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### Income Composition and Inequalities in Hungary, 1987–2003<sup>1</sup>

#### Abstract

The paper analyses income distribution trends in Hungary during the period of transition. When summarizing income distribution shifts between 1987 and 2000, three periods with different income distribution-labour market and social policy regimes are distinguished. In addition to sensibility tests of various inequality measures, the paper presents results of inequality decompositions by social subgroups. The focus of the second part is on explaining most recent developments between 2000 and 2003, based on TÁRKI household surveys, with special attention paid to the possible effects of two wage shocks (minimum wage increase and drastic rise in public sector wages).

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## **Introduction**

As it was shown earlier, the development of inequalities between 1987 and 2000 can be divided into three well-differentiated phases (Tóth 2003). The first phase, roughly between 1987 and 1992, is characterized by the worst recession in the Hungarian economy since the World War II. This phase saw the restructuring of the labour market, a rise in unemployment and a polarization of households by their employment composition. In the second phase, between 1992 and 1996, the economy remained more or less unchanged with a fairly high inflation rate and unemployment rate. In the third period, between 1996 and 2000, economic growth began and the inflation and unemployment rates fell. The development of inequalities showed clearly distinguishable patterns in the three phases.

In the first phase of the transition, between 1987 and 1992, all inequality indices rose greatly. The most significant change in this period was the labour market polarization of households: the number of workers in households decreased and consequently there was a fall in the proportion of people living in households with working heads, and an even greater fall in the proportion of people living in households with at least two persons employed. Differences in incomes increased between households in line with differences in education levels. The restructuring of education system (expansion of enrolment in higher levels) had inequality-reducing effects in this period.

In the second phase of the transition (between 1992 and 1996) inequalities continued to grow non-negligibly, although to a lesser extent than in the previous period. In this phase the growth of inequalities was primarily attributable to widening income differentials by education levels. Additionally, the dispersion of incomes increased considerably as a function of number of children, ethnicity and settlement type as well. In this phase inequalities grew in almost all social subgroups, with the exception of households with heads over 60 years of age and Roma households.

In the third phase of the transition (the second half of the 1990s) there was minimal change in measured inequalities and the various indicators sensitive to different segments of the income distribution fail to show unambiguous results in this respect. This does not mean, however, that there were no changes in the structure of inequalities—these changes could have counterbalanced each other (see Tóth 2003).

In October 2003 the TÁRKI Social Research Centre carried out a new survey in its series: the TÁRKI Household Monitor Survey (henceforth: Monitor Survey). These data can be used for a time series comparative study on the trends in income inequalities in the most recent period, since the survey was carried out using essentially standard methods as part of the income survey series that started in 1992. A summary of the methodology of the survey can be found in Szivós and Tóth (2004).

In the current paper we examine the following simple questions:

(1) How did the indices of aggregate income inequalities change between 1987 and 2003 (with special emphasis on the period 2000–2003)?

(2) How did income inequalities change within and across individual social demographic subgroups?

(3) What was the role of the inequalities of individual income components, especially of incomes gained from state welfare redistribution, in the shaping of the incidence of income distribution?

(4) What were the effects of the two shock-like events in social policy in the period studied (the raising of the minimum wage and the raising of wages in the public sector)?

(5) How does the level of inequalities in Hungary compare to those of other EU members?

Within each of the above topics we investigate the question of whether the period between 2000 and 2003 shows continuity with the trends observed between 1987 and 2000 or displays new characteristics. It will also be discussed in what ways the results could have been affected by methodological advances in the latest wave of Monitor Surveys. The analysis employs three different methods to take the sizes of households into account.<sup>2</sup> The major indicators used in the study and our methodological assumptions are listed in the *Appendix*.

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<sup>2</sup> In order to adjust for household size an elasticity measure  $e$  is used. The personal equivalent income is given by the following equation:  $N=Y/S^e$ , where  $Y$  is the total household income and  $S$  is the number of household members. Two different elasticity measures are considered. If  $e=1$ , we have the income per capita. If  $e=0.73$ , we have an elasticity measure which is implicitly assumed in Hungarian calculations of minimum subsistence (Förster and Tóth 1998). We get very similar results if the first adult member of the household is taken to be 1 unit, the second adult member is weighted by 0.7 and the remaining members by 0.5. Finally, the third method follows the directives of the European Union for the annual reports of member states and joining states on their strategies to deal with social exclusion (Atkinson *et al.* 2002): this takes the first adult member of the household to be 1 unit, the second and subsequent members over 14 years of age are weighted by 0.5 and members under 14 by 0.3.

### The major indicators of income distribution between 1987 and 2003

The first analysis of the data suggests that in the last period of the Monitor Survey (between 2000 and 2003) a new phase began: inequalities increased once again in the Hungarian society. The ratio of the mean per capita incomes of the top tenth and the bottom tenth of the population increased from 7.5 to 8.1 while it increased from 7.5 to 8.4 in terms of household income (see *Table 1*). The widening of the income gap is backed up by each of the indicators examined here, although the robustness of the indicators and the significance levels of the results vary (Tóth 2004).

**Table 1: *Inequality indicators as a function of the unit of observation (individual or household) and the type of equivalence scale used. Annual household incomes between 1987 and 2003***

	1987	1992	1996	2000	2003
E=0.73					
P90/P10, person	2.80	3.14	3.55	3.52	3.58
P90/P10, household	2.97	3.07	3.33	3.35	3.50
S10/S1, person	4.55	5.52	6.62	6.63	7.30
S10/S1, household	4.85	5.36	6.26	6.81	7.60
Gini coefficient, person	0.236	0.263	0.29	0.292	0.302
Gini coefficient, household	0.248	0.267	0.284	0.296	0.310

	1987	1992	1996	2000	2003
E=1.0					
P90/P10 person	2.81	3.07	3.95	3.79	3.90
P90/P10 household	2.83	2.91	3.64	3.58	3.76
S10/S1 person	4.60	5.96	7.47	7.54	8.08
S10/S1 household	4.74	5.50	6.99	7.50	8.43
Gini coefficient, person	0.244	0.266	0.300	0.305	0.316
Gini coefficient, household	0.248	0.263	0.289	0.306	0.322

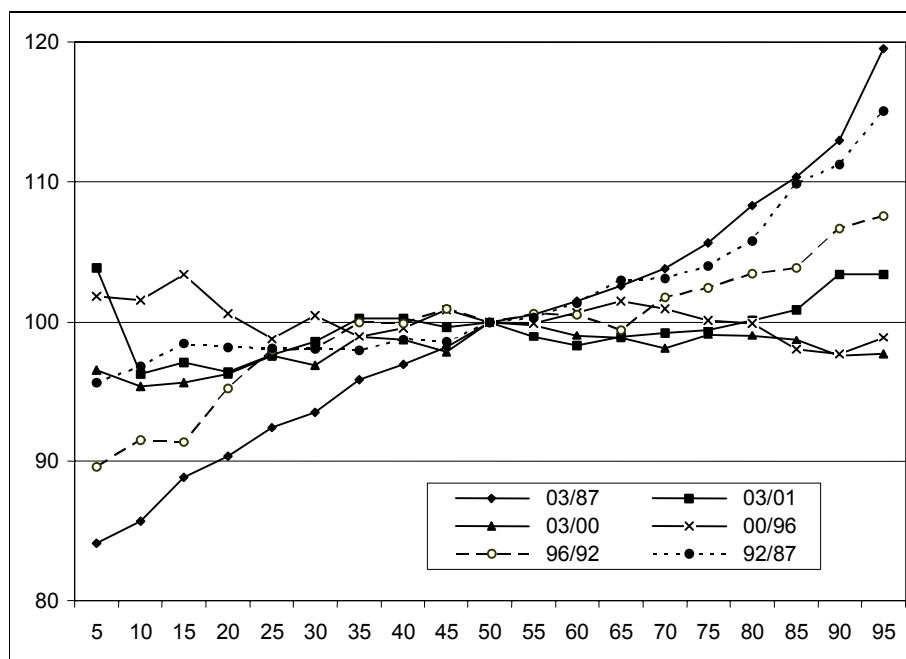
*Note:* For a detailed description of the indicators appearing in the table see the *Appendix*.

*Source:* 1987: Hungarian Central Statistical Office (HCSO) Income Survey; 1992, 1996: Hungarian Household Panel Survey; 2000, 2003: TÁRKI Household Monitor.

Before drawing any far-reaching conclusions we need to consider the fact that the resulting inequality indicators are greatly dependent on the success of our questionnaires in capturing macro incomes. Year after year we have made minor adjustments to our Hungarian Household Panel and Monitor Surveys with the aim of improving their efficiency in capturing as much of incomes as possible. Despite all our efforts, however, our surveys lag behind macro data, with the gap becoming wider each year. This is due in part to questioning techniques and in part non-participation in surveys (as evidenced, for example, by a reduction in the proportion of responses) or under-reporting of incomes. This issue will be discussed in more detail in the fourth Section.

The question to what extent inequalities held for the centre or either end of the income distribution can be measured by examining the growth indices of various income percentiles in each period. With the growth indices computed for twentieth percentiles (i.e. for the incomes of individuals at the 5, 10, 15 ... 90, 95 per cent points of the population arranged in increasing order of income), we get the results shown in *Figure 1*. This method reveals a substantial increase in income inequalities over the whole period of 1987–2003. (As we can see, the relevant curve rises steeply: the incomes of the bottom quintile display considerably less growth than average, while the incomes of the top percentiles show considerably more growth than average in the studied period.)

Figure 1: The growth indices of twentieth percentiles of income in each period (%)



Note: The growth index of a given twentieth percentile as a percentage of the growth index of the median.

Sources: 1987: HCSO Income Survey; 1992–1996: Hungarian Household Panel Survey; 2000–2003: TÁRKI Household Monitor.

The remaining curves on the relevant sub-periods tell an interesting story. The growth curve for the period between 1987 and 1992 has two distinct segments. The percentiles below the median grow at a somewhat slower rate than average but the relative indices of individual twentieth percentiles are almost identical. The curve above the median, however, is substantially steeper. That is, the higher the percentile, the faster the growth rate is. In other words, the rich became much richer in this period but the poor either got no poorer or their poverty increased to a much lesser extent within a society of otherwise greatly increasing inequality. Between 1992 and 1996, on the other hand, the increase in inequalities was on the whole weaker (the curve is altogether less steep). The incomes of the bottom three twentieth percentiles (i.e. the bottom 15 per cent of the population) lag far behind the average growth rate, while the top 10 per cent of incomes increased by substantially more than average. Between 1996 and 2000 the income gap did not widen significantly. In this period the incomes of the poorest one and a half million people increased at slightly over the average rate and the incomes of the richest one and a half million at slightly below the average rate. This may at first

seem unexpected if we overlook the significance of the context: by this time there was already a sizeable gap between the starting incomes of the bottom and the top one and a half million people and the absolute values of the above-average growth of the lowest incomes could be negligible compared to the income gain of the richest, even if the latter is characterized by a somewhat lower figure in percentages. Finally, in the last period (between 2000 and 2003) there are only slight differences between the growth indices of the various twentieth percentiles. We can reasonably assume that the increase in inequalities occurred within these percentiles, most probably at the top end of the distribution.

**Table 2: The personal distribution of equivalent incomes according to indicators sensitive to different sections of the income distribution, between 1987 and 2003**

	1987	1992	1996	2000	2003
Indicators sensitive to the top range					
P90/P50	1.69	1.86	1.90	1.92	1.92
GE(2)	0.116	0.168	0.236	0.207	0.261
A(0.5)	0.046	0.059	0.071	0.072	0.078
Indicators sensitive to the central range or symmetrically to the two ends of the distribution					
S10/S1	4.55	5.52	6.62	6.63	7.30
P90/P10	2.80	3.14	3.55	3.52	3.58
GE(0)	0.092	0.119	0.143	0.147	0.156
GE(1)	0.097	0.127	0.156	0.155	0.175
Gini coefficient	0.236	0.263	0.290	0.292	0.302
A(1)	0.088	0.112	0.133	0.137	0.144
Indicators sensitive to the bottom range					
P10/P50	0.60	0.59	0.54	0.55	0.54
A(2)	0.164	0.219	0.244	0.294	0.259

*Note:* The  $e=0.73$  equivalence scale was used here. For a detailed description of the indicators appearing in the table see the *Appendix*.

*Source:* 1987: HCSO Income Survey; 1992, 1996: Hungarian Household Panel Survey; 2000, 2003: TÁRKI Household Monitor.

The in-depth analysis of the indicators sensitive to the various sections of the distribution, calculated on the basis of the  $e=0.73$  equivalence scale, also suggests that the increase in inequalities was primarily located in the higher percentiles (see *Table 2*). This is suggested, for instance, by the substantial increment of the GE(2) indicator (from 0.207 to 0.261). In the bottom range of the income distribution inequalities were more likely to decrease. Indicators sensitive to the central range systematically show growing inequalities.



### Inequalities and social-demographic groups

The following analysis attempts to quantify the contribution of social-demographic factors to the development of aggregate inequalities. The factors examined include the ages, education and ethnicities of the household heads in the survey, as well as the growth of inequality within and across subgroups defined in terms of the labour market compositions and the number of children in the households.<sup>3</sup> First the development of the mean log deviation (MLD, i.e. the GE(0) indicator) will be examined for each subgroup along each dimension (*Table 3*). Next, we shall see to what extent the above-mentioned dimensions affected the magnitude of inequality in each year (*Table 4*).

The position of a social-demographic subgroup can be suitably characterized by a combination of the income ranks of the members of that subgroup relative to the total population mean on the one hand, and the income distribution within that subgroup on the other hand. Certain population subgroups are relatively homogeneous: differences within the group are smaller than average. Homogeneous subgroups of this kind include people in villages, people in towns, members of households with female heads, people over 60, members of households with pensioners as heads and households with at least two workers or a pensioner and at least one worker. In addition, we get separate stable homogeneous subgroups if we decompose along the dimension of education, regardless of the level of education.

If the dispersion of incomes is small within a group and the magnitude of incomes is substantially above the mean, a substantial proportion of the group members are likely to be in an above-average position. Such homogeneous subgroups in above-average positions include people with higher education, and households where there is at least one worker in addition to the household head. In some years the population of Budapest and childless households fall into this category as well. In other years, however, the better-than-average position of these latter subgroups is realized in the context of a large income dispersion.

If small dispersion is paired with incomes below the mean within a subgroup, we have a homogeneous subgroup of low income. This category unequivocally comprises the population in villages, the subgroups of people living in households with heads with primary education and in households with female heads. Households with three or more children and Roma households are

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<sup>3</sup> The decomposition methodology (see Mookherjee and Shorrocks 1982) works on the assumption that all inequalities can be decomposed along a given dimension into the sum of inequalities within a certain group (e.g. women or young people or people living in villages) and inequalities across groups (e.g. women–men or young–old or village–town–Budapest). The method employed here separates the factors in line with this principle (for details see Tóth 2003).

consistently low-income groups. It must be added, however, that the subgroup of large families was more heterogeneous than average in some years. Both the level and the dispersion of the incomes of the Roma subgroup steadily decreased over the period studied.

In general, the income dispersion within the household is greater for households where the head is inactive or is between 36 and 59 years of age. This was sometimes true for young households (in the last two periods) as well as for the population of Budapest and for households where, at most, the head worked (in 1992 and 2003).

The most significant change between 2000 and 2003 appears to originate in the employment status of the household head. The income positions of households with at least two workers (the head and an additional member) substantially improved, while the positions of other categories deteriorated relative to the mean (see *Table 3*). At the same time, intra-group inequalities decreased in almost all labour market categories (with the exception of households where the heads are pensioners but somebody else works). Altogether, the dispersion of incomes slightly increased as measured by the MLD indicator. The greatest increase occurred in Budapest, among people with secondary education and among childless and two-child households.

**Table 3: Income inequality and relative income levels within each population subgroup, 1987–2003**

Subgroup	Income inequalities within a given population subgroup for $e=0.73$ equivalent income personal distribution (MLD $\times 1000$ )					The ratio of the mean equivalent income of a given population subgroup as a percentage of the population mean ( $\lambda_k = \mu_k / \mu$ )				
	1987	1992	1996	2000	2003	1987	1992	1996	2000	2003
<i>Total</i>	92	121	143	147	156	100	100	100	100	100
Settlement type										
Village	85	119	121	127	131	96	92	84	85	86
Town	90	93	130	137	139	100	96	98	97	98
Budapest	105	149	135	138	178	111	128	138	135	136
Gender of head										
Male	nd	118	145	148	157	nd	103	102	101	103
Female	nd	119	131	141	138	nd	86	90	97	87
Age of head										
18–35 years	92	108	133	174	164	91	94	93	100	92
36–59 years	82	122	164	156	168	109	107	107	102	106
Over 59 years	92	113	82	90	87	85	88	89	94	92
Education of head										
Primary	86	121	109	109	104	91	80	73	75	68
Vocational training school	80	74	106	103	105	96	96	92	89	91

Subgroup	Income inequalities within a given population subgroup for $e=0.73$ equivalent income personal distribution (MLD $\times$ 1000)					The ratio of the mean equivalent income of a given population subgroup as a percentage of the population mean ( $\lambda_k = \mu_k/\mu$ )				
	1987	1992	1996	2000	2003	1987	1992	1996	2000	2003
Secondary education	86	87	107	111	131	111	110	114	116	112
Higher education	81	120	109	156	151	129	150	163	159	168
Employment status of head										
The only worker	108	125	159	172	152	88	97	98	99	88
Working, with additional workers in the household	76	99	115	125	121	111	117	121	118	129
Inactive	262	155	176	188	163	53	73	65	69	60
Pensioner	76	89	97	98	79	75	75	82	86	81
Pensioner, but with some workers in the household	59	73	83	78	84	105	103	104	106	100
Number of children in the household										
0	102	123	129	128	147	105	104	112	108	111
1	79	107	144	156	133	105	103	100	102	100
2	76	103	129	118	143	95	101	96	89	92
3+	79	147	141	214	115	75	77	72	71	61
Ethnicity*										
Not Roma	nd	112	132	134	144	nd	102	103	103	104
Roma	nd	191	132	128	109	nd	62	46	45	49

Note: nd: no data. \*Data from 2001 rather than 2000 were used for calculations for the factor of ethnicity.

Source: 1987: HCSO Income Survey; 1992, 1996: Hungarian Household Panel; 2000, 2003: TÁRKI Household Monitor.

Comparing the explanatory values of the various dimensions, we find that the educational level of the household head and the labour market composition of the household have the greatest effect on income inequalities in 2003 as well (see *Table 4*). For the dimension of education, the inequality between groups is 25 per cent, which is essentially the same as in previous years. For the dimension of employment status, however, the corresponding figure is 20 per cent, which is an increase relative to all previous years in the study. In addition, income dispersion grew considerably as a function of the number of children in the household. In 2003 nine per cent of all inequalities are accounted for by the number of children. This is approximately the same as the explanatory value of ethnicity and settlement type, although these are clearly three entirely different dimensions. For the dimension of ethnicity,

exceptionally great differences can be found: the relative incomes of Roma families are the lowest compared to all other categories, reaching approximately half of the mean. Moreover, this population subgroup is also very homogeneous, since the dispersion of income within the group is rather small (MLD=0.109). We get a different picture for family size: households with three or more children lag far behind households with one or two children. While the latter have a relative income around the population mean, the mean equivalent income of the former is approximately 60 per cent of the population mean. The variable of settlement type shows several composition effects. This is also indicated by multivariate analyses, since the effect of settlement type usually disappears in analyses concerning income distribution or movement to below the poverty line.

**Table 4: Variance explained by between group inequality in various dimensions, 1987–2003**

	1987	1992	1996	2000	2003
MLDx1000	92	121	143	147	158
Part explained by between group inequality, % (total MLD=100)					
Settlement type	2	6	11	9	8
Gender of household head	nd	2	1	0	1
Age of household head	6	3	2	0	2
Education of household head	8	18	25	23	25
Employment composition of household	12	15	14	11	20
Number of children	5	3	6	5	9
Ethnicity	nd	4	7	7	9

*Note:* nd: no data. Total inequality = within group inequality + between group inequality. Cells contain percentage values explained by the latter.

*Source:* 1987: HCSO Income Survey; 1992, 1996: Hungarian Household Panel Survey; 2000, 2003: TÁRKI Household Monitor.

One of the most important consequences of the transformational recession following the regime change was the decrease in the employment level and the increase in inactivity. As a result, participation in the labour market polarized not only at the level of individuals, but also at the level of households. In the last period (2000–2003), however, positive tendencies seem to have developed in this respect. While total employment only slightly increased according to the macro data, this spread among households in a relatively advantageous fashion. According to the results of the Monitor

Survey in 2000, 56 per cent of the total population lived in households with heads in employment, and nine per cent lived in households with unemployed heads. By 2003 the proportion of the former had increased to 61 per cent and the proportion of the latter had decreased to six per cent. Similar restructuring took place in the number of workers in the household: the proportion of those whose households had at least one worker increased and the proportion of those whose households had no workers decreased. Similar trends can be observed with regard to the numbers and proportions of unemployed members in accordance with other sources of data on unemployment and employment.

### **Changes in the income composition of households**

It was mentioned above that the employment and income structure sections of the questionnaire were substantially modified for the latest Monitor Survey. Because of this fact the time-series analysis of our results on income composition calls for special caution. According to the data the proportion of households with market incomes decreased by a considerable amount (from 74 per cent to 64 per cent). Based on this result it is reasonable to assume that differences between the internal income structures of households belonging to various employment categories gradually grew. That is, while in households with workers it was the proportion of market incomes that increased in relative terms, in households with pensioner or inactive heads the relative proportions shifted towards incomes from social transfers. We suggest that the primary explanation for this restructuring is that pensioner households had increasingly limited access to market incomes, and therefore the proportion of pensions and other social transfers substantially increased within their total incomes. This indeed seems to be plausible: the proportions of market incomes within the household fell greatly in households with unemployed or inactive heads and the same observation also holds for pensioner households.

In characterizing the inequalities of the total income, the magnitude of the income dispersion before redistribution also plays a role. In addition to this we need to consider how much the dispersion of transfers coming from welfare redistribution contributes to the shaping of the total household income. Throughout the 1990s the dispersion of incomes before redistribution steadily increased, which was on the whole counterbalanced by public social transfers and social insurance benefits. This was true in 2003 as well, although in this year the dispersion of market incomes decreased relative to 2000 (see *Table 5*). This result, combined with the fact that the Gini coefficient for the total equivalent household income increased,

suggests that the inequality-reducing effect of welfare transfers was less pronounced in the period between 2000 and 2003 than in previous years.

**Table 5: Inequalities of household income components separately and combined, 1992–2003 (Gini coefficients, %)**

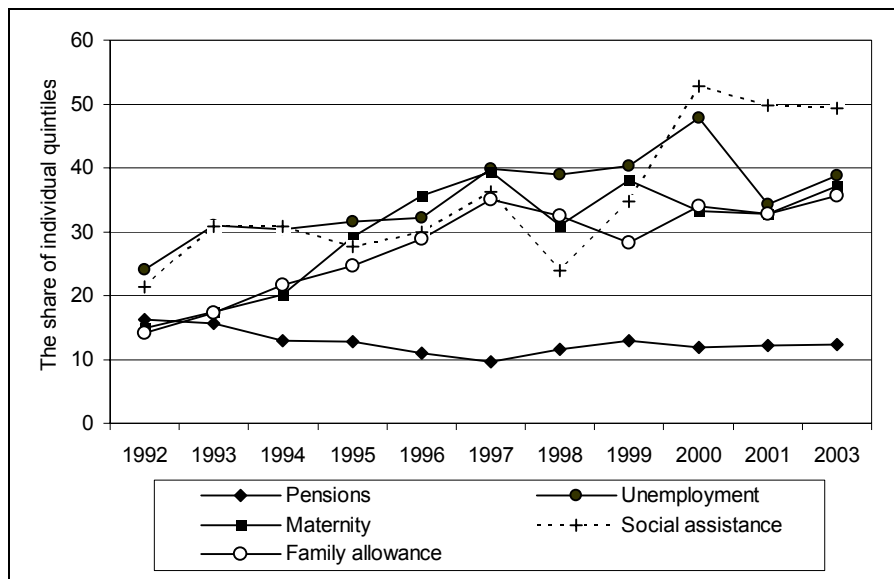
Income components	1992	1996	2000	2001	2003
Market incomes	46.6	50.1	54.8	52.4	45.2
Other non-public	64.3	65.8	70.1	73.9	85.9
Incomes before redistribution	47.2	50.4	55.4	53.3	53.5
Public social transfers	37.3	37.9	40.6	43.6	45.7
Social insurance benefits	31.8	37.9	37.1	39.8	39.1
Incomes before redistribution + public social transfers	45.1	48.4	53.3	51.6	53.5
Total income before imputation	29.5	30.8	33.0	33.1	36.7
Total equivalent income after imputation (household)	26.7	28.4	29.6	29.7	32.2

*Note:* The values of the Gini coefficient in the table represent the concentration of the non-zero incomes per consumer unit of households. The unit of measurement is the household. Pre-transfer incomes = market incomes (earned and from property) + other non-public transfers.

*Sources:* 1992, 1996: Hungarian Household Panel Survey (A)—national cross-section sample which does not include the surplus sample of Budapest, the size of the starting sample is 2056 households; 2000, 2001, 2003: TÁRKI Household Monitor.

Similarly to the practices of previous years, we have looked at the development of the incidence of each welfare transfer (i.e. its distribution across quintiles defined in terms of total income) for this period as well. The aim of this analysis was essentially to establish the magnitude of the ‘targeting’ of welfare transfers. During the 1990s we found that the targeting of all types of welfare transfer expanded, with the exception of pensions. That is, increasingly greater proportions of all unemployment benefits, maternity benefits, social assistance benefits and family allowances reached the bottom quintile. This tendency continued in the period between 2000 and 2003 (see *Figure 2*). In 2003 one eighth of all pensions, 35–40 per cent of all unemployment benefits, maternity benefits and family allowances, and almost half of all social assistance benefits reached the bottom quintile of the income distribution. Claims about the inappropriateness of the targeting of welfare transfers are therefore no longer valid—we must add, nevertheless, that the assessment of the ‘appropriateness’ of targeting will always be relative and a function of values and preferences.

**Figure 2: The share of the bottom income quintile from various welfare transfers, 1992–2000 (%)**



Source: 1992–1997: Hungarian Household Panel Survey (B)—complete sample, including the Budapest surplus sample, the size of the starting sample is 2600 households; 1998–2003: TÁRKI Household Monitor.

The last type of income to be considered in characterizing the magnitude of inequalities is imputed income. Imputed income can come from three main sources. An estimate of the total, undetailed income of an unavailable household member is supplied by someone with adequate knowledge of the finances of the household. If the income entry of the questionnaire is left blank by a respondent, the missing figures are imputed from the mean incomes of subjects belonging to the category closest to the respondent's. (The imputed income in this case is broken down into only two major aggregates: earnings and allowances.) Finally, imputation (on the basis of similarity again) can occur as a correction measure when data are available on a respondent's employment status and, possibly, on his or her share in a given income, but the supplied figure seems implausible for some reason. Imputed incomes of this kind constituted 13 per cent of all final household incomes in 2000 and 16 per cent in 2003. Imputation was somewhat more likely to be applied to higher deciles than to lower ones. Nevertheless,

imputation and income estimation as described above had the overall effect of decreasing inequalities in 2003, similarly to previous years (*Table 5*).

### **Two wage shocks and their possible effects**

Between 2000 and 2003 there were two exogenous wage shocks: the more than doubling of the minimum wage in 2000–2001 and the drastic rise of public sector wages in 2002. These two policy measures had significant effects of their own. As these are discussed in detail by Kézdi, Horváth and Hudomiet (2004, this volume), we shall omit the in-depth description of the events and we shall not cover the effects on the labour market here. It is worth reflecting, however, on the possible consequences of these regulations concerning the development of income distribution.

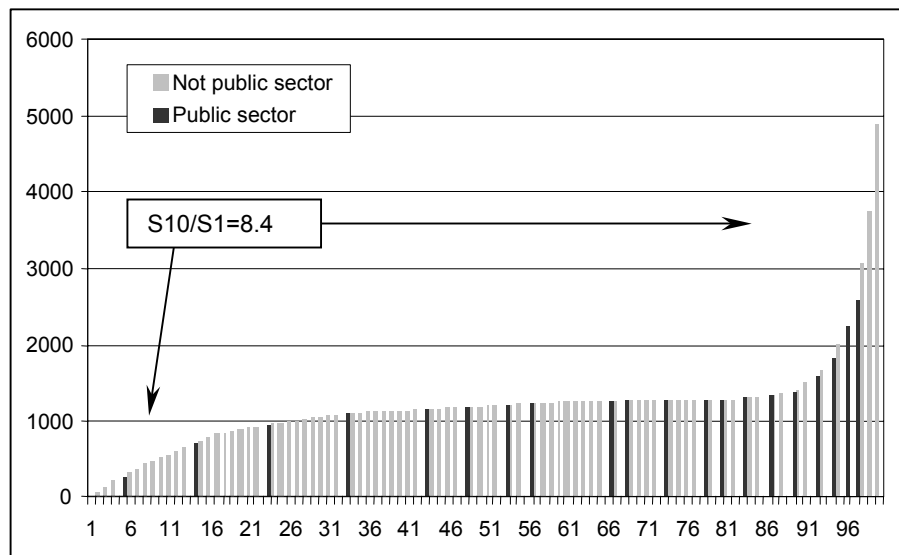
We have good reasons to expect that labour market effects of these wage shocks are translated via several mechanisms into income distribution consequences. First, the unit of observation of income distribution is the household, which has members other than the workers affected by the wage regulations. This may further complicate otherwise clear mechanisms. Second, income is more than wages: on average wages make up 55 per cent of net household incomes, although this varies greatly as a function of the number of workers in the household. In those where there is a working member in addition to the head, the proportion of wages is over 80 per cent, while in pensioner households with no working members the proportion of wages is only 4 per cent. In households with unemployed or inactive heads the proportion of wages in the total net income of the past year is still around 40 per cent.

For this reason, actual simulations on this subject cannot be done in a small database of the size of the Monitor Survey. We can, however, gather indications or stylized facts that do not contradict one or the other hypothesis. We know that the rise in the minimum wage had the effect of reducing inequalities in earnings in the labour market. The ratio of the mean gross earnings between the top and the bottom deciles of workers at companies with over 50 employees decreased from 9.3 in 1997 to 7.8 in 2001 (HCSO 2002). Also, the ratio of P90/P10 fell from 4.86 in 2000 to 4.18 in 2001 and 4.1 in 2002 (Kertesi and Köllő 2004). The results of the Monitor show that inequalities in the equivalent market incomes of households substantially decreased between 2000 and 2003: the Gini coefficient of the relevant incomes fell from 52 per cent to 45 per cent. This, of course, could be the combined outcome of more than one factor, but one of these may be a single condensing effect brought about by the minimum wage rise. Seen in a different context (which Kertesi and Köllő (2004) find the most important), the shock of the minimum wage rise diverted the economy from a certain



track of job creation. Although the rise in minimum wages reduced the inequalities in earnings and the incomes of workers already in the labour market increased and their inequalities decreased, the freeze in the expansion of the labour market could at some point widen the income gap between those in the labour market and those left outside. In the results of the Monitor Survey this is suggested, for instance, by the reduction in the proportion of households having market incomes, even if the primary cause of this is likely to be a fall in the employment rate of pensioners.

**Figure 3.1: Simple example demonstrating the possible inequality effects of a rise in public sector wages—distribution before the rise**

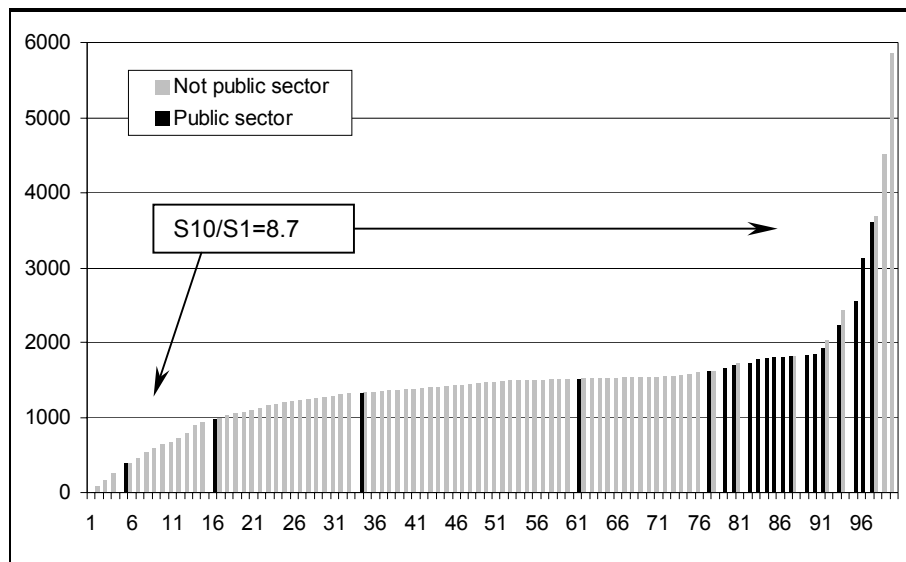


*Note:* Initial state: the proportion of public sector families in the population is 20 per cent. Their positions in the income quintiles are: 14, 17, 16, 22 and 31 per cent.  $S_{10}/S_1$ : ratio of average incomes of the two extreme deciles.

The situation is different with the drastic rise in public sector wages. Politicians and some analysts expected inequality-reducing effect of the rise in public sector wages (through the revision of badly-paid public sector workers' wages). This effect, however, is by no means self-evident, as can be shown by a thought experiment based on the results of the latest Monitor Survey. Let us assume that the government is dissatisfied with the current wages of public sector workers and would like to raise these wages substantially relative to the wages of other employees. At present (that is, prior to the assumed wage increase) around 20 per cent of households have heads working in the public sector. The positions of these households in the

income distribution would look something like *Figure 3.1* (if we pictured everyone ‘lined up’ in increasing order of income). Let us now suppose that there is a wage increase in the economy by at least 20 per cent, but the government applies double the normal factor to the wages of public sector workers. That is, the wages of public sector workers will rise by 40 per cent. Accordingly, public sector workers will be positioned differently in the new line-up: they will be crowded together a little higher up (see *Figure 3.2*). As a result, other things being equal, the decile ratio of all incomes (i.e. the value of  $S_{10}/S_1$  showing the ratio of the top and the bottom deciles) will rise from 8.4 to 8.7.

**Figure 3.2:** *Simple example demonstrating the possible inequality effects of a rise in public sector wages—distribution after the rise*



*Note:* Non-public sector workers get a pay rise of 20 per cent, public sector workers get a pay rise of 40 per cent. After the rise the positions of the public sector workers in the quintiles are 10, 13, 15, 25 and 38 per cent.  $S_{10}/S_1$ : as above.

This partly fictitious exercise is meant to demonstrate that a rise in public sector wages can in fact have the effect of increasing inequalities overall. It cannot be proven beyond doubt that this is what actually happened, but there is no satisfactory evidence for the contrary hypothesis either. A database substantially larger than the Monitor Survey would be needed to show the real effects of the rise in public sector wages beyond doubt, or at least with more confidence than we now have.

### International comparison

International comparison for the enlarged EU has been facilitated in recent years by the European Union's increasingly detailed statistical comparisons of the inequality systems of present and future member states as the joining process progressed. The studies have placed special emphasis on social exclusion and poverty (EC 2001, 2002; EUROSTAT 2002a, 2002b; for a summary see Lelkes 2003). The latest comparisons of this kind have followed detailed and unified methodological guidelines and have formed a more and more integral part of the regular system of monitoring and reporting, and have played a role in the process of planning and decision making. At the time of closing the current research, two kinds of datasets are available on Hungary. One is submitted to the Union for validation by the Hungarian official statistical system. The other is the results of the TÁRKI Monitor Survey (see *Table 6*). The two datasets differ from each other, which leads us to the conclusion that datasets must be selected with special caution, since this could in some cases lead to significant differences in interpretation when international comparisons are made.<sup>4</sup>

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<sup>4</sup> Depending on sources used, various independent country assessments in international projects draw different conclusions on Hungary. Relying on Luxembourg Income Study datasets, OECD comparisons put Hungary into a middle inequality group (Förster, 2000).

**Table 6: Income inequalities in the member states of the expanded European Union, 1999–2003**

	EU-15	New member states
More equal countries (S80/S20: between 3–4)	Denmark, Sweden, Finland, Germany, Austria, Netherlands, Luxembourg	Slovenia Czech Republic Hungary (HCSO: 3.4)
Moderately unequal countries (S80/S20: between 4–5)	Belgium, France Ireland, Italy	Poland Hungary (TÁRKI: 4.5) Cyprus, Malta
Unequal countries (S80/S20: above 5)	Great Britain Spain Greece Portugal	Lithuania Latvia Estonia

*Note:* On the basis of the distribution of personal equivalent incomes with modified OECD scale correction calculated on the basis of the net household incomes per year, in accordance with the proposal that this should be used for computing the so-called Laeken indicators (Atkinson *et al.* 2002).

*Source:* Hungary: HCSO communication, and internal estimate. Other: Dennis and Guio (2003a, 2003b).

If for instance we take the data supplied by the Hungarian Central Statistical Office, Hungary will be classed as a relatively equal country, immediately following the traditionally egalitarian Denmark and Sweden, as well as two new member states, Slovenia and the Czech Republic. If, on the other hand, we consider the results of the survey by TÁRKI, Hungary to be grouped with the countries of continental Europe at about the same level where French income inequalities are found. In any case, it can be seen in a wider perspective that Hungarian income distribution is not located at either extreme. The degree of inequalities is substantially greater in several current member states (especially in Mediterranean countries and in the U.K.), while especially in Scandinavian countries the indicators of income inequalities show substantially lower values

### Summary

The results of the development of the income distribution between 2000 and 2003 in Hungary are presented in our study. Summarizing our major findings, the following picture emerges.

The magnitude of measured inequalities appears to have grown considerably between 2000 and 2003. The inequality between households in terms of incomes per capita increased from 7.5 to 8.4 measured as the ratio of the mean incomes of the top and the bottom deciles. The interpretation of

the increase and speculation as to whether it should be seen as a long-term trend or a one-time surge should be treated with caution.

At the preparation stage of the most recent wave of research, special attention was paid to improving the quality of data collection and a lot of effort was put into getting the best possible income data. To achieve these aims the questionnaire had to be modified and some components of the questioning methodology had to be changed. We believe that the results indicating an increase in income inequalities could, in part, be a consequence of this change, since the 'captured' incomes, we conjecture, are now more likely to include both higher income tiers and entrepreneur incomes than in previous years.

According to our in-depth analyses the increase in inequalities occurred primarily in the top income decile and, within that, probably in the top five per cent. We have two theoretically plausible explanations for this. First, the steady growth of the economy in the past six or seven years (even though its rate has slowed down in recent years) could have created a situation where the growth continued to advantage the top income groups above all. Second, the effects of the drastic regulations in income policy passed in recent years might have been felt at the time of data collection. The large-scale rise in public sector wages, for instance, might have crept into the income distribution.

In characterizing the internal structure of inequalities, differences in employment status and level of education continue to play a decisive role. However, while throughout the 1990s the education level of the household head and, within that, the differential returns to earlier investments in education played an increasingly important role, employment polarization rejoined the factors determining inequalities in such a way that its effect appeared to diminish by the end of the period.

Other international comparisons on the subject also call attention to the fact that it is essential to repeatedly check datasets and to carry out data collection with great care. Every available source agrees that inequalities are substantially greater in several current and joining members of the Union than in Hungary, but alternative data sources (as was seen in the discussion) class our country with different inequality groups. In an international comparison Hungarian income distribution is not extreme, neither among old members, nor among joining members of the Union. With respect to new member states, the Hungarian indicators of income distribution are higher than in the Czech Republic and Slovenia, but lower than in Poland or the Baltic countries.

In summary, we cannot exclude the possibility that inequalities actually increased in the period studied. Whether we saw a new phase of the regime change is too early to say. This could only be verified or disproved on the

basis of the results of the next Monitor Survey. Nevertheless, if we do have a fourth phase, it will undoubtedly differ in character from previous episodes. At the turn of the 1980s and 1990s we saw the institutional reorganization of the economy and the transformational recession behind the increase in inequalities. In the mid 1990s there was a one-time drastic interference in social policy (the stabilization package of 1995). We now see something different: inequalities are shaped coincidental of facts of growth, the restructuring of the economy, the business cycle, and by specific demographic processes.

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## Appendix

The definitions of inequality measures used in the study.

### 1) Variance based measures

Gini coefficient:  $G = (1/2n(n-1))\sum_{i=1, \dots, n} \sum_{j=1, \dots, n} |y_i - y_j|$ .

Generalized Entropy Measure:  $GE(\alpha) = (1/(\alpha^2 - \alpha))[(1/n)\sum_{i=1, \dots, n} (y_i/\mu)^\alpha - 1]$ , if  $\alpha \neq 0, 1$

$GE(0) = MLD = (1/n)\sum_{i=1, \dots, n} \log(\mu/y_i)$ , if  $\alpha = 0$  and

$GE(1)$  (Theil index)  $= (1/n)\sum_{i=1, \dots, n} (y_i/\mu)\log(y_i/\mu)$ , if  $\alpha = 1$ .

$GE(2) = 1/\mu [1/n (\sum_{i=1, \dots, n} (y_i - \mu)^2)]^{1/2}$

Atkinson index:  $A_\varepsilon = 1 - [(1/n)\sum_{i=1, \dots, n} (y_i/\mu)^{1-\varepsilon}]^{1/(1-\varepsilon)}$ , if  $\varepsilon \geq 0$ , but  $\varepsilon \neq 1$

while  $A_\varepsilon = 1 - \exp[(1/n)\sum_{i=1, \dots, n} \ln(y_i/\mu)]$ , if  $\varepsilon = 1$  and  $\exp(\cdot) = e^{(\cdot)}$ ,

where  $n$  is the number of observations in the sample,  $y_i$  is the income of the  $i$ -th unit,  $\mu$  is the mathematical mean of the total  $y_i$ , while  $\alpha$  and  $\varepsilon$  are parameters applied depending on the weight to be given to the welfare levels of observation units located at different levels of the income distribution. Where  $\alpha$  is assigned a smaller value, the parametrized measures will be sensitive to the bottom end of the income distribution. Conversely, with higher values of  $\alpha$  the measures will be sensitive to the top end of the income distribution.

### 2) Distribution based measures

P10: the ratio of the top cut-off point of the bottom income decile relative to the median (P50) income, %.

P90: the ratio of the bottom cut-off point of the top decile relative to the median (P50) income, %.

S1, S5, S6 and S10: the shares of the bottom, the fifth, the sixth, and the top income deciles from the total income.

Robin Hood index: the sum of deviation from the decile ratios expected for equal distribution.

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