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Economic Transformation and Income Distribution: Some Evidence from the Baltic Countries

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Abstract

A transition from a centrally planned to a market economy implies a massive reallocation of resources requiring realignments in relative prices, which may have important distributional effects. This paper examines the extent to which income differentials have changed in countries where bold reforms have been introduced. Discussing the experience in the Baltic states, it finds that--largely due to a significant increase in the dispersion of earnings--recorded income differentials in these countries have widened markedly and that the redistributive effects of social assistance and tax policies have been only marginal.

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The prevention of wide income differentials was an important political objective in formerly centrally planned economies. This objective was generally achieved, however, at the cost of a severe misallocation of resources and economic stagnation. In order to channel resources into more productive uses, many countries have introduced bold market-oriented reforms aimed at correcting distorted relative prices. Inevitably, relative price changes bring about redistributional effects, which may cause income differentials to widen.

This paper examines the extent to which income differentials have widened in countries where ambitious stabilization and structural reform policies have been implemented. The Baltic states are particularly interesting cases. In the pre-reform period, these countries enjoyed not only living standards higher than those in the countries of the former Soviet Union (FSU) but also the relatively lowest degree of income inequality. Following the dissolution of the FSU, they embarked on comprehensive transformation programs considerably earlier than other countries in this region and have already created the necessary preconditions for sustained economic growth.

In evaluating the impact of the Baltic reform programs on the distribution of income, the paper starts by reviewing the empirical evidence in the pre-reform period. Using standard summary statistics of income inequality, it then estimates the degree to which the dispersion became greater during the first three years of their transition to market economies. Next, the paper decomposes different income sources and analyzes their contribution to the overall extent of income inequality. In this connection, particular attention is paid to the distribution of earnings. Assuming that welfare is determined by both the level of income and its distribution, the paper finally estimates the welfare contributions of individual income sources based on Kakwani's (1995) *progressivity index*.

The main conclusions are these. First, income differentials have widened markedly in the Baltic countries since the beginning of their transformation. While in the pre-reform period income inequality was considerably lower than in market economies, today the dispersion of income appears to be greater than in many OECD countries. These results, however, have to be qualified by the limitations arising from statistical weaknesses, particularly in the data of the pre-reform period. Second, the widening of income differentials is largely explained by a significant increase in the dispersion of earnings owing to more pronounced wage differentials, increased unemployment, and lower participation rates. Third, the redistributive effects of social assistance and tax policies have been only marginal.

I. Introduction

The prevention of wide income differentials was an important political objective in pre-reform Central and Eastern Europe. This objective was widely achieved, however, at the cost of a severe misallocation of resources and economic stagnation. In order to channel resources into more productive uses, many countries have introduced bold market-oriented reforms aiming at correcting distorted relative prices. Coupled with sustained financial adjustment, these measures have contributed to a marked increase in economic efficiency, and most countries in transition have seen a turnaround in output. However, relative price changes inevitably bring about important distributional effects. 1/ Very few studies (e.g. Stodder, 1991) have ever tried to estimate the welfare implications of the transition process, however, they suggest that the potential opportunity costs of rising inequality may be significant. This may be an important reason why some countries, particularly many of the former Soviet Union (FSU), have moved rather cautiously in introducing market-oriented reforms.

In this paper, we examine the extent to which income differentials have widened in countries where bold policy measures have been introduced. The Baltic states are especially interesting cases. Following the dissolution of the FSU, they embarked on ambitious stabilization and reform programs considerably earlier than other countries. These programs have proven very successful in stabilizing inflation at low levels and creating the necessary preconditions for sustained economic growth. 2/ In fact, living standards in these countries have started to recover, whereas some FSU states are still experiencing sizable output declines and high inflation. Not surprisingly, therefore, they are widely regarded as model cases for a successful transition.

It is important to note, however, that such an intertemporal comparison of income differentials is restricted by various factors. Apart from the dubious quality of the Family Budget Surveys especially in the pre-reform period and the presentation of income data in grouped form, there is virtually no information on nonmonetary incomes and the comparison is further restricted by the limited range of consumer goods that were

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1/ While the liberalization of prices (including factor prices) has probably the most direct impact on the dispersion of income, there are, of course, numerous other channels through which the distribution of income can be affected. These channels include, inter alia, tax and expenditure policies, monetary and exchange rate policies, and trade policies. For a discussion of these channels and the conceptual problems to measure the effects of certain policies on income distribution, see, for example, Johnson and Salop (1980) and IMF (1986).

2/ For a review of these programs, see, for example, Hansson and Sachs (1994); Lainela and Sutela (1994); and Saavalainen (1995). On individual country experiences, see Hansen et al. (1994); Knöbl et al. (1994); and Wolf et al. (1994).

available. As is well-known, however, privileges played an important role in centrally planned economies but at the same time, queuing was an important egalitarian device. While we discuss these caveats in greater detail in this paper, we make no attempt to estimate the extent to which our results might be distorted by these phenomena. Similarly, we do not examine the extent to which the distribution of wealth has been affected by the transformation process. With the elimination of the monetary overhang at the onset of this process, monetary assets were largely eroded by high inflation. However, there is virtually no information on how much wealth has been accumulated by different income groups since then. Presumably, privatization and the repatriation of land have played a particularly important role in this regard, which will likely be reflected in future income streams.

With these caveats in mind, the rest of the paper is structured as follows: In section II, we start by examining the distribution of income in the FSU in the pre-reform period. On the basis of various standard summary statistics of income inequality, we analyze the degree to which monetary income differentials have widened since then. In section III, we examine the contributions to inequality of different components of income, whereby we pay particular attention to the distribution of earnings. In section IV, we discuss the contributions of these individual income components to welfare, employing Kakwani's (1995) *progressivity index*. In section V, finally, we summarize our findings and draw some conclusions.

II. The Distribution of Income

1. The distribution of income in the pre-reform period

Although innumerable surveys were conducted on the distribution of income, very few figures were actually published in the pre-*glasnost* period in the FSU. Censorship was widespread, and despite several attempts to make deductions from the limited information that was released, little was known about income inequality. 1/ For individual republics, there was virtually no information.

The availability of data improved considerably in the late 1980s, when Goskomstat released several new statistical series on the distribution of personal money income for the individual republics. As regards the distribution of earnings, figures were published not only for the recent year but retrospectively for a number of years back to 1956. However, the quality of the Family Budget Surveys remained dubious. 2/ Most importantly, they were not representative of the population, covering the territory of the FSU incompletely and unevenly. Families were mainly

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1/ These attempts include Wiles and Markowski (1971) and Bergson (1984).

2/ For a detailed discussion of these surveys, see Atkinson and Micklewright (1992).

selected on the basis of the industrial affiliation of their wage earners, with the selection probability increasing with the number of wage earners in the households.

Moreover, the analysis of these data remained difficult. First of all, income data were grouped, i.e. presented as percentages of the total population falling into various income intervals. Second, there was no information about the distribution within the intervals; in particular, there was no information about the intra-interval means. Finally, they were doubly censored, with both the lower and upper income ranges being open-ended.

To overcome these problems, Alexeev and Gaddy (1993) applied Kolmogorov-Smirnov estimators to fit the Soviet data to a log-normal distribution. While the presentation of income data did not permit reliable estimation of the underlying Lorenz curves, 1/ their nonparametric approach did allow them to estimate summary statistics of income inequality, namely the Gini coefficient and Atkinson indices of income inequality. 2/ As regards the latter, Alexeev and Gaddy chose various levels of inequality aversion, ranging from 0.5, where almost equal weight is given to all individuals, to 3, where considerable more weight is attached to the poorer groups relative to the mean.

Their results suggest that there were marked differences in the distribution of income across individual countries before the dissolution of the FSU, with the Baltic countries enjoying not only the highest mean incomes but also the lowest degree of overall income inequality measured by the Gini coefficient (Table 1). 3/ According to this measure, the overall dispersion of income was significantly smaller than in most FSU countries, except Belarus and Ukraine. 4/ At the same time, there seems to have been less inequality at the lower end of the size distribution as suggested by the Atkinson indices, regardless of the level of inequality aversion.

1/ There have been various approaches to estimate Lorenz curves from grouped observations (e.g. Kakwani and Podder, 1976; and Villasenor and Arnold, 1989). However, these approaches do not always work well. Certain groupings of the data can yield distorted estimates.

2/ For an overview of different measures of inequality see, for example, Atkinson and Micklewright (1992) and Blackwood and Lynch (1994).

3/ However, this result should be regarded with caution because, as is well known, an unambiguous ranking of income distributions across countries requires that the Lorenz curves do not intersect. Otherwise, alternative income distributions might rank differently depending on the precise shape of the households' common utility function.

4/ These results are in line with those derived by Kakwani (1995), who estimated a separate continuously differentiable function fitting the different data points.

Table 1. Mean Income and Inequality Measures for the Baltic States and Countries of the Former Soviet Union, 1990

	Mean Income 1/	Gini	Decile Ratio	Variation Coefficient	Atkinson indices A=0.5	A=2	A=3
Tajikistan	129	0.334	...	0.618	0.282	0.458	0.551
Uzbekistan	105	0.315	...	0.605	0.251	0.416	0.504
Turkmenistan	115	0.308	...	0.617	0.234	0.396	0.484
Kyrgyz Republic	119	0.308	...	0.564	0.229	0.390	0.479
Azerbaijan	119	0.345	...	0.701	0.245	0.441	0.542
Kazakhstan	158	0.297	3.46	0.654	0.188	0.347	0.435
Moldova	163	0.267	3.08	0.547	0.167	0.301	0.378
Armenia	169	0.269	3.14	0.532	0.169	0.304	0.381
Ukraine	175	0.240	2.76	0.489	0.155	0.266	0.331
Georgia	176	0.291	3.53	0.673	0.169	0.326	0.413
Russia	186	0.259	3.16	0.685	0.155	0.284	0.358
Belarus	189	0.233	2.73	0.520	0.145	0.250	0.314
Lithuania	212	0.248	3.11	0.738	0.139	0.259	0.329
Latvia	216	0.240	3.08	0.716	0.135	0.249	0.316
Estonia	234	0.240	3.31	0.909	0.130	0.243	0.311
Former Soviet Union	171	0.281	3.53	0.659	0.144	0.295	0.381

Source: Alexeev and Gaddy (1993, tables 3 and 4b); Atkinson and Micklewright (1992, table UE13).

1/ In rubles per months per head.

Table 1 also includes variation coefficients and decile ratios estimated by Atkinson and Micklewright (1992). 1/ Variation coefficients are particularly sensitive to the upper ranges of the distribution, and high values suggest that inequality is due to the presence of very rich individuals. While these estimates imply that at the upper end of the size distribution income in the Baltic countries has been distributed more unequally than in most FSU countries, it is important to note that they are based on interpolations of the open-ended top and bottom intervals rather than on Kolmogorov-Smirnov estimators employed by Alexeev and Gaddy (1993). The results are very sensitive to the method of interpolation and may well overstate the true magnitude of income dispersion.

2. The distribution of income in the early phase of the transition

Following the dissolution of the FSU, the Baltic states have embarked on ambitious stabilization and reform programs. At the same time, important efforts have been made to improve the quality of economic statistics. While under Soviet planning household surveys were conducted by selecting employees--more or less for a lifetime--from chosen enterprises and farms in each branch of industry, new sampling methods have been introduced to make the surveys more representative. In all three countries, individuals are now chosen from the population register, with their gender and age and the household size being used as stratifying criteria. In Estonia, some 1,780 persons are surveyed, who live in 575 households. In Latvia and Lithuania, income and expenditure data from about 3,200 and 4,000 persons living in 1,180 and 1,500 households, respectively, are collected. 2/ In addition, the presentation of these data has been radically changed; rather than presenting data based on certain income intervals, in all three countries, household incomes and expenditure are now shown by decile, greatly facilitating their analysis.

Based on these new household surveys, summary statistics have been estimated for the distribution of income in 1994 (Table 2). These estimates suggest that the transformation process in the Baltic states has been accompanied by a marked increase in the dispersion in income. This applies in particular to Latvia where the Gini coefficient increased by 17percentage points compared with increases by about 10 and 11 percentage points in Estonia and Lithuania, respectively. The overall increase in the dispersion of income seems to reflect widening income differentials particularly at the lower end of the size distribution. If people did not care much about income inequality so that equal weight were given to all individuals, the

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1/ The decile ratios reported in table 1 refer to the ratio of gross income at the top decile relative to the median (P_{90}) over the gross income at the bottom decile relative to the median (P_{10}).

2/ Notwithstanding these improvements of the household surveys, a number of important problems still remain. For a discussion, see Cornelius (1995a).

Table 2. Mean Income and Inequality Measures for the Baltic States, 1994

	Mean Income 1/	Gini Coefficient	Decile Ratio	Variation Coefficient	Atkinson indices		
					A=0.5	A=2	A=3
Estonia	87.9	0.342	5.05	0.670	0.092	0.303	0.866
Latvia	36.0	0.411	8.92	0.810	0.136	0.445	0.964
Lithuania	50.3	0.360	6.56	0.716	0.105	0.354	0.920

Source: National authorities; and staff estimates.

1/ In U.S. dollars per month per head.

increase in income dispersion would have had little impact on social welfare. In fact, at an aversion parameter of 0.5, the Atkinsonindex of income inequality was hardly affected. However, the more weight was attached to the poorer segments of the population, the more the Atkinson index increased. At an aversion parameter of 3, the Atkinson index rose in all three cases by more than two and a half times compared with 1990.

In contrast, the variation coefficients indicate relatively smaller changes at the top of the size distribution. While it increased somewhat in the case of Latvia, it remained almost unchanged in Lithuania and even declined in Estonia. Data on recorded income thus seem to suggest that the emergence of relatively rich individuals, who have pushed ahead relative to the rest of the population, has played a rather limited role in explaining the overall increase in the dispersion of income in the Baltic states.

An examination of the decile ratios provides further support for this hypothesis. Although the decile ratio more than doubled in all three countries, this was largely due to a decline in the income of the bottomdecile relative to the median rather than an increase in the relative income at the top decile. While in the pre-reform period P_{10} amounted to nearly 60 percent, it declined to less than 30 percent in all three cases. In contrast, P_{90} ranged from 180 percent in Latvia to 190 percent in Estonia in the pre-reform period. The largest change was recorded in Latvia where it increased to 266 percent in 1994, whereas it remained below 200 percent in Estonia and Lithuania.

However, in examining changes in the distribution over time, a number of caveats need to be taken into account, which relate to statistical weaknesses of the household surveys, particularly in the pre-reform period. The statistics for the pre-reform period are likely to have understated the true extent of inequality in the FSU, because the Family Budget Surveys undersampled from both the upper and the lower part of the income distribution by excluding some occupational groups, e.g. party officials, military officers and students. In addition, the system of privileges in the pre-reform period benefitted mainly people at the upper end of the distribution. On the other hand, the pre-reform data were biased by

excluding queueing, which was an important egalitarian rationing device in the FSU. 1/

Second, the household surveys do not reflect incomes earned in the shadow economy. According to estimates by Gaddy and Alexeev (1993, p. 33) on the basis of surveys of Soviet immigrants to the United States, the inclusion of illegal income had virtually no effect on the Gini estimated for the Baltics in the pre-independence period. However, anecdotal evidence suggests that the transformation process has been accompanied by particularly large increases in income in the informal sector. To the extent that high income earners have a particular interest in underrecording their incomes--irrespective of whether they stem from legal or illegal sources--it seems likely that the data derived from household surveys underestimate income differentials especially in the upper ranges of the size distribution. 2/ This implies that market-oriented reforms may have been accompanied by an even larger widening of income differentials at the top than suggested by the summary statistics presented here.

These caveats need to be taken into account also when comparing income distributions across countries. In particular, comparisons with FSU countries should be considered with considerable caution as in many of them household surveys are still based on the methodology of the Family Budget surveys employed before 1990. Notwithstanding these caveats, the increase in the dispersion of income in the Baltic countries seems to have been larger than in most other countries in Central and Eastern Europe and the FSU. According to estimates by Milanovic (1995), the central Asian republics, which showed the relatively highest degree of income inequality before the dissolution of the FSU, experienced an average increase in the

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1/ The egalitarian effect of queueing was probably largest in the lower and middle range of the income distribution. In contrast, privileges such as access to special shops and preferential treatment in ordinary shops, restaurants or cafeterias for executives, foreign currency, housing, official cars, reserved hospital and holiday-resort facilities, benefitted mainly people at the upper end of the distribution, estimated at 0.2 to 0.3 percent of the total population. According to Morrisson (1994), whose estimates are based on rather generous assumptions about the value of such benefits, the pre-reform Gini coefficients in various Central and Eastern European economies could have been distorted downward by a maximum of 3 to 4 percentage points.

2/ This seems especially likely in the case of Latvia, where according to the household surveys the mean income per month *per head* amounted to only US$36 in 1994--compared with an average monthly wage of nearly US$200.

Gini of 8 points between 1988 and 1993. 1/ In Russia and Ukraine, the increase amounted to 7 and 3 Gini points, respectively. Finally, in Poland the income distribution widened by 6 Gini points and in the Czech Republic by 8 Gini points.

With a Gini ranging from 0.34 in Estonia to 0.41 in Latvia, the distribution of income in the Baltic states appears more unequal than the OECD average. 2/ Within the OECD, however, the distribution of income has varied markedly, whereby the Baltic countries seem to be comparable with the Southern European countries, such as Greece and Portugal. Compared with most developing countries, particularly those in Latin America and Africa, the dispersion of income in the Baltics has remained significantly lower (Chart 1).

III. Income Inequality by Components

In examining the factors, which explain the overall distribution of income, we disaggregate inequality by income components employing Kakwani's (1977) approach. 3/ According to this approach, the Gini coefficient of the total income may be expressed as

$$G = \frac{1}{\mu} \sum_{i=1}^{n} \mu_i C_i \qquad (1)$$

where C_i is the concentration index of the ith income component and μ_i its mean. The concentration index is similar to the Gini index except that it ranks individuals by their total income rather than by the ith income component so that it may be negative. The concentration of an income component measures how evenly that income component is distributed over the total individual income. If C_i is smaller (greater) than the Gini

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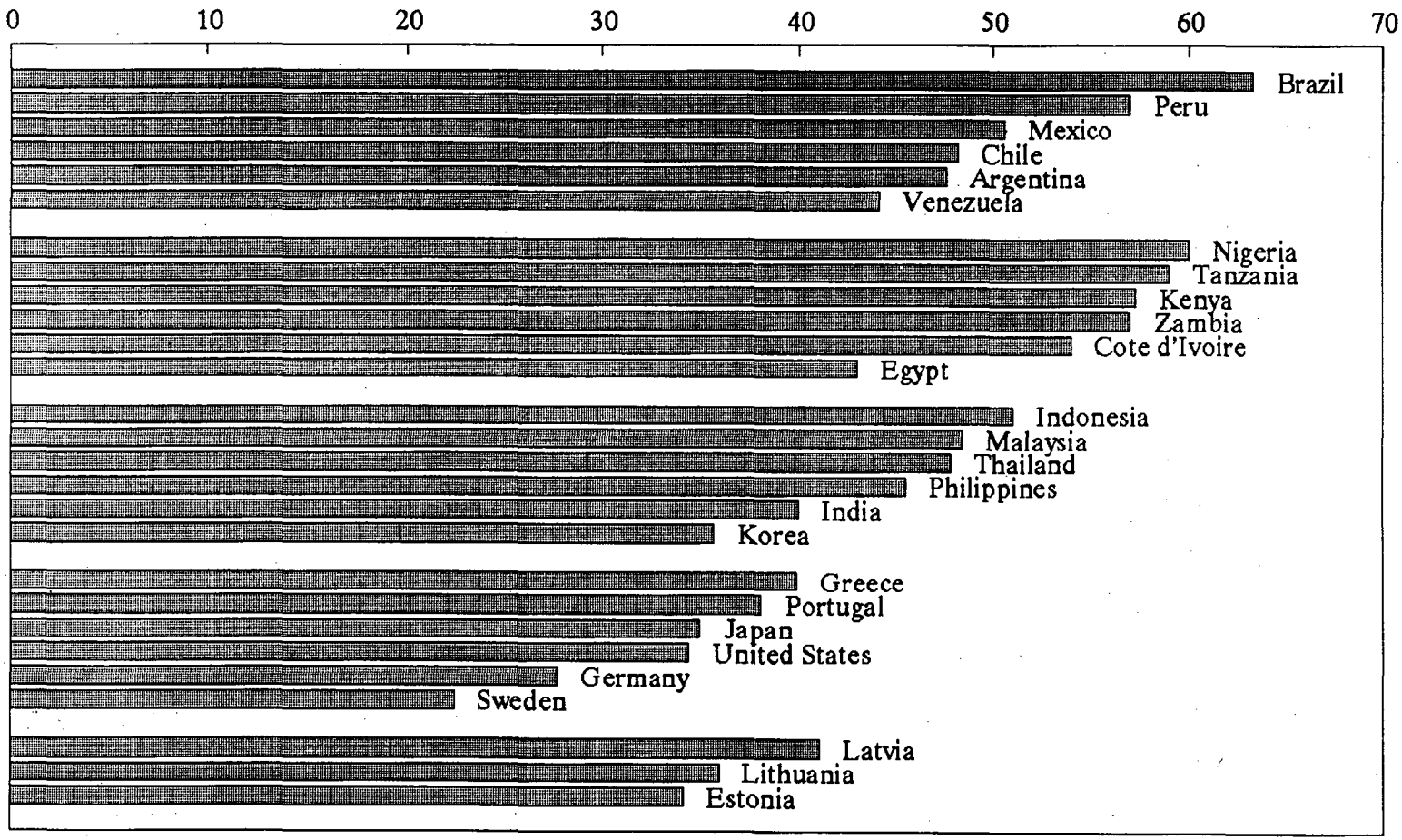
1/ However, according to a representative Multipurpose Poverty Survey conducted in the Kyrgyz Republic in the fall of 1993, the actual increase in the dispersion of income seems to have been much larger than suggested by official data. Based on this survey, a Gini of 0.678 was estimated, implying that the distribution had widened by 37 Gini points. For details, see Ackland and Falkingham (forthcoming 1996).

2/ Based on data from the 1980s, Milanovic (1994) has estimated the average Gini coefficient for the OECD at 0.312.

3/ Recently, this approach has been used by Kakwani (1995) for analyzing Ukrainian income data.

Chart 1: Gini Coefficients for Selected Countries 1/



Source: Milanovic (1994), Annex Table 4.

1/ Estimates refer to different years of the 1980s.

coefficient, then the ith income component is distributed over the total income in favor of poorer (richer) individuals.

As Table 3 reveals, the most important source of income inequality in Estonia and Lithuania, for which disaggregated income data are available, is the dispersion of earnings. As the most important source of income, earnings have contributed about 77 and 67 percent, respectively, to the overall degree of inequality. While disaggregated income data are not easily comparable with pre-reform data, there is reason to believe that their share in overall income inequality has increased significantly over time.

Table 3. Estonia and Lithuania: Inequality by Income Components, 1994

	Estonia			Lithuania		
	Share 1/	C_i	Contribution to total Inequality 1/	Share 1/	C_i	Contribution to total Inequality 1/
Wages	69.4	37.7	76.6	55.8	43.1	66.7
Entrepreneurship 2/	5.9	43.5	7.5	20.2	37.5	21.0
Dividends	6.1	55.1	9.8	1.0	74.2	2.0
Social insurance	0.5	21.9	0.3	0.7	10.8	0.2
Social assistance	5.1	-4.1	-0.6	1.8	-9.6	-0.5
Pensions	6.5	-11.9	-2.3	12.1	-3.6	-1.2
Other income	6.5	45.5	8.6	8.5	50.1	11.8
Total income	100.0	34.2	100.0	100.0	36.0	100.0

Sources: National authorities; and staff calculations.

1/ In percent.

2/ Includes agricultural income which plays a particularly large role in the case of Lithuania.

Although somewhat less equally distributed than total income in the pre-reform period, earnings in the top decile were only about three times higher than those in the bottom decile. 1/ Since then, however, the distribution of earnings has been allowed to rise considerably, especially after the abolition of the excess wage tax in Estonia and the statutory incomes policy in Lithuania in 1993, which has led to a marked increase in wage differentials. 2/ In 1994, earnings in the top decile in Lithuania were more than 240 percent higher than the median, while earnings in the bottom decile amounted to only 21 percent of the median. For Estonia, an even higher decile ratio was estimated, with earnings in the top and bottom deciles amounting to 221 and 17 percent of the median, respectively. The increase in the dispersion of earnings is also mirrored by the coefficient of variation, which rose by more than 25 points in the initial stages of the transformation process.

Apart from increasing wage differentials, two other factors have likely affected the dispersion of earnings. First of all, while there was general job security in the pre-reform period, unemployment has risen to 5-10 percent in the Baltic states since the beginning of their transformation. It can be assumed that this sharp increase has affected especially low-skilled wage earners at the lower end of the size distribution. Second, there has been a sharp drop in participation rates, which has been most pronounced in Estonia where they fell from almost 95 percent in the late 1980s to about 75 percent in 1994. This decline is largely explained by tight eligibility rules for unemployment benefits and low benefits, which

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1/ In Estonia, the percentage of earnings in the lowest decile relative to the median (P_{10}) amounted to 53.7 percent in 1989. Earnings in the top decile relative to the median (P_{90}) were estimated at 172.8 percent. In Latvia, these ratios were estimated at 53.5 percent and 173.6 percent, repectively; in Lithuania they were estimated at 53.9 and 178.7 percent, respectively (Atkinson and Micklewright (1992, table UE 6). In this context, it is interesting to note that earnings in the Baltic countries have been far more dispersed than in other former centrally planned economies. Atkinson and Micklewright (1992, p. 80), for example, report decile ratios of 2.5, 2.6 and 2.8 for former Czechoslovakia, Hungary, and Poland, respectively.

2/ Whereas the Baltic states moved rapidly in liberalizing prices of goods and services, the authorities initially continued to intervene in the labor market. In order to deal with a sharp deterioration in their terms of trade and to break the momentum of inflation expectations, the authorities in Estonia and Latvia imposed a tax on excessive wage increases in the state sector in 1992, while Lithuania implemented a statutory incomes policy. These wage controls have contributed to a significant adjustment in real incomes, which was regarded as indispensable in light of the severe supply shock caused by the sharp rise in imported energy prices (Cornelius, 1995b). Consequently, the wage controls, which inevitably had important distortionary effects, were converted into voluntary guidelines in early 1993.

have amounted to less than 15 percent of the average wage. Presumably, the decline in participation rates has been concentrated on the lower end of the size distribution, contributing to an even larger widening of earnings differentials.

While in 1994 the absolute dispersion of income from entrepreneurship, dividends, and other sources has been even greater than the dispersion of earnings, their relative contribution to total inequality has been less significant due to their small share in total income. Although social insurance benefits (mainly unemployment and health benefits) have been distributed far less unequally, they did increase the dispersion of total income. In contrast, pensions have had a redistributive effect in both countries. This is also true for social assistance in the form of cash benefits. However, their effect on the distribution of income has been even smaller, reducing the extent of total income inequality only by 0.6 and 0.5 percent, respectively. 1/ An important reason for this may be sought in the fact that most cash benefits are not means-tested but are rather based on a broad categorical approach, according to which all individuals falling into a certain category (e.g. having children) are eligible for social assistance regardless of their income. Not surprisingly, therefore, cash benefits have had a rather limited effect on alleviating poverty. 2/

While the previous analysis has focussed on pre-tax income, from a welfare point of view disposable income may be regarded as a more suitable measure. However, the redistributive effects of direct taxes seem to have been rather small in both Estonia and Lithuania, amounting to only one and two Gini points, respectively (Table 4). 3/ In fact, in both countries personal and corporate incomes are taxed at a flat rate. With indirect taxes becoming relatively more important as a source of budget revenue, it can be expected that the redistributive effects of taxes will even decline further.

1/ A similar value (-0.3), for example, has been estimated by Kakwani (1995, Table 10) for Ukraine.

2/ Cornelius (1995a) has estimated that in the case of Lithuania cash benefits have reduced the poverty gap by only about one percentage point. With perfect targeting of the poor, a three and a half times larger reduction could have been achieved. However, as Ahmad (1992) argues, detailed means-testing is likely to be administratively cumbersome so that the actual impact of social assistance reforms would probably be considerably smaller.

3/ Ceteris paribus, the distribution of disposable income becomes more equal with higher average tax rates. However, since the average tax rate may be changed without changing the tax elasticity or the tax progressivity, the comparison of the pre-tax and post-tax Lorenz curves as a measure of the redistributive effects of direct taxes should be regarded with considerable caution.

Table 4. Baltic States: Redistributive Effects of Direct Taxes, 1994

	Gini		
	Per Capita Before Tax Income	Per Capita After Tax Income	Redistribution Effect of Taxes 1/
Estonia	0.342	0.332	-0.010
Lithuania	0.360	0.341	-0.019

Sources: National authorities; and staff estimates.

1/ Negative sign indicates reduction in income inequality.

IV. Welfare by Income Components

In general, people are assumed to prefer not only efficiency, i.e. higher real incomes, but also equity. Thus, with an unchanged average income, a widening in income differentials is normally considered to be welfare-decreasing. In turn, a given distribution with a higher average income is considered to be superior to one with a lower income. This is taken into account by the Generalized Lorenz curve (GLC) which has been developed by Shorrocks (1983). Scaling the standard Lorenz curve by the average income of the distribution, Shorrocks proved that social welfare functions that are Schur concave and nondecreasing functions of all incomes are equivalent to defining GLCs and comparing distributions on the basis of these curves.

While it is possible for one GLC to dominate another even though their respective ordinary Lorenz curves cross, neither distribution can be said to be welfare superior to the other if the two GLCs intersect. In order to arrive at a complete welfare ranking of distributions in a single measure, Sen (1974) proposed a welfare function

$$W = \mu(1-G) \qquad (2),$$

with μ denoting the mean income and G the Gini coefficient.

Based on Sen's approach, Kakwani (1995) suggested decomposing total welfare into individual income components by combining (1) and (2):

$$W = \sum_{i=1}^{n} \mu_i(1-C_i) \qquad (3)$$

The welfare elasticity with respect to the ith income component may be expressed as follows, assuming that income from the ith component changes infinitesimally across all income recipients, i.e., that the change does not affect the ranking of recipients:

$$\eta_i = \frac{\mu_i(1-C_i)}{\mu(1-G)} \qquad (4)$$

In order to separate the income and inequality effects, equation (4) may be re-written as:

$$\eta_i = \frac{\mu_i}{\mu} + \frac{\mu_i(G-C_i)}{\mu(1-G)} \qquad (5)$$

If the change in the ith income component measured by the first term favors the poor more than the rich, the inequality effect measured by the second term is positive (and vice versa). On this basis, Kakwani (1995) defines the ratio of the inequality component to the income component as the *progressivity index* P of the ith income component:

$$P_i = \frac{(G-C_i)}{(1-G)} \qquad (6)$$

The progressivity index indicates whether the change in the ith income component favors the poor or the rich. If the ith component is distributed

in proportion to total income, C_i is equal to G so that P_i is zero; in this case a change in the ith income component is distribution-neutral.

Table 5 presents calculations of the welfare contributions and the progressivity index for each income component in 1994. In both countries, the largest contributions have stemmed from salary income, which have had a welfare elasticity of 0.66 and 0.5, respectively. Significant contributions have also come from pensions, and, in the case of Lithuania, from incomes from entrepreneurship, largely in the agricultural sector. In contrast, social insurance benefits have contributed to welfare only marginally, with an elasticity of 0.06 and 0.09, respectively. While in the case of Estonia cash benefits have had a significant share in total welfare, their role has been rather limited in the case of Lithuania.

Table 5. Estonia and Lithuania: Welfare by Income Components, 1994

	Estonia		Lithuania	
	Contribution to total welfare 1/	Progressivity index	Contribution to total welfare 1/	Progressivity index
Wages	65.7	-0.05	49.7	-0.11
Entrepreneurship 2/	5.1	-0.14	19.7	-0.02
Dividends	4.2	-0.32	0.4	-0.60
Social insurance	0.6	0.19	0.9	0.40
Social assistance	8.1	0.58	3.1	0.71
Pensions	11.0	0.70	19.6	0.62
Other income	5.4	-0.17	6.6	-0.22
Total income	100.0	-	100.0	-

Sources: national authorities; and staff estimates.

1/ in percent.

2/ including agriculture.

However, a welfare comparison needs to take into account the costs of increasing welfare in the form of a wider dispersion of income. Although wages have had the largest share in total welfare, they may not be considered as welfare superior to, say, cash benefits. Their progressivity index indicates that they are regressive favoring the better-off. While the non-comparability of pre- and post-reform data on individual income components prevents us from studying changes in the progressivity index over time, increasing wage differentials, increases in unemployment and lower participation rates would suggest that the welfare effects of salary incomes have become more regressive since the beginning of the transformation process. In contrast, pensions, social insurance benefits, and cash benefits show a positive progressivity index, indicating that an increase in these components favors the poor.

There appears to be considerable room for reforming the social safety net, aiming at a better targeting of the poor. In 1994, the Baltic states spent on average about 10 percent of GDP on social security and welfare which is comparable with the level of spending in high income countries and considerably higher than the average spending on social safety nets in middle income countries. 1/ Future reform efforts will need to be directed mainly at improving the efficiency of the social safety net and in all three countries the authorities have recognized the importance of improving protection for the poorest segments of the population. 2/ However, a better targeting of social assistance may itself be politically difficult to achieve as it also implies redirecting transfers away from middle and high income groups, which have a vested interest in the present pattern of transfers.

V. Conclusions

Having enjoyed the lowest degree of income inequality in the pre-reform period among the FSU countries, the initial phase of the transformation process in the Baltic states towards market economies has been accompanied by a significant change in the distribution of income. While their stabilization and reform programs have been highly successful in establishing the preconditions for sustained economic growth, income differentials have widened markedly in all three countries. To a large extent, the widening in income differentials reflects a greater dispersion of earnings caused by greater wage differentials, lower participation rates,

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1/ In 1992, the average expenditures for social security and welfare in a sample of 19 high income countries were about 12 percent of GDP and the corresponding figure in a sample of 29 middle income countries was about 5 percent of GDP (Government Finance Statistics Yearbook, 1994).

2/ For a discussion of reform options for the social safety net in transition economies see "Social Safety Nets for Economic Transition" (1995).

and increased unemployment. These distribution effects have been cushioned only marginally by social assistance programs, which have remained largely based on a broad categorical approach. Similarly, the redistributive effects of direct taxes have been very limited due to flat tax rates, and, with indirect taxes expected to gain in importance, the equalizing effects of the tax system are likely to be eroded further.

Three years after the beginning of the transition process, the dispersion of incomes in the Baltic states is now comparable with those of Southern European countries, while in the pre-reform period the degree of income inequality appeared more akin those of Northern European countries. Despite the considerable widening of income differentials in the early phase of transition, there seems to have been broad political support for the reform programs in all three countries. Whether this will continue may depend not only on the expected increase in average living standards but also on whether the authorities' succeed in their efforts to redirect social assistance towards better protecting the poorest segments of the population.

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