379	509.0 0.0072
<i>lnGDP</i>	1.72 0.0038			97.5 0.0297	-99.9 0.0124
<i>lnGDP</i> ²	-0.088 0.0048			-5.00 0.035	5.10 0.0158
<i>GDPOP</i>		1.7E-05 0.0117			
<i>GDPOP</i> ²		-4.6E-10 0.0399			
<i>T</i>			0.0058 0.0012		
<i>T</i> ²			-8.4E-05 0.0176		
$\overline{R^2}$	0.51	0.363	0.47	0.41	0.55
<i>F</i>	16.59	9.54	14.13	10.63	17.97
<i>D.W.</i>	0.81	0.65	0.70	0.79	0.73
No. of obs.	31	31	31	29	29

^a The numbers in small print under the coefficients are significance levels.

apparently arises from the omission of variables. This is supported by the tables, which highlight the stability of the coefficients in all the regressions. As stated, including additional independent variables resolves the problem of serial correlation.¹¹

¹¹ Correcting the serial correlation by adding the dependent variable with a lag as an independent

The estimate of equation (2) yielded the following results:

$$(3) \quad GINI = -8.05 + 1.72 \ln GDP - 0.09 (\ln GDP)^2,$$

-3.14
3.16
-3.06

where t -values appear under the regression coefficients. These results¹² make it simple to calculate the per capita output which gives the greatest income inequality—i.e., NIS 16,880 for 1971 (at 1991 prices).

As can be seen from Table 5, the qualitative results are unchanged when other indices of inequality are used, such as the percentage of total income earned by the top two deciles, or by the bottom four deciles. The signs of the coefficients in the regression which includes the GINI index as a dependent variable are the same as those obtained when the top two deciles are the dependent variable, and change when the lowest four deciles are the dependent variable.

Some of the attempts to check the validity of the Kuznets hypothesis on the basis of time-series data (e.g., Soltow, 1968) used a graphic presentation in the form of diagrams or tables (instead of regressions), with the age of the economy serving, by implication, as an indicator of economic development. In this article we have tried to use a regression in the form of the square of the age of the economy (time) as an index of economic development, instead of the natural logarithm of per capita GDP, and this did not affect the results. The same occurred when per capita GDP was used (instead of its logarithm) as an index of economic development.

3. CONCLUSION

This study shows that a rise in the unemployment rate affects wage-earners in the lower income brackets more than those in the higher ones; this is consistent with results obtained in studies of other countries. A rise in the inflation rate was also found to reduce the share of national income going to the lower strata. The lower deciles thus bear the burden of both unemployment and inflation, with the former having the stronger effect.

In line with other studies, no significant link was found between the growth rate and inequality in income distribution. This finding contradicts the trickle-down theory of economics, according to which the lower strata benefit more from economic growth than the upper ones. One expected result is the significant, negative connection between the

variable is problematic, as the data regarding the GINI index are not continuous.

¹² The GINI index must fall between 0 and 1, and this type of regression does not guarantee that this condition holds. It is possible to perform a regression which ensures from the outset that the index falls in the required range, but we opted for a functional form which enables the economic interpretation to be maintained. An analysis of the sensitivity of the results shows (Table 6) that the GINI index falls outside the range for only the most extreme values of the independent variables.

share of transfer payments in GDP and the income inequality index among wage-earning families. The present study shows that the extent of government intervention did not significantly affect inequality, but this result depends on which variable is selected to indicate intervention, and on the form of functionality of the estimated equation. One thought-provoking result is that the Minimum Wage Law, whose purpose was to improve the distribution of income, was found to have no significant effect on income inequality.

Very few studies investigating the Kuznets hypothesis—of which the current paper is one—are based on time-series data, due to the limitations of such data. Although the data relate to only 41 years, the twentieth century is characterized by shorter intervals between technological improvements, so that the time covered is equivalent—in terms of economic development—to a far longer period of economic history in previous centuries. Furthermore, Israel has undergone an accelerated process of economic development, compared with other countries. We hope that the empirical confirmation of the Kuznets curve will serve to reinforce the few studies which have been carried out in this field.

Table 6
Analysis of Elasticity: Range of Change^a

	Sample average	Upper limit	Lower limit
<i>GINI</i>	0.3119	1	0
<i>GDPOP</i>	14,591	Impossible	2,723 or 79,906
<i>UNEMP</i>	5.4	95.46	Impossible
<i>INF</i>	55.1	7,471	-3,494

^a This table is based on Regression 1 in Table 5.

Table 7
Analysis of Elasticity of the Effect of Inflation on the *GINI* Index^a

	Monthly inflation							
	0	-5	0.5	1	2	5	10	20
<i>GINI</i> Index	0.0000	0.1002	0.0098	0.0196	0.0389	0.0954	0.1834	0.3325
	0.3000	0.3163	0.3000	0.3000	0.3016	0.3147	0.3513	0.4420
	0.6000	0.6200	0.6020	0.6039	0.6077	0.6190	0.6365	0.6698
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

^a Until 1974, interviewees' nominal income was not adjusted to constant prices, and hence the *GINI* index was biased.

Table 8
Table of Correlations

Variable	<i>GINI</i>	<i>GDPOP</i>	<i>UNEMP</i>	<i>INF</i>	<i>GROWTH</i>	<i>CG</i>	<i>CTR</i>	<i>FW</i>	<i>MINWAGE</i>
<i>GINI</i>	1.000	0.553	0.508	0.375	-0.360	0.392	0.361	0.241	0.322
<i>GDPOP</i>	0.553	1.000	0.078	0.416	-0.508	0.088	0.967	0.959	0.895
<i>UNEMP</i>	0.508	0.078	1.000	0.011	-0.184	0.225	0.157	0.232	0.08
<i>INF</i>	0.375	0.416	0.011	1.000	-0.331	0.171	0.373	0.465	0.436
<i>GROWTH</i>	-0.360	-0.508	-0.184	-0.331	1.000	-0.523	-0.646	-0.616	-529
<i>CG</i>	0.392	0.088	0.225	0.171	-0.523	1.000	-0.690	0.102	0.127
<i>CTR</i>	0.361	0.967	0.157	0.373	-0.646	-0.690	1.000	0.944	0.92
<i>FW</i>	0.241	0.959	0.232	0.465	-0.616	0.102	0.944	1.000	0.947
<i>MINWAGE</i>	0.322	0.895	0.08	0.436	-0.529	0.127	0.92	0.947	1.000

Definitions of the variables

<i>GDPOP</i>	per capita GDP	<i>T</i>	Time (1950 = 1)
<i>LN₁GD₁</i>	natural logarithm of per capita GDP	<i>CTR</i>	Share of current transfer payments in GDP
<i>GROWTH</i>	growth rate of GDP	<i>MINWAGE</i>	Ratio of minimum to average wage
<i>UNEMP</i>	rate of unemployment	<i>FW</i>	Number of employees from Judea, Samaria, and the Gaza Strip
<i>INF</i>	rate of inflation	<i>CG</i>	Share of public civilian consumption in GDP
<i>GINI</i>	<i>GINI</i> index	<i>TG</i>	Share of total public consumption in GDP
<i>UP2</i>	Percent of income earned by top two deciles	<i>PSE</i>	Share of civilian employees in total number of employees
<i>LOW4</i>	Percent of income earned by lowest four deciles		

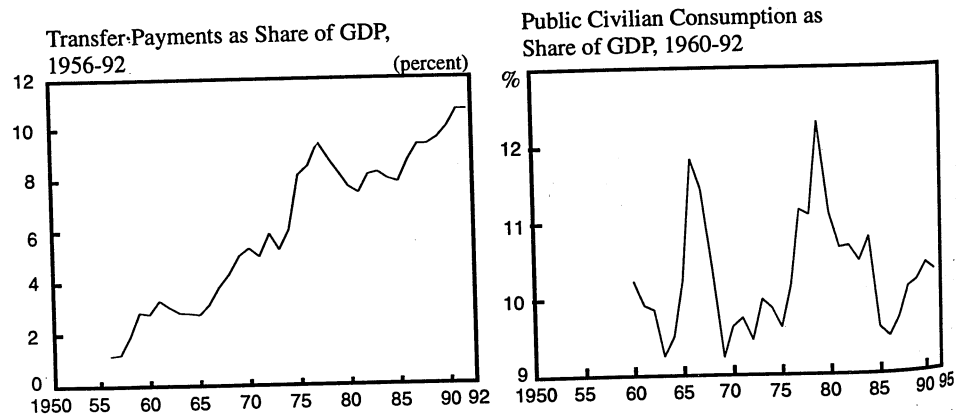
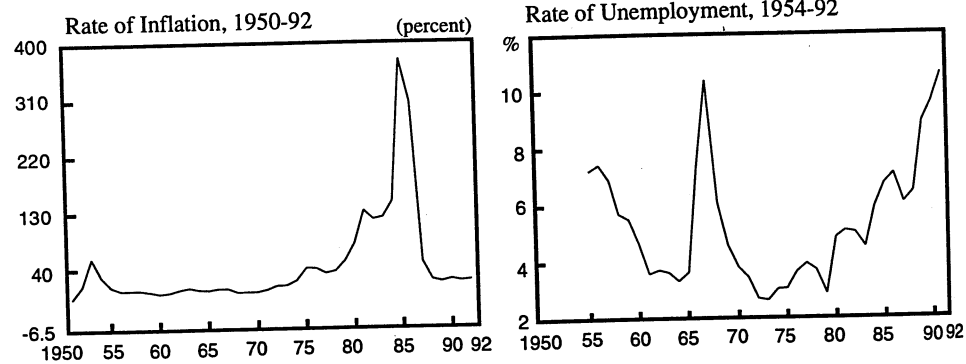
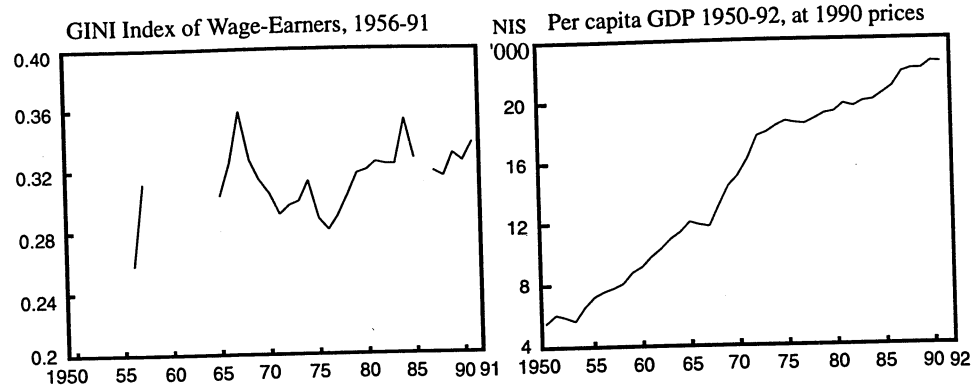
Table 9
The Data

	GINI	INF	GDPOP	UNEMP	CTR	CG	PSE	TG	GROWTH	FW	MINWAGE
1950	0.18160	-6.5934	5479.2					34.736			0.0000
1951		14.118	6043.0					32.337	30.097		0.0000
1952		57.732	5869.1					30.540	4.3965		0.0000
1953		28.105	5638.4					32.520	-1.2942		0.0000
1954		12.245	6536.8					31.918	18.689		0.0000
1955		5.9091	7205.8	7.2085	1.1682			32.530	14.207		0.0000
1956	0.25800	6.4378	7519.1	7.4158	1.2062			40.675	8.9987		0.0000
1957	0.31200	6.4516	7748.3	6.9000	1.9192			32.678	8.8013	0.0000	0.0000
1958		3.4091	8032.1	5.7000	2.8406			31.702	7.4007	0.0000	0.0000
1959	0.27300	0.60000	8779.9	5.5000	2.7848			29.677	12.698	0.0000	0.0000
1960		2.2863	9116.7	4.6208	3.2957	10.230		29.539	6.6004	0.0000	0.0000
1961		6.7055	9782.6	3.5903	3.0394	9.9100	0.20800	30.897	11.000	0.0000	0.0000
1962		9.4718	10298	3.7268	2.8120	9.8500	0.21715	31.008	9.9986	0.0000	0.0000
1963	0.29380	6.5724	10952	3.6331	2.7916	9.2400	0.20959	31.148	10.600	0.0000	0.0000
1964		5.1522	11412	3.3386	2.7438	9.5000	0.21065	29.090	8.4833	0.0000	0.0000
1965	0.30400	7.7000	12070	3.6388	3.1340	10.220	0.21588	29.621	9.3973	0.0000	0.0000
1966	0.32600	7.9851	11882	7.3670	3.8016	11.830	0.23369	32.115	1.0022	0.0000	0.0000
1967	0.35900	1.6337	11770	10.379	4.3050	11.430	0.24658	41.910	2.2983	0.0000	0.0000
1968	0.32740	2.1151	13141	6.0831	5.0144	10.390	0.22108	39.476	15.401	0.0000	0.0000
1969	0.31460	2.4855	14423	4.5675	5.3109	9.2200	0.23060	40.455	12.801	0.0000	0.0000
1970	0.30560	6.1000	15080	3.8147	4.9920	9.6200	0.23910	46.835	7.8001	20.600	0.0000
1971	0.29160	11.970	16233	3.4566	5.8666	9.7400	0.24199	43.253	11.100	34.000	0.0000
1972	0.29760	12.879	17668	2.7032	5.2464	9.4500	0.24125	38.292	12.500	52.600	20.500
1973	0.30020	19.985	17920	2.6389	6.0167	9.9800	0.24658	51.301	4.7990	61.600	38.600

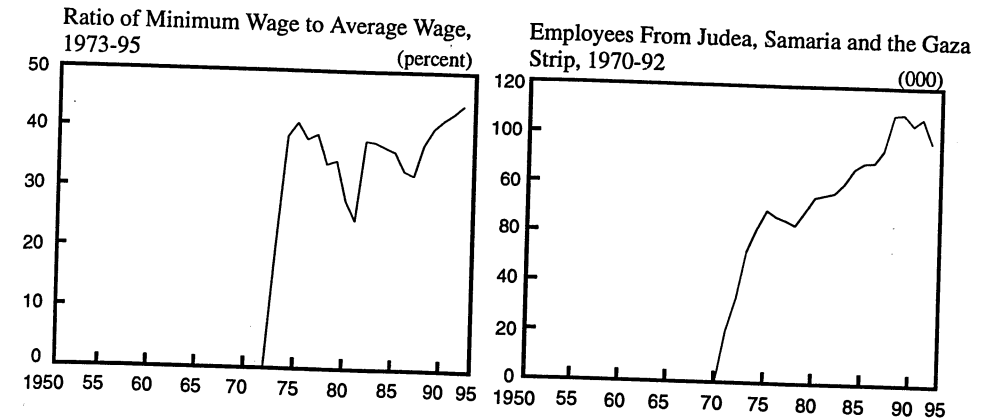
Table 9 (continued)

	GINI	INF	GDPOP	UNEMP	CTR	CG	PSE	TG	GROWTH	FW	MINWAGE
1974	0.31340	39.714	18342	3.0327	8.1415	9.8600	0.26062	50.204	5.4543	69.400	40.900
1975	0.28860	39.279	18635	3.0599	8.5095	9.6100	0.27108	53.129	3.9453	66.900	38.200
1976	0.28100	31.332	18517	3.6347	9.4039	10.150	0.27498	48.110	1.5996	65.500	39.000
1977	0.29020	34.600	18451	3.9284	8.7889	11.150	0.27827	41.831	1.9000	63.600	34.000
1978	0.30360	50.594	18774	3.7064	8.2590	11.080	0.28864	43.318	4.0007	69.000	34.600
1979	0.31787	78.293	19135	2.8809	7.6773	12.300	0.29162	38.676	4.5002	75.000	27.900
1980	0.32000	131.02	19244	4.8251	7.4338	11.100	0.29329	40.590	2.9993	76.000	24.600
1981	0.32520	116.80	19745	5.0723	8.1312	10.650	0.29799	41.367	4.4999	76.900	38.100
1982	0.32380	120.34	19579	5.0048	8.2362	10.670	0.29844	38.257	1.1003	80.700	37.800
1983	0.32360	145.66	19883	4.5059	7.9681	10.470	0.29312	35.764	2.8006	86.800	37.000
1984	0.35300	373.83	19974	5.9052	7.8396	10.780	0.29308	37.090	2.4998	89.300	36.300
1985	0.32720	304.65	20410	6.7153	8.6769	9.5900	0.29599	36.983	4.0000	89.400	33.100
1986		48.100	20862	7.0657	9.3107	9.4700	0.29666	32.245	3.7999	94.700	32.400
1987	0.31880	19.851	21800	6.0505	9.3114	9.7100	0.28802	35.766	6.1998	108.90	37.600
1988	0.31522	16.300	22000	6.4327	9.5631	10.110	0.29000	33.988	2.5997	109.40	40.300
1989	0.33043	20.206	21993	8.8879	9.9751	10.190	0.29381	30.546	1.7008	104.90	41.800
1990	0.32519	17.167	22476	9.5763	10.651	10.410	0.29439	30.372	5.3996	107.70	42.900
1991	0.33732	19.004	22435	10.574	10.636	10.310	0.29581	30.082	5.8695	97.800	44.300

Figures



Figures (continued)



REFERENCES

- Adelman, I., and C.T. Morris (1973). *Economic Growth and Social Equity in Developing Countries*. Stanford, CA: Stanford University Press.
- and S. Robinson (1989). "Income Distribution and Development." In *Handbook of Development Economics* (Vol. 2). Edited by H. Chenery and T.N. Srinivasan. Amsterdam: Elsevier Science Publishers B.V. Pp. 950-990.
- Aghion, P., and P. Bolton (1991). "A Trickle-Down Theory of Growth and Development with Debt-Overhang," *Review of Economic Studies*, 1995. (Forthcoming)
- Ahluwalia, M.S. (1976a). "Inequality, Poverty and Development," *Journal of Development Economics*, 3 (December), 307-342.
- (1976b). "Income Distribution and Development: Some Stylized Facts," *American Economic Review*, 66 (May).
- Aitchison, I., and J.A.C. Brown (1957). *The Lognormal Distribution*. Cambridge: Cambridge University Press.
- Alesina, Alberto, and Dani Rodrik (1994). "Distributive Politics and Economic Growth," *Quarterly Journal of Economics*, 109 (No. 25, May), 465-490.
- Artstein, Yael, and Zvi Sussman (1991). *The Dynamics of Wage Increases in Israel: Market Forces and Inter-Industry Comparisons*. (Research Department Discussion Paper No. 91.02) Jerusalem, Bank of Israel. (Hebrew)
- Banerjee, Abhijit, and Andrew F. Newman (1991). "Risk-Bearing and the Theory of Income Distribution," *Review of Economic Studies*, 58 (No. 2, April), 211-235.
- Bank of Israel, Annual Reports (various years).
- Benabou, Roland (1993). "Working of a City: Location, Education and Production," *Quarterly Journal of Economics*, 108 (No.3, August), 619-52.
- Ben-Shahar, Haim (1961). "Shifts in the Income Distribution of Wage Earners, 1950-1957," Ministry of Finance, Jerusalem. (Hebrew)
- Bjorklund, A. (1991). "Unemployment and Income Distribution: Time-Series Evidence from Sweden," *Scandinavian Journal of Economics*, 93 (No. 3), 457-465.
- Blejer, Mario, I., and Isabel Guerrero (1990). "The Impact of Macroeconomic Policies on Income Distribution: An Empirical Study of the Philippines," *Review of Economics and Statistics*, 72 (No. 3, August), 414-423.
- Blinder, Alan S., and Howard, Y. Esaki (1978). "Macroeconomic Activity and Income Distribution in the Postwar United States," *Review of Economics and Statistics*, 6 (No. 4, November), 604-609.

- Central Bureau of Statistics, *Family Expenditure Survey, 1950-1960*. Publication No. 148. (Hebrew).
 ———, *Family Expenditure Survey, 1963/64*. Publication No. 200. (Hebrew)
 ———, *Family Expenditure Survey, 1975/76*. Publication No. 563. (Hebrew)
 ———, *Family Expenditure Survey, 1979/80*. Publication No. 711. (Hebrew)
 ———, *Family Expenditure Survey, 1986/87*. Publication No. 837. (Hebrew)
 ———, *Income Surveys, 1965-1967*. Publication No. 283. (Hebrew)
 ———, *Income Survey, 1984*. Publication No. 779. (Hebrew)
 Chenery, H.B. and M. Syrquin (1975). *Patterns of Development 1950-1970*. London: Oxford University Press.
 Dahan, Momi (1989). "Inflation Tax and Income Inequality," Seminar Paper, Masters Degree, Hebrew University, Jerusalem. (Hebrew)
 Durlauf, N.S. (1992). *A Theory of Persistent Income Inequality*. Mimeo.
 Flug, Karnit, and Nitsa Kasir (1993). *Compliance With the Minimum Wage Law in the Private Sector*. (Research Department Discussion Paper No. 94.12.) Jerusalem: Bank of Israel. (Hebrew)
 Gabbai Y., and Y. Lipshitz (1992). "Wages, Taxation and Labor Costs in Financial Institutions and in Government," *Economic Quarterly*, 151 (April), 591-608. (Hebrew)
 Flug, Karnit, and Nitsa Kasir (1993). *Compliance With the Minimum Wage Law in the Private Sector*. (Research Department Discussion Paper No. 94.12.) Jerusalem: Bank of Israel. (Hebrew)
 Galor, Oded, and Joseph Zeira (1993). "Income Distribution and Macroeconomics," *Review of Economic Studies*, 60 (No. 1, January), 35-52.
 ———, and Daniel Tsiddon (1992). *Income Distribution and Output Growth: The Kuznets Hypothesis Revisited*. (Brown University Department of Economics Working Paper No. 93-1, December).
 Ginor, P. (1983). *Social and Economic Gaps in Israel*. Tel Aviv: Am-Oved. (Hebrew).
 Glomm, Gerhard, and B. Ravikumar (1992). "Public versus Private Investment in Human Capital: Endogenous Growth and Income Inequality," *Journal of Political Economy*, 100 (No. 4, August), 813-834.
 Greenwood, Jeremy and Boyan Jovanovic (1990). "Financial Development, Growth and the Distribution of Income," *Journal of Political Economy*, 98 (October), 1076-1107.
 Hanoch, J. (1961). *Income Differentials in Israel*. Report No. 5, Jerusalem: Falk Institute. (Hebrew)
 Kuznets, Simon (1955). "Economic Growth and Income Inequality," *American Economic Review*, 45 (March), 1-28.
 ——— (1963). "Quantitative Aspects of the Economic Growth of Nations: VIII, Distribution by Size," *Economic Development and Cultural Change* (11), 1-80.
 ——— (1967). *Modern Economic Growth: Rate, Structure and Spread*. New Haven, CT and London: Yale University Press.
 Liviatan, Oded (1982). "The Development of the Cost of Living Allowance and Other Wage Items," *Economic Quarterly*, 29 (No. 15, December), 349-357. (Hebrew)
 Nolan, Brian (1988-89). "Macroeconomic Conditions and the Size Distribution of Income: Evidence from the United Kingdom," *Journal of Post Keynesian Economics*, 11 (No. 2, Winter), 196-221.
 Papanek, Gustav, F., and Oldrich Kyn (1986). "The Effect on Income Distribution of Development, the Growth Rate and Economic Strategy," *Journal of Development Economics*, 23 (No. 1, September), 55-65.
 Paukert, Felix (1973). "Income Distribution at Different Levels of Development: A Survey of Evidence," *International Labour Review*, 108 (No. 2, August-September), 97-125.
 Perotti, R (1991). *Income Distribution, Politics and Growth: Theory and Evidence*. Columbia University, Discussion Paper No. 625.
 Persky, Joseph (1992). "Retrospectives: Pareto's Law," *Journal of Economic Perspectives*, 6 (No. 2, Spring), 181-192.
 Persson, Torsten, and Guido Tabellini (1991). *Is Inequality Harmful for Growth? Theory and Evidence*. (Working Paper No. 3599), National Bureau of Economic Research, January. Pp 37.
Report of the Committee on the Distribution of National Income in Israel (1966), Jerusalem. (Hebrew).
Report of the Committee on the Distribution of National Income in Israel (1971), Jerusalem. (Hebrew).
 Sharon, E. (1988). "The Child Allowance System in Israel: 1959-87, How Did it all Start and Where is it Heading?" *Economic Quarterly*, 134 (No. 38, December), 202-216. (Hebrew)
 Soltow, Lee (1968). "Long-Run Changes in British Income Inequality," *Economic History Review*, (April), 17-29.

- Sussman, Zvi, and Dan Zakai (1983). *Changes in the Wage Structure of the Civil Service and Rising Inflation: Israel 1974-81*. Jerusalem: Bank of Israel Research Department. (Hebrew)
 Tabellini, Guido (1991). "The Politics of Intergenerational Redistribution," *Journal of Political Economy*, 99 (No. 2, April), 335-57.
 Weinblatt, James, and Y. Luski (1993). "The Effect of the Minimum Wage on Employment and Wages in Israeli Industry." (Discussion Paper No. 93-11.) Monaster Center for Economic Research, Ben Gurion University of the Negev. (Hebrew)
 Yaniv, G. (1986). *Non-Compliance with the Minimum Wage Law: Theoretical Aspects and the Implications for Israel's Economy*. Research Paper No. 53. National Insurance Institute, Research and Planning Unit. (Hebrew)
 Zeira, Joseph (1992). *Workers, Machines and Economic Growth* (December). Mimeo.