2

Trends in income distribution in some Western countries

2.1. Purpose of survey

This chapter tries to present in comparable form a considerable number of figures collected by other authors and by institutions. The figures refer to income distribution in Western countries during the last decades. By way of exception one comparison over a longer period is referred to, and as a contrast some figures on India are given. Income distribution is considered here only as the frequency distribution over households or persons, not as the distribution over factors of production. The purpose of this survey is to remind the reader of the trends in this distribution over the last decades. As is well known, income distribution is one of the important social aspects of our society. Most critics of the 19th and 20th century Western societies have considered income distribution among their criteria. Some of our recent problems, such as wage claims, strikes and inflation, have as a background a continuing dissatisfaction with income distribution and understandably so. The main question behind this survey therefore is: Where do we stand with this important criterion of Western society? This question cannot be answered adequately by only considering primary income distribution. In most countries a considerable degree of redistribution occurs as a consequence of various reforms in the field of taxation, social security and other government intervention.

Even though considerable work has been done in recent decades, the material available shows important lacunae. This

implies that for many countries there is scope for undertaking more research in this field. This will be clear from the limited number of countries considered, especially in the tables dealing with redistribution. The phenomenon is of course related to the degree of tax discipline existing in the various countries.

Throughout this essay countries will be indicated by their motor car symbols. For the readers not acquainted with them, they are listed here:

BR	Brazil*	J	Japan*
CDN	Canada	MEX	Mexico*
D	Germany (F.R.)	N	Norway
DK	Denmark	NL	Netherlands
F	France*	RA	Argentina*
GB	United Kingdom	RCH	Chile*
H	Hungary*	S	Sweden
IND	India*	USA	United States

2.2. Some concepts used

Since this author only used material collected by others he did not go into a number of subtleties considered by the original authors. These subtleties are many, especially with regard to the inclusion of some items in or their exclusion from the income concept used. The only concepts used in this study are *primary income* – the income before taxes are paid, *income after tax* and *income after complete redistribution by public finance.* The latter concept includes the imputed values of services rendered to the person or persons considered below cost, minus the amounts actually paid by the recipients. Possible redistribution effects of social insurance institutions of an autonomous character have been neglected. It is often assumed that these redistribution effects are not considerable. For some continental European countries this remains an open question, however.

Among the authors quoted Bentzel [2] explicitly states that

* Countries mentioned occasionally only. Most of the evidence collected refers to countries without an asterisk.

the income-after-complete-redistribution concept he uses equals consumption expenditure, plus savings. Some other sources, namely some of the family budget inquiries and explicitly Dandekar and Rath [18], only collect consumption expenditures; for low incomes the deviation from income will be small.

The main further concepts this study concentrates upon are *income recipients* as different from *households* and *families* and *income per consumer*. By far the larger part of studies quoted deal with one of the first three concepts as their unit of observation; only a small part of them considers the individual consumers as their unit. There is already a difference between households and families, in that most sources do not include single person households as families. Only Nicholson [46] explicitly uses households and families as synonymous. Families may not be identical to income recipients as one family may count more income recipients. Fairly precise information on this aspect is available in many cases. The difference between households and income recipients on the one hand and *persons consuming* on the other hand is much larger, however, than the difference between the number of households and of income recipients. Households of five persons are not exceptional and the average size of households in lower and higher income brackets has developed differently as we shall see (cf. Section 2.6).

The figures collected or calculated from those collected will be shown as much as possible in the form of deciles (tenths) and quintiles (fifths) of the total number of units present in the country and the year studied. It was not always clear how these parts were defined, but as a rule they are parts of the total number of households or of income recipients. All figures of this kind have been expressed as promilles (‰) of total income. In some cases, however, total income has been replaced by median income times total number of incomes, representing something quite different. The only figures not affected by this operation are the ratios between deciles or quintiles, and it is on these that our conclusions concentrate.

2.3. Sources and errors; indicators of inequality

Sources used by the authors quoted may either be 'complete' inquiries, such as census and tax statistics, covering in principle all objects under investigation or 'samples', such as family budgets, sample censuses (cf. [84]) or ad hoc inquiries (for instance, Nicholson [46]). Sampling techniques have advanced sufficiently in order to keep sampling errors under better control than the main source of error: tax evasion. Increased efficiency of tax collection may give some hope that tax evasion is declining; and some checks have been possible, from time to time, to estimate its extent. The increased role of corporations as compared to private firms may also be a favourable development. The subject remains one where more research is highly desirable.

Even though the absolute figures contain considerable errors, the errors in some of the derived figures are considerably less. This applies to comparisons over time, or estimates of the influence of redistribution, which are the main objects of this study.

Several indicators of inequality have been used. The main yardstick used in this survey consists of the ratio between the upper and the lower quintile or the ratio between the upper and the lower decile. They are shown in Tables 2.I.A, 2.II.A, 2.III.A, 2.IV and 2.V. For comparison, in Tables 2.I.B, 2.II.B and 2.III.B some other indicators have been collected. For well-known reasons, Pareto's α has not been used. Those used are:

(i) d, the relative average deviation, that is, the average absolute deviation each income shows from average income, expressed as a portion of average income. Its lower limit is zero (equality of all incomes), its upper limit 2 (a large number of incomes zero and one non-zero).

(ii) P_5, the upper fifth percentile income as a percentage of median income. Of course one could have used other percentiles as well.

(iii) R, the inequality index derived from the Lorenz curve and representing the ratio of the area between the diagonal

Table 2.I.A
Income before taxes for lower and upper deciles or quintiles of income recipients (R), households (H), or families (F); ‰ of total income of country; selected countries and years.

Country	CDN (wages + sal.)		D (R)		DK (R)			GB (R)		
Year	1930/1	1951	1936	1950	1939	1952	1963	1938	1949	1957
Decile 1	–	–	10	10	14	16	–	–	–	–
Decile 2	–	–	20	30	30	32	–	–	–	–
Quintile 1	21	39	30	40	44	48	52	–	72	–
Decile 9	–	–	140	140	158	154	166	120	145	–
Decile 10	–	–	390	340	352	286	260	380	330	280
Quintile 5	485	399	530	480	510	440	426	500	475	–
Source:	[27]		[75]		[3]		[54]	[41]	[75]	[41]

Country	N (sample)		NL (H)			S (R)				USA (F)			
Year	1840	1960	1935	1946	1962	1935	1948[a]		1954[a]	1935/6	1946/7	1959	1960/1
Decile 1	–	–	–	10	15	–	–	12	20	–	–	–	–
Decile 2	–	–	–	22	30	–	–	33	36	–	–	–	–
Quintile 1	–	–	59	32	45	–	32	45	56	41	50	45	46
Decile 9	–	–	–	147	151	166	163	152	155	–	–	–	–
Decile 10	570	240	366	383	318	395	303	300	273	–	–	–	–
Quintile 5	–	–	512	530	469	561	466	452	428	517	460	457	455
Source:	[60]		[82]	[75]	[48]	[2]	[75]		[75]	[28]	[28]	[28]	[7]

[a] Unadjusted tax records.

Table 2.I.B
Other inequality indicators, income before taxes.

(1) Relative average deviation d

Country	GB		NL						USA		
Year	1949	1966	1921	1927	1933	1938	1950	1964	1948	1955	1966
Lower income limit	£ 250	£ 300		Dfl. 1400			Dfl.3000	Dfl.5000	$ 2500	$ 2500	$ 3000
d	0.58	0.48	0.72	0.73	0.65	0.68	0.62	0.48	0.59	0.60	0.45

Source: CBS [11].

(2) Upper 5th percentile income, as a percentage of median (earnings only) P_5

Country	BR	CDN	F	GB	H	J	MEX	RA	RCH	S (all incl.)		USA	
Year[a]		1961								1930	1960	1939	1959
P_5	380	205	280	200	180	280	450	215	400	303	222	267	206

Source: Lydall [42] (only countries for which also indicators of education inequality are given by Lydall).
[a] Years not mentioned; near 1960.

Table 2.I.B (continued)

(3) Inequality index (concentration ratio of Lorenz curve) R, per cent

Country	D		DK		GB		NL		S		N[a]		USA[b]	
Year	1936	1950	1939	1952	1938	1964[c]	1938	1962[c]	1935	1963[c]	1865	1950	1903	1956
R	49	45	50	44	43	40	48	44	54	40	50	32	50	33

Source: UN [75]; N: Soltow [60] p. 55; USA: Keat [36].
[a] Average of two towns (Østfold, Vestagter).
[b] Wages only.
[c] Supplementary information from United Nations.

(4) Maximum equalization percentage E

Country	DK		GB		NL	S	
Year	1939	1965	1938	1955	1950	1935	1948
E	33	27	30	27	31	38	31

Source: UN [75]; DK [54].

and the curve, divided by the area of the triangle under the diagonal. Its limits are 0 (equality) and 1 (a large number of incomes zero and one non-zero).

(iv) *E*, the maximum equalization percentage, being the percentage of total income that must be taken from the higher and given to the lower incomes in order to make them all equal. Also its limits are 0 and 100 per cent.

2.4. Incomes of income recipients, households or families, before taxes

Tables 2.I.A and 2.I.B summarize the information collected from the sources quoted. For Canada the only figures available refer to labour incomes, whereas the other figures cover all incomes. The trend of the lower incomes has been upward and for the highest incomes downward, if expressed in terms of average or median incomes. The most notable exception is the one of the Netherlands in 1935. Partly this may be due to the Great Depression, during which profits were low or negative and a considerable number of households received unemployment benefits; another part of the explanation may be the family size situation, to be discussed in Section 2.6. One more common feature of the figures is that before World War II half of national income went to the 20 per cent highest income recipients, families or households. The Norwegian sample by Soltow is interesting for several reasons. It covers by far the longest period available and shows a clear equalitarian trend, typical for the Scandinavian countries and Britain. Table 2.I.B shows similar features extending also to the Netherlands and the United States and possibly to (Western) Germany.

From Table 2.I.A we derive the following figures on the reduction in inequality as measured by the various indicators (Table 2.I.C).

If the percentage fall of inequality in primary incomes were to last, a reduction to one-half of existing inequality would take 50 to 85 years.

Table 2.I.C
Reduction in inequality.

Indicator	Country	Length of period observed in years	Fall in indicator, per cent	Per cent per year	Average for indicator, per cent per annum
d	GB	17	17	1.0	1.0
	NL	43	33	0.8	
	USA	18	24	1.3	
R	D	14	8	0.6	0.6
	DK	13	12	0.9	
	GB	26	5	0.2	
	NL	22	6	0.3	
	S	28	26	0.9	
	N	85	36	0.4	
	USA	53	34	0.6	
E	DK	26	18	0.7	0.6
	GB	17	10	0.6	
	S	13	7	0.5	

[a] Sample of two towns only.
[b] Wages only.

2.5. Influence of taxes and of complete redistribution

Tables 2.II.A and 2.II.B partly repeat the figures of Tables 2.I.A and 2.I.B, but add income-after-tax figures where they were available. From these tables we note that taxes have reduced the share of the highest decile everywhere and, after World War II, have raised the share of the lowest decile. Since the decile data do not cover many cases, the other indicators, shown in Table 2.II.B, deserve some more attention.

We note that the after-tax inequality index *R* for Britain fell by 8 percentage points over 21 years, for Denmark by 7 points over 13 years and for Sweden by 11 points over 13 years; the average picture being 9 points in 16 years, hence half a point per annum. If this (linear) trend could go on, the inequality in after-tax incomes could be reduced to half its British value in 1959 during a period of 27 years or one generation. A similar exercise for the maximum equalization percentage *E* tells us

Table 2.II.A
Income before (B) and after (A) taxes for lower and upper deciles and quintiles of income recipients (R) or families (F); ‰ of total income of country; selected countries and years.

Country	DK (R)				GB						NL				S (R)			
Year	1939		1952		(F)1938		(R)1955		(F)1957		1946 (R)		1950	1962(F)	1935		1948	
	B	A	B	A	B	A	B	A	B	A	B	A		B A	B	A	B	A
Decile 1	14	14	16	17							10	–		28 33				
Decile 2	30	27	32								22	–		47 52				
Quintile 1	44	41	48								32	48		75 85			32	35
Decile 9	158	162	154		120	128	144	149	135	145	147	150		144 145	166	172	163	161
Decile 10	352	350	286	275	380	336	293	245	280	235	383	300		298 251	395	369	303	270
Quintile 5	510	512	440		500	464	437	394	415	380	530	450		439 397	561	541	466	431
Source:	[3]	[75]	[3]	[75]	[41]		[75]	[76]	[41]		[75]	[76]		[48]	[75]	[76]	[75]	[76]

Table 2.II.B
Other inequality indicators, income before and after taxes.

(1) Inequality index (Gini ratio of Lorenz curve) *R*, per cent

Country	DK		GB			NL	S	
Year	1939	1952	1938	1955	1959	1950	1935	1948
R, pre-tax	50	44	43	41	32	45	54	44
R, after-tax	47	40	38	34	30	41	52	41

(2) Maximum equalization percentage *E*

Country	DK		GB		NL	S	
Year	1939	1952	1938	1955	1950	1935	1948
E, pre-tax	36	31	30	27	31	38	31
E, after tax	34	28	27	24	28	37	28

Source: UN [76]; GB–1959: Nicholson [46].

that in fourteen years a reduction in *E* by 6 points took place and hence a reduction to half its present value of, say, 20, would take, if the trend continues, 23 years, a comparable figure.

Tables 2.III.A and B show the influence of 'complete redistribution', neglecting possible further redistribution by some autonomous social security institutions. The case of Denmark, based on a very careful inquiry [54] is particularly interesting. The quintile ratio (upper/lower) of 8.2 before tax is reduced to 2 or 3, depending on the assumption made with regard to the profits derived by the various income groups from some of the public overall expenditures. The corresponding figures for the Netherlands are less impressive, but considerable too; one wonders whether the Swedish figures by Bentzel are as comparable as their description suggests [2].

The inequality index *R* is reduced, according to Table 2.III.B, by 7 percentage points for both the United Kingdom in 1959 and the United States in 1967, corresponding with a reduction

Table 2.III.A
Income before (B) and after (A) complete redistribution, assuming public overhead expenditures to be of equal advantage to (a) each income recipient, (b) in proportion to income received, or (c) either (a) or (b) for various public expenditures.

Country	DK			NL (H)					S			
Year	1963			1935		1962			1935		1948	
Assumption	B	Aa	Ab	B	Ac	B	Aa	Ab	B	A	B	A
Decile 1	.	.	.	.	.	15	21	24	.	.	.	.
Quintile 1	52	132	102	59	70	45	60	65	.	.	32	35
Decile 9	.	126	151	146	145	151	151	150	166	172	163	161
Decile 10	260	140	157	366	315	318	267	242	396	370	301	269
Quintile 5	426	266	308	512	460	469	418	392	562	542	464	430
Quintile 5 / Quintile 1	8.2	2.0	3.0	8.7	6.6	10.4	7.0	6.0	.	.	14.5	12.3
Decile 10 / Decile 1	.	.	.	.	.	21.2	12.7	10.1	.	.	.	.
Source:		[54]			[82]		[48]				[2]	

Table 2.III.B
Other inequality indicators, income before and after redistribution.

Inequality index (concentration ratio of Lorenz curve) *R*, per cent

Country	GB		USA
Year	1937	1959	1967
Pre-redistribution	35	32	42
Post-redistribution	27	25	35
Idem, adj. for family size	.	.	31

Source: GB – 1959: Nicholson [46] quoting for 1937 Barna; USA: Lampman [40].

along the trend of about 14 years. The last figure given in Table 2.III.B for the United States will be discussed in Section 2.7.

2.6. Size of households and families

Table 2.IV informs us about an aspect of income distribution not so often discussed, namely the changes over time of the size of households and families in higher and lower income brackets. Over the period for which figures are available, the phenomenon is most pronounced for the Netherlands, where the lower and the upper quintile family size was about equal in 1935/6, but where the ratio upper/lower amounted to 1.77 in 1962. For deciles the change was from 0.79 to 2.05. For households the 1962 ratios are over 3 even.[48]. These figures reflect demographic changes of various kinds. First, family planning in confessional, lower income brackets came late, due to Church resistance. Secondly, both young and old people today can afford to become or remain independent households, which often they could not in the 'thirties or 'twenties.

Similar tendencies can be observed for Germany and Britain, although to a lesser extent, but hardly for the United States according to Selma Goldsmith [28]. Even so average family size is larger in the upper than in the lower quintile. For comparison the figures for India, representing a developing country with as many inhabitants as Africa and Latin America together, have been added. They illustrate the penetration of family planning in the higher income brackets and the virtual absence in the lower income brackets in 1967/8.

2.7. Income ratios for persons in upper and lower strata

Using Table 2.IV we are now able to give a better picture of the trends in income distribution than so far, by calculating ratios of income per capita between high and low family income brackets. It has to be kept in mind that the deciles and quintiles are still based on numbers of households or families and not on numbers of persons in the population. The latter computation can be carried out only with the aid of the base material.

In Table 2.V.A incomes before tax have been shown and, in part B of that table, incomes after complete redistribution.

Table 2.IV

Persons (P) or consumption units (U) per household (H) or family (F) in lower and upper deciles or quintiles; selected countries and years.

Country	D			GB		IND	
	P/H			P/H		P/H	
Year	1927/8	1962/3[a]	1965	1937/9	1957	Rural 1967/8	Urban
Decile 1	3.70	1.81	1.39	3.18	2.00	5.87	6.09
Decile 2	(3.78)	(2.23)	(1.65)	.	.	5.72	6.00
Quintile 1	3.74	2.02	1.52	.	.	5.80	6.05
Decile 9	(3.95)	(3.30)	(3.13)	.	.	4.75	2.89
Decile 10	4.25	3.22	3.13	3.54	4.45	4.20	2.50
Quintile 5	4.10	3.14	3.13	.	.	4.48	2.70
Quintile 5 / Quintile 1	1.10	1.55	2.06	.	.	0.77	0.45
Decile 10 / Decile 1	1.15	1.78	2.25	1.29	2.23	0.71	0.41
Source:	[56]	[29]	[84]	[17]	[46]	[18]	

Country	NL					USA			
	U/F		P/F		P/H	P/F			
Year	1923/4[b]	1935/6[b]	1935/6	1962	1962	1903	1935/6	1941	1959
Decile 1	(3.30)	(3.76)	5.35	2.40	1.21	.	.	.	.
Quintile 1	(3.58)	(3.18)	4.50	2.58	1.39	3.48	3.73	3.55	3.24
Decile 5	(3.20)	(3.36)	4.20	4.99	4.63	.	.	.	.
Quintile 5	(3.78)	(3.60)	4.60	4.82	4.50	3.86	3.92	4.00	3.89
Quintile 5 / Quintile 1	(1.05)	(1.13)	1.02	1.77	3.23	1.11	1.05	1.12	1.20
Decile 10 / Decile 1	(0.97)	(0.89)	0.79	2.05	3.82	.	.	.	.
Source:	[8]	[10]	[10]	[48]	[48]	[39]	[28]	[28]	[28]

[a] Hamburg only.
[b] Amsterdam only.

Table 2.V

Ratios of income between upper and lower groups; quintiles (Q) or deciles (D) per household (H) or family (F) compared with ratios per person (P), using assumptions (a), (b) or (c) on advantage of public expenditures for various groups (cf. Table 2.III).

A. Highest to lowest ratios of income before tax

Country	D		NL		USA	
Year	H Prewar[a]	H Postwar[b]	H 1935/6	H 1962	F 1935/6	F 1959
Q ratio H or F	17.7	12.0	8.7	10.4	12.6	9.9
Q ratio P	16.1	5.6	8.5	3.2	12.0	8.2
D ratio H or F	.	34	.	31	.	.
D ratio P	.	15	.	5.5	.	.

Source : Tables 2.I and 2.IV.
[a] Incomes : 1936; household size : 1927/8.
[b] Incomes : 1950; household size : 1965.

B. Highest to lowest ratio of income (quartile or decile averages) after complete redistribution per household (H), family (F) and per person (P)

Country	NL				
Year	H[a] 1935/6	H 1962		F[b] 1962	
Assumption[c]	c	a	b	a	b
Q ratio H or F	6.6	7.0	6.0	7.0	6.0
Q ratio P	6.4	2.2	1.9	4.0	3.4
D ratio H or F	.	12.7	10.1	.	.
D ratio P	.	3.3	2.6	.	.

Source : Tables 2.III and 2.IV.
[a] H for incomes.
[b] F for family size.
[c] Cf. Table 2.III.

For recent years the figures per capita for the new countries where data have been found are considerably more favourable than the figures for households or families. In Germany they are reduced to one-half, in the Netherlands to one-third; in the United States the reduction, as expected, is less. For incomes per capita after complete redistribution quintile ratios are now

obtained comparable to the Danish figures in Table 2.III.A. The American figure for *R* in 1967 in Table 2.III.B, after adjustment for family size, is in line with those for 1959 in Table 2.V.A.

No figures for Scandinavian countries were found; to the extent that the Dutch changes between 1935/6 and 1962 are due to the belated penetration of family planning into lower income groups, changes over the last decades may have been not so outspoken in these countries.

Again for comparison, figures have been added for consumption expenditure in India (Table 2.VI). The differences with Western countries are striking and reflect the dramatic problems of developing countries in social matters.

Table 2.VI
Some data on consumption expenditure in rupees per person per annum in lower and upper income brackets; 1960/1 and 1967/8 (constant 1960/1 prices); rural (R) and urban (U) areas and ratios.

Year	1960/1		1967/8	
	R	U	R	U
Decile 1	88.0	113.0	88.4	95.3
Decile 2	100.4	156.1	102.0	145.1
Quintile 1	188.4	269.1	190.4	241.0
Decile 9	382.5	553.5	399.2	580.2
Decile 10	682.0	1061.1	711.7	1054.9
Quintile 5	1064.5	1614.6	1110.9	1635.1
Decile 10 / Decile 1	7.8	9.4	8.1	11.0
Quintile 5 / Quintile 1	5.7	6.0	5.8	6.8

Source: Dandekar and Rath [18].

2.8. Summary

Although the material available shows well-known lacunae and uncertainties, errors in changes over time and in the

estimation of the effects of redistribution schemes will be less than errors in the absolute figures. Our main findings are:

(1) The trend in income shares of the lowest groups over the last decades has been upward, that of the highest groups downward (Table 2.I.A).

(2) If the observed percentage reduction of inequality per year were to last it would take 50 to 85 years in order to reduce existing inequality to one-half (Tables 2.I.B and 2.I.C).

(3) Taxes have reduced the after-tax income share of the highest decile and raised, after World War II, the share of the lowest decile (Table 2.II.A).

(4) If the linear trend in inequality indicators for incomes after tax were to continue, halving inequality would take some 25 years or one generation (Table 2.II.B).

(5) Complete redistribution by public finance reduces the ratio of the upper to the lower quintile from 8 to 2.5 in Denmark (1963) and from 14 to 6.5 in the Netherlands (1962) (Table 2.III.A).

(6) If the trend in R for incomes after complete redistribution were to continue, reduction to one-half of its present value would take 14 years (Section 2.5).

(7) Demographic factors have improved income distribution over persons more than over families (Table 2.IV), especially in the Netherlands.

(8) For the Netherlands in 1962 the ratio of *income per capita* for the upper to the lower family income quintile is 2 as compared to 6.5 for *income per household;* contrast this with the situation in 1935/6 when there was no difference between this ratio for per capita income and income per household. Similar changes took place in Germany and in Britain (Tables 2.IV and 2.V), but to a lesser extent.

(9) In India the ratios of consumption expenditures per capita of high incomes to low incomes are high and have increased between 1960/1 and 1967/8 (Table 2.VI), illustrating the dramatic social situation there.