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## Welfare Disparities in Transition Economies: Case of Estonia

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41<sup>st</sup> Congress of the European Regional Science Association

Zagreb, Croatia, from 29<sup>th</sup> August to 1<sup>st</sup> September 2001.

### **Welfare Disparities in Transition Economies: Case of Estonia**

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#### **Abstract**

A decade ago substantial disparities in income were considered mainly as a problem of developing countries. In communist societies income distribution was considerably more equal despite the fact that average income level was much lower than in the Western welfare states.

The situation in the former communist countries significantly changed after reforms began in the early 90s, when a large differentiation by income and wealth rapidly took place.

Theoretically, the uneven income distribution has been considered as a supportive factor to economic growth. Recent empirical research (as well as the analyses done by the authors) generally does not confirm that.

The authors emphasize that considerable differences in income are considered as "unfair" by large groups of the population. The result might be destabilization in society and low economic growth.

In fact, high technology transfers to the transitional countries support economic growth. However, production efficiency cannot be achieved without a highly qualified and motivated labor force. Large differences in income often benefit a limited number of highly qualified professionals but ruin the morale and eventually qualifications of large groups of employees.

As a conclusion, the transitional economies have to decrease income and regional disparities to maintain sustainable growth.

## **1. Introduction**

For centuries economic theorists have been interested in the relation between income distribution and economic development (more strictly economic growth. Researchers again became interested in the topic in the nineties. One reason for that was the fact that the standpoints presented in the earlier theoretical models were not corroborated as a result of empirical investigations. During the last half-century economic conditions and attitudes of people have also changed, which, in fact, has made researchers approach the matter from a new point of view.

Hence, the aim of this article is to examine income distribution in Estonia both in the context of transition countries and member states of the European Union, to find out analogies and differences. The issue has both an economic and a political aspect. From an economic standpoint, it should be found out, if the present income distribution changes more unequal, does it ensure a faster economic development in the future; or should one attempt to equalize the present income distribution in order to achieve economic development? If the state's participation in economy decreases, it presumably leads to the inequalization of income distribution, may it become an impediment for development? Politically Estonia, for admission to the European Union, has to build up a (European) social scheme of society acceptable by member states. Income distribution can be viewed as one, and rather essential aspect, of this.

## **2. Treatments of Income Distribution in Economic Theories**

By income distribution we mean the distribution of earned gross income (the monetary equivalent of gross production) between the members of the society. A theoretical answer to the question whether relatively equal or unequal income distribution contributes to economic development depends on what is regarded as economic development and which factor is regarded as the principal guarantee for that. In the most general sense economic development lies in an increase in welfare.

To realize it, in addition to an increase in wealth (which is normally treated as economic growth) such fundamental values as liberty, success, justice and security should be guaranteed for the members of the society. All the named values cannot be maximized at the same time because they are contradicting ambitions. Liberty and success are

usually regarded as prerequisites of economic growth, in order to achieve economic development the two last cannot be forgotten either.

Whereas economic growth and economic development are, in fact, phenomena connected with each other, the most common way of measuring the latter is by income level per capita in comparable currency. Pursuant to the classification of the World Bank based on the data of 1997, all member states of the European Union belong to the countries with high-income economies. Out of the Central and Eastern European transition countries Slovenia is the only one, which belongs to that group. Estonia together with Croatia, Hungary, Poland and Czech and Slovak republics is included in the next group. According to this classification the rest of transition states (Latvia and Lithuania among them) belong to the group of states, which are still more backward (Classification...1998). Thus, rapid economic growth is a normal goal for transition countries to achieve a higher level of development through it. But to what extent such a goal is realistic? In the same year of 1997 the difference of income level calculated on the basis of the parity of purchase power in Germany and in Estonia was *ca* fourfold (21388 \$ and 5241 \$ respectively) (GDNGD, 1999). If we want to reach the level of Germany in 1997 by 2007, the annual *per capita* income level growth should be 15%. Even in 1997, a year extremely favourable to us, it was only 11,5% according to the data referred to above. Therefore, for transition countries, economic growth cannot be the only development goal nor a factor which ensures development.

A significant aspect of welfare (satisfaction) subjectively perceived by members of the society is the political stability and social security. A desire to ensure economic growth at any price leads to the reduction of these (Alesina/Perotti, 1993). However, the equalization of too inequal income distribution has a stabilizing effect on the society. Most people compare their living standard with the consumption opportunities of other people within the same country. If differences are perceived reasonable to a great extent, people are satisfied with their lives. This is valid of course only if the income allows to live in a normal way (considering the development level of economy and country).

The development level of economy can be assessed through satisfaction only at the present moment. Economic growth is inevitable to ensure welfare in the long run. A widespread opinion up to now is that inequal income distribution has a favourable influence on economic growth. Both classical and neoclassical economic theories

consider capital (including land and other natural resources) among other factors the most important for guaranteeing economic growth. Manpower just gives an opportunity to make use of the existing production potential.

Let us recall here the primary accumulation period of capital set forth by K. Marxi, which results in relative poverty of a great part of population, but is inevitable to ensure future progress. A process analogous to that took place in Estonia ten years ago. In order to accumulate capital investments are needed, which in turn, requires savings. Considering the fact that strata which are relatively more well-off save a bigger part of an additional income unit than those who are poorer, then a more inequal income distribution should really facilitate economic growth. At a certain capital concentration its quantity changes into quality — a change in the production technology takes place which still accelerates the future development. But why do empirical studies not corroborate the ever logical positive correlation of inequal income distribution and economic growth?

One of the reasons may be the fact that the human factor has a remarkably greater role in the economic development of today than it was assumed earlier. Indeed, a very big initial capital is required to create new technology, but quite a smaller contribution of capital instead suffices to implement it elsewhere (also in other countries). The work force, which is qualified and able to learn, is required to apply the transfer effects of high-level production technology, which comes into the country through foreign capital, for the purpose of economic growth. (Barro/Sala-I-Martin, 1995). Ineal income distribution, which although may contribute to the creation of a few very highly qualified top scientists (top engineers, top politicians, others), leads to the unavoidable degeneration of general qualification of manpower. Poverty reproduces poverty, illiteracy reproduces illiteracy. Such *circulus vitiosus* has already started in Estonia, and most likely, it does not take long until foreign investments shall be accompanied by specialists able to use the new technology. The relation of savings and investments has also changed. Today substantial investments are not made on account of own funds (if so, the income gained on capital should be really left to the owner of the capital). Even relatively small savings are aggregated through a developed capital market and handed over to the disposal of investors. One can suppose that people belonging to intermediate income groups (and below) are especially interested in investing their savings in production projects which seem solid (and not speculate with their savings on the

international securities market). Although at first sight the distribution of savings between a greater number of people seems to be an impediment to economic growth, actually a contrary outcome may be accomplished instead.

### **3. Measuring Income Distribution and Comparative Analysis**

The assessment of the equality of income distribution is based on the share that the income of persons who belong to different income groups have of total income. Typically ten (income deciles) or five (income quintiles) income groups are observed. The first income group includes 10% or 20% of the population, respectively, their income level is the lowest, and the last group includes the same number of those who have the largest income. If the income distribution were perfectly equal, each group's share of the total income would be also 10% (or 20%). The Gini index (coefficient) is used as a general indicator of income distribution equality, it is expressed as a ratio of the gap between the Lorenz curve, which shows the cumulative share of income groups of the society's total income, and the straight line representing the completely egalitarian distribution, to the area below the named straight line (as a percentage). The Gini will be equal to 0 when the income distribution is perfectly equal, and if the total income accrues to only persons in the largest income group, it will equal to 100. Whereas both situations above are just hypothetical, the Gini index calculated on the basis of empirical data always falls between 0 and 100.

When comparing income distribution of different states (and periods), it is important to know on the basis of whose income, which income and on the basis of how many groupings the Gini was computed. Sometimes the income distribution of urban and country population is observed separately, sometimes only wage earners are taken into account, etc. The division into units may be based on households (families) or income *per capita* of a family member. The result will be different. The income distribution calculated per households is more unequal. The share of the lowest group's income is smaller and the share of the highest group's income is larger than in case of income distribution assessed *per capita*.

The distribution of gross income is clearly more unequal than the distribution of net income. For instance, in 1992 the Gini index *per capita* calculated on the basis of net income in Denmark was 24,3, but the same indicator for gross income was 28,8 (WIID,

1999) The distribution of net income expresses a redistribution through taxes.

The value of the Gini coefficient is also dependent on the calculation methods applied. The value of the Gini calculated on the basis of income deciles is always smaller than the index value calculated on the basis of the same data in using quintiles. This is a general regularity due to the formula. Therefore one cannot compare the indices without knowing the exact rules for computing it.

The comparative analysis of income distribution is therefore hindered by the fact that the Gini index has been computed in different countries and in different periods according to different methods. The following analysis compares income distribution in the present EU member states and in the transition countries in the beginning of the 90-ies based on the data of the World Bank. ~~Unfortunately the authors did not find more recent comparable data.~~ From among the present European Union countries (no data was given on Portugal and Greece) income distribution was the most equal in Austria, with the Gini value of 23,1 and the most unequal in Ireland (35,9) (see Table 1). The average value of the Gini coefficient weighted by population was 30,5. In Austria 10,4% and in Ireland only 6,7% (average 8,0%) of income was attributed to the fifth of population who receive the lowest income. The share of the fifth with the largest income of total income was 33,4% in Austria and 42,9% in Ireland (average 38,6%). The share of the income of quintile IV differed less in different countries (average 22,8%), ranging from 22,4% to 23,1%.

**Table 1. Income Distribution in Developed Countries and Transition Countries of Europe<sup>1</sup>**

| Country   | Gini index | Share of Income Quintile of Net Income (%) |      |      |      |      |
|-----------|------------|--|------|------|------|------|
|           |            | I  | II   | III  | IV   | V    |
| Austria   | 23,1       | 10,4                                       | 14,8 | 18,5 | 22,9 | 33,4 |
| Finland   | 25,6       | 10,0                                       | 14,2 | 17,6 | 22,3 | 35,8 |
| Luxemburg | 26,9       | 9,5  | 13,6 | 17,7 | 22,4 | 36,7 |
| Germany   | 28,1       | 9,0  | 13,5 | 17,5 | 22,9 | 37,1 |
| Italy     | 31,2       | 7,6  | 12,9 | 17,3 | 23,2 | 38,9 |
| Spain     | 32,5       | 7,5  | 12,6 | 17,0 | 22,6 | 40,3 |

<sup>1</sup> The table provides selective data, average figures are calculated for the whole group.

|                                   |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|
| Great Britain                     | 32,6 | 7,1  | 12,8 | 17,2 | 23,1 | 39,8 |
| France                            | 32,7 | 7,2  | 12,7 | 17,1 | 22,8 | 40,1 |
| Ireland                           | 35,9 | 6,7  | 11,6 | 16,4 | 22,4 | 42,9 |
| Average of EU countries           | 30,5 | 8,0  | 13,1 | 17,3 | 22,9 | 38,6 |
| Slovak Republic                   | 19,5 | 11,9 | 15,8 | 18,8 | 22,2 | 31,4 |
| Byelorussia                       | 21,6 | 11,1 | 15,3 | 18,5 | 22,2 | 32,9 |
| Romania                           | 25,5 | 9,2  | 14,4 | 18,4 | 23,2 | 34,8 |
| Czech Republic                    | 26,6 | 10,5 | 13,9 | 16,9 | 21,3 | 37,4 |
| Latvia                            | 27,0 | 9,6  | 13,6 | 17,5 | 22,6 | 36,7 |
| Poland                            | 27,2 | 9,3  | 13,8 | 17,7 | 22,6 | 36,6 |
| Hungary                           | 27,9 | 9,7  | 13,9 | 16,9 | 21,4 | 38,1 |
| Lithuania                         | 33,6 | 8,1  | 12,3 | 16,2 | 21,3 | 42,1 |
| Kyrgyzstan                        | 35,3 | 6,7  | 11,5 | 16,4 | 23,1 | 42,3 |
| Turkmenistan                      | 35,8 | 6,7  | 11,4 | 16,3 | 22,8 | 42,8 |
| Estonia                           | 39,5 | 6,6  | 10,7 | 15,1 | 21,4 | 46,3 |
| Average of transition countries * | 29,0 | 8,4  | 13,2 | 17,7 | 23,3 | 37,4 |

\*Data was not given on Albania, Macedonia, Transcaucasian states, Tadjikistan and Uzbekistan.

Source: WDI 1998

In transition countries income distribution was more inequal from state to state than in developed countries, but an average of the groups was more or less on the same level (value of the Gini coefficient 29,0). Out of the countries under survey Slovak Republic had the most equal income distribution (19,5), and Estonia was non-competitively a country with the most inequal income distribution (39,5). The share of the income of the poorest fifth was the highest in Slovak Republic (11,5%) and the lowest in Estonia (6,6%). The share of the income of the richest fifth was just the opposite: the lowest in Slovakia (31,4%) and the highest in Estonia (46,3%). Slovakia and Estonia were the extreme examples in the whole sample. The average share of the lowest grouping's

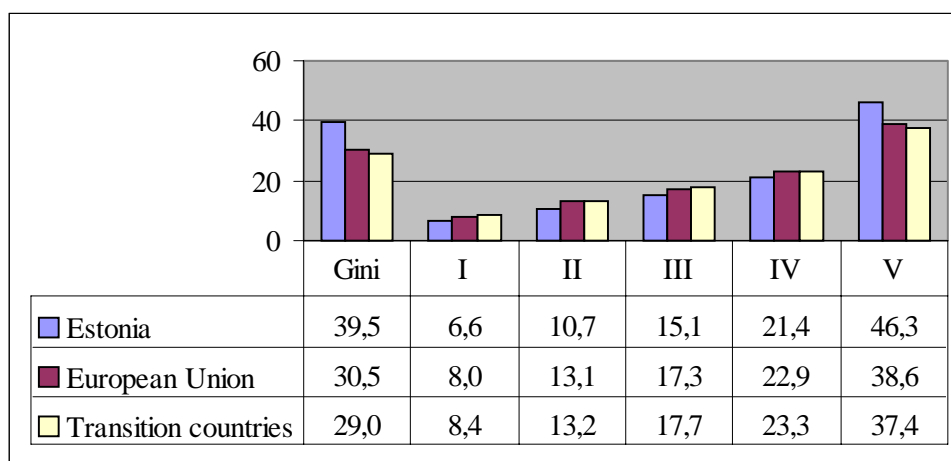
income in transition countries was a bit higher (8,4%) and the share of the highest grouping a bit smaller (37,4%) than in developed countries.

On the basis of the table's data one cannot conclude that the development level of a country (wealth) and the inequality of income distribution are related to each other in some way. The income distribution figures for Finland and Romania are very analogous, however, income *per capita* estimated by the parity of purchase power is four times higher in the first one. Estonia and Turkmenia also stand side by side in the table for similar income distribution, although the income level in the latter is almost two times lower. Naturally, one cannot decide on the basis of the value of a single indicator whether income distribution in view of the present situation of the society is optimally inequal or not. Still, the average close to both groups provides a preliminary assessment of income distribution equality which is regarded as normal in the observable period of time and region.

Chart 1 provides a comparison of Estonian income distribution figures with the respective average ones of the member states of the European Union and transition countries. Estonian income distribution differs greatly from the average of both groups. Income is not more inequally distributed only between the extreme groupings, but the people in intermediate income quintiles are also relatively poorer than in other countries. The situation of the second quintile is especially drastic.

There was no other country among those under observation where the income share of the second quintile was below 11%, and there were five countries in which the poorest fifth received more than 10% of income. At the beginning of the transition period an exceptionally inequal income distribution was a distinctive feature of Estonia among the countries under observation, and this resulted in the aggravation of the financial differentiation of population. A number of geographically and culturally far away and traditionally less developed countries such as Bolivia, China and Uganda had an analogous income distribution (WDI, 1998). It is worth mentioning that in other countries which experienced great economic reforms at the same time such a severe polarization of the society was avoided. Traditionally we do not compare our economic figures to Turkmenia and Kyrgyzstan. Therefore, a vital aim of Estonia's economic development during the transition period, besides a growth in the actual *per capita* income, is also the equalization of income distribution.

**Chart 1. Comparison of Estonia's income distribution with the average figures of groups.**



Source: WDI, 1998, calculated and drawn by the authors

#### 4. Income Distribution Dynamics

The study of income distribution dynamics has long traditions in the countries of South-East Asia and South America. Comparable data lists on the present member states of the European Union can be found until the 90-ies and on transition countries in the recent years. On the whole, it can be stated that great changes in income distribution are not common in developed countries with a stable economic situation. For instance, income distribution in Germany has hardly changed during twenty years (1973–1993). In Great Britain, which formerly had absolutely analogous income distribution with Germany, it has changed a bit more inequal in the beginning of the 90-ies. There are countries where income distribution has been traditionally relatively equal (Scandinavian countries, but also Czechoslovakia and Hungary in the 70-ies for example), and countries where it is relatively more inequal (Italy, France), (WIID, 1999)

As to transition countries, income distribution was rather different in the beginning of the transition period (see Table 1). Therefore it is interesting to learn which changes have taken place here later on. The Gini indices set forth in Table 2 are calculated on the basis of income deciles and therefore these figures cannot be directly compared to those given in the previous table (the value of the Gini index calculated on the basis of the sama data is smaller here).

**Table 2. Income Distribution Dynamics in Transition Countries 1995–1997\***

| Country         | 1995 | 1996 | 1997 | 1997/1995 |
|-----------------|------|------|------|-----------|
| Slovak Republic | 20,0 | 24,8 | 23,4 | 1,17      |
| Hungary         | 24,3 | 24,5 | 24,6 | 1,01      |
| Byelorussia     | 24,7 | 24,2 | 24,9 | 1,01      |
| Czech Republic  | 21,5 | 28,1 | 27,6 | 1,28      |
| Romania         | 31,2 | 30,6 | 30,3 | 0,97      |
| Lithuania       | 33,3 | 34,4 | 32,4 | 0,97      |
| Estonia         | 39,0 | 37,4 | 34,1 | 0,87      |
| Poland          | 32,4 | 33,1 | 34,2 | 1,06      |
| Bulgaria        | 37,2 | 34,8 | 34,6 | 0,93      |
| Average         | 30,8 | 31,3 | 31,5 | 1,02      |

\*Gini index calculated on the basis of income deciles

Source: WIID, 1999

The table allows to read both stability (Hungary, Byelorussia, Romania, Lithuania) and the convergence of countries. Czech and Slovak Republics are characterized by inequalization of income distribution, Estonia ja Bulgaria by equalization. It is only in Poland, which had a more inequal income distribution than average also at the beginning of the period, it has become more severe. Diminishing of differences between countries brings forward a hypothesis that a certain optimum inequality of income distribution under particular circumstances actually exists. The income distribution in Estonia in the period under observation has become more similar to that in other transition countries, but has still remained rather inequal. Unfortunately, the equalization tendency of income distribution in Estonia did not continue. According to the data of the Bank of Estonia the value of the Gini index decreased until 1997, reaching its minimum value of 32,7, and again increased in 1998 to the value of 35,4 (Eesti..., 1998). The ratio of the incomes of the richest and the poorest tenth, which

constantly decreased until then, became again larger in 1998.

## **5. Relation of Income Distribution to Macroeconomic Indicators**

The figures of database *WIID* and of two databases of the World Bank (GDNGD, 1999 and CC, 1998 and 1999) are combined for the purpose of the following analysis. The aim was to examine the relation of the Gini index, which expresses the equality of income distribution, to general macroeconomic indicators. Unfortunately, based on this data, a relation between income distribution and economic growth was not revealed at all. The reason may have been a relatively small variability of indicators of economic growth in the years under observation and the fact that there existed convergence of income distribution. However, it is worth pointing out here an earlier result by the author, pursuant to which the value of the Gini coefficient *ca* 30 would maximize the economic growth of transition countries in the first years of the transition period (*Kaldaru*, 1999: 92). According to an assessment by R.Barro (1999) too inequal income distribution retards economic growth mostly in poorer countries. What may be the situation like in transition countries today can be answered after a few years when the comparable data is obtained.

The hypothesis brought forward in the beginning of the article was confirmed (at least to the extent which encourages further research) that a more equal income distribution fosters saving. The ratio of savings to GDP (average propensity to save) was in a statistically significant positive correlation with the ratio of investments into GDP (0,437), hence, the equalization of incomes does not sever the capital resources for future development. Out of the average propensity to save and the Gini index regression equations a parabola with downward branches proved the best, which maximum point fell on the Gini index value of 14,8. The statistically reliable probability of the model was 0,999 and it depicted 37,7% of the variability of an average propensity to save. Thus the average propensity to save decreases under the circumstances of a transition economy the faster the more inequal the income distribution proves. The ratio of domestic investments to GDP was related to the Gini index even more strongly. A falling straight line (correlation coefficient  $-0,69$ ) described 48,1% of the variation of a result indicator. Thus, the more equal income distribution, the faster capital accumulates and the faster economy develops in the future. Renewal of technology is one of the key factors in the development of transition economy.

According to the data of transition countries, income distribution proved the more unequal (correlation coefficient 0,86) the larger was the share of private sector of total consumption, and the more equal (correlation coefficient  $-0,72$ ) the bigger the ratio of state budget and GDP. Estonia with the share of private consumption *ca* 60% and the ratio of state budget to GDP *ca* 40% fell among the average in the sample. Whereas a politico-economic course has been chosen to reduce the state's share, this fact will press (has already pressured) on the inequalization of income distribution.

If normally it is not possible to directly relate income level and the equality of income distribution (see the analysis of Table 1 above), then in accordance with the data of transition countries, GNP *per capita* corrected by the parity of purchasing power was related to the Gini index correlation coefficient  $-0,69$ . The conclusion: the more unequal income distribution the poorer the country, would be intriguing, but obviously illogical. One can rather draw a conclusion that a great inequality of income distribution is a feature of poverty and low development level, in order to overcome it the country must have collected some wealth. As a result of regression analysis it turned out that the concave parabola of the Gini index described 60,7% of the income variability (both the model and the regression coefficients were reliable with a vanishingly small probability of error). Up to wealth magnitude of 8000 – 9000\$ *per capita*, income distribution has a tendency to equalization, in richer countries inequality grows. Whereas Estonia has not by far reached such a level of income, a need for inequalization of income distribution cannot be motivated by this regularity.

## **6. Regional differences of income**

The following section gives a general idea about regional income disparities in Estonia. In addition to the income differences among social groups, there are also widening differences on the regional level. It is probably one of the worst result of Estonian economical and political transition outcomes.

Data for the study was delivered from local municipalities' actual budgets records during the years 1996 and 2000. As an income indicator was chosen personal income tax revenues collected by the municipal governments (241) on their territorial jurisdiction. We realize that there are limitations of such a generalization, but broad trends are easy to follow.

Estonian municipalities were distributed to 6 even groups and ranked by average income (tax revenues). The capital city Tallinn figures are shown separately (Table 3).

**Table 3. Average income tax per capita, 1996-2000**

| Group   | Income tax per capita |       |               |           | Compared to highest group, % |        | Distance from Tallinn, km | Distance from county centre, km |
|---------|-----------------------|-------|---------------|-----------|------------------------------|--------|---------------------------|---------------------------------|
|         | 2000                  | 1996  | Change, kroon | Change, % | 2000                         | 1996   |                           |                                 |
| 1       | 2,961                 | 1,665 | 1,297         | 77.9%     | 100.0%                       | 100.0% | 89                        | 22                              |
| 2       | 2,262                 | 1,245 | 1,017         | 81.7%     | 76.4%                        | 74.8%  | 111                       | 22                              |
| 3       | 1,858                 | 1,050 | 808           | 77.0%     | 62.7%                        | 63.1%  | 147                       | 23                              |
| 4       | 1,506                 | 829   | 677           | 81.7%     | 50.9%                        | 49.8%  | 163                       | 25                              |
| 5       | 1,259                 | 732   | 527           | 72.0%     | 42.5%                        | 43.9%  | 172                       | 31                              |
| 6       | 1,040                 | 586   | 455           | 77.6%     | 35.1%                        | 35.2%  | 187                       | 38                              |
| Tallinn | 3,811                 | 2,419 | 1,391         | 57.5%     | 128.7%                       | 145.3% | 0                         | 0                               |

Source: authors calculations

There are considerable and persistent differences in the income per capita by municipalities population. Differences between the highest and lowest income regions are about 3 times and slightly grew during the period 1996 to 2000. Also during the period income per capita in Tallinn (the biggest municipality) was significantly higher than in all other municipalities groups. But all groups getting close to income level in the capital city. There are at least two reasons.

First, in 1999 were made changes in the income collection basis. The taxpayers have to pay their income tax at the municipality, where he or she is registered as a resident. In reality, many persons are registered as citizens in one municipality, but actually they work or live in another region. That is the usual situation for Tallinn, where commuting is very widespread. Therefore, many persons who are working in Tallinn, transfer their income taxes to the region where he is registered as a resident.

Second, in very recent years the more wealthier people started move to residential areas outside the capital city. Eventually, the highest average income municipalities in

Estonia are local communities around capital city, despite the average salaries in these municipalities are relatively moderate.

To evaluate the "regionality" factor of incomes were estimated correlation between income per capita in municipalities and their location as shown on table 4 (Raus, Trasberg, 2000) .

**Table 4. Correlation coefficients between income per capita and different variables**

| Variable  | 1999   | 1996   |
|---|--------|--------|
| Distance between municipality and Tallinn       | -0.659 | -0.481 |
| Distance between municipality and county center | -0.339 | -0.423 |
| Type of municipality                            | 0.356  | 0.526  |

Source: (Raus, Trasberg, 2000)

There is a significant correlation between income in regions and the municipality's distance from Tallinn. The more distant a municipality is from capital city, the smaller its resident's income. In 1996, the correlation coefficient between income and distance to county center was bigger than the correlation coefficient for distance to Tallinn.

Also were calculated regression models for the years 1996 and 1999 for Estonian municipalities personal income tax revenues:

Regression model for 1996:

$$\begin{aligned}
 FYYS_i &= 1950,0 - 132,9 \ln(T_i) - 142,8 \ln(M_i) + 421,8 D_i \\
 (t) \quad & (24,44) \quad (-11,56) \quad (-8,53) \quad (9,39) \\
 i &= 1,2, \dots, 253, \quad R^2 = 0,589 \quad \hat{R}^2 = 0,584 \quad F = 118,72
 \end{aligned}$$

And regression model for 1999:

$$\begin{aligned}
 FYYS_i &= 3683,4 - 310,0 \ln(T_i) - 220,7 \ln(M_i) + 378,6 D_i \\
 (t) \quad & (29,56) \quad (-17,18) \quad (-8,51) \quad (5,34) \\
 i &= 1,2, \dots, 253, \quad R^2 = 0,631 \quad \hat{R}^2 = 0,627 \quad F = 142,07
 \end{aligned}$$

There

$FYYS_i$  - personal income tax per capita, EEK

$Ln(T)$  - logarithmic function between municipality (center) distance from Tallinn (if distance from Tallinn increases 1%, then income per capita decreases a certain amount of EEK)

$Ln(M)$  - logarithmic function between municipality distance from county center (if distance from county center increases 1%, then income tax per capita decreases a certain amount of EEK)

$D$  - variable,  $D = 1$  for towns,  $D=0$  for local communities (income tax per capita is that many kroons higher than when other conditions are equal).

The most substantial factor in the model that had an impact on per capita income tax level in 1999 was the distance between the municipality and the Tallinn region. At the same distance from the capital city, the income level is higher in the towns rather than in the local communities. In contrast, in 1996, the income differences were more influenced by the type of municipality. Later [the “geographic” factor became more apparent. The trend is that income grows faster in these groups, which are located closer to Tallinn. The biggest income growth was in the groups, where distance from the capital area was smallest. Consequently, the differentiation by revenues in the town-local community basis transforms as a regional difference!](#)

The three variables, ( $\ln(T)$ ,  $\ln(M)$  and  $D$ ), explained 58.9% of varieties of personal income tax in 1996, but more than 63% in the year 1999. Therefore, about two thirds of income differences can be explained by "geographic" factors and growing regional disparities.

Also the size (number of residents) of the municipality [is an obvious factor in income differences. The bigger municipalities had higher incomes per capita as compared to the smaller ones](#) (Trasberg). [During the period, income per capita in Tallinn \(the biggest municipality\) was significantly higher than in all other](#) (smaller) [municipalities.](#)

How does income differ regionally? Certain figures of income regional diversities are given in table 5. Here municipalities grouped in table 3 are allocated to 5 five different regions. [Two regions are clearly divisible. Incomes in Tallinn and North Estonia are significantly higher than in other regions.](#) Another situation is in the [southern part of](#) country, where [low income](#) municipalities prevail and [the majority of population belongs to the](#) lowest [income groups.](#)

**Table 5. Estonian municipalities allocation by regions and income groups, %**

| Group | Average income | Tallinn, | North - East | West | Central | South |
|-------|----------------|----------|--------------|------|---------|-------|
| 1     | 2,961          | 18       | 4            | 11   | 6       | 1     |
| 2     | 2,262          | 6        | 10           | 10   | 13      | 1     |
| 3     | 1,858          | 1        | 11           | 10   | 14      | 4     |
| 4     | 1,506          | 1        | 8            | 7    | 16      | 8     |
| 5     | 1,259          | 0        | 11           | 11   | 8       | 10    |
| 6     | 1,040          | 0        | 10           | 5    | 10      | 16    |

North: Harju, North East: Ida-Virumaa, Lääne-Virumaa, Jõgeva; West: Hiiu, Lääne, Pärnu, Saare Central: Järva, Rapla, Tartu, Viljandi; South: Põlva, Valga, Võru

Source: authors calculations

There are several factors that cause growing disparities among the regions. Here we emphasized three factors that are most important in our opinion.

First, income disparities are based in the differences on occupation structure. In Tallinn and its surroundings are concentrated the financial, transport and industrial sectors, which provide relatively high paying jobs. Also most of the foreign investments are concentrated here. The capital city attracts investors by its modern infrastructure, ports and highly qualified labor force. Higher living standards, and better career opportunities, living conditions and entertainment offerings in turn lure residents from other regions to move Tallinn. Migration to Tallinn region impoverishes the other regions because they lose the best-qualified workers and entrepreneurial people. Erosion of the tax basis cuts spending for schools, healthcare and infrastructure which again accelerates migration from distant regions to Tallinn (Trasberg, 2001).

Second, traditional sectors of economy like agriculture and foods processing in rural areas are depressed. Liberal foreign trade regime does not allow setting up balanced custom tariffs against imported agricultural and food products depressed that sector in Estonia very considerably. In addition, Estonian regional policy has been too weak to provide new alternatives and supports for several regions. In addition, there is psychological pressure for rural residents to move out of their regions.

Third, most of the Estonian government and other institutions are concentrated in Tallinn that creates an economic environment around them. There are hundreds of government institutions that provide stable and relatively high incomes to thousands of bureaucrats and supporting personnel. The total value of government sector budgets (central, local, funds and organization, other) cover more than 40% of the Estonian GDP.

In conclusion, there are visible factors, which show the growing disparities among Estonian regions by personal income.

## **Conclusion**

Income distribution and economic growth are unquestionably related to each other, but the form of its manifestation depends on the development level of a country and its cultural peculiarities. Whereas perfectly equal and absolutely inequal income distribution are just theoretical constructions, there must be an optimum inequality of income distribution in every real situation, which allows the country to ensure its future development. The problem of a number of relatively poor countries (also some transition countries) is a too inequal income distribution, which destabilizes the society. Unfortunately, Estonia also belongs to those countries and can be compared with geographically and culturally distant developing countries in respect of income distribution. The ultraliberal politico-economic trend which is chosen, increases more and more material stratification and leads to ever growing inequality of income distribution. Sooner or later it will become a retarding factor for economic development. Non-compliance with European traditions (also regarding income distribution) may prove also a political hindrance when the admission of Estonia to the European Union is under discussion.

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