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Main Characteristics of the Hungarian Income Inequality as Shown by the Data of the Income Surveys Carried out by the CSO in the Last Half Century

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MŰHELYTANULMÁNYOK

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ÖDÖN ÉLTETŐ – ÉVA HAVASI

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Main Characteristics of the Hungarian Income Inequality as Shown by the Data
of the Income Surveys Carried out by the CSO in the Last Half Century

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Main Characteristics of the Hungarian Income Inequality as Shown by the Data of the Income Surveys Carried out by the CSO in the Last Half Century

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Abstract

The study shortly surveys the main characteristics of the income surveys carried out by the Hungarian CSO in the last half century, then examines how the incomes of the households and especially the income inequalities developed in this period. The changes in the income inequality are shown in several inequality measures in the study. The emphasis is on the Theil inequality measure, because it can be unequivocally additively decomposed into parts representing the differences in the mean income between the various social groups and their weights on the one hand and the average within group inequalities on the other. The decomposition enlightens how and to what extent the various personal, household and regional characteristics contribute to the income inequality within the population and how the extent of this contribution changes in time and because of what causes. Based on the data of the last two income surveys the study examines the contribution to the inequality not only on the basis of the per capita income, but also on that of the equivalent income. Finally, on the basis of the huge amount of empirical data the study makes a few summary statements.

Keywords: income statistics, income inequality, index numbers

JEL: D310, R200

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A jövedelmi egyenlőtlenség jellemzői Magyarországon az elmúlt 50 év KSH adatfelvételei alapján

Éltető Ödön – Havasi Éva

Összefoglaló

A tanulmány először röviden áttekinti a magyar KSH által az utóbbi fél évszázadban végrehajtott jövedelmi felvételek főbb jellegzetességeit. Majd bemutatja, hogyan változott a lakosság jövedelmi helyzete és különösen a jövedelmek egyenlőtlensége a vizsgált időszakban. Az egyenlőtlenség mérésére a tanulmány többféle mutatót is ismertet, ezek közül a hangsúly a Theil-féle egyenlőtlenségi mutatón van, amely egyértelműen additív módon felbontható a különböző társadalmi csoportok átlagjövedelmében mutatkozó különbségekből és a csoportok súlyaiból adódó rész- és a csoportokon belüli egyenlőtlenségek összegére. A felbontás eredményeképpen vizsgálható, hogy az egyes személyi, háztartási és regionális jellemzők milyen mértékben járulnak hozzá a lakosságon belüli jövedelmi egyenlőtlenséghez, valamint az is, hogyan változnak ezek a hozzájárulások az időben. Az utóbbi két jövedelmi felvétel adatait felhasználva a tanulmány e két időpontra nemcsak az egy főre jutó, hanem az ekvivalens jövedelem egyenlőtlenségét is vizsgálja. A rendelkezésre álló bő adatforrás és a hosszú szakmai tapasztalat feljogosítja a szerzőket arra, hogy a tanulmány végén néhány összefoglaló megállapítást tegyenek.

Tárgyszavak: jövedelemstatisztika, jövedelmi egyenlőtlenség

JEL kódok: D310, R200

INTRODUCTION

The study was written in order to give a short historical overview of the income inequalities in Hungary in the last half century on the basis of the data of the income surveys carried out by the CSO. Though since the beginning of the nineties information on the income situation of the population are available not only from CSO sources, we rely –while appreciating the significance of alternative sources (primarily the data of the TARKI institute) - in our discussions on the data of the income surveys of the CSO which are based on large-scale samples and cover a rather long period. Even within the CSO, too, there several other data available on the incomes of the households, first of all from the household budget surveys (HBS) carried out annually since 1949, but these other surveys do not aim at getting information primarily on the size and distribution of the income of the households and besides, considering the sample sizes they can not compete with the purposeful income surveys. Though in this study we focus on the income inequalities, as a frame for interpretation we give a short survey of the historical development of the level of the incomes.

To present a period covering half a century in a single segment involves a lot of difficulties, because concepts with similar content may have different meaning, significance in different periods. Even such simple categories like town or village have different meaning today than twenty or fifty years ago. The content and role of educational attainment of people has also changed. The social weight and possibilities of people with educational level of six classes in elementary school or maturity in secondary school fifty years ago can hardly be compared with contemporary people having educational attainment less than elementary school or „only” maturity. The same applies to changes in the social role of the number of children in the family. As a consequence of a gradual decrease in the number of children nowadays families upbringing three children are already considered as large families. The stratum of families tackling one child only goes on increasing, but the meaning and significance of having only one child in the family is far away from that when it appeared in the Hungarian society.

When comparing incomes in time obviously consumer price indexes have to be used. However, the income calculated in such a way and made comparable in real value in constant prices does not contain the effects originating from the changes in the role of the income in cash. In a social environment where the production for self consumption, works and services within and between households, where the role and weight of „free of charge” state/social allotments and services undergo essential proportional shift as compared to incomes in cash, there the consumers price index satisfactory in itself for measuring and interpreting the „income”.

In spite of and beside these difficulties comparisons in time have their role and importance. Never before were prepared such long time series for presenting the incomes of and income inequalities within the households. These are now presented to our readers in the hope that even if to a small extent only we can contribute to a more exact survey and understanding of the income situations in Hungary in the past half century.

1. A SHORT SUMMARY OF THE INCOME SURVEYS OF THE CSO CARRIED OUT FROM 1959 TILL PRESENT DAYS

Although economists, sociologists have already long ago dealt with the problem of income differences between countries and between households within a country, their regular and systematic statistical registration began in Hungary only at the end of the fifties of the last century, in 1959.

On the initiative and with the guiding of János Árvay in 1959 the CSO collected empirical data on the production results and inputs of small agricultural holdings in order to prevail the income situation of peasant's farms. The first large-scale income survey based on interviewing the households was carried out in 1960 on a sample of 18 thousand households selected at random from the list of the 1960 census. However, this survey was restricted to worker and employee households only.

The first income survey representing all private households was carried out in 1963 on a sub-sample of the microcensus of that year covering 15 thousand households selected at random. This data collection can be considered as the first large-scale income survey representing all private households of the country. As to the incomes the reference year was 1962. Succeeding the CSO till 1988 inclusive carried out quinquennially the actual income survey, the common characteristics of which can be summarized as follows:

- the samples were territorial probability samples, generally subsamples of this actual
- the sample sizes were 15-20 thousand households (once 26 thousand);
- to co-operate in the survey has always been free, in spite of this the non-response
- the SCO sent an income questionnaire to the employers of all employees and members of co-operatives inquiring all incomes paid by the employer to the person in question in the reference year. The data on earnings and on certain other incomes shown in the results are based decisively on these data reported by the employees;
- incomes from selling or self-consumption of agricultural products produced on household plots or on private farms were calculated multiplying the detailed

inquired quantities by suitable profit keys. These keys were determined using agricultural macrostatistical data.

These quinquennial income surveys due to their characteristics listed above reflected rather reliably and precisely the income level, income situation and income distribution of the households in the reference year.

In the course of these quinquennial income surveys covering a quarter of a century, data on social benefits in kind and on social services were also collected in a few occasions. Their money value was estimated, thus the so called total income (money income plus the value of social benefits in kind) of the households was also determined. The total income of a household thus included the money value calculated on the basis of macrostatistical expenditures of the medical, educational, social, cultural benefits and services utilized free of charge or at reduced price by the household. On the whole it can be said that incomes in kind calculated in such a way fulfilled an equalizing effect on the living conditions of the households, because the differences on the basis of the estimated total income proved smaller than taking into account „only” the money incomes.

After the change in the economic and social system it was not any more possible for the CSO to require data referring to individual specified employees from the employers. The number of employees in state enterprises kept decreasing which in itself made the validity of employer's statistics worse. The new regulations referring data protection also prohibit direct linking of institutional and personal data. The situation was made also more difficult by the increasing mistrust and rejecting attitude of the population towards personal inquiries and especially when sensitive personal data such as income data are requested. The introduction of the personal income tax and thereby the possibility of punishment for tax evasion considerably contributed to the rejecting attitude of people towards inquiries of such types.

As a consequence of the changes in the circumstances the income survey carried out in 1993 was a failure. The collected data could not be published partly because of the fairly high non-response rate and partly because of the unreliability of the recorded income data. It became evident that we can not get reliable income data in the „traditional” way. Realizing this the practice came into existence to carry out income surveys based on interviewing households as part or subsample of an inquiry made compulsory by law (census, microcensus) and the primary information obtained by asking the households should be improved through various supplementary and imputing methods to improve the validity of the income data. This practice was followed in 1996 and lastly in 2005, when the income surveys were carried out on 25 percent subsamples of the actual 2 percent microcensus sample and the questionnaires of the microcensus and the income survey were filled out simultaneously. To co-operate in the income survey was, naturally voluntary in these cases, too, but the fact that the interviewer turned to the questions of the income survey after having filled out the obligatory microcensus

questionnaire reduced in itself the chance of a non-response. In the practice of household (or personal) interviews one of the greatest advantages to be successful is being „inside the threshold”. This advantage is secured by connecting the voluntary income survey with an obligatory census or microcensus.

In the last income surveys 82-83 percent of the sampled households co-operated in the survey, a rather favorable rate in international practice. A further advantage of connecting the income survey with a microcensus (or census) consists of the fact that thus quite a number of useful background data (sex, age, educational attainment, occupation, assignment, type and branch of the place of work, dwelling conditions etc.) make it possible to correct the original sample weights through a post-stratification (calibration). Besides, well-founded substituting and imputing procedures can also be applied. Such income imputations based on microsimulation and making use of partly the microcensus data of the non-,respondents, partly macrostatistical or large-scale surveys data were applied already in the course of processing the 1996 income survey data, but even more intensively in connection of the 2005 income survey. Though this procedure was received some doubts, still the substituted data assure more realistic results, than those biased ones because of conceals and refusals. Naturally, we have to be conscious of the fact that in the near future we will not be able to produce such reliable data on the income of the households as before the change of the economic and social system.

2. MEASURING THE INCOME DISTRIBUTION OF HOUSEHOLDS

The primary aim of income surveys is to give a many-sided picture of the income position of various population groups and strata, of the level and distribution of incomes, the role of various income sources in living conditions. In fortunate case the distribution of incomes can be well described by a probability distribution function. In such a case all characteristics of the distribution can easily be calculated using the analytical form and the parameters of the distribution function. In the sixties of the last century the Hungarian income distributions could generally be well approximated by a two- or three-parameters lognormal distribution. In 1977, on the other hand, a logistic or named alternatively the generalized sech distribution described better the income distribution of the active and all households (Éltető-Vita {1982}).

An income distribution is generally characterized by the proportion of persons (households) belonging to concentrated or more detailed income categories. The income categories can be formed on the basis of the income per household, per capita or per the so called equivalent (per consumption unit) income. The income per household is applied rather rarely, because the actual income level closely depends on the size and composition of the

household. Therefore it is generally accepted to use some equivalence scale to determine the income categories, although there are no unified, generally accepted rules how to form the equivalence scale. Most often the so-called OECD1 or OECD2 scale is used, but many countries apply their own national equivalent scales. In our study the consumption unit refers consistently to the OECD1 equivalence scale, according to which the first adult person=1 unit, other adult persons=0.7 unit and a child=0.5 unit. Note that the per capita income is equivalent to a special equivalent scale, where all persons have the same equivalence unit, namely 1.

Instead of characterizing the income distribution by the proportions of units getting into fixed income categories the so-called decile distribution is also often used to describe the distribution of incomes. The decile distribution shows the shares from the total income of each 10 percent of the income units ranged by the size of the per capita or equivalent income. The decile distribution is often completed by the shares of the upper and bottom 5 percents in order to get a more exact picture of the income situation of the poorest and the richest. However, because of the essentially smaller number of cases in the sample, the income data of these upper and bottom 5 percents are often not reliable enough. In researches based on small samples even the data of the deciles are doubtful, therefore it would be more fortunate to use the data obtained from the quintile distribution, but in practice this advice is followed rarely. The most „popular” inequality measure is namely q_{10} , which is based on the decile distribution.

In what follows we try to present beside the decile, quintile, quartile distributions by means of quite a number of inequality measures and indexes our knowledge obtained on the income distribution and income inequality within the Hungarian population in the past half century and in more details in the past ten-twelve years.

3. INDICATORS OF THE INCOME INEQUALITY

Since the interest of economists, experts in social sciences, economic and social politicians turned to researches in the income distribution of the population, one of the most important problems consisted in how to measure in a relevant way the inequality of the incomes. In the last century a lot of proposals came up how to measure the inequality. In what follows we undertake without claiming completeness to present only those used in practice most frequently. Here we note that István György Tóth in his book (Tóth [2005]) discusses the inequality measures in two large groups: 1. measures of distribution type, 2. measures of dispersion type. In his book a considerable part deals with sensibility analyses. According to

his calculations the various measures react differently to income changes in the different parts of the distribution. All inequality measures discussed by him react most sensibly to income changes in the upper income decile. Here the Theil-index reacts rather vigorously, while the Gini-index less significantly. In what follows we present several inequality measures, first of all those for which long time series of estimates are available and thus they may play important role in our analyses.

a) *The Gini inequality measure (G)*

One of its definition is:

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|}{2n(n-1)\bar{y}}$$

Its geometric interpretation is: the double of the area bounded by the Lorenz-curve and the diagonal line. One of its disadvantageous property is that income distributions with significantly different character may have the same G value. The value of this measure is generally estimated on the basis of the decile distribution in such a way that the Lorenz-curve is substituted by strait lines inside the deciles. (This method of estimation proved significant for us, because individual data are available from the income surveys in 1996 and 2005 only.

$$\hat{G} = 0,9 - 0,2 \sum_{i=1}^9 D_i, \text{ where } D_i = \sum_j^i d_j$$

that is D_i is the cumulative sum of the decile values.

As a consequence of substituting some curve sections by straight lines \hat{G} slightly underestimates the real value of G. Naturally, if G is estimated not on the basis of cumulated decile values, but for instance on the cumulated twentieths, we get a more exact estimate.

b) *The relative dispersion in percent*

$$\text{rel v} = \frac{\sigma}{\bar{x}} \cdot 100$$

where σ denotes the dispersion of the weighted per capita (or equivalent) incomes.

c) *Maximal equalizing rate (Robin Hood-index)*

This measure based on the decile distribution shows how many percent of the incomes should be taken off the deciles sharing more than 10 percent of the incomes and be given to deciles sharing less than 10 percent in order to get an entirely uniform distribution.

$$E = 100 \sum (d_i - 0,1), \text{ if } d_i \geq 0,1$$

d) q_{10} – the quotient of the averages (shares) of the upper and bottom deciles

$$q_{10} = \frac{d_{10}}{d_1}$$

e) q_5 – the quotient of the averages (shares) of the upper and bottom quintiles

$$q_5 = \frac{d_9 + d_{10}}{d_1 + d_2}$$

f) *Éltető-Frigyes income inequality measures (Éltető-Frigyes [1968])*

$$v = \text{HIM (Hungarian Inequality Measure)} = \frac{\bar{x}_f}{\bar{x}_a}$$

where \bar{x}_f denotes the income average of those having income higher than the overall average;

\bar{x}_a is the average income of those having less income than the average; $v_f = \text{HIM}_f = \frac{\bar{x}_f}{\bar{x}}$ is the

inequality of the upper part of the distribution; $v_a = \text{HIM}_a = \frac{\bar{x}}{\bar{x}_a}$ is the inequality of the lower part of the distribution; $v = v_f v_a$.

It can be mentioned that professor M. Zenga more than 40 years after the study by Éltető and Frigyes was published proposed the reciprocal of v , or more exactly $1 - 1/v$ as an inequality measure (Zenga 2007)].

g) variance of the logarithm of the incomes

$$\sigma_{\ln}^2 = \frac{\sum_{i=1}^n w_i e_i (\ln x_i - \bar{\ln x})^2}{\sum_{i=1}^n w_i e_i}$$

where x_i denotes the per capita or equivalent income in the i th household of the sample, $\bar{\ln x}$ is the average of the logarithm of incomes; n is the number of households in the sample; e_i is the sum of equivalence values in household i (in special case the size of the i th household).

h) *The Theil inequality measure (T)*

$$T = \frac{1}{N} \sum W_i n_i \frac{x_i}{\bar{x}} \ln \frac{x_i}{\bar{x}}$$

T weights the logarithm of $\frac{x_i}{\bar{x}}$ by the share in total income.

For a number of the above measures we dispose of long time series, although in most cases for the per capita incomes only

4. THE LEVEL OF INCOMES AND CHANGES IN THE INCOME INEQUALITY IN TIME

Before analyzing in details the income inequalities first we show shortly how the level of the incomes changed in time, because it is not at all indifferent at what income level the inequalities are realized.

In Table 1. the changes in the income level and in their dynamics between 1962 and 2004 are shown. In Table 2., on the other hand, the values of the inequality measures can be seen. Thus the connection between the two can be followed up.

Table 1.

Level and dynamics of the per capita incomes between 1962 and 2004

| Denomination | 1962 | 1967 | 1972 | 1977 | 1982 | 1987 | 1995 | 2004 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|
| Per capita net income in nominal value | 1 075 | 1 138 | 1 579 | 2 322 | 3 385 | 5 262 | 17978 | 65550 |
| Per capita income in 2004 prices | 38883 | 40311 | 52037 | 64260 | 67413 | 73699 | 46661 | 65550 |
| Dynamics of real incomes (1962=100.0) | 100.0 | 103.7 | 133,8 | 165,3 | 173,4 | 189,5 | 120.0 | 168,6 |
| Dynamics of real incomes (preceding income survey = 100) | 100.0 | 103.7 | 100.8 | 123.5 | 104.9 | 109.3 | 63.3 | 140.5 |

Source: Income surveys of the CSO, 1962-2004

The size of the per capita income in real value kept increasing from the sixties till the end of the eighties once more dynamic, another time less dynamic. As to the level of living of the households the year 1987 was decisive, because afterward, still in the years before the change in the economic and social system, the living conditions turned unfavorable. Because of the economic recession attachable to the change in the economic and social system the real value

of the incomes decreased radically till the second half of the nineties, then stagnated and in the turning of the years 1997-1998 began to increase again. In 2004 the per capita monthly income was 66 thousand Forint, in real value still less, than in the eighties.

In the period of the second five year plan, between 1961 and 1965 the per capita national income increased by 20 percent, the real income of the population by 18 percent. Afterwards, in the period of the third five year plan, between 1966 and 1970 the pace of the development became even faster. The per capita national income increased by 37 percent and the real income of the population followed this increase.

In 1972 the per capita income increased in real value by 33 percent as compared to the previous ten years. While the level of the incomes of the households increased radically, the income inequality measures showed a strong decrease between 1962 and 1967, then between 1967 and 1972 a mild increase.

In the period of the next five year plan (1971-1975) the per capita national income increased further by 33 percent and though the increase in the incomes of the households was smaller than that, still the increase in the level of living was also spectacular. In this period the social security became a civic right and the pension system uniform. All these together with the general increase in the income level resulted in a perceptible decrease of the inequality of incomes.

Since the end of the seventies the increasing dynamics of the incomes came to a stop, although the per capita incomes – in a smaller pace – went on increasing till 1987. The low level and decreasing tendency of the inequality measures which characterized the seventies turned between 1982 and 1987 and began to increase.

The inequality of incomes went on further increasing in the period of fall of the incomes of the households. While in 1987 the mean income in the upper income decile of the population exceeded by less than five times that in the lowest decile, this rate became at least sevenfold since the middle of the nineties.

In 1995 the per capita income in the private households reached in real value at most 63 percent of that level in 1987 and at the same time the sizes of the income inequality measures surpassed all earlier values.

The values of income inequality measures in 2004 show no genuine changes as compared to those in the middle of the nineties. The strong increase in the income level was not followed by that in the income inequalities.

Table 2.

Values of some inequality measures between 1962 and 2004

| Measure | 1962 | 1967 | 1972 | 1977 | 1982 | 1987 | 1995 | 2004 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Robin Hood | 18.4 | 16.0 | 16.6 | 15.0 | 14.9 | 17.0 | 21.0 | 21.4 |
| Q ₁₀ | 5.75 | 4.61 | 4.93 | 4.13 | 3.80 | 4.71 | 7.55 | 7.55 |
| V (HIM) | 2.09 | 1.92 | 1.96 | 1.84 | 1.82 | 1.99 | 2.36 | 2.41 |
| T | 0.112 | 0.093 | 0.097 | 0.077 | 0.072 | 0.103 | 0.176 | 0.184 |
| G | - | - | 0.232 | 0.212 | 0.206 | 0.236 | 0.296 | 0.312 |

Source: Income surveys of the CSO, 1962-2004.

One of the methods of analyzing the income inequalities is the investigation of incomes by deciles. Since the middle of the nineties the value of q_{10} remained 7.55 (that is the average income of those in the upper decile surpassed by seven and half times that in the lower decile). Or put it in an other way: while the average income of those in the first decile was about one third of the national average, that in the upper decile surpassed the national average by two and a half times. The income of 60 percent of the population was below the national average.

In 1967 (for 1962 no such data are available) the income of those belonging to the lowest decile was about one third of the national average very similarly to the present situation. At the same time the income in the upper decile amounted to one and a half of the average in contrast to the today's rate of two and a half. At the same time 80 percent of the population has an income less than the average. In 1967 the value of q_{10} was 4.6, that is this global measure of income differences was much smaller than in the present. However, the peculiar feature that the jump in the income is characteristic to those in the decile was true in that time, too.

The middle of the seventies was a period of income level up combined with a general increase in the income level. The income of those in the lowest decile approached half of the national average and the mean income of those belonging to the 6th decile was already very near to the national average. Such equity of the incomes parallel with a significant improvement of the standard of living could not be experienced in the last half century, neither before nor afterward in Hungary.

In the period preceding immediately the change in the economic and social system (data referring to 1987) parallel to a further improving – though in a smaller pace – of the living conditions the relative income position of the poor and those in the middle class changed

unfavorably. The position of those with higher income, on the other hand, improved somewhat and within them of those belonging to the upper income decile considerably improved.

Since the nineties till the present days, in a period of decrease, then increase again of the level of living, too, prevailed the worsening income situation of the poor and the lower middle class and improvement surpassing the average of the income position of those with highest income.

Table 3.

Size of the per capita income and its ratio to the average income by income deciles between 1967 and 2004

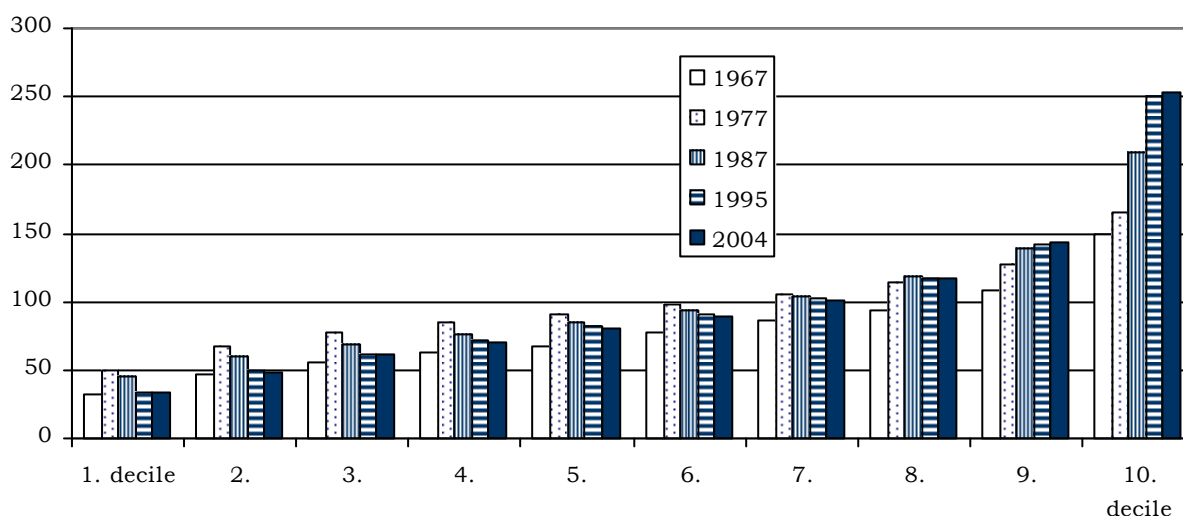
| Dee nomination | 1967 | 1977 | 1987 | 1995 | 2004 |
|---|--|-------|-------|--------|--------|
| Per capita net mean income in nominal value | 1 138 | 2 322 | 5 262 | 17 978 | 65 550 |
| | Ratio of per capita income by income deciles (percent) | | | | |
| Income in the 1st decile | 32.1 | 49.1 | 44.7 | 33.1 | 33.6 |
| Income in the 2nd decile | 46.9 | 68.0 | 60.1 | 50.3 | 48.9 |
| Income in the 3rd decile | 56.2 | 77.4 | 68.8 | 61.9 | 60.8 |
| Income in the 4th decile | 62.5 | 84.9 | 76.8 | 72.1 | 70.7 |
| Income in the 5th decile | 67.9 | 91.3 | 85.1 | 81.8 | 79.8 |
| Income in the 6th decile | 78.1 | 98.1 | 94.0 | 91.1 | 89.6 |
| Income in the 7th decile | 85.9 | 105.4 | 104.5 | 102.2 | 101.5 |
| Income in the 8th decile | 93.8 | 114.1 | 118.0 | 116.6 | 117.6 |
| Income in the 9th decile | 108.6 | 127.0 | 138.7 | 141.3 | 144.1 |
| Income in the 10th decile | 149.2 | 164.9 | 209.3 | 249.6 | 253.6 |

Source: Income surveys of the CSO, 1967-2004

In 1995 and 2004 the average income in the lowest decile was one third of the national average in contrast with the 49 percent in 1977 and 45 percent in 1987. Since the second half the seventies it can be observed that the ratio of the incomes in the deciles from the first to the seventh to the national average changed unfavorably. In the cases of those belonging to the eights, ninths, tenths deciles the situation was just the opposite. The size of the sift was most spectacular in the case of those with highest income.

Figure 1.

**The rate of the per capita incomes to the average income
by income deciles, 1967-2004**



To sum up the series of the income inequalities we can state that the medium large income inequalities in 1962 showed a definite decrease to 1967, then in the next five years began to rise again. The seventies are a period of the increase and leveling of incomes. The inequality, according to all measures except G, reached its lowest value in 1982. There was a considerable increase to 1987 which continued with increasing dynamic till 1995. From 1995 to 2004 the inequality measures do not indicate noticeable increase.

In the following we investigate within the national tendencies also the income tendencies by the type of the settlement and between some main social strata.

Tables 4. and 5. show for the period 1987-2004 the changes in the Gini-measure and in the ratio of the income averages of the upper and the lower deciles and in some further dimensions: in groups formed by the economic activity of the head of the household and the number of dependent children.

Table 4.

The value of G by some household characteristics, 1987-2004

| Household groups considered | 1987 | 1995 | 2004 |
|--|-------|--------|-------|
| Households living in Budapest | 0.252 | 0.336 | 0.362 |
| Households living in country towns | 0.234 | 0.291 | 0.355 |
| Households living in villages | 0.225 | 0.257 | 0.355 |
| Household head is employed | 0.244 | 0.315 | 0.407 |
| Household head is pensioner or dependent | 0.212 | 0.2,57 | 0.348 |
| Household head is self-employed or entrepreneur | - | 0.286 | 0.388 |
| Household with no dependent child | 0.231 | 0.266 | 0.296 |
| Households with three or more dependent children | 0,221 | 0,286 | 0.385 |
| All households | 0,236 | 0,296 | 0,312 |

Source: Here and in the next table: Income surveys of the CSO, 197-2004.

Table 5.

The value of q₁₀ by some household characteristics, 1987-2004

| Household groups considered | 1987 | 1995 | 2004 |
|--|------|------|------|
| Households living in Budapest | 4.9 | 10.0 | 7.8 |
| Households living in country towns | 4.5 | 7.2 | 7.3 |
| Households living in villages | 4.5 | 5.9 | 6.6 |
| Household head is employed | 4.8 | 7.8 | 7.1 |
| Household head is pensioner or dependent | 4.0 | 6.3 | 7.7 |
| Household head is self-employed or entrepreneur | 7.4 | 11.2 | 8.7 |
| Household with no dependent child | 4.5 | 6.0 | 6.8 |
| Households with three or more dependent children | 4.4 | 6.1 | 5.2 |
| All households | 4.71 | 7.55 | 7.55 |

Deviating from the situation referring to the total population G shows in all considered household groups a definite increase of the inequality from 1987 to 1995 and from 1995 to 2004, whereas the ratio of incomes of those in the 10th decile to those in the first decile (q_{10}) took a different form in the same period. While the increase of the inequality from 1987 to 1995 is very definite without exception, from 1995 to 2004 the inequality increased in some of the groups and decreased in some others.

Investigating the role of the type of the settlement in the income inequality affords to give a more tinted interpretation for the content of our inequality measures and to dwell on the modification in the meaning of our notions which are dealt with in time as identical. This way we can enlighten on the important fact that the change in time of the inequalities are related not only to changes in the level and distribution of the incomes, but also to modification of the weight and content of the used categories.

Table 6.

Distribution of inhabitants by the type of settlements*, 1967-2004

| Type of settlement | 1967 | 1977 | 1987 | 1995 | 2004 |
|--------------------|-------|-------|-------|-------|-------|
| Budapest | 17.9 | 19.7 | 18.6 | 18.6 | 17.4 |
| Country towns | 23,9 | 30,4 | 37.7 | 44.6 | 47.8 |
| Villages | 58,2 | 49,9 | 43.7 | 36.9 | 34.8 |
| Together | 100,0 | 100,0 | 100,0 | 100,0 | 100.0 |

*The type of settlement is based always on the ranging valid in the given year
 Source: Territorial data of the CSO, 1967-2004.

In 1967 18 percent of the population lived in Budapest, 24 percent in country towns and 58 percent in villages. The rate of those living in villages went on decreasing, in 1977 the half of the population still lived in villages, in our days a little bit more than one third. The rate of those living in country towns is of opposite tendency, unbrokenly increasing, in 2004 nearly the half of the population lived in country towns.

The ratio of those living in Budapest within the whole population increased till the end of the seventies, then stagnated and nowadays a decreasing tendency. Today nearly the same number of people lives in the capital, than in the second half of the sixties.

Table 7.

**Size of the per capita incomes and their ratio to national average income
by types of settlement, 1967-2004**

| Denomination | 1967 | 1977 | 1987 | 1995 | 2004 |
|---|---|-------|-------|--------|--------|
| Per capita average income (in nominal value) | 1 138 | 2 322 | 5 262 | 17 978 | 65 550 |
| | The size of the per capita income by types of settlement | | | | |
| Budapest | 1 334 | 2 619 | 5 990 | 22 573 | 83 566 |
| Country towns | 1 124 | 2 297 | 5 250 | 17 646 | 66 209 |
| Villages | 1 084 | 2 242 | 4 694 | 16 063 | 55 607 |
| | Ratio of per capita incomes to the national average by types of settlements | | | | |
| Budapest | 117.2 | 112.8 | 113.8 | 125.6 | 127.5 |
| Country towns | 98.8 | 98.9 | 99.8 | 98.2 | 101.0 |
| Villages | 95.9 | 96.6 | 89.1 | 89.3 | 84.8 |

Source: Income surveys of the CSO, 1967-2004

Whilst the distribution of the population according to the types of the settlements changed considerably, the legal position of the Hungarian settlements also changed. Within the rather stable number of settlements more and more villages obtained the state of a town. In 1980 there were altogether 96 towns and cities in Hungary, today their number is two and a half times more than formerly. In respect of the size and the level of development our towns show in our days a larger level of homogeneity than ever before. This presents itself also in the income situation of those living in towns and cities.

The income disadvantage of people living in villages as compared with the national level was characteristic during the whole period considered, however, parallel to the increase of the number of towns and cities and the population living there, the income disadvantage of people living in villages become more accentuated.

As was pointed out earlier the values of the two income measures G and q_{10} increased unambiguously in respect of the types of settlements from 1987 to 1995 similarly to the tendency in the whole country, between 1995 and 2004, however, changed in a contradictory manner. (Unfortunately, for earlier years no data are available in such decomposition.)

The income inequality within households living in Budapest went on increasing in the period of the last two income surveys on the basis of the G index, while on the basis of the inequality measure indicating the ratio in the average incomes of the upper and lower deciles decreased. In the case of households living in country towns the value q_{10} barely changed in this short period, while the G index increased vigorously. What indicates these differences in the inequality measures?

The Gini index is a neutral measure, it does not take into account that the income differences in what part of the income scale are manifested, whether they are shown between the high and low income groups or within these groups. In the case of the measure q_{10} the population and within them those living in Budapest, in country towns and in villages is divided into ten groups equal in number and disregarding the differences within the groups and between the majority of groups we investigate only the ratio of the incomes in the highest and the lowest deciles. Even in this latter case we disregard the differences within these extreme groups or take them into account only in the sense that size of the income of all persons influences the average income or their share, respectively. The Gini measure, on the other hand, takes into account all income differences irrespectively whether they occur among those with medium income or among the rich. When calculating this index all income differences are judged identically.

The Gini-index shows an unambiguously increase between 1995 and 2004 both on national level and by types of settlements. This indicates that the income differences, the variance of the incomes went on increasing. This tendency was most accentuated among those living outside the capital. This means that the in number increasing population living in country towns is less homogeneous in respect of their incomes than it was formerly. In the case of those living in villages the income differences increased even if their share in the population decreased.

The share of the households living in Budapest in the total income of the population surpassed their share in the number of the population both in 1995 and 2004. The share of those living in country towns in the total income of the population although increased, but is still less than their share in the in the population. The share of those living in villages in the total income of the population was far below their share in the population both in 1995 and 2004 and the lag is of increasing tendency.

The change of the shares in total income of those belonging to the highest and lowest income deciles can be examined from two points of view. It is worth investigating how large is this share on the basis of the nation-wide deciles and how large is it when the deciles are formed by types of settlements (this can be seen in Table 8. in columns showing data by the two types of deciles).

The proportional share of those living in Budapest in total income decreased in such a way that they were present in less proportion both in the upper and in the lowest deciles calculated on national basis in 2004 than formerly. For a part of the poor living in Budapest the leaving of the capital was the solution in the worse economic situation. A part of the wealthy households living in Budapest also leaved the capital and settled in its agglomeration making use of the advantages of the capital and the country life simultaneously. Thus within the population of the capital an income leveling can be observed. The income inequalities increased not between the poorest and the wealthiest, but rather among the other groups.

Within the income increase proportionate to the growth of the number of people living in country towns first of all the increase in the rate of the prosperous households within the country-wide deciles is characteristic. The increase in the number of those living in country towns can be attributed partly to declaring legally towns a number of more developed villages, partly to the moving of well-to-do people from villages to towns. Both causes resulted that from among the people living in country towns less households belong to the national-wide first decile and more to the national highest decile. Beside these peculiarities the income heterogeneity of those living in country towns further increased.

In the case of people living in villages the moving away of the more prosperous households and besides the breaking away of the villages which got the rank of a town are unambiguously outlined. At the same time on account of the villages belonging to the agglomeration of the capital and those preferred by well-to-do households it can be observed that the share of people living in villages among those with highest income surpasses their proportional number. As a result of all of these the worsening income position of households living in villages is associated with strong income differentiation. The income inequality within the villages in our days approaches that within the country towns. Among those living in villages we can observe in increasing number extremely poor and rich households. This is reflected in the increase of the values of G and q_{10} .

Table 8.

The value of q_{10} and the share in total income by types of settlements and within these by national and own deciles, 1995-2004 (percent)

| | | |
|--|-------------|-------------|
| Household groups examined | 1995 | 2004 |
| The value of q_{10} | | |
| Households living in Budapest | 10.0 | 7.8 |
| Households living in country towns | 7.2 | 7.3 |
| Households living in villages | 5.9 | 6.6 |
| The rate of those living in Budapest in the total population | 18.6 | 17.4 |
| The share of those living in Budapest in total income | 23.3 | 22.3 |
| The share of the lowest decile in total income (country-wide deciles) | 2.3 | 1.1 |
| The share of the highest decile in total income (country-wide deciles) | 43.9 | 39.6 |
| The share of the lowest decile in total income (own deciles) | 2.7 | 3.3 |
| The share of the highest decile in total income (own deciles) | 26.9 | 25.9 |
| The rate of those living in country towns in the total population | 44.6 | 47.8 |
| The share of those living in country towns in total income | 43.7 | 48.3 |
| The share of the lowest decile in total income (country-wide deciles) | 3.3 | 3.1 |
| The share of the highest decile in total income (country-wide deciles) | 23.7 | 24.9 |
| The share of the lowest decile in total income (own deciles) | 3.4 | 3.4 |
| The share of the highest decile in total income (own deciles) | 24.3 | 24.9 |
| The rate of those living in villages in total population | 36.9 | 34.8 |
| The share of those living in villages in total income | 32.9 | 29.5 |
| The share of the lowest decile in total income (country-wide deciles) | 4.1 | 5.5 |
| The share of the highest decile in total income (countrywide deciles) | 13.2 | 15.3 |
| The share of the lowest decile in total income (own deciles) | 3.7 | 3.6 |
| The share of the highest decile in total income (own deciles) | 21.7 | 23.7 |

Source: Income surveys of the CSO, 1995-2004.

Returning to the inequality measures in Tables 4. and 5. the role of the economic activity of the household head in the income inequality increased dynamically from 1987 to 1995 and also from 1995 to 2004. The income inequality explaining role of above all the inactive state of the household head became stronger between 1995 and 2004. The income circumstances of the population living in inactive households shows now a more heterogeneous picture than in the middle of the nineties. The number of the dependent children in households with inactive head is increasing, because mothers obtaining child-care assistance do not belong to active earners, neither workless or unemployed heads of households, nor those living from casual work. At the same time income differences among the pensioners increased.

The income differentiating role of high number of children in the household went on increasing, while the value of q_{10} decreased according to the data of the last two income surveys, that is the income difference between the highest and lowest income deciles of the large families decreased as compared to the situation in 1987.

Already the interpretation of the values of G and q_{10} calls the attention that the understanding of and giving numerical values to inequalities require a wider frame of interpretation and intense attention.

From the decomposition of a further income inequality measure, the T measure we can obtain further view-points to understanding the income inequalities within the population and to get numerical values for the roles played by various household characteristics in the inequality. The next chapter deals with these questions.

5. THE DECOMPOSITION OF THE T-MEASURE INTO BETWEEN GROUPS AND WITHIN GROUPS INEQUALITIES

From among the inequality measures listed in chapter 3. only the T -measure introduced by H. Theil disposes of the important feature that it can be decomposed unambiguously and additively to between groups and within groups inequalities.¹

Henry Theil developed his inequality measure on the basis of information theoretical considerations. If y_i denotes the share of the i th person in a country or in a populating group from the total income and N denotes the number of persons, then

¹ Formally the log variance is also decomposable, but σ_{\ln}^2 is the variance of not the incomes, but the logarithm of incomes, therefore this decomposition can not be interpreted as inner and outer inequalities. The rel variance is also decomposable, but in one of the members the sum of weights do not add to one.

$$H(y) = \sum_{i=1}^N y_i \ln \frac{1}{y_i}$$

is the entropy of the rates of shares, which attains its maximal value $\ln N$, if everybody has an equal share from the total income. Therefore the value of the inequality measure

$T = \ln N - H(y)$ will be 0 in the case of the maximal entropy, that is if the incomes are distributed entirely equally. T can be interpreted as a message transforming the population rates into income rates.

In what follows we sum up a few expectable and important properties of the T inequality measure.

- a) T is not sensitive to the choice of the unit of the income, $T(y) = T(ky)$, that is $T(y)$ is a 0 grad homogeneous function in y .
- b) The inequality increases if the same amount of income is distributed among more persons

$$T_1(y) > T(y), \text{ if } N_1 > N.$$

- c) If $y_i > y_j$ and the income of person j increases at the cost of person i , that is

$$y'_i - y'_j < y_i - y_j$$

and in the meantime the total income and the incomes of other persons do not change, then the value of T decreases (Dalton-Pigou transfer principle).²

- d) Let the population consist of mutually exclusive groups. Then

$$T = \ln N - H(y) = \sum_{g=1}^G Y_g \ln \frac{Y_g}{N_g / N} + \sum_{g=1}^G Y_g \left[\sum_{i \in S_g} \frac{y_i}{Y_g} \ln \left(\frac{\frac{y_i}{Y_g}}{\frac{1}{N_g}} \right) \right] \quad /1/$$

where Y_g denotes the share of group g from the total income, that is

$$Y_g = \frac{S_g \bar{y}_g}{N \bar{y}}.$$

When decomposing T the first part gives the inequality arising from the differences in the group averages and from the weights of the groups, while the second part the average inequality within the groups.

In the case of income distributions defined by a distribution function the value of T can, generally, be calculated from the parameters of the function. For example in the case of a two-parameter lognormal distribution

² As the referee of our study pointed out T not only fulfils the principle of the regressive transfer, but is also sensitive to the position of the transfer on the income scale.

$$\left[f(z) = \frac{1}{\sigma\sqrt{2\pi z}} \exp\left(-\frac{1}{2} \frac{(\ln z - \mu)^2}{\sigma^2}\right) \right]$$

$T = \frac{1}{2} \sigma^2$. For the Pareto distribution ($f(x) = \alpha x^{-\alpha-1}$, $x \geq 1$)

$$T = \frac{1}{\alpha - 1} \ln \frac{\alpha}{\alpha - 1}$$

The decomposition in the case of the inequality of the per capita incomes can be written as

$$T = \sum_{g=1}^G \frac{N_g}{N} \frac{x_g}{\bar{x}_g} \ln \frac{\bar{x}_g}{\bar{x}} + \sum_{g=1}^G \frac{N_g}{N} \frac{\bar{x}_g}{\bar{x}} T_g \quad /2/$$

Where $N = \sum W_i n_i$; W_i = the multiplying factor at the household i , n_i denotes the number of members in household i ; x_i = the per capita income of household i ; N_g = the effective number of members in group g ; \bar{x}_g denotes the average per capita income in group g ; T_g = the value of the T measure within the group g , that is

$$T_g = \sum_{k \in S_g} \frac{x_k}{\bar{x}_g} \ln \frac{x_k}{\bar{x}_g}.$$

Dividing the first member of the decomposition /2/ by T we obtain the percentage contribution of the given grouping (or more groups together) to the inequality measure T. These percent contributions are shown as explaining powers in a number of tables.

If we analyze the factors influencing the inequality of not the per capita, but the equivalent (per consumption unit) income, then in formula /2/ instead of \bar{x} and \bar{x}_g the averages \bar{y} and \bar{y}_g should be written.

The significance of the decomposability of the T inequality measure consists in the fact that by the help of it we can recognize those factors (groups of factors), which contribute to the highest degree to the income differences within the population. The households of a country can be divided into mutually exclusive subgroups on the basis of very much criteria. From the point of view of the results it is not at all indifferent how detailed or contracted groups are applied. The more detailed we divide the totality of households, or on the basis of the more criterions are formed the groups of the households, generally the greater part of the T inequality measure can be explained by the differences in the income averages of the groups such formed. Including a further grouping criterion in the decomposition can never decrease the explained part of the inequality, but it increases it by smaller or greater degree. However, the sample size and the number and detailedness of the household and personal characteristics observed in the income survey limit the possible detailedness of the decomposition. In deciding of what and how many characteristics are worth trying when decomposing T

experience and economic consideration play role. On the basis of long experiences it can be said that it is not worth forming very small groups, because from the decomposition of the T-measure in /2/ it is clear that the weights of the groups contribute significantly to the explaining power of the differences in group averages. Therefore, even in the case if average income of a small group differs significantly from the total average, very probably it will play an insignificant role only in the decomposition of T.

In order of to avoid the effect of possible arbitrariness of the groupings elected when decomposing T, we applied two types of grouping. The effects of the groupings on the decomposition of the T-measure was calculated on the basis of the data of four income surveys carried out in 1983, 1987, 1996, and 2005, respectively. This makes it possible to investigate whether the contribution of the various factors to the inequality changed and if yes, to what extent. In the case of the last income surveys we calculated the effect of the various factors on the T-measure determined not only on the basis of the per capita income, but of the equivalent incomes, too.

The factors and their variants at the first type of grouping are:

- the size of the household: 1, 2, ..., ≥ 6
- the number of dependent children under 20 years: 0, 1, 2, 3, ≥ 4
- the educational attainment of the head of household:
 - elementary school
 - skilled worker, vocational school
 - secondary school
 - higher education
- age group of the head of household: ≤ 29 , 30-39, 40-49, 50- 59, ≥ 60 .

Table 9. shows the explaining power of the differences in the group averages (and in the weights of the groups) of the above groupings in the decomposition of the T-measure.

The role of the various household characteristics in the income inequality was investigated not only within all households, but also separately within the subpopulation of households with active earner. In this latter case, however, data were available from the last two income surveys only.

As is evident from comparing tables 9. and 10. the size of the household and the number of dependent children differentiate the per capita incomes more considerably within the households with economically active head, than in the case of all households. The explaining power of the age groups and the educational attainment of the head of household, on the other hand, practically do not depend on whether considering all households or the economically active households only. The same is true for the common explaining power of the four characteristics considered.

Table 9.

**The explaining power of some household characteristics in the inequality
of the per capita incomes when decomposing the T- measure,
1982, 1987, 1995, 2004 (percent)**

| Characteristics and combinations | 1982 | 1987 | 1995 | 2004 |
|---------------------------------------|-------|-------|-------|-------|
| 1. Size of household | 11.8 | 7.2 | 8.5 | 8.4 |
| 2. Number of dependent children | 24.3 | 12.5 | 11.5 | 12.4 |
| 3. Age group of the household head | 15.9 | 9.2 | 2.6 | 4.2 |
| 4. Educational attainment of the head | - | - | 13.9 | 20.1 |
| Characteristics 1. and 2. | - | - | 12.4 | 13.1 |
| Characteristics 1. and 3. | 30.8 | 18.9 | 12.8 | 14.0 |
| Characteristics 1. and 4. | - | - | 23.6 | 28.3 |
| Characteristics 2. and 3. | 38.2 | 21.7 | 14.8 | 15.2 |
| Characteristics 2. and 4. | - | - | 28.4 | 33.7 |
| Characteristics 3. and 4. | - | - | 18.6 | 23.6 |
| Characteristics 2., 3. and 4. | - | - | 29.6 | 35.4 |
| Characteristics 1., 2., 3., and 4. | - | - | 32.1 | 38.3 |
| T-measure | 0.072 | 0.103 | 0.176 | 0.182 |

Note: data for 1982 and 1987 are incomplete.

Source: Income surveys of the CSO, 1982-2004

Table 10.

The explaining power of some household characteristics in the inequality of the per capita income of the economically active households when decomposing the T-measure, 1996 and 2004 (percent)

| Characteristics and their combinations | 1995 | 2004 |
|---|------|------|
| 1. Household size | 14.1 | 14.0 |
| 2. Number of dependent children | 13.0 | 14.4 |
| 3. Age group of the household head | 2.6 | 3.1 |
| 4. Educational attainment of the household head | 13.6 | 19.9 |
| Characteristics 1. and 2. | 17.2 | 17.9 |
| Characteristics 1. and 3. | 16.4 | 17.3 |
| Characteristics 1. and 4. | 25.9 | 30.4 |
| Characteristics 2. and 3. | 14.7 | 15.5 |
| Characteristics 3. and 4. | 27.8 | 33.3 |
| | 17.2 | 23.7 |
| | 33.0 | 37.8 |

Source: Income surveys of the CSO, 1995, 2004

The role of the household size in differentiating the incomes decreased till the beginning of the nineties, then increased somewhat, but its role falls far behind the explaining power of the number of children in the household and even much more the educational attainment of the head of household. The latter dominates in explaining the income differences. In 2004 this single factor explained one fifth of the income inequality within both the total population and the active households.

It is worth investigating further whether we get other results and if yes to what extent, if the T-measure indicating the income inequality is decomposed not on the basis of the per capita income, but of the equivalent incomes.

It is a general experience, not only in Hungary, but in other countries, too, that equivalent incomes indicate lower inequality, than per capita incomes, because the various equivalence scales strive to take into account just the differences in the needs of persons of different age and activity as well as the savings of larger households in housing and other expenses. Table 11. presents the results of the decomposition of the T-measure of the equivalent incomes by the same characteristics used in the decomposition of the inequality of the per capita incomes in

1995 and 2004 for active, inactive and all households. We disregarded to show the same for „other inactive” and „dependent” households, because on account of their insignificant number this seemed justified.

Table 11.

Percent rates obtained from the decomposition of T showing the inequality of the net equivalent incomes, 1995, 2004

| Characteristics and their combinations | 1995 | | | 2004 | | |
|--|------------|-----------|------|------------|-----------|------|
| | Active | Pensioner | All | Active | Pensioner | All |
| | Households | | | Households | | |
| 1. Household size | 7.3 | 10.2 | 3.9 | 5.4 | 3.0 | 2.2 |
| 2. Number of dependent children | 6.9 | 10.8 | 5.8 | 7.9 | 2.7 | 2.3 |
| 3. Age group of household size | 1.3 | 7.8 | 1.3 | 2.3 | 3.3 | 3.7 |
| 4. Educational attainment of head | 14.5 | 12.1 | 14.6 | 20.3 | 21.9 | 22.6 |
| Characteristics 1. and 2. | 9.1 | 12.0 | 6.4 | 8.0 | 3.8 | 4.1 |
| Characteristics 1. and 3. | 8.9 | 12.1 | 6.7 | 8.2 | 5.6 | 7.3 |
| Characteristics 1. and 4. | 20.6 | 21.0 | 19.4 | 25.2 | 25.5 | 25.4 |
| Characteristics 2. and 3. | 8.2 | 12.1 | 8.2 | 7.9 | 4.3 | 7.1 |
| Characteristics 2. and 4. | 22.4 | 21.8 | 22.4 | 26.7 | 24.2 | 25.7 |
| Characteristics 3. and 4. | 16.6 | 18.6 | 17.6 | 23.1 | 26.1 | 24.8 |

| | | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| Characteristics 1., 2. and 3. | 10.7 | 13.8 | 9.5 | 10.0 | 6.0 | 9.1 |
| Characteristics 1., 2. and 4. | 24.0 | 23.2 | 23.3 | 28.0 | 25.2 | 27.3 |
| Characteristics 1., 3. and 4. | 22.8 | 23.4 | 22.1 | 27.3 | 28.2 | 27.8 |
| Characteristics 2., 3. and 4. | 23.4 | 23.3 | 23.9 | 28.0 | 25.2 | 27.3 |
| Characteristics 1.,2.,3. and 4. | 26.3 | 25.7 | 26.0 | 30.4 | 29.0 | 30.4 |
| The value of T | 0,170 | 0.088 | 0.157 | 0.166 | 0.115 | 0.173 |

Source: Income surveys of the CSO, 1996, 2005

Since the beginning of the nineties the differences in the ages of the household heads do not contribute considerably to the differences neither of the equivalent nor of the per capita incomes. The income differentiating role of the age began to decrease since the end of the seventies on account of the reshaping of the social security system, the unification of the pension system and the general entitlement to receive pension. The income lag of the old is getting less typical; in fact since the nineties the per capita income of those living in households with heads 60 years old or older exceeds the national average. This results primarily from acquiring the entitlement to receive a pension, from pensions securing safe subsistence and from the ceasing of supporting obligation.

From income point of view the active life period is the most favorable period. The members of households with a head 50-59 years old live not only nowadays, but lived in the former decades, too, in income situation far exceeding the average one. It is characteristic already to this life period that the supporting obligation decreases, while in the case of active earners this is the most profitable period both professionally and considering their labor – market position. In the case of pensioners their pensions did not yet loose much from its purchasing power. The double income source, too, is characteristic to this life period. Though the ratio of people living in households with old heads is increasing, this increase lags far behind the decrease of people living in households with a young head.

Table 12.

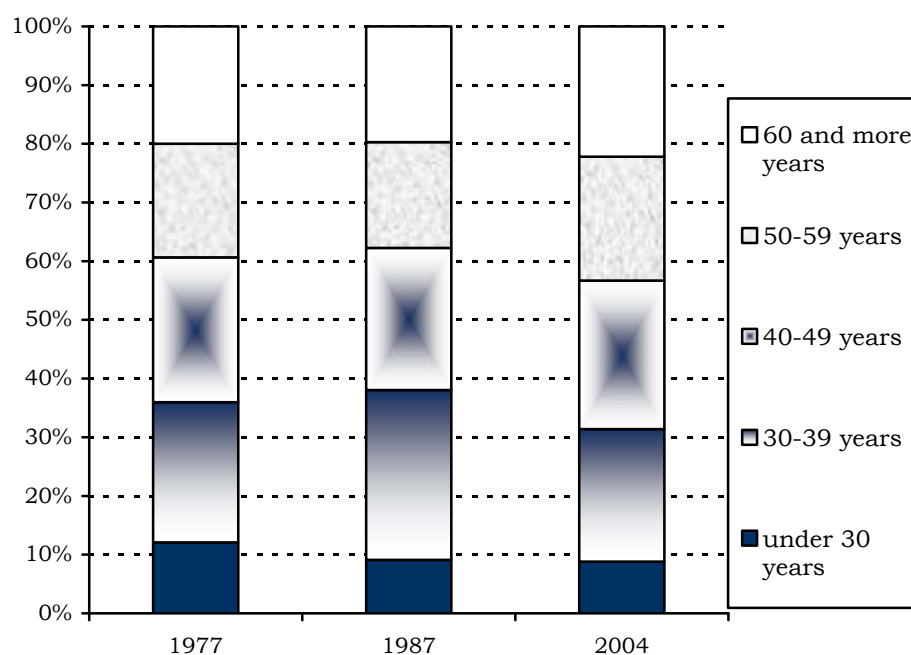
Size of the per capita income and its ratio to the national average according to the age groups of the household head, 1977, 1987, 2004.

| Age group (year) | 1977 | | 1987 | | 2004 | |
|------------------|-------------------------------|------------------------|-------------------------------|------------------------|-------------------------------|------------------------|
| | Size of the income (Ft/month) | National average = 100 | Size of the income (Ft/month) | National average = 100 | Size of the income (Ft/month) | National average = 100 |
| Below 30 | 1 980 | 85.3 | 4 568 | 86.8 | 60 599 | 92.4 |
| 30 - 39 | 2 090 | 90.0 | 4 672 | 88.8 | 56 037 | 85.5 |
| 40 - 49 | 2 451 | 105.6 | 5 601 | 106.4 | 62 122 | 94.8 |
| 50 - 59 | 2 869 | 123.6 | 6 377 | 121.2 | 79 642 | 121.5 |
| 60 and more | 2 170 | 93.5 | 5 022 | 95.4 | 67 693 | 103.3 |
| Together | 2 322 | 100.0 | 5 262 | 100.0 | 65 553 | 100.0 |

Source: Income surveys of the CSO, 1978, 1988, 2005.

Figure 2.

Distribution of persons according to the age group of the household head, 1977, 1987, 2004



One of the most conspicuous features of the decomposition the income inequality characterized by the T-measure is that the impact of the number of the dependent children on the income inequality shows a strongly decreasing tendency in time. This did not occur on account of the improvement of the income situation of the households with several children, but can be attributed decisively to the fact that the weight of people living in households with children decreased continuously. (This can be seen in Tables 13. and 14.) In 1972 38 percent of the population lived in childless households, today lives more than the half (54 percent). Within the households with children those with three or more dependent children represent a relatively steady rate, around 9 percent.

Table 13.

Distribution of the persons according to the number of dependants under 20 in the household between 1972 and 2004 (percent)

| Denomination | 1972 | 1977 | 1987 | 1995 | 2004 |
|---------------------------|--------------|--------------|--------------|--------------|--------------|
| No dependent child | 38.0 | 41.6 | 40.2 | 43.7 | 54.0 |
| One dependent child | 29.2 | 24.8 | 23.4 | 23.9 | 20.0 |
| Two dependants | 23.5 | 25.0 | 28.3 | 23.6 | 17.0 |
| Three and more dependants | 9.3 | 8.6 | 8.3 | 9.3 | 9.0 |
| <i>Together</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> |

Source: Income surveys of the CSO, 1972-2004.

Table 14.

The size of the per capita income in percent of the average according to the number of dependants under 20 years between 1972 and 2004 (percent)

| Denomination | 1972 | 1977 | 1987 | 1995 | 2004 |
|--------------------------|--------------|--------------|--------------|--------------|--------------|
| No dependent child | 106.3 | 107.0 | 114.2 | 118.9 | 117.5 |
| One dependent child | 103.0 | 101.1 | 103.2 | 97.1 | 93.6 |
| Two dependants | 92.6 | 93.4 | 87.2 | 84.3 | 80.4 |
| Three dependants | 78.4 | 80.4 | 69.9 | 45.1 | 46.4 |
| Four and more dependants | 46.3 | 57.7 | 50.7 | 45.1 | 46.4 |
| <i>Together</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> |

Source: Income surveys of the CSO, 1972-2004.

It was true already in the seventies, but since the eighties it is even more characteristic that the per capita income in childless households exceeds that of those living in households with children. The relative income position of those living in households with greater number of children improved somewhat from 1972 to 1977, then till today the inverse situation prevailed. In 2004 the per capita income of those living in households with four or more dependent children did not reach even the half of those living in childless households,

The per capita income of persons living in childless households in 2004, similarly to the situation in 1995, exceeded the national average by nearly 20 percent, whereas in the seventies the difference was below 10 percent. Since the middle of the nineties the per capita income was below the national average even in households with one dependent child. Advancing in time since the seventies of the last century till nowadays it can be seen that the income position of those living in households with one child, two, three, four children had a deteriorating tendency.

We can experience a similar situation in the case of households with active earner and with different number of children. From 1977 to 2004 the income rate in percent of the average of those living in households with three or more children decreased from 71 to 59 percent, in the case of households with two children from 90 to 80 percent. At the same time the rate of those living in households with children, especially with more children considerably decreased in the period considered, the distribution of the population by the number of the children in the household became more even. However, because in the decomposition of the Theil inequality measure not only the differences in the group averages play a role, but also the weights of the groups, that is why the inequality explaining power of the number of the children in the household could decrease.

Table 15.

**According to the educational attainment of the head of household
in 1995 and 2004 (percent)**

| Educational attainment | 1995 | 2004 |
|-------------------------|--------------|--------------|
| Elementary school | 40.5 | 30.4 |
| Vocational school | 23.7 | 29.1 |
| Secondary school | 22.6 | 24.4 |
| High school, university | 13.2 | 16.1 |
| <i>Together</i> | <i>100.0</i> | <i>100.0</i> |

Source: Income surveys of the CSO, 1995, 2004.

Changes in the group weights played a decisive role also in the fact that in the last quarter of the century the income inequality explaining power of the differences in the educational attainment of the household head increased considerably. In 2004 20 percent of the inequality of the per capita incomes and 23 percent of the equivalent incomes could be explained by the differences in the educational attainment of the household heads. The educational attainment plays a decisive role in the change of the inequality independently of the changes in the group weights.

If we take into account beyond the household characteristics examined so far the economic activity of the household head and the type of the settlement, where the household lives, even a greater part of the inequality can be explained. Within the activity we applied the following groups: intellectual employees, physical worker employees, entrepreneurs, members of co-operatives, pensioners, persons on child-care fee or assistance, unemployed, dependents and others. Both in the case of the educational attainment and the age group of the household head three groups were differentiated: elementary school, secondary and higher education, and young (under 30 years), middle-aged (30-59 years) and elderly (60 years and older). In the case of the number of children the differentiation went up to three and more children, while up to four and more persons in the case of the household size. In the calculations we used the combinations of the two groupings. Table 16. shows the single and combined contributions to the value of the T-measure of these groupings. (The contribution of some groupings could not be calculated for some years on account of missing data. Because the factors examined are not independent from each other, the combined explaining powers are, naturally, smaller than the sum of the contributions of the single factors.

For the type of the settlement no adequate calculations are available for earlier years, its role, however, was already discussed in connection with the values of the inequality measures G and q_{10} .

It is remarkable that the explaining power of the economic activity of the household head shows increasing tendency in time. This is connected partly with the increase of the weight of the group of entrepreneurs after the change in the economic and social system, but at the same time the income differences between groups with various position, qualification and educational attainment also significantly increased.

Table 16.

Per capita income inequality explaining power of some household characteristics, 1982, 1987, 1995, 2004 (percent)

| Characteristics | 1982 | 1987 | 1995 | 2004 |
|--|------|------|------|------|
| 1. Economic activity of the household head | 8.9 | 9.4 | 15.6 | 16.8 |
| 2. Educational level of the household head | - | - | 13.7 | 17.2 |
| 3. Age group of the household head | 15.9 | 9.2 | 2.6 | 2.1 |
| 4. Type of the settlement of the home | - | - | - | 6.5 |
| 5. Number of children and household size | - | - | 12.4 | 12.4 |
| 1., 2., 3., 4. and 5. characteristics together | 48.8 | - | 43.3 | 41.4 |

Source: Income surveys of the CSO, 1982-2004.

The high and in time increasing explaining power of the educational attainment is evident, although here it is somewhat smaller than shown in the earlier table because of the more concentrated groups. The explaining power of the here applied concentrated grouping by the number of children and household size did not change in the last two income surveys. Through increasing the number of characteristics we succeeded in explaining the income inequality characterized by the T-measure to a higher degree than before. In 2004, for example, to 41 percent.

Table 17.

The income inequality explaining power of some household characteristics through decomposing the T-measure (two-variable composite effects), 2004 (percent)

| Combinations of variables | Contribution to T |
|---|-------------------|
| 1. and 2. Economic activity and educational attainment of the household head | 27.5 |
| 1. and 3. Economic activity and age group of the household head | 23.1 |
| 1. and 4. Economic activity of the household head and type of settlement | 29.2 |
| 1. and 5. Economic activity of household head, number of children and size of household | 23.2 |
| 2. and 3. Educational attainment and age group of the household head | 21.2 |
| 2. and 4. Educational attainment of the head and type of settlement | 29.1 |
| 2. and 5. Educational attainment of the head, number of children and size of household | 21.4 |
| 3. and 4. Age group of the head and type of settlement | 6.7 |
| 3. and 5. Age group of the head, number of children and size of household | 12.7 |
| 4. and 5. Type of settlement, number of children and the size of household | 14.1 |

Source: Income survey of the CSO, 2004.

When examining the effects of the double groupings it is noteworthy that variables 1. and 4. and 2. and 4. , respectively, that is the type of the settlement and the economic activity and educational attainment of the household head show the greatest contributions (29.2 and 29.1 percent) to the value of T. At the same time variables 3. and 4. that is the age group of the household head and the type of the settlement contribute to the income inequality to a minimal degree, 6.7 percent only. The pairs of variables 3. and 5. and 4. and 5. respectively, that is the age group of the household head and the type of the settlement on the one hand and the household size and the number of children together and the type of the settlement, on the other contribute to the inequality also to a rather small degree, to 23 and 14 percent, respectively.

Table 18.

The joint explaining power of household characteristics when decomposing the T inequality measure (joint effects of three and more variables), 2004 (percent)

| Combinations of variables | Contribution to T |
|---|-------------------|
| 1., 2., 3. Activity , educational attainment and age group of the household head | 28.9 |
| 1., 2., 4. Activity, educational attainment of the household head and type of settlement | 28.8 |
| 1., 2., 5. Activity, educational attainment of the household head, number of children, size of h.h. | 36.1 |
| 1., 3., 4. Activity and age group of the household head and type of settlement | 25.0 |
| 1., 3., 5. Activity and age group of the household head, number of children, size of household | 30.5 |
| 2., 3., 4. Educational attainment, age group of household head, type of settlement | 22.6 |
| 2., 3., 5. Educational attainment, age group of household head, number of children, size of household | 30.1 |
| 2., 4., 5. Activity, educational attainment of the head, type of settlement, number of children, size of household | 30.8 |
| 1., 2., 3., 4. Activity, educational attainment, age group of household head, type of settlement | 30.6 |
| 1., 2., 3., 5. Activity, educational attainment, age group of the head, number of children and size of household | 37.5 |
| 1., 3., 4., 5. Activity, age group of household head, type of settlement, number of children and size of household | 33.1 |
| 1., 2., 4., 5. Activity, educational attainment of household head, type of settlement, number of children and size of household | 39.8 |
| 2., 3., 4., 5. Educational attainment, age group of household head, type of settlement, number of children, household size | 32.0 |
| 1., 2., 3., 4., 5. All considered variables together | 41.4 |

Source: Income survey of the CSO, 2004.

From among the triple groupings that of the variables 1., 2. and 5. is outstanding, that is the economic activity and the educational attainment of the household head, the household size combined with the number of children, which together explain more than 36 percent of the inequality. The explaining powers of the variables 1., 3. and 5., 3., 4. and 5. as well as 2., 4. and 5. are nearly the same, 30-31 percent. Finally, as regards the explaining power of the quadruple combinations, the joint effect of the variables 1., 2., 4. and 5. is nearly 40 percent, which increases to a minimal degree only, by 1.5 percent when including the fifth variable, too. The single and combined contributions to the inequality of the equivalent incomes indicating by the T-measure were available according to the second type of grouping considered here. They are shown in Table 19.

From comparing the data of the three last tables we can obtain a few surprising conclusions. In accordance with what we have already seen in connection with the first type of grouping here, too, it can be observed about the role of the factors affecting the inequality of the per capita and equivalent incomes, that, namely, that the variables taken into account explain the inequality of per capita incomes to a higher degree, then that of the equivalent incomes.

Table 19.

Single and joint contribution of a number of variables to the value of the T-measure indicating the inequality of the equivalent incomes, 2004 (percent)

| Variables and their combinations | Contribution to T |
|--|-------------------|
| 1- Economic activity of the household head | 21.4 |
| 2. Educational attainment of the household head | 20.6 |
| 3. Age of the household head | 1.6 |
| 4. Type of the settlement | 4.5 |
| 5. Number of children and size of the household | 6.2 |
| 1. and 2. Economic activity and educational attainment of the household head | 27.5 |
| 1. and 3. Economic activity and age group of the household head | 22.6 |

| | |
|---|------|
| 1. and 4. Economic activity of the household head and type of the settlement | 22.8 |
| 1. and 5. Economic activity of the household head and number of children, household size | 25.6 |
| 2. and 3. Educational attainment and age of the household head | 21.2 |
| 2. and 4. Educational attainment of the household head and type of settlement | 21.6 |
| 2. and 5. Educational attainment of the household head and number of children household size | 25.6 |
| 3. and 4. Age of the household head and number of children, type of settlement | 6.0 |
| 3. and 5. Age of the household head and number of children, household size | 7.9 |
| 4. and 5. Type of settlement and number of children, household size | 9.8 |
| 1., 2.,3. Economic activity, educational attainment and age of the household head | 28.7 |
| 1., 2., 4. Economic activity, educational attainment of household head, type of settlement | 28.8 |
| 1., 2., 5. Economic activity, educational attainment of head, number of children, household size | 32.9 |
| 1., 3., 4. Economic activity, age of the household head and number of children, size of household | 24.4 |
| 1., 3., 5. Economic activity, age of the household head and number of children, household size | 26.8 |
| 2., 3., 4. Educational attainment, age of household head and type of settlement | 22.4 |
| 2.,3.,5. Educational attainment, age of household head and type of settlement | 26.4 |
| 2.,4.,5. Educational attainment of household head, type of settlement, number of children, h.h.size | 27.3 |

| | |
|---|------|
| 1.,2.,3.,4. Economic activity, educational attainment and age of household head, type of settlement | 30.3 |
| 1., 2.,3., 5. Economic activity, educational attainment and age of household head, number of children, household size | 34.3 |
| 1., 2., 4., 5. . Economic activity, educational attainment of household head, type of settlement, and number of children, size of household | 29.5 |
| 1., 2., 4., 5. Educational attainment and age of the household head, type of settlement and number of children, household size | 36.8 |
| 2., 3., 4., 5. Educational attainment, age of household head and type of settlement, number of children, household size | 28,4 |
| 1., 2., 3., 4., 5. All variables considered together | 38.6 |

Source: Income survey of the CSO, 2004.

The variables taken into account together explain the inequality of the per capita incomes in 41 percent, that of the equivalent incomes in 39 percent. Nevertheless there are a few variables and variable combinations, where the explaining powers show an opposite picture. While the contribution of the differences of groups formed by the economic activity of the head of household to the inequality of the per capita incomes was less than 17 percent in 2004, the contribution to the inequality of the equivalent incomes was 21 percent. The educational attainment of the head of household, too, differentiated the equivalent incomes to a higher degree, than per capita incomes. The contribution was 21 percent in the former case, while in the latter case „only” 17 percent. The different income differentiating effects of these two variables can be observed in some variable combinations, too. The most significant difference appears in the joint effect of the educational attainment of the household head, the number of children and the size of the household. This combination explains a bit more than 21 percent from the per capita income inequality, while nearly 26 percent from the inequality of the equivalent incomes. It is interesting that the type of the settlement combined with whether the economic activity or the educational attainment of the household head differentiate the per capita incomes to a higher degree than the equivalent incomes (29 percent as against 23 percent and 29 percent as against 22 percent, respectively). Among the triple and multiple combinations, on the other hand, there is no such one where the inequality explaining.

Power would be higher for the equivalent incomes than for the per capita incomes. In a few cases, however, we can find such variable combinations, which differentiate the per capita incomes and equivalent incomes equally or almost equally. However, it is important to emphasize again that the variables considered are not independent from each other, on the one hand, and the inequality explaining power of a variable or variable combination depends

beside on the income level and income differences of those belonging to the group(s) on the weight(s) of the group(s), too, on the other. Furthermore, if analyzing changes in time the changes in the weights of the groups within the total population are to be taken into account, too.

6. CONCLUDING REMARKS

In our study we made an attempt to present the income inequalities within the Hungarian population to the readers. We investigated the income differences by the help of various inequality measures pointing out that the different measures are sensitive to different peculiarities of the income inequalities. All inequality measures may have reasons for use, because they characterize the inequality of incomes from different points of view.

It matters, furthermore, whether we compare the per capita or the equivalent incomes of the households, the latter gives, namely, a more realistic picture of the „real” level of living of the people and of the income differences, but for lack of the necessary data we could mostly rely on the former.

The equality or inequality of the incomes is inseparable from the level of incomes, therefore in our study, even if only touchingly, we deal also with this topic, too.

The inequality of incomes was rather moderate in Hungary in the seventies and even in the first half of the eighties, but paralleled with this leveling off the income of the population increased dynamically in the seventies. The level of living of the population went on increasing, even if in a smaller measure, in the eighties, too. In real value the income of the population reached its zenith in 1987, but accompanied already by the increase of the income inequality. In consequence of the economic recession associated with the change in the economic and social system the level of living of the population in real value did not approach even the level characteristic to the seventies and at the same time the low level of income was associated with an inequality far exceeding that in the former decades. The living conditions of the population improved from the middle of the nineties, first barely noticeably, then more dynamically, but this increase of the incomes did not bring essential change in the inequality of incomes. On national level the income inequality measures barely changed between 1995 and 2004, the inequalities between social strata changed at the same time. The decomposition of the T-measure helped the interpretation of these changes in the within group inequalities.

When investigating the welfare of the countries beside the level of the welfare the inequalities in the welfare keep getting a more important role. This can be considered partly as a criticism of the practice of investigating the welfare only by its level, partly as recognition that although the high inequality of incomes, the disproportionate income differences can be

considered as important elements of the democratic fundamental values, they are at the same time serious obstacles of the sustainable development. The Index of Sustainable Welfare (ISEW) or the alternate of the GDP, The Genuine Progress Indicator (GPI) already modify the GDP of the countries by the size of the income inequality within the given country. The Laeken indicators of the EU, which strive after the comprehensive presentation of the poverty and social exclusion, treat with great emphasis the distribution of incomes within countries, the size and quality of the income inequalities.

Though the analysis of the income inequalities, the numerical determination of the size and the causes of the inequality look on a long past, in the last decades they became again an important sphere of analysis on account of the joining of Hungary to the EU. With our present study we want to contribute to this increased interest. The data we used originate from the income surveys of the Hungarian CSO carried out in the last half century. One of our objects aimed at presenting in a systematic way this valuable and not fairly utilized data source.

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