EXPLAINING THE INCREASE IN INEQUALITY DURING THE TRANSITION

Paper prepared by

Mr. Branko Milanovic

World Bank, Policy Research Department

for

Session VI: Social Policy and Income Distribution During the Transition

presented at the
International Conference on

Challenges to Economies in Transition:
Stabilization, Growth, and Governance

held in honor of the
Fifth Anniversary of the Kyrgyz som
Bishkek, Kyrgyz Republic
May 27-28, 1998

EXPLAINING THE INCREASE IN INEQUALITY DURING THE TRANSITION[1]

Branko Milanovic
World Bank, Policy Research Department

Introduction

To explain the change in inequality that has occurred in all transition economies,[2] we need first to present the economic changes in terms of what happened to incomes of different social classes, and then to translate this into the "language" of personal incomes. This is, of course, a common problem of moving from social classes and thus factoral income distribution to personal income distribution (for a recent overview see Atkinson, 1995). The "translation" is cumbersome but necessary if we want to combine (i) a discussion of economic forces that shape income distribution with (ii) how these forces "played themselves out" in the arena of personal income distribution. To look into (i) we have to use the standard economist's "kit of tools" which is designed to study the behavior of individuals who are either workers or capitalists or farmers or transfer-recipients. In doing this we "tag" individuals by assuming that they have no other sources of income but one. This is the approach I use in Sections 1 and 2 where I present first, a simple model of factoral income distribution during the transition, and second, a numerical illustration of change in inequality.

"Tagging" is, of course, wrong: a capital-owner may (and presently often does) work; a workman may own stocks and engage in entrepreneurial activity; a pensioner may work part-time or lease some of his assets. Thus when we move to personal income distribution, the point of view changes: we no longer "tag" individuals but simply add all their sources of income, adjust total income for personal and household characteristics (household size, age of children etc.), and then rank everybody according to his/her adjusted household income. People are no longer workers or capitalists or pensioners; they just have incomes, some of which may be in the form of wages, or profit, or pensions. In terms of disaggregation of an index of inequality we go from the disaggregation by *recipients* to disaggregation by *income sources*. The latter is the point of view I adopt in Section 3 where I present empirical evidence on income inequality and factors that were responsible for its increase. In the concluding Section 4, I contrast the conclusions drawn from the empirical evidence with the conclusions drawn from the model and numerical illustrations in Sections 1 and 2.

---

[1] The findings, interpretations, and conclusions expressed in this paper are entirely those of the author. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent. I am grateful to Jan Rutkowski for very helpful comments.

[2] See Milanovic (1998, Chapter 4).

1. Change in sector shares and factor incomes

Consider a following simple model of an economy before and after the transition.

Pre-transition. The economy is composed of two sectors. First, a small private sector whose size is limited through various legal restrictions (e.g. a limit on the number of workers that can be employed; no access to credit; banned sectors of operation etc.); and second, a large state sector. The private sector (consisting mostly of the self-employed) maximizes the average product per worker (aplp)[3] where subscript p denotes private sector. It employs OP workers (Figure 1). Since its growth is limited by legal barriers, it is not allowed to maximize the aplp curve. The average income in private sector is therefore y.

Since there is no unemployment, the state sector must employ the rest of the labor force (NP)[4] and its wage (ws) is established at the point where the demand for labor (mpls) intersects the vertical P line.[5] Normally, we would expect that since ws<y, labor would flow to the private sector. This is precluded because of the legal limits on the private sector size.

---

[3] All per capita magnitudes are written in lower case.

[4] The state sector share should be read from right to left.

[5] A more usual assumption (see e.g. Blanchard and Keeling, 1996; Commander, Tolstopiatenko and Yemtsov, 1997, Appendix 1) has been to assume that the private sector equalizes marginal product of labor and the wage, while the state sector maximizes the average product of labor. This was rationalized by arguing that the private sector was a "normal" private sector, and the state sector was labor-managed. However, this approach fails to acknowledge that almost the entire private sector before the transition was self-employed or cooperative, and that average product was therefore a better maximand. Further, only in Yugoslavia, and to some extent in Poland, could the old state sector be described as labor-managed.

### Figure 1. Private and state sector equilibrium before the transition
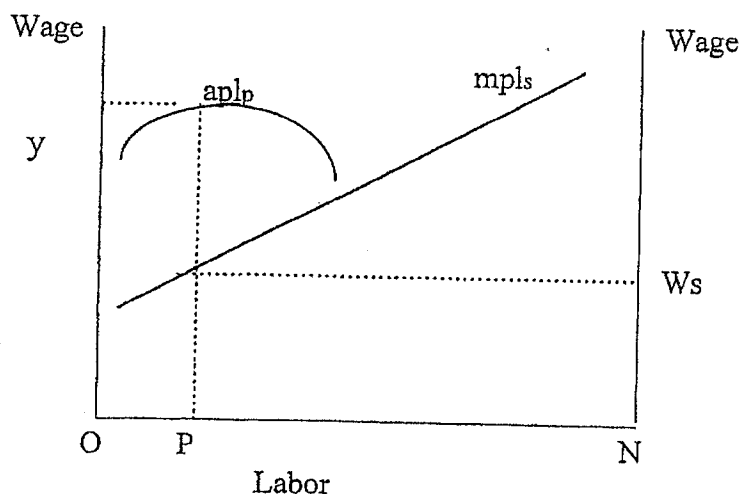
There is no taxation of the private sector. The entire surplus of the state sector (the area between the mpls line and ws) is taxed and is used to pay pensions (and other social transfers). Writing the number of private and state sector employees respectively as N_p and N_s, and total number of pensioners as T (for transfer-recipients), we can write the identity (1) where the LHS shows the output from the production side and the RHS its distribution. Total tax revenues $\tau_s N_s$ (tax per state sector employee *times* number of state sector employees) is for simplicity assumed to pay only for total pensions (average pension or transfer (t) *times* T).

$$
\text{(1)} \quad y\,N_p + w_s\,N_s + \underbrace{\tau_s\,N_s}_{\text{taxes}} = y\,N_p + w_s\,N_s + t\,T
$$

Note that since N_s and N_p and the aplp and mpls curves are known, the entire LHS is known. Since T is known (by assumption), t can be directly obtained. (The other way to look at it is to realize that total output of the state sector must be exhausted for wages and pensions. Once ws is determined, t becomes known.)

Transition. The transition is defined as the removal of legal restrictions on the private sector.[6] Moreover, private sector is no longer a self-employment sector which maximizes the average product per worker but becomes a "normal" private sector where firms hire labor until mplp=wp. The private sector demand for labor now becomes mplp (Figure 2). State sector demand for labor (mpls) shifts downward as demand for state sector output declines. If we assume wage rigidity (wages stay at the pre-transition level ws or do not decline sufficiently) there would be some unemployment (Nu).[7]The employment shares of the private sector has increased, and that of state sector declined.

Figure 2. Private and state sector equilibrium after the transition
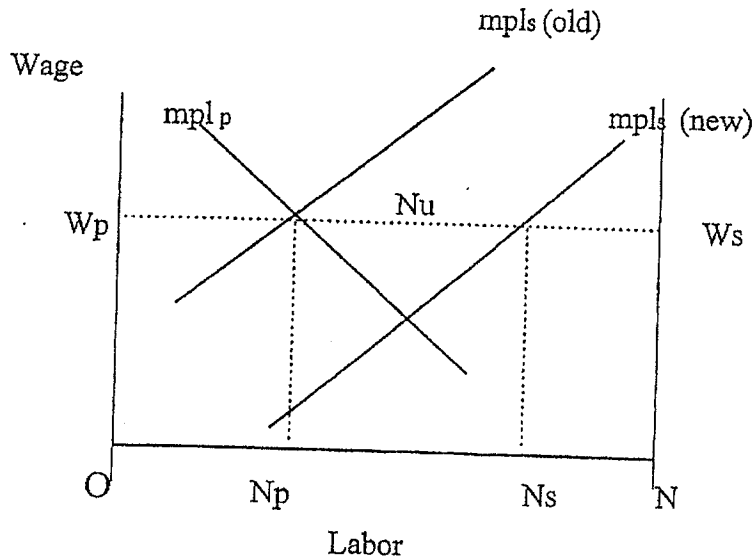
The entire surplus of the state sector is still taxed away to pay for pensions. However, this is no longer sufficient to maintain pensions unchanged in real terms both because the state sector has shrunk, and, in addition to (an unchanged) number of pensioners, the government must also pay unemployment benefits to Nu individuals. The private sector must now be

---

[6]In a similar model, Blanchard and Keeling (1996) define the transition as a removal of subsidies received by state sector. Under both scenarios, the relative sizes of the private and state sector change in favor of the private.

[7]Wages in the two sectors must now be the same.

taxed. Not all of its surplus (the area between mplp curve and wp) is taxed, but only a portion α. The rest of the surplus is capitalists' income.[8]

Now, on the production side instead of two "income recipients" (the self-employed and workers in the state sector), we have three "recipients" (workers in the private sector, capitalists, and workers in the state sector). This yields:

$$
\text{(2)} \qquad w_p \, N_p + (1-\alpha)b + w_s \, N_s + \underbrace{\tau_s \, N_s + \alpha b}_{\text{taxes}}
$$

where b=private sector profit; αb is taxed away from capitalists and $(1-\alpha)b$ they keep. The last two terms in (2) represent total taxes that are assumed to pay for pensions and unemployment benefits. For simplicity, the average amount of unemployment benefits is assumed equal to average pension.

On the distribution side, this yields:

$$
\text{(3)} \qquad w_p \, N_p + y_k \, N_k + w_s \, N_s + t \, (T + N_u)
$$

where y_k=average net income of capitalists, N_k = number of capitalists, and all other symbols as before. If we compare equation (3) and the RHS of equation (1), we note that the distribution side has changed during the transition in three ways: (i) the self-employment sector has now split into private sector workers and capitalists; (ii) N_p has increased while N_s has shrunk (compare Figures 1 and 2), leading to an increase in private sector income $w_p \, N_p + y_k \, N_k$, and a decrease in state sector income $w_s \, N_s$; (iii) the unemployed have joined the pensioners as transfer-claimants.

2. Changes in factor income inequality and overall inequality

But to study the overall change in inequality, it is not sufficient to consider only what happened to factor shares. This is because the factor shares are distributed with different degrees of inequality.

Before the transition state sector wages were more equally distributed (among the recipients of state sector wages) than was the self-employment income (among the recipients

---

[8]We can further assume that capitalists invest at least a portion of their surplus thus shifting the demand for labor curve upward and increasing the demand for private sector labor. If in the state sector depreciation is equal to the user cost of capital, there would be no net investments, and the state sector demand for labor would remain unchanged. Thus dynamically, the proportions between the private and state sector will continue to shift in favor of the latter. For a similar mechanism see Blanchard and Keeling (1996).

of the latter). In other words, the Gini coefficient of Ws was lower than the Gini of Y (upper case letters indicate total amounts of wages, or private sector income).[9]

Take the RHS of equation (1), depicting the distribution of pre-transition incomes, and assume (ultra restrictively) that state sector wages (w_s) and pensions (t) are distributed equally per capita (and that we study *per capita* income inequality). Then, the only source of inequality may seem to come from inequality in the distribution of Y. However, this is not the case because there would be also some inequality associated with the differences in average incomes of workers in the state sector, pensioners and the self-employed. The overall income Gini (GINI) can be written:

(4) $\text{GINI} = G_y \, \pi_y \, p_y \; + G_w \, \pi_w \, p_w + G_t \, \pi_t \, p_t +$

$+ \; \dfrac{1}{\mu} \; [(y\text{-}ws) \; py \; pw \; + (y\text{-}t) \; py \; pt + (ws\text{-}t) \; pwpt] + L$

where μ=average overall income, Gi's are the Gini coefficients of *recipients only* of self-employment income (G_y), state sector wages (G_w) and pensions (G_t); π's are income shares of the three types of income; *p*'s are the population shares, and L is the overlapping term showing that part of inequality that is due to the fact that some people belonging to the group with a high average income (say, the self-employed) have *lower* incomes than some people belonging to a group with low income average incomes (say, pensioners). Assuming (ultra restrictively) $G_w = G_t = 0$, and $y = \beta w_s$ and $t = \gamma w_s$ where $\beta > 1$ (see Figure 1), and $\gamma < 1$ (since average pension is a fraction of average wage), the overall inequality before the transition becomes

$$\text{GINI} = G_y \, \pi_y \, p_y + \; \dfrac{1}{\mu} \; w_s \, [(\beta\text{-}1) \; p_y \, p_w \; + (\gamma\text{-}\beta) \; p_y \, p_t + (1\text{-}\gamma) \; p_w p_t] + L$$

The typical population shares before the transition were approximately 60% of household heads employed in the state sector, 20% self-employed or employed in the private sector, 20% pensioners. Assuming further that the average pension was 1/2 of the average wage ($\gamma = 0.5$) and average self-employment income 3/2 of the average wage ($\beta = 1.5$),[10] the GINI becomes

---

[9]The entire private (self-employment) income before the transition is denoted by Y. After the transition, we still denote the entire private sector income by Y; however, it is now equal to Wp (private sector wages) *plus* B (capitalists' profit).

[10]So that the overall average income μ (0.6*1+0.2*0.5+0.2*1.5) is equal to the average

(5)   GINI = 0.06 G_y + 0.06 + 0.04 + 0.06 + L $\simeq$ 0.18 + L

where we have assumed, based on some empirical evidence, that G_y=0.3. L (overlapping) inequality can stem only from the self-employed who might "overlap" with other social groups. This is so because all pensioners and all state sector workers have respectively γw_s or w_s: there can be no "overlapping" between them. Moreover, there is some evidence that the self-employed not only "overlapped" with some other recipients, but even bracketed them. The self-employed before the transition included both poor farmers, barely above the subsistence level, and rich entrepreneurs who, thanks to connections and luck were able to make large profits.[11]These two extreme groups among the self-employed were particularly in evidence in countries that combined a large private agricultural sector divided in many small plots like Yugoslavia, Poland and Hungary, and also allowed some non-agricultural private enterprise.

Equation (5) shows that under the ultra restrictive assumptions of equal wages and equal pensions (for respectively all state-sector workers and all pension recipients), the overall Gini in pre-transition countries would have been between 18 and 20, where this extra "nudge" above GINI=18 comes from the presence of both relatively poor and relatively rich among the self-employed. Gini of 20 is approximately the value recorded in Czechoslovakia, the most egalitarian among former socialist countries. Supporting indirectly the ultra restrictive assumption of equal wages and pensions, it was argued with some plausibility by Ve...ernik (1986; 1993) that before the transition disposable household income in Czechoslovakia could have been well approximated by multiplying individual household *demographic* characteristics--number of the employed, number of pensioners and number of children--with constants (which are, by definition, equal for everybody).[12] Implicitly, inequality of wage or pension distribution could be treated as negligible.

---

[10](...continued)
wage.

[11]The latter group produced even a few instances of "socialist" millionaires like Jan Kulczyk, the founder of *Inter Fragrances*, a large Polish perfume exporter, or Erno Rubik of the Rubik cube fame in Hungary. For the evidence of an inverted U shape of the private sector *share* in disposable income, see Milanovic (1992, p. 21).

[12] Household income, approximated by the formula c_0 + c_1*number of employed members + c_2*number of pensioners + c_3*number of children, could explain more than 60% of actual variation in Czechoslovak incomes (see Vecernik, 1993).

If we now abandon the ultra restrictive assumptions of $G_w=G_t=0$, and replace $G_w=0$ with (the empirically-based) $G_w=0.25$;[13] and similarly $G_t=0$ with the empirically-based $G_t=0.15$[14] (while still ruling out overlapping between workers and pensioners: that is, still assuming that all workers have higher incomes than all pensioners), the GINI increases to about 27. With the overlap component, it would be about 28. Most of the increase is due to inequality among wage earners (see Table 1). Indeed the Gini between 24 and 28 was the level observed in Poland, Romania, Slovenia, Hungary, Bulgaria and most of the republics of the former Soviet Union before the transition.[15]

In conclusion, assuming "ideal-typical" conditions of socialist economies before the transition and breaking down equation (4) we find that:

(i) about 16 Gini points of inequality (see Table 1) was due to the differences in average incomes between the self-employed, workers in the state sector and pensioners;

(ii) about 9 Gini points was due to inequality among state-sector workers;

(iii) about 2 Gini points was due to inequality among the self-employed and pensioners;

(iv) and the rest (1-2 Gini points) was due to "overlapping."

---

[13] Atkinson and Micklewright (1992, p.81) give the earnings' Ginis in 1986-87 as 20 in Czechoslovakia, 22 in Hungary, 24 in Poland, 28 in the USSR. Similarly, Redor (1992 [1988]) gives the following values: Hungary (1980) 21; Poland (1980) 23; Czechoslovakia (1979) 20; USSR (1964) 24. For more details see Figure 5 below.

[14] Ginis of pensions (calculated across pension recipients) ranged in East European countries between 12 and 18 (World Bank PRDTE data base).

[15] See Atkinson and Micklewright (1992, p.113); also Milanovic (1997, p.44).

Table 1. Break-down of inequality before the transition

	Formula	Value (in Gini points)
(A) Inequality among state workers	Gw πw pw	9
(B) Inequality among the self employed	Gy πy py	1.8
(C) Inequality among pensioners	Gt πt pt	0.3
(D) Differences in average incomes	$\frac{1}{\mu}$ ((y-ws) py pw +(y-t) py pt + (ws-t) pwpt)	≅16
Total without overlapping [A to D]		≅27
Overlapping		1-2 points
Total GINI		about 28

Assumptions: pw=60%, py=20%, pt=20%; Ws=1; pension/wage=0.5; self-employment income/wage=1.5; Gw=0.25; Gy=0.3; Gt=0.15. Hence, πw=60%, πy=30%, πt=10%, μ=1.

Transition. How are these values affected by the transition? There are two factors driving inequality up: (i) the change in the composition of the employed; and (ii) the increase in inequality amongst both the private sector and state-sector workers. On the offsetting side, a movement of some workers from the state sector to transfer recipients (unemployment) where inequality is less, will tend to lower the overall GINI.

First, from Section 1 we know that the shares of the private and state sector will change during the transition. The former will grow; the latter will decline. Since inequality in the private sector was originally greater (G_y=0.3 vs. G_w=0.25) and is likely to remain so, the shift in employment will tend to increase the overall GINI. (A qualifier "tend" is needed because the relationship, as shown in footnote 16 below is more complicated.)

Second, inequality in the new private sector (G_y) will rise.[16]

---

[16]The evidence (see Rutkowski (1996) for Poland; Ve...ernik (1994a) for the Czech republic; Vodopivec and Orazem (1995) for Slovenia, and Rutkowski (1995) for Bulgaria) shows not only that private sector incomes become more unequally distributed (a thing which we might expect), but that state sector wages' inequality rises too. However, in order to keep matters relatively simple, I shall ignore the higher inequality of Ws.

Combining the "new class" of capitalists that has emerged during the transition with private-sector workers, and rewriting equation (4) where subscript y refers to both of them, while subscript t denotes now both the pensioners and the unemployed,

(4) $\text{GINI} = G_y \, \pi_y \, p_y \; + G_w \, \pi_w \, p_w + Gt \,_\pi t \; pt +$

$+ \dfrac{ws}{\mu} \, [(\beta\text{-}1) \, p_y \, p_w \; + (\beta\text{-}\gamma) \, p_y \, p_t + (1\text{-}\gamma) \, p_w p_t] + L$

we can "isolate" the following causes of increased inequality:

(i) Assume that Δh percentage of state sector workers "moves" to the private sector. This reduces p_w from 60% to $(60\text{-}\Delta h)$%, and increases p_y from 20% to $(20+\Delta h)$%. Since $G_y > G_w$, GINI will rise.[17]

---

[17] If Δh is sufficiently small, the change in the non-overlap component of the GINI will be

$$\delta\text{GINI}/\delta h = \frac{2}{\mu} (Gy\ y\ py - G^w\ ws\ pw) + \frac{ws}{\mu} [(\beta\text{-}1)\ pw - (\beta\text{-}1)\ py + (\beta\text{-}\gamma)\ pt - (1\text{-}\gamma)\ pt]$$

$$= \frac{2ws}{\mu} (Gy\ \beta\ py - Gw\ pw) + \frac{ws}{\mu} [(\beta\text{-}1)\ (pw - py) + (\beta\text{-}1)\ pt] =$$

$$= \frac{2ws}{\mu} (Gy\ \beta\ py - Gw\ pw) + \frac{ws}{\mu} [(\beta\text{-}1)\ (pw - py + pt)] \qquad (4A)$$

where we use the fact that $\pi y = \beta ws py/\mu$ and $\pi w = ws pw/\mu$.

The sign of the first RHS term in (4A) is unknown (in general case). The second term will be positive if there is a difference in average incomes between the groups (i.e. if $\beta > 1$). If the difference between the average incomes is small (β close to 1), the equation (4A) may be negative. In that case, GINI will increase due to an increase in the overlap component. The overlap component will increase because the share of the more "dispersed" (unequal) sector increases. Using the values from our example, however, $\delta\text{GINI}/\delta h = 0.18$. Thus with $\delta h = 0.2$ (as assumed below), the change in the Gini, due to the non-overlap component alone, will be 0.036 or 3.6 Gini points.

(ii) The changed composition of employment will affect income shares: π_y will increase and π_w will decline. Since $G_y > G_w$, GINI will rise.

(iii) G_y will also increase driving overall GINI up.[18]

Let now twenty percent of labor force move out of state into private sector (Δh=0.2), and ten percent of labor force become unemployed (N_u=0.1). The share of private sector in the population (household heads) increases to 40% and in total income to 57%; the share of state sector in population and in total income drops to 30%; the share of transfer-recipients (pensioners and the unemployed) in population increases to 30% and in income to 14%.[19] β and γ for simplicity stay unchanged.[20] The overall GINI without the overlap component rises to about 33; with the overlap component probably to 35-36. This is approximately the level of inequality recorded now in the Baltics and the Balkans. Inequality in Central Europe is lower (about 25) and in Russia and Ukraine higher (about 45).

---

[18] The change in GINI will be ΔGINI = πy py ΔGy > 0.

[19]Before the transition, overall income was 100 wage units (this can be seen from the RHS of equation 1). After the transition, the overall income is 105 wage units: 40 persons in private sector earning 1.5 average wage *plus* 30 persons in state sector earning average wage *plus* 30 transfer recipients earning 1/2 average wage = 105 wage units.

[20]Note than β=1.5 ws is still possible despite the fact that wp=ws (see Figure 2). This is because the private sector income includes not only wages but net profits as well, i.e. the rectangle wpNp plus a part of the area (net profits) between mplp and wp in Figure 2.

Table 2. Break-down of inequality after the transition

	Formula	Value (in Gini points)
(A) Inequality among state workers	Gw πw pw	2.2
(B) Inequality among private sector	Gy πy py	9.1
(C) Inequality among transfer-recipients	Gt πt pt	0.6
(D) Differences in average incomes	$\frac{1}{\mu}$ ((y-ws) py pw +(y-t) py pt + (ws-t) pwpt)	≅21
Total without overlapping [A to D]		≅33
Overlapping		2-3 points
Total GINI		about 35-36

Assumptions: pw=30%, py=40%, pp=30%; Ws=1; pension or unemployment benefit/wage=0.5; self-employment income/wage=1.5; Gw=0.25; Gy=0.4; Gp=0.15. Hence, πw=29%, πy=57%, πp=14%, μ=1.05.

If we compare Tables 1 and 2, we can see the sources of increased inequality. The shift of workers from the relatively egalitarian state sector to the private sector and into unemployment increased inequality by 1 Gini point (sum of A, B and C in Table 2 vs. the sum of A, B and C in Table 1).[21] Had inequality in the private sector remained the same, there would have been no increase.

The differences in average incomes—primarily due to the fact that the weight (p_y p_t/μ) attached to (the large) gap between the average private sector income and average pension has increased substantially--account now for 21 instead of 16 Gini points. The greater inter-group differences have therefore added some 5 Gini points to inequality. The greater inter-group differences are not due to the changed *average relative* incomes between the groups (which by construction I assumed constant), but to a changing composition among the employed, and between the employed and the transfer-recipients. In essence what occurred was the "hollowing out" of the middle. While before the transition, 60% of the household head were employed at the average income (=state sector wage) while 20% each were either earning more (the self-employed) or less (pensioners), the transition cut down this "middle

---

[21]The first three lines in Table 1 sum to 11.1 Gini points; the same lines in Table 2 sum to 11.9 Gini points.

class" to half as a large chunk of them moved to the private sector and some became unemployed. Thus both the "rich" and the "poor" increased, while the middle shrunk.

In conclusion, this simple example illustrates that the bulk of the increased inequality (about 5 Gini points) was due to the changing composition of employment and the emergence of unemployment ("hollowing out of the middle") and about 1 Gini point to the increased inequality in the private sector. A further Gini point increase might have been caused by the greater income overlapping of private sector people with state-sector workers and transfer-recipients (the latter two groups are still assumed not to overlap).[22]

3. Inequality by sources of income[23]

The analysis so far has been couched in terms of income *recipients*. This is from the point of view of exposition of what happened during the transition an easier way to proceed. We can simply say that some *persons* who used to work in state sector have transferred to private sector. But this "tagging", as mentioned in Introduction is neither realistic (people have numerous sources of income), nor are income distribution data normally presented in that way. Thus we need to move to a study of income sources (wages, private-sector income etc.) rather than individuals, that is, to the disaggregation of the GINI by factor *incomes*.

The formula for the decomposition of the GINI also gets simpler as the overlap term disappears.[24] We can now write disposable income *for each person* as the sum of wages (w), cash social transfers (t), and *non-wage* private sector income (p). The Gini coefficient of disposable income is then formally equal to the weighted average of the concentration coefficients C_i of the three individual sources (wages, transfers, private sector income) where weights are their shares (S_i) in total income (equation 6):[25]

---

[22]The greater overlap of private sector people is simply due to their greater numbers. Since they are distributed across the entire income spectrum and there are more of them, the overlap component of the GINI will increase.

[23]Parts of this section are published in Chapter 4 of Milanovic (1998).

[24]Unlike in the previous case, GINI can be exactly decomposed.

[25]The concentration coefficient captures both inherent inequality with which a given income source is distributed (source Gini coefficient) and the correlation of that source with the overall income. Thus, an inherently unequal source like social assistance with a high Gini coefficient will have a low or negative correlation with overall income (because most of social assistance recipients are poor), and its concentration coefficient will be low or negative. When we use the term "concentration" of the source we have in mind not only its inherent inequality but also how it correlates with the overall income. The exact definition of the concentration

(continued...)

$$(6) \qquad\qquad G = \Sigma_{i=1}^{3} S_i C_i = S_w C_w + S_t C_t + S_p C_p$$

The change in the Gini between two dates (before and after the transition) can be written as:

$$(7) \quad \Delta G = \Sigma_{i=1}^{3} \Delta S_i \ C_i + \Delta C_w \ S_w + \Delta C_t \ S_t + \Delta C_p \ S_p + \Sigma_{i=1}^{3} \Delta S_i \ \Delta C_i$$

The first term on the RHS shows the change in Gini due to the changing shares of different income sources; the next three terms show the change due to changing concentration coefficients of income sources; and the last term is an interaction term.

What happened to factor shares? Consider first what happened to S_i's during the transition. Table 3 shows the shares of wages, pensions, other social transfers, and non-wage private incomes before the transition (1987-89) and in 1993-95 in six transition economies: four in Eastern Europe, two in FSU. For simplicity of presentation, I have selected only the end-years for each country. The yearly data are shown in Figure 3 (left panels). All data are calculated from the countries' *Household Budget Surveys*. The sample is limited to the countries where I had access to the fairly detailed [26] successive annual or quarterly income distribution data.[27]

Wages are defined as all labor earnings including those from second jobs, fringe benefits (in cash or in kind) and from either state or private sector. (Private sector wages were, of course, very rare before the transition). Pensions include all types of pensions (old-age, survivor, invalidity). Other social transfers are all non-pension cash social transfers like

---

[25](...continued)
coefficient of the source i is Ci =Gi Ri where Gi=Gini coefficient of the source and Ri =

$$\frac{\text{cov}[i, rank(income)]}{\text{cov}[i, rank(i)]}$$

ratio of covariances between source i and ranking of recipients according to total income, and source i and ranking of recipients according to source i. *rank (.)* is a rank function taking values from 1 to N (total number of recipients). If the two ranks coincide, R=1, and Cw=Gw. Since in cov[i,rank(i)] both i and *rank(i)* uniformly increase, its value will be greater or equal than that of cov[i rank(income)]. Therefore, R≤1.

[26] Individuals divided into deciles according to per capita household disposable income *plus* income composition by each decile.

[27] The list of surveys and the discussion of data quality is in Annex 1.

family benefits, unemployment allowance, sickness benefits, [28] scholarships, social assistance. Finally, *non-wage* private incomes are a mixed bag. They include self-employment net income, value of home consumption, private gifts and remittances from abroad, net interest [29] and entrepreneurial income, income from the lease or rental of assets etc. This source does not include wages earned in private sector but does, in principle, include distributed business profits.

Table 3. Composition of population disposable income before
the transition and "now" (1993-96)
(in percent; calculated from *HBS*s)

Countries (years)	Wages		Non-wage private income		Pensions		Other social transfers	
	pre	"now"	pre	"now"	pre	"now"	pre	"now"
Bulgaria (89-95)	57	47	22	31	17	18	5	4
Hungary (87-93)	60	50	14	16	19	19	7	15
Poland (87-95)	55	44	24	24	17	27	5	6
Slovenia (87-95)	67	57	20	25	17	22	2	4
Eastern Europe	**60**	**50**	**20**	**24**	**17**	**21**	**5**	**7**
Russia (89-94)	74	55	5	23	8	18	7	3
Latvia (89-96)	82	50	12	24	8	18	3	9
FSU	**78**	**53**	**9**	**23**	**8**	**18**	**5**	**6**

Sources: see Annex 1.

The regional means are unweighted averages. Rows sum to 100.

a/ Gross income for pre-transition years. Since personal income taxes were negligible, the difference between gross and disposable income is very small.

---

[28] Some, however, might be included in wages (if paid out by enterprises).

[29] In cases of high inflations, however, this source is not included. In *HBS*s, it is always shown in nominal terms. But, in high inflation conditions most or all of nominal interest income compensates for the depreciation of the principal. (Often when real interest rates are negative, not even that is accomplished.) Strictly speaking, we would need to include as income only the *positive real interest* portion. When inflation is very small or zero, nominal and positive interest portion are almost the same; but with high inflation it would be a much worse error to treat the entire nominal interest income as real income than to disregard it altogether.

The data in Table 3 show:

• The share of wages has declined in all countries. Its decline has been sharper in Russia and Latvia (where initially wages were more important as an income source) than in Eastern Europe. In the East European countries, the share of wages declined everywhere by about 10 percentage points. In Russia, the wages' share dropped by almost 20, and in Latvia by 30 percentage points.
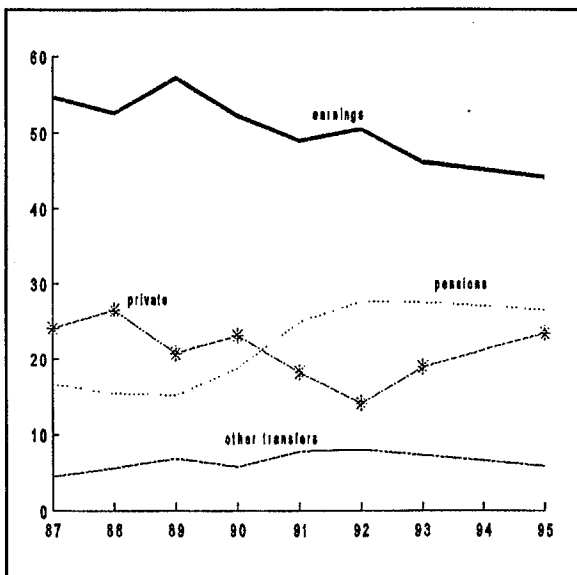
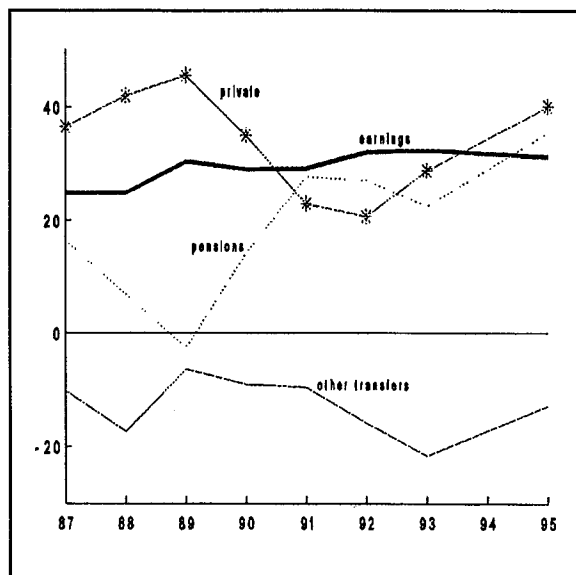*Figure 3*

Composition of disposable income	Concentration coefficients of wages,
(in percent)	social transfers and private-sector income

Poland
(a)

Slovenia
(b)

Figure 3 (continued)

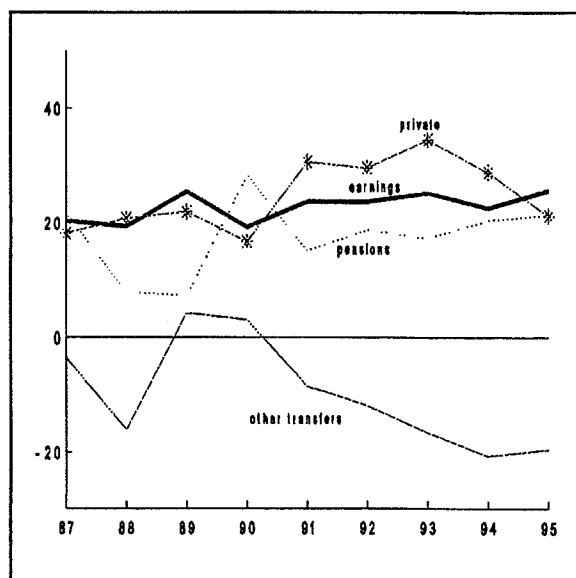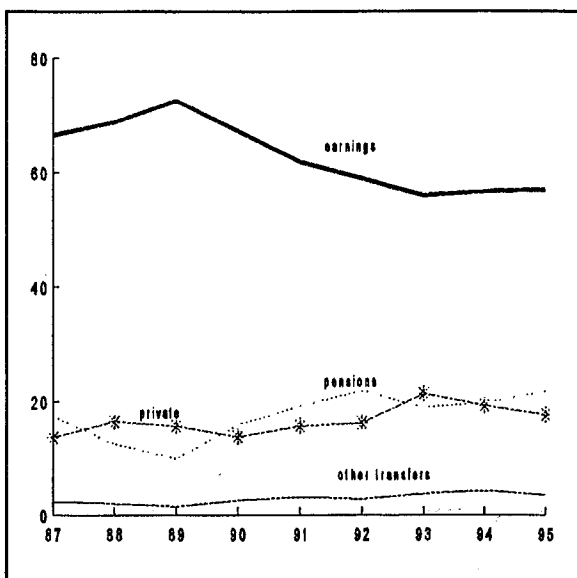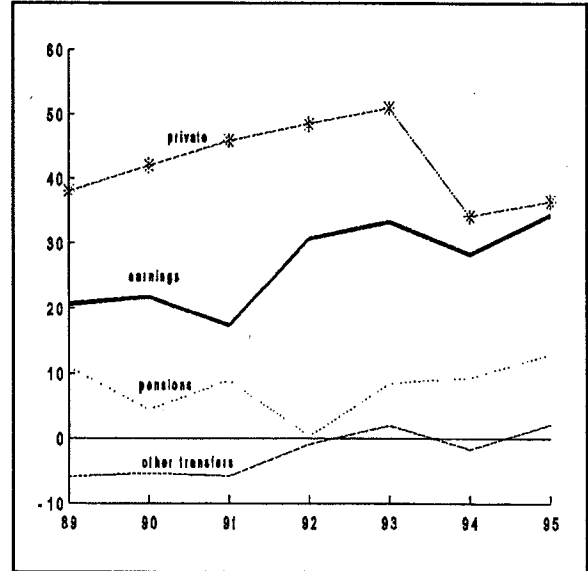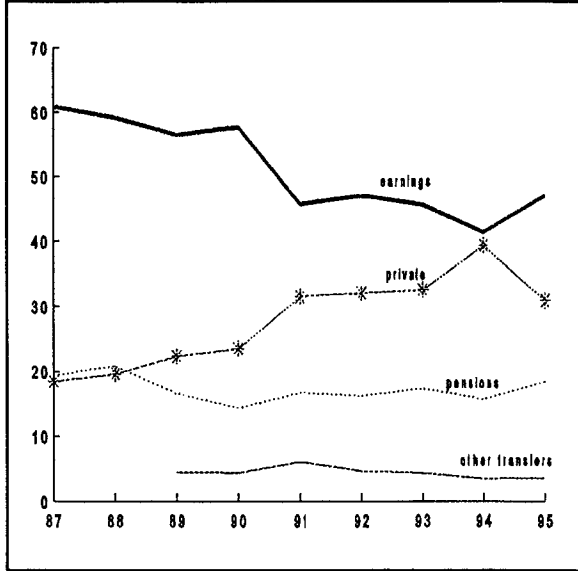|	
Composition of disposable income (in percent)	Concentration coefficients of wages, social transfers and private-sector income

Bulgaria
(c)

Hungary
(d)

Figure 3 (continued)

Composition of disposable income
(in percent)

Concentration coefficients of wages,
social transfers and private-sector income

Russia
(e)

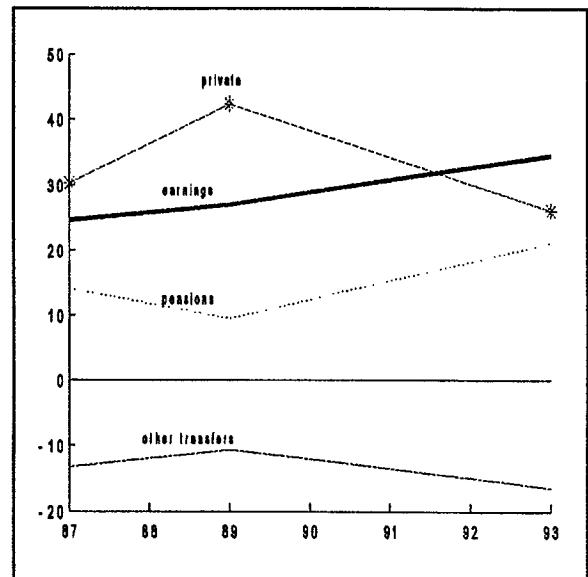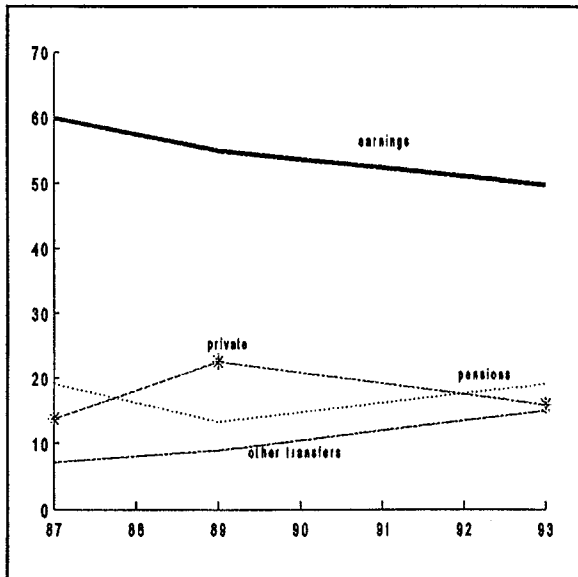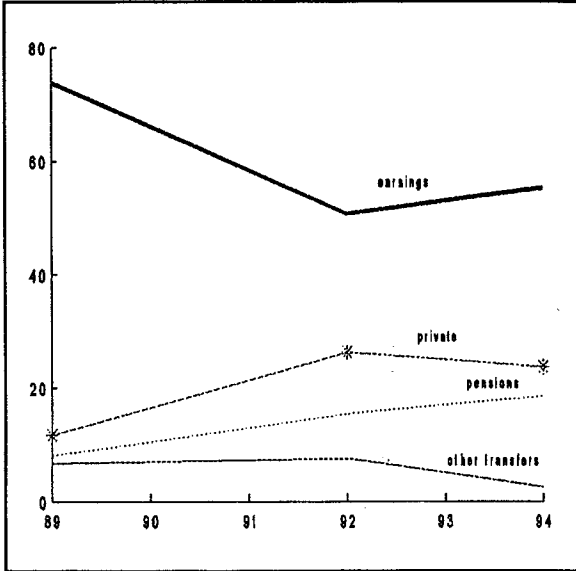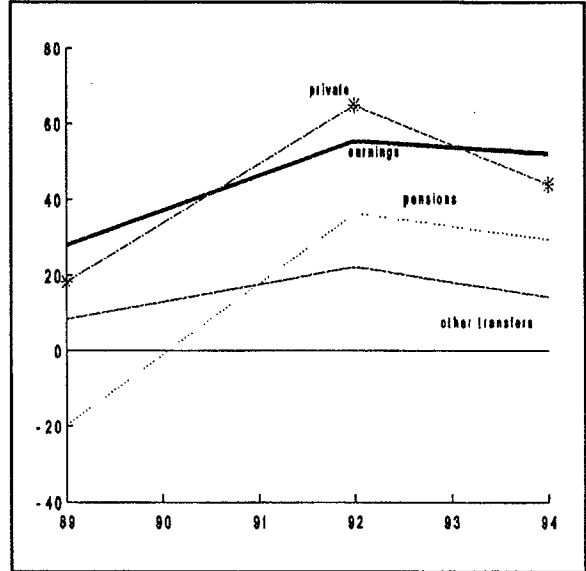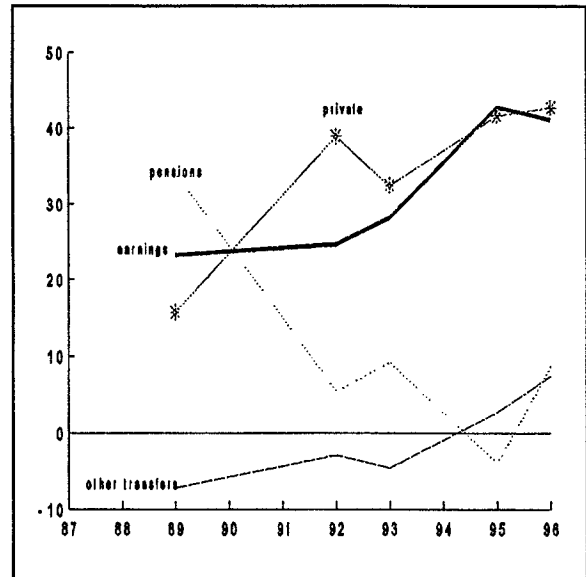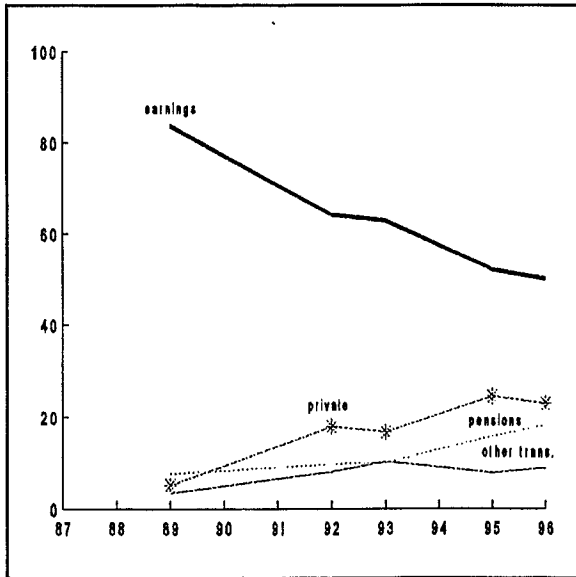### Latvia
(f)

Not
e: More unequally distributed income source has a higher coefficient. The concentration coefficient also shows how much a given source "pushes" up the overall inequality.

Sources: Household Budget Surveys (see Annex 1).

• In Eastern Europe, non-wage private sector income increased everywhere by a few percentage points only.[30] In Russia and Latvia, by contrast, this source of income increased its share by almost 15 percentage points.

• The share of pensions increased without exception in all countries. The increase again was sharper in Russia and Latvia which started with a lower pre-transition share.

• Non-pension social transfers increased in all countries except in Russia. Their growth has been particularly dramatic in Hungary where in 1993 they accounted for 16 percent of population disposable income (10 percent in the form of various family benefits, 4 percent as unemployment allowances).

•Overall, the income compositions in Eastern Europe, on the one hand, and Russia and Latvia, on the other, are much more similar now than before the transition. Wages in all countries are around 1/2 of total disposable income, non-wage private sector accounts for one-fourth of disposable income and so do cash social transfers. But because the initial starting point was further from the current outcome for Russia and Latvia, the changes in income composition in these two countries were more dramatic than in Eastern Europe.

What happened to factor concentration coefficients? Consider next *Ci*'s from equation 6.

• In all countries, the concentration coefficient of wages went up (Table 4). The increase was substantial for the East European countries, averaging about 10 points (or 50% of the initial value), and truly "gargantuan" for Russia and Latvia. The concentration coefficient of wages in both countries is in excess of 50. A concentration coefficient can increase either because the Gini of the source (wages in this case) goes up or the correlation between the income sources (wages) and disposable income rises. Without additional

---

[30] As mentionned, non-wage private sector income includes (i) self-employment and small enterprise income including that in agriculture, (ii) value of home consumption, (iii) gifts and remittances, (iv) property and rental incomes. Before the transition, the entire private sector income belonged there (as in our description of transition in Section 1). After the transition, many of successful self-employed and small enterprises grew into "regular" private firms. Their wage payments, as well as those of *ab novo* private companies and the privatized SOEs, are now included together with other wages. This explains why this source of income --which now accounts for only a part of total private sector income-- has not grown more substantially. In addition, in case of Poland for example, there was a sharp real, and relative (in relation to overall country average income), drop in farmers' incomes after the transition.

information (i.e. individual data) we cannot disentangle the two.[31] Whatever the cause, higher concentration of wages clearly puts an upward pressure on the Gini.

Table 4
Concentration coefficients before the transition and "now" (1993-96)
(in percent; based on *HBS*s; individuals ranked by per capita disposable income) a/

	Wages		Non-wage private income		Pensions		Other social transfers	
	pre	"now"	pre	"now"	pre	"now"	pre	"now"
Bulgaria (89-95)	21	34	38	37	11	13	- 6	2
Hungary (87-93)	25	35	30	26	14	21	-13	-16
Poland (87-95)	25	31	37	40	17	36	-10	-13
Slovenia (87-95)	20	26	18	21	22	21	- 4	-19
Eastern Europe	**23**	**32**	**31**	**31**	**16**	**23**	**- 8**	**-12**
Russia (89-94)	28	55	18	44	-20	30	8	14
Latvia (89-96)	23	50	16	43	34	9	- 7	7
FSU	**25**	**52**	**17**	**43**	**--**	**20**	**--**	**11**

Sources: see Annex 1.

The regional means are unweighted averages. -- indicates that the country differences are so large that averaging is meaningless.
a/ Gross income for pre-transition years. Since personal income taxes were negligible, the difference between gross and disposable income is very small.

• Non-wage private income has kept the same concentration coefficient in Eastern Europe overall; the changes in individual countries are small too. Before the transition, private sector income had a substantially higher concentration than wages in Bulgaria, Poland and Hungary (30's vs. 20's). Since wages' concentration coefficients have risen, the two (wages, and non-wage private sector income) now have about the same concentration. In Russia and Latvia, private income's concentration, like that of wages, has increased substantially. But it has risen less than the concentration of wages and is still lower.

• The average concentration coefficient of pensions in Eastern Europe has increased substantially (from 16 to 23) mostly on account of changes in Poland and Hungary. The

---

[31] See however an attempt in Section 4.

improvement in the average ratio between pensions and wages[32] has led to pension income (and pensioners) being distributed across the entire income spectrum--much more so than in the past when they were more concentrated among the middle to poorer segments of the population.The data for Russia are suspect, particularly a very high concentration coefficient for 1994. In Latvia, the differentiation and concentration of pensions have declined following the introduction of "flat" pensions in 1992 (see Figure 3f right panel).

•The change in the concentration coefficient of other (non-pension) social transfers is important in its own right, because the brunt of anti-poverty policy (particularly in conditions of massive income declines) falls on these transfers. By their nature, they are either explicitly targeted on the poor (like social assistance) or implicitly so (like unemployment benefits). In Eastern Europe, their targeting has improved from being very mildly pro-poor in absolute terms (-8) to more strongly so (-12). Almost the entire improvement in targeting is due to the introduction of unemployment benefits (Milanovic, 1997, chapter 5). Since (i) the unemployed are often among the poor and are easily identifiable, and (ii) the rules for benefits' eligibility are relatively clear and are followed by the unemployment offices, unemployment benefits have been focused on the poorer segments of East European population.[33] In Russia and Latvia, targeting has deteriorated.

Decomposing the overall GINI change.

The outcome of the changes in Si's and Ci's is the change in overall GINI. Table 5 shows the decomposed change in the Gini between a pre-transition year (1987 or 1989) and 1993-6. The last column shows the overall increase in the GINI between the two end periods. (The pre-transition year, whether 1987 or 1989 is fixed by the data availability. Since income distribution in the late 1980's was stable, the exact year does not matter much. This, however, is not the case for the choice of the *transition* year because now inequality does change. To avoid "pinning" all conclusions to one --end point year-- I present in Annex 2 the year-after-year GINI decomposition for the entire period. The year-to-year GINIs for East European countries are given in Figure 4.)

We can make three conclusions.

First, the change in the composition of income has had very little to do with increased inequality. In the only country where it did have a significant impact (Russia), it contributed to *reduce* inequality, i.e. the composition of income in 1994 was more favorable to equality than

---

[32] Not shown here.

[33] Point (ii) for example does not hold for social assistance. Also, total spending on unemployment benefits exceeds spending on social assistance in all East European countries.

in 1989.[34] This is chiefly because social transfers, which were the most equally distributed income source in Russia before the transition, increased their share in overall income (see Table 3). In other countries, changed income composition added or subtracted only about 1 Gini point to total inequality.

Second, higher concentration coefficients of wages (in all countries) drove the overall Gini up. It was the most important factor behind the increase in inequality. The increased wage concentration was responsible for between 3.5 and 8 Gini points increase in Eastern Europe, and for huge 16-18 Gini points increases in Latvia and Russia. In the latter two countries, the increase was due not only to a greatly increased concentration coefficient of wages, but also to a very high initial 1988 share of wages in income. Thus the weight attached to a more unequal concentration of wages is greater (see the term S_w in equation 6) than if the original share were low.

---

[34] Had, of course, the concentration coefficients of various sources remained at their pre-transition levels.

Table 5: Decomposition of the change in the Gini coefficient between 1993-96 and before the transition (in Gini points)

Country (end years)	Due to:						Interaction term	Overall Gini change (between the end-years)
	Change in composition of income	Change in concentration of:						
		Wages	Social transfers	Out of which:		Non-wage private sector		
				Pensions	Non-pension transfers			
Bulgaria (89-95)	+1.4	+7.8	+0.9	+0.4	+0.4	-0.4	+0.3	+10.0 (from 21.7 to 31.7)
Poland (87-95)	-1.7	+3.4	+3.5	+3.2	-0.1	+0.8	+0.9	+7.0 (from 25.0 to 32.0)
Slovenia (87-95)	-0.2	+3.6	-0.6	-0.1	-0.4	+0.4	-3.8	+2.6 (from 19.8 to 22.3)
Hungary (87-93)	-1.3	+5.9	-0.6	+1.4	-0.2	-0.6	-1.3	+2.2 (from 20.7 to 22.9)
Russia (89-94)	-3.4	+17.8	+5.1	+3.9	+0.4	+3.0	+1.2	+23.6 (from 21.9 to 45.5)
Latvia (89-96)	-1.6	+15.0	-1.5	-2.0	+0.5	+1.4	-3.3	+10.0 (from 22.6 to 32.6)

Figure 4
Gini coefficients in Eastern Europe
(based on individuals ranked by annual household per capita disposable income)
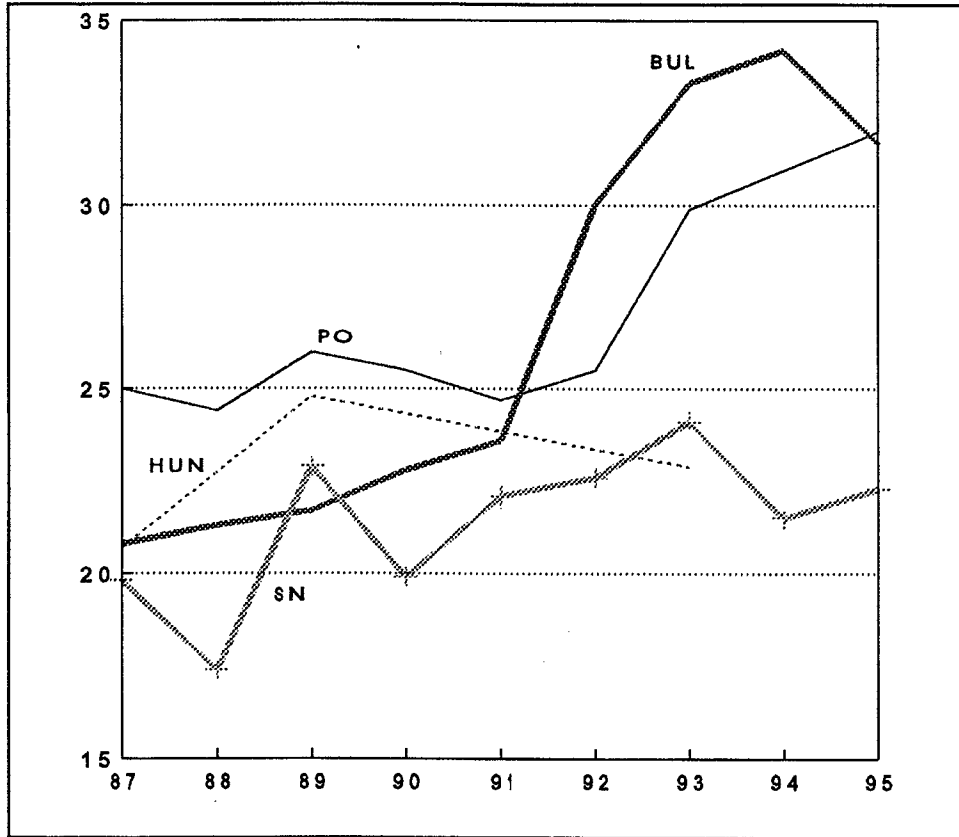
Sources: see Annex 1.

The increased non-wage private sector income concentration was responsible for 3 Gini points increase in Russia and about 1.5 points in Latvia, while its impact was negligible in Eastern Europe.

Third, the effect of transfers on inequality was not uniform across the countries. In Bulgaria, Slovenia, and Hungary, the concentration of transfers did not change. In Latvia, better targeting of transfers reduced inequality by 1.5 Gini points. In Poland and Russia, on the contrary, greater concentration of transfers *increased* inequality. This was due to a greater concentration coefficient of pensions. Non-pension transfers, because of their small initial size, did not anywhere have much impact on the overall change in inequality. [35]

The "stylized" facts are illustrated well on the example of Bulgaria in Figure 3c. The rising concentration of wages (from around 20 to 35) contributed strongly to inequality. The concentration coefficient of private sector income which was high already before the transition remained at the same level while the share of private sector income in total increased. The rising share also pushed up the overall inequality. Pensions' concentration and share both remained unchanged thus leaving inequality unchanged. Finally, non-pension transfers were too small (less than 5 percent of total income) to make any difference to the overall GINI.

Polish, and to a lesser degree Slovenian, results, illustrate a different story (see Figures 3a and 3b). Although wage concentration increased markedly, the most dramatic developments were in the area of social transfers: their rising concentration, and the rising share in overall income. In 1995, pensions had the same concentration coefficient as wages and non-wage private sector income.

Russia represents a unique case of a country where *all* income sources' concentration coefficients are higher now than before the transition: they all pushed overall inequality up (see Figure 3e, right panel). The only factor that moderated the increase in inequality was a shift toward more equally distributed income sources: transfers and non-wage private sector income which prior to the transition had smaller concentration coefficients than wages (see Table 3).

As we saw before, transfers, and in particular pensions, either left inequality unchanged (Slovenia, Hungary and Bulgaria),[36] or contributed to its increase (Poland and Russia). The only exception among our countries is Latvia where "improved" (more pro-poor) concentration of

---

[35] This conclusion differs to some extent from Cornia's (1994, p.39) observation that "the relative importance of redistribution [via transfers] has grown...Targeting of these [social] transfers has generally improved or remained sufficiently progressive."

[36] Note the relative stability of pensions' concentration coefficients in Slovenia, Hungary and Bulgaria (Figures 3b, 3c and 3d right panels).

pensions was due to the introduction of almost flat pensions in 1992 (note the steep downward-sloping line for pensions in Figure 3f, right panel). [37]

4. The conclusions: contrasting the model and the empirical evidence

The model and numerical simulations from Sections 1 and 2 led to several predictions regarding the change in factor shares and inequality during the transition. We shall consider three predictions: regarding (i) the changes in the income shares, (ii) mechanism that underlies increased inequality, and (iii) "hollowing out" of the middle class (state-sector workers).

First, we expect, of course, a declining share of state-sector income. The model also "predicts" that, after the transition, the share of transfers in total income will be greater. This is because the government will have to pay, in addition to unchanged relative pensions,[38] unemployment benefits. Indeed, this is what the evidence from seven transition economies in Table 3 confirms. There is not a single economy where the share of cash social transfers has not risen. This is also true separately for pensions, and for all other transfers.[39]

Second, one cause of increased inequality during the transition lies, according to our numerical simulations, (1) in the transfer of labor from the relatively low-inequality state sector to the high-inequality private sector. In the empirical part, we saw that (2) the concentration coefficient of wages which includes both private and state sector wages increased everywhere and, moreover, that its increase was the most important element driving GINI up. Is (2) consistent with (1)? Note first that since Cw now includes private sector wages (while before the transition it did not), there is *prima facie* evidence that private sector wages had something to do with a higher Cw.[40] Second, a higher Cw may be due either to a higher Gini coefficient of wages (which is what we would expect from our model) or to the increase in the correlation coefficient between wages and overall income. We can write this as:

$$Cw = Gw\, Rw.$$

Before the transition Cw was between 23 and 25; after the transition it rose to 32 in Eastern Europe and about 50 in Russia and Latvia (see Table 4). Since we know that before the transition Gw was between 25 and 30 (see Figure 5), Rw must have also been close to 1 (more

---

[37] The concentration coefficient of pensions decreased from 34 in 1989 to -4 in 1995.

[38] Compared to state wages (state wages are the numeraire).

[39] With the exception of Russia where non-pension transfers have declined.

[40] It is, of course, also possible even if not probable that Cw increased only because the concentration coefficient of state sector wages increased.

exactly between 0.85 and 0.9). And, indeed it could be expected that the link between one's wage ranking and one's overall income ranking (see the formula of Rw in footnote 25 above) was fairly high because wages represented about 60 percent of total income in Eastern Europe and even 80 percent in the FSU. But, if Rw before the transition was close to 1, there was no much "room" left for Rw to increase during the transition. If, for example, Rw went up from 0.9 to 1, that would "push" Cw upwards by only about 2-2.5 points (from Cw=25 to Cw=27.5). On the other hand, we know that Cw increased by 9 points in Eastern Europe and more than 25 points in Russia and Latvia. Consequently, most of the increase of the concentration coefficient of wages must be due to the increased *Gini* coefficient of wages, i.e. to the *greater inequality among the wage-earners*. The empirical evidence is therefore consistent with the implication contained in the numerical example in Section 2.

Figure 5
Gini coefficients of wages, 1956-1994
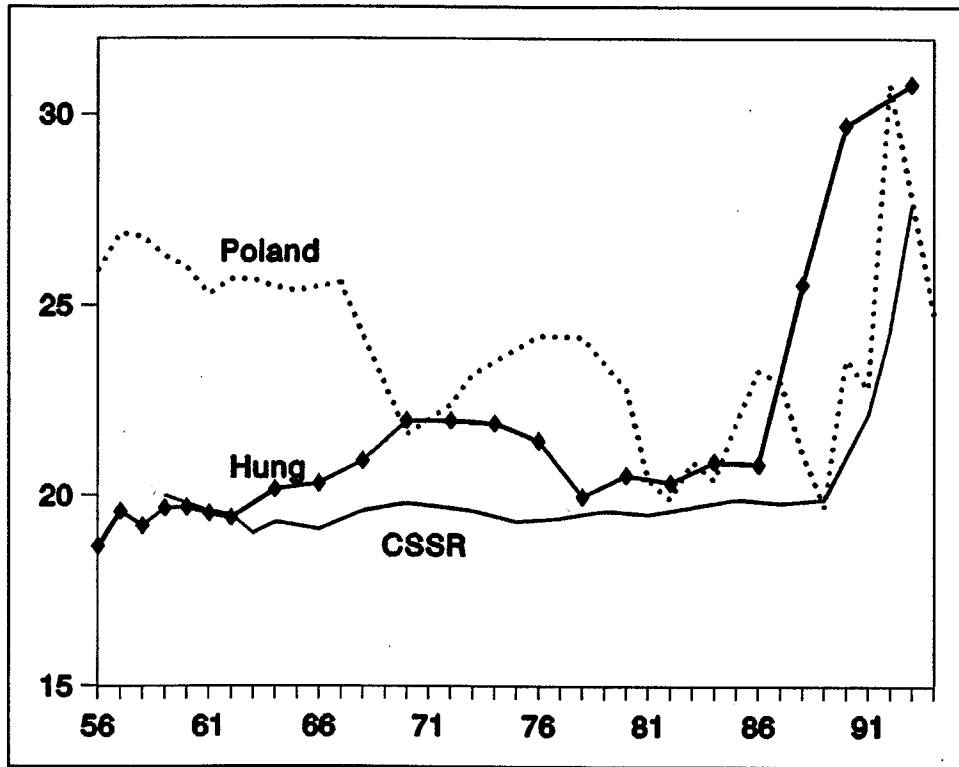
Source: Calculated from the countries Statistical yearbooks (various issues) from the distribution of monthly wages (World Bank PRDTE data base).

Note: There is a break in the Hungary series in 1988 due to introduction of gross (instead of net) wages.

Third, according to our model, the most important source of increased GINI is the "hollowing out of the middle", that is increasing inter-group differences (see Table 2). Since the empirical evidence does not deal with recipients but with income sources, we do not have direct evidence on this. However, what one observes for several countries (Poland, Slovenia, Latvia, Hungary) is both an increase and a gradual closing of the gap between the concentration coefficients of non-wage private sector income, and wages (see Figure 3). At the beginning of the transition, the non-wage private sector income had typically higher C's than wages. But during the transition, a part of private sector income "moves" into wages as some small businesses and the self-employed decide to expand and join the "regular" capitalist private sector. This "switch" dampens the increase in the recorded share of non-wage private sector (which, as we have seen, has remained unchanged in Eastern Europe), and since potentially the most profitable and unequal part "moves" out dampens too the increase in this source's concentration coefficient. By the same token, the "switch" combined with the widening of wage distribution in the state sector and in the *ab novo* private sector, increased the concentration of wages. Thus the two sources, non-wage private income and wages, came to have similar, albeit higher than before the transition, Cs.

Because the "hollowing out" hypothesis is couched in terms of *people* with specific sources of income (e.g. state sector workers) who get pulled in two opposite directions--some do very well (e.g. become entrepreneurs), and others very badly (e.g. become unemployed)-- the increase of the concentration coefficients does not directly address this hypothesis. The "hollowing out", however, is consistent with the increased wage and private-sector inequality. But more research is needed: one needs to study issues of polarization, rather than inequality--a topic that is beyond the scope of this paper.

ANNEX 1

DESCRIPTION OF THE SURVEYS USED AND DATA PROBLEMS

1. Description of the surveys used

For all East European countries and Latvia, the data come from the official surveys conducted by the countries' statistical agencies (CSO). For Russia, the 1989 is the official survey; the 1994 survey is the World Bank and *Goskomstat Rossii* jointly sponsored *Russian Longitudinal Monitoring Survey*, RLMS (see Table 1).

For Poland, Bulgaria and Slovenia all survey instruments are the same, that is the surveys for each individual country have exactly the same design year after year (barring some improvements: e.g. the Polish surveys became fully representative in 1993). For Hungary, the 1987 and 1993 survey instruments are the same (*Household budget survey* that is normally conducted once every two years, but whose 1991 results were not published). The 1991 survey is a microsimulation of a large 1987 *Income survey* conducted by CSO. For Latvia, the 1989 survey is a *Living Standard Survey*; [41] the 1992-93 surveys, however, are the unrepresentative quota-sample Soviet *Family budget surveys*. Finally, for 1995-96, I use the new and representative *New Latvian Household Survey*. For Russia, the 1989 data come from the old Soviet survey; the 1992 and 1994 are from the representative RLMS (Round 4).

Almost all surveys are annual. The shortest ones are the 1995 and 1996 Latvia surveys which are quarterly. Out of the total of 34 surveys used, 29 are annual, 3 are semi-annual, and 2 are quarterly.

---

[41] *Living standards survey* was conducted once every five years.

Table 1. Characteristics of the surveys

County (number of surveys)	Source of data; survey conducted by:	Period covered	Period of analysis	Data reported in:	Representative survey	Income concept	Income includes home consumption	Other problems with income or expenditure definitions
Poland (8)	CSO, Household budget surveys (*Budzety gospodarstw domowych*)	1987-93; 1995	1987-92 and 1995 yearly; 1993 first six months.	Grouped data for the period 1987-92 (published in the annual *Budzety gospodarstw domowych*, Central Statistical Office, Warsaw). Individual data for 1993 and 1995.	Fully representative since 1993; before policy, Army and non-agricultural private sector omitted.	Disposable after 1993; gross before (the difference between gross and disposable was minimal; less than 1%)	Yes	None
Hungary (3)	CSO, Household budget surveys for 1987 and 1993; Income survey microsimulation for 1989	1987, 1989, 1993	Yearly.	For 1987, grouped data as published in *Csaladi Koltsegvetes 1987*, Central Statistical Office, Budapest, 1989, pp.78-9, 102-3, 126-7. For 1989, detailed grouped data from Kupa and Fajth (1990). For 1993, individual data available.	Yes	Disposable	No	None

County (number of surveys)	Source of data; survey conducted by:	Period covered	Period of analysis	Data reported in:	Representative survey	Income concept	Income includes home consumption	Other problems with income or expenditure definitions
Slovenia (9)	CSO, Household budget surveys.	1987-95	Yearly.	Grouped data. For 1987-91 data published in *Anketa o potrosnji domacinstava*, Federal statistical Office, Belgrade (all data presented by republics). For 1992-95 personal communication by the Statistical office of Slovenia (Mrs. Irena Krizman and Mrs. Alenka Kajzer).Some results published also in *Statisticne informacije, and Rezultati raziskovanja* st.684/1997 Statistical Office of Slovenia, Ljubljana.	Yes	Disposable	Yes	Incorrect definition of income (adjustment made) a/
Bulgaria (7)	1989-94 CSO, Household budget surveys; 1995 Gallup survey	1989-95	1989-94 yearly; 1995 first six months.	For 1989-94 grouped data reported in *Biudzeti na domakinstvata v Republika B'lgariya*, National Statistical Institute, Sofia. For 1995, individual data available.	Yes	1989-94 gross income (the difference between gross and disposable minimal). 1995 disposable.	Yes	Slightly incorrect definition of income (adjustment made) a/

County (number of surveys)	Source of data; survey conducted by:	Period covered	Period of analysis	Data reported in:	Representative survey	Income concept	Income includes home consumption	Other problems with income or expenditure definitions
Latvia (5)	CSO, 1989 Living standards survey; 1992-93 Family budget surveys; 1995-96 New Family budget surveys	1989, 1992, 1993, 1995, 1996	1989, 1992-93 annual; 1995-96 quarterly	Grouped data. For 1989 data reported in *Survey of Living Standards*, Riga: Goskomstat Latviiskoi SSR, 1990; for 1992-93 reported in *Gimenes budzets*, Riga: CSO; for 1995-96, personal communication by the Latvian Statistical Offices (Mr. Edmunds Vaskis).	Not before 1995 (the Soviet-type branch-based survey). Representative since 1995.	1989-93 gross income (the difference between gross and disposable minimal). 1995-96 disposable.	Not in 1992-93. Yes for other years.	1989: slightly incorrect definition of income. a/ 1992-93 money income only.
Russia (3)	1989 CSO; 1992 and 1994 RLMS	1989, 1992, 1994	1989 annual; 1992 quarterly 1994 (Oct. 1993-Feb. 1994)	For 1989 and 1992, grouped data reported respectively in Popkin (1992, Table 5) and Popkin (1993, Table 20). For 1994, individual data available.	1989 not representative the Soviet-type branch-based survey); 1992 and 1994 surveys representative.	1989 gross income (the difference between gross and disposable minimal). 1992 and 1994 disposable income.	Yes	1989 slightly incorrect definition of income. a/

Note: CSO=country's statistical office. HBS=Household budget survey. FBS=Family Budget survey. RLMS=Russian Living Standards Monitoring Survey. a/ Disposable income calculated by deducting some revenue items from the income concept used by the CSO (and according to which the individuals and households were ranked).

Out of 35 surveys used, I had access to individual data for five. For all others I used the grouped data. The number of published groups varied between 10 and 20. The income groups were formed according to CSOs' definitions of per capita income. In two countries (Slovenia and Bulgaria) this led to some problems because the CSO-defined income included items that did not belong to income.[42] In Slovenia, it included net withdrawals from saving accounts and personal borrowing; in Bulgaria, sales of assets and insurance compensations. These items had to be deducted from the CSO-defined income in order to obtain actual disposable income. Performing this operation on the grouped data (in distinction to individual data) implies that the measured income inequality becomes underestimated because we no longer, strictly speaking, estimate the Gini coefficient of disposable income but the concentration coefficient of disposable income. The problem is negligible in the case of Bulgaria because the "wrong" items account for less than 1 percent of the CSO-defined income; in Slovenia, however, they account for about 8 percent of the CSO-defined income.

For Poland, Bulgaria, Latvia and Russia, for a number of years, the income concept used is gross rather than the disposable income.[43] However, since personal income taxes were minimal because gross income excludes payroll taxes withdrawn at source which represented the largest chunk of personal taxes. In all cases, the difference between disposable and gross income was less than 1 percent, and thus using either of the two concepts would produce the same results. (This, of course, has changed now with the introduction of more substantial PIT system in Hungary and Poland.) Finally, in all cases except Hungary in 1993, home-consumption is included in income.

The components of disposable income are standard. Disposable income is equal to all wage earnings (from primary and secondary jobs etc.) plus cash social transfer plus income from property and entrepreneurship plus received gifts plus value of home consumption. It excludes payroll and PIT taxes.

2. Comparing pre-transition and transition years: what are the biases?

The comparison between Polish, Bulgarian, and Slovenian survey results over the period 1987-95 is straightforward and warranted. All the data come from essentially the same surveys, and no dramatic changes in the refusal rates (they went up though) or underreporting (it went up too) occurred. The same is, to a large extent, true for Hungary whose 1987 and 1993 survey instruments are the same.

---

[42] The same problem exists with the Bulgarian data but is negligible since the "wrong" items account for less than 1 percent of the CSO-defined income. In Slovenia, the "wrong" items, however, account for almost 8 percent of the CSO-defined income.

[43] Disposable income=gross income minus payroll and direct personal taxes (PIT).

However, this somewhat optimistic assessment needs to be qualified. There is a change for which the users of surveys, and possibly the "producers" of surveys too, could not control. It is the change that accompanied the transition, and has nothing to do with the survey design *per se*. We can call it systemic or underlying change. Generally speaking, refusal rates have increased during the transition and particularly among the rich; coverage of wage and social transfer income that was nearly 100 percent before the transition has deteriorated (as earnings reported by the households which in the past used to be double-checked against the enterprise or pension authorities' records are no longer so checked); the omission or inadequate coverage of informal (and illegal) sector income before the transition has now become an even greater problem as such incomes have increased in absolute and relative terms. These are some of the problems for which we, as users of the surveys, cannot correct. The bottom line effect of these systemic changes -- assuming an unchanged survey design-- is that incomes are now more underestimated than in the past. The direction of the bias in terms of inequality is less clear. In the past, surveys underestimated inequality by not accounting for many fringe benefits and perks received by the elite.[44] Today, they might underestimate it by not covering those with high incomes who refuse to participate.

But, it is up to each researcher to decide how strong an emphasis he or she wishes to place on these systemic (underlying) changes; how much he or she believes that they vitiate all pre-post comparisons. I would tend to believe that the underlying change in Eastern Europe was not of such a magnitude as to render, after appropriate *caveats*, the comparisons of inequality before and after the transition unreliable. On the other hand, the argument that such comparisons are much less reliable can be, I think, made with respect to some of the republics of the former Soviet Union. In the Soviet case, not only was the underlying change much more profound (witness the explosion of the informal sector), but the initial surveys were fundamentally flawed because they were not random surveys but basically surveys of the families of the employed (see the discussion below), among which the "average" households (e.g. both parents employed, and having 1 or 2 children) tended to be oversampled. To these households a quota of the pensioners and students living outside their homes was added. The pre-transition surveys in the former Soviet Union were biased, left out large segments of the population, and tended to show higher average incomes and lower inequality. Thus the recorded change in inequality in Latvia and Russia is almost certainly bound to appear larger than the actual change.

Survey biases before the transition.

What can we more formally say about the survey biases before the transition? We shall consider four areas: survey design, uderreporting of income, the use of per capita vs. equivalent units, and annual vs. quarterly data.

---

[44] Subsidies were not included either; yet their effect was (with the possible exception of housing subsidies) to reduce inequality.

The very fact that these *caveats* are listed here indicates that we cannot do much (or anything) to remedy them. Yet they are worth listing for two reasons: to provide some caution when it comes to the interpretation of the results, and to delineate the areas that most clearly need improvement in future work.

Survey design

This is the problem of sampling inadequacy. The household surveys that we use have been criticized, rightly, for several biases. The Eastern European surveys were sample surveys. However, in several countries (e.g. Poland), they were not designed to be representative of the entire population but rather of individual socioeconomic groups (SEGs). This was probably the product of a Marxist view of society as composed of social classes and concern with intergroup equity. The data were thus representative of workers' households (in the state sector) or of pensioners, but they could not be easily combined to obtain an accurate picture for the whole population, essentially for two reasons. First, the sample shares of the groups that were included were not always proportional to their shares in the population (e.g., there were too many workers and not enough pensioners) and the results were not corrected for systematic differences in the rate of refusal to participate in the surveys. Second, some groups were left out of the surveys entirely. These groups included both those with high incomes (self-employed entrepreneurs, Army and police personnel) and those with low incomes (the institutionalized population, the unemployed). Income distribution was truncated at both ends.

The Soviet data were even more problematic. Not only could data for SEGs not be combined, but the surveys were not based on a sample technique but on selecting households at their place of work (the so-called "branch [of production] approach"). Workers and farmers were chosen by their managers and asked to cooperate with statistical authorities. The results were biased: the employed were systematically overrepresented in relation to the non-employed (to correct some of the bias a quota of pensioners and students was added);[45] workers in large enterprises and with a longer work record were more often selected that those working in small firms and with a shorter work record. Since the selection criterion was employment, larger households were undersampled.[46] The survey was essentially a panelCwith the same households staying in the sample year after yearCbut to further complicate matters, it was not explicitly

---

[45] The pensioners households were simply "added on" Ci.e. statistical offices will be asked to add a quota of pensioners which was often below their true share in the population.

[46] In order to have unbiased results, the probability of selection of a larger household should be proportionately greater than the probability of selection of a smaller household. But when the criterion of selection is employment and the participation rates are high, the two households (e.g. one with two adults and three children, and another with two adults only) will have approximately the same probability of being selected.

designed as panel, and the identification numbers of the households were not systematically maintained. The panel nature of the survey further biased the results: since households were supposed to stay in the sample indefinitely, the share of older working households,[47] presumably with higher than average earnings, was too high.

In conclusion, there were two kinds of biases. First, a bias toward the sampling that is representative of various pre-defined socio-economic groups but not of the population as a whole with the result that people that could not "fit" into any of the main social groups were likely to be left out, and these people were often at greater risk of poverty than the average citizen. Second, a bias toward the "average" or "normal" households that existed only in the household surveys that followed the so-called "branch principle". These are Soviet and, it seems, Romanian surveys.[48] The sampling selection was skewed in favor of "average" enterprises, "average" workers in terms of earnings, "average" skills, "average" family size (a couple with one or two children) etc. Thus even within a given social group (workers in state enterprises) income distribution was truncated.

Underreporting of income

The second problem has to do with income. The use of income, rather than expenditure, data tends to underestimate "true" welfare. This is because people tend to hide their sources of income and thus to underreport them.[49] They are less careful when asked to remember their expenditures. An example of this tendency is shown in Figure 1, which gives income and expenditure data by ventiles (5 percents of recipients) for Poland in 1993. Individuals are ranked on the horizontal axis according to their level of household (per capita) income. An interesting fact is revealed by the situation of the lowest income ventile. The reported expenditures of the lowest ventile are twice its income and are equal to the expenditures of the fourth ventile. This indicates a possible measurement problem: the people in the lowest income ventile are in reality not very different from those who are (according to income) significantly better off. It seems that they either

---

[47] Once households stopped working, they generally tended to drop out.

[48] In addition, Romanian results were doctored to such an extent that they are worthless for the years before 1989. Bulgaria also followed "the branch principle" in the 1970's, but abandoned it later.

[49] The underreporting problem exists in market economies too. It is particularly severe for self-employment and capital income. Atkinson, Rainwater and Smeeding (1995, Table A3) find, using LIS data, that self-employment income is underestimated (compared to the national accounts data) by between 10 percent (Canada) and 60 percent (W. Germany). Property income in almost all countries (US, UK, Italy, Germany, Finland, Canada and Australia) is underestimated by a half.

severely underreport their income or that their permanent income substantially diverges from their current income. But in any case, in our statistics they would be counted as poor. We thus impart an upward bias to the poverty rates. Generally speaking, the countries that have a greater share of the informal sector ("gray economy") and small-scale private sector will be more affected. [50] Their data will systematically show lower incomes and higher poverty than the data in countries in which an overwhelming share of income is earned in the state sector, or in the wage-reporting (and thus tax-paying) private sector, or is received in the form of social transfers. Inter-temporal comparisons will be affected too. As the share of the gray economy rises with the transition, the problem becomes more serious. On the offsetting side, however, improvements have been made in the survey techniques and greater effort is now made to include such "gray" sources of income. For example, all countries except those that still stick with the Soviet-type surveys, now include the self-employed in their *HBSs*.[51] Hungarian statistical authorities have been imputing tips, "fees" and "black" income. Finally, while the gray income often remains illegal (in the sense that people do not pay taxes on it), there is no longer a political compulsion to ignore it. The political compulsion existed in the past, with both households and the enumerators being keenly aware that such sources of income are not only illegal but also "politically incorrect." Both preferred to look the other way and ignore all non-official sources of income. This source of bias is now gone.

---

[50] Eighty-four percent of individuals belonging to the lowest income ventile are individual farmers, farmers-workers, and the self-employed (outside agriculture).

[51] In the past, they were left out of the surveys.

Figure 1. Income and expenditures per capita, Poland 1993
(individuals ranked by income per capita)
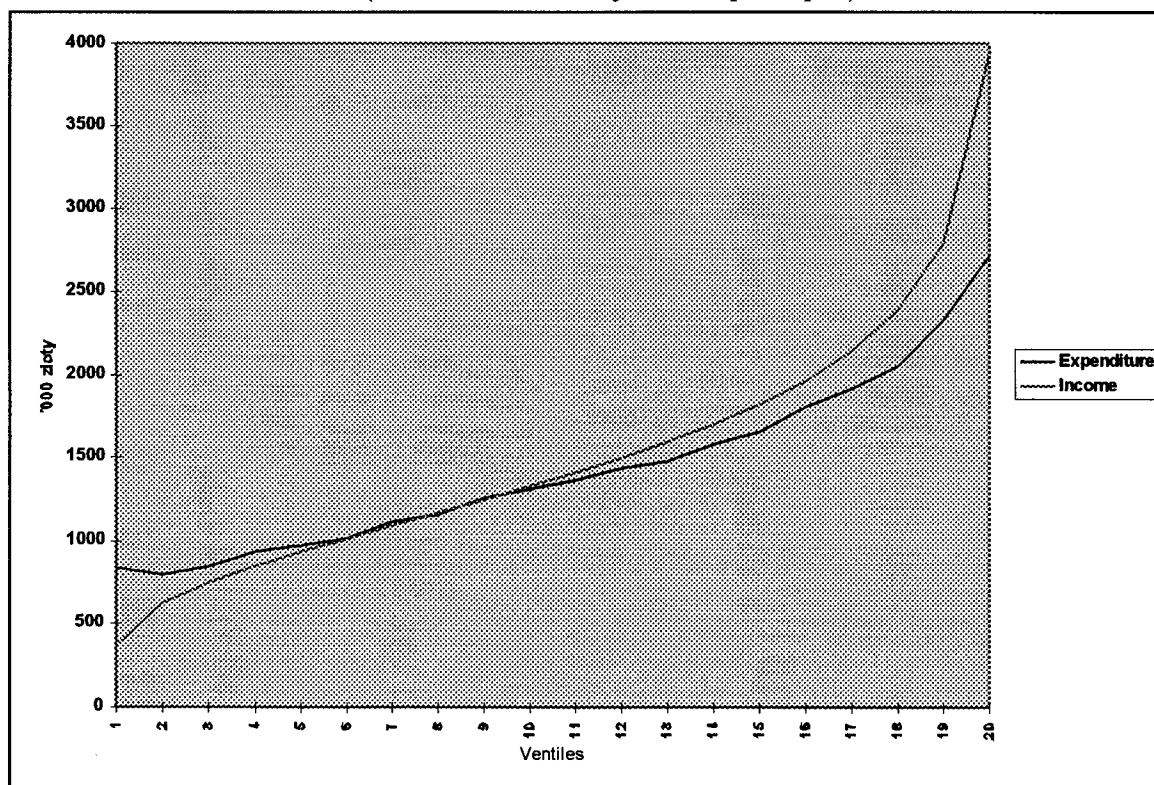
Per capita versus equivalent units

International comparisons of poverty are --to make an understatement-- complicated. In the particular context of transition economies, there are at least several problems that must be mentioned. First, the use of a per capita poverty line exaggerates poverty in any country compared to using an equivalent-scale derived poverty line. This is because with an equivalence scale the needs of additional family members (often children) do not rise in proportion as they do when we use a per capita measure. By implication then, the use of a per capita line exaggerates even more poverty in countries with larger average family size.[52] For example, Marnie and Micklewright

---

[52] In a recent paper Coulter, Cowell and Jenkins (1992) show that the poverty headcount charts a U-shaped pattern, first decreasing and then rising, as equivalence scale moves from 0 (full economies of scale: total household income alone counts) to 1 (per capita calculations).

(continued...)

(1993) compare Uzbekistan and Ukraine using the same Soviet *Family Budget Surveys* (FBS) for 1989. They find that the larger household size in Uzbekistan accounts for 14 out of 38 percentage point difference in the headcount index between the two republics. There are several reasons why we use the per capita line: the data in all countries are published in that form (rather than being adjusted for household composition by the use of equivalence scales); the economies of scale in consumption under socialism were typically less than in market economies because the main source of such economies of scale (housing, utilities, etc.) were heavily subsidized and this still remains true although to a lesser extent; the use of per capita poverty comparison allows us to move easily from such per capita comparisons to GDP per capita comparisons.

Quarterly versus yearly data

A final problem concerns the time period of data collection. Normally, the surveys are designed in such a way that households report (i.e. keep track of, or recall) income and expenditures for a quarter or a month. These data are then "blown up" for the entire year.[53] Under conditions of high inflation, however, the data collected in different months represent wholly different real quantities of goods and services and cannot be summed up unless they are adjusted for inflation. The adjustments are sometimes not made by statistical agencies, and at times they are made inadequately (if, for example, inflation is understated). Under such conditions, quarterly data on income or expenditure distribution, from which we calculate poverty figures for several FSU countries, are to be preferred because they refer to a shorter time period and imply about the same command over real goods and services. The usual drawback of the short-period data, namely, that they overestimate income inequality and poverty (there are more people with extraordinarily low and high incomes the shorter the time period), is then of less import than the advantage that the same reported money amounts represent approximately the same real quantities of goods and services.

Comparison: before and after the transition

If we take that the "best" achievable household survey should be: (i) representative for the country as a whole, (ii) refer to annual income; (iii) use disposable income; (iv) include home-consumption, and (v) have income "correctly" defined, and consider the transition-year surveys, no

---

[52](...continued)
The same results are obtained by Forster (1993, p.21) in an empirical study of 13 OECD countries.

[53] In order to increase the response rate (which was one of the main sources of bias), Polish household surveys began to require households to keep track of their income and expenditures for one, instead of three, months. The response rate increased from 65 to 80 percent (see Kordos, 1994).

survey fulfills all five conditions but several come close. Bulgarian and Slovenian surveys have a slightly incorrect definition of income for which I could not fully adjust as I did not have the individual data; Hungary's 1993 survey does not include home-consumption in income;[54] for Poland in 1993, I had semi-annual instead of annual data. Russian and Latvian 1994-96 surveys are quarterly. One may also be somewhat skeptical regarding the claim that the Russian RLMS survey is self-weighted.

(Note, however, that even the "best" achievable survey would still contain some possible biases--which are present in all the surveys, including in those in developed countries. The "best" survey would still probably understate the two tail-ends of income distribution (the poorest and the richest) who are typically undersurveyed, and it would also underestimate some sources of income like those from property (routinely underestimated by up to 50 percent in developed countries)[55] and entrepreneurship.)

Table 2 shows where the surveys falls short of the five requirements listed above, and what this implies in terms of the bias when estimating inequality.

Table 2. Survey defects and inequality bias:
pre-transition and transition years

	Pre-transition	Transition	Change in inequality bias
Poland	incomplete coverage of recipients	semi-annual in 1993; but annual in 1995	Slight overestimate of the increase
Hungary		no home consumption in 1993	Slight overestimate of the increase
Slovenia	income definition problem	income definition problem	None
Bulgaria	Minor income definition problem gross instead of disposable income	Minor income definition problem gross instead of disposable income	Negligible
Latvia	quota, biased sample	quarterly instead of annual data	Overestimates increase (strongly)
Russia	quota, biased sample	quarterly instead of annual data	Overestimates increase (strongly)

---

[54] It includes it in expenditures, but it could not have been separated from other expenditures and thus could not be added to income.

[55] The so-called "non-earned" income is understated by about 40 percent (compared to national accounts statistics) by the US Current Population Survey (see Michel, 1991, p.185).

In case of Hungary, the absence of home-consumption will lead to a slight increase in inequality, because home-consumption is generally greater for the poorer households. In Poland, too, there should be a slight overestimate of the increase because the pre-transition surveys did not include the entire population (i.e. left out some well-off segments).

For Bulgaria, the use of gross income instead of disposable will reduce measured inequality (to the extent that personal income taxes are progressive). However, since PIT is very small, as most taxes are deducted at source, the downward bias be negligible.

The bias is more serious for Latvia and Russia. The old Soviet survey could not satisfy more than two (annual data and inclusion of home consumption) out of five requirements listed above.[56] The choice of households to participate in the surveys was biased. The new improved surveys suffer from too short a period of observation (a quarter).

---

[56] In addition. since the difference between gross and net income was negligible, they could be said to satisfy the condition (iii).

ANNEX 2

Decomposition of annual changes in the Gini coefficient

BULGARIA							
base year 1989	1990	1991	1992	1993	1994	1995	
Shares	0.5	1.4	1.7	1.7	3.3	1.4	
Wages	0.6	-1.9	5.7	7.1	4.3	7.8	
Non-wage private	0.9	1.7	2.3	2.9	-0.9	-0.4	
Social Transfers	-1.1	-0.4	-1.5	-0.0	0.1	0.9	
Pensions	-1.1	-0.3	-1.7	-0.4	-0.2	0.4	
Non-pension	0.0	0.0	0.2	0.4	0.2	0.4	
Total	1.1	1.9	8.3	11.7	12.5	10.0	
Residual	0.2	1.1	0.1	-0.0	5.8	0.3	
POLAND							
base year 1987	1988	1989	1990	1991	1992	1993	1995
Shares	0.3	-0.5	-0.6	-2.4	-3.2	-2.6	-1.7
Wages	-0.0	3.0	2.2	2.3	3.9	4.1	3.4
Non-wage private	-2.1	-3.1	-0.4	1.7	1.5	3.4	3.5
Social transfers	1.3	2.1	-0.4	-3.3	-3.8	-1.9	0.8
Pensions	-1.6	-3.2	-0.4	1.9	1.8	1.0	3.2
Non-pension	-0.3	0.2	0.1	0.0	-0.3	-0.5	-0.1
Total	-0.7	1.0	0.5	-0.3	0.4	4.9	6.9
Residual	-0.1	-0.5	-0.4	1.3	2.1	1.8	0.9

SLOVENIA							
base year 1987	1988	1989	1990	1991	1992	1993	1994	1995
Shares	0.0	0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.2
Wages	-0.7	3.5	-0.7	2.2	2.3	3.2	1.5	3.6
Non-wage private	0.4	0.5	-0.2	1.7	1.6	2.2	1.5	0.4
Social transfers	-2.8	-2.4	1.2	-1.4	-0.7	-1.4	-1.1	-0.6
Pensions	-2.4	-2.5	1.2	-1.2	-0.5	-0.8	-0.2	-0.1
Non-pension	-0.3	0.2	0.2	-0.1	-0.2	-0.3	-0.4	-0.4
Total	-2.4	3.1	0.1	2.3	2.8	4.3	1.7	2.6
Residual	5.8	0.8	1.4	0.8	-0.9	-2.0	1.0	-3.8

HUNGARY		
base year 1987	1989	1993
Shares	1.2	-1.3
Wages	1.4	5.9
Non-wage private	1.7	-0.6
Social transfers	-1.3	-0.6
Pensions	-0.9	1.4
Non-pension	0.2	-0.2
Total	4.2	2.2
Residual	1.1	-1.3

LATVIA				
base year 1989	1992	1993	1995	1996
Shares	-1.1	-1.0	-1.7	-1.6
Wages	1.2	4.2	16.4	15.0
Non-wage private	-2.2	-2.1	-2.6	-1.5
Social transfers	1.2	0.9	1.3	1.4
Pensions	-2.2	-1.9	-2.9	-2.0
Non-pension	0.1	0.1	0.3	0.5
Total	0.9	1.3	9.4	10.0
Residual	1.7	-0.6	-4.1	-3.3

REFERENCES

Atkinson Anthony B. (1994), "Seeking to Explain the Distribution of Income", Discussion paper WSP 106, Centre for Economics and Related Disciplines, London School of Economics, December.

Atkinson, Anthony B. and John Micklewright (1992), *Economic Transformation in Eastern Europe and the Distribution of Income*, Cambridge: Cambridge University Press.

Atkinson, Anthony B., Lee Rainwater and Timothy Smeeding (1995), "Income Distribution in Advanced Economies: Evidence from the Luxembourg Income Study", Luxembour Income Study (LIS) Working paper No. 12, Luxembourg, October.

Blanchard, Olivier and J. Keeling (1996), "A Numerical Model of Transition", mimeo, May 30, 1996, p.20.

Commander, Simon, Andrei Tolstopiatenko and Ruslan Yemtsov (1997), "Channels of Redistribution: Inequality and Poverty in the Russian Transition", paper prepared for the Conference on inequality and poverty in transition economies, EBRD, London, May 23-24, 1997.

Cornia, Andrea Giovanni (1994), "Income Distribution, Poverty and Welfare in Transitional Economies: A Comparison between Eastern Europe and China", *Innocenti Occasional Paper* Economic Policy Series No.44, Florence, Italy:Unicef, October.

Coulter, Fionna A.E., Frank A. Cowell and Stephen P. Jenkins (1992), "Equivalence Scale Relativities and the Extent of Inequality and Poverty", *The Economic Journal*, 102:1067-1082.

Forster, Michael F. (1993), "Comparing Poverty in 13 OECD CountriesCTraditional and Synthetic Approaches", *LIS Working paper* No. 103, August.

Kordos, Jan (1994), "Outline of the Current Budget Surveys in Poland", mimeo.

Kupa, Mihaly and Gaspar Fajth (1990), "Hungarian Social Policy Systems and Distribution of Income of Households", Hungarian Household Panel Survey (TARKI) Budapest, mimeo.

Marnie, Sheila and John Micklewright (1993), "Poverty in Pre-reform Uzbekistan: What Do Official Data Really Reveal", mimeo, August.

Michel, Richard C. (1991), "Economic Growth and Income Equality since the 1982 Recession", *Journal of Policy Analysis and Management*, **6**:2, pp. 181-203.

Milanovic, Branko (1992), "Income Distribution in Late Socialism: Poland, Hungary, Czechoslovakia, Yugoslavia and Bulgaria Compared", Socialist Economies Reform Unit, Income Distribution during the Transition, paper No. 1, World Bank, Washington.

Milanovic, Branko (1998), *Income, Inequality and Poverty during the Transition from Planned to Market Economy*, Washington, D.C.: World Bank.

Popkin, Barry (1992), "Poverty in the Russian Federation: Demographics and Coverage by Current Support System", mimeo, September 23, 1992.

Redor, Dominique (1992; first published in French 1988), *Wage Inequalities in East and West*, Cambridge: Cambridge University Press.

Rutkowski, Jan (1995), "Labor Markets and Poverty in Bulgaria", A background paper for the World Bank poverty assessment, mimeo, October.

Rutkowski, Jan (1996), "High Skills Pay off: The Changing Wage Structure during Economic Transition in Poland", *Economics of Transition*, vol.4, May, pp. 89-112.

Ve...ernik, Jiri (1986), "Mzdova a prijmova diferencijace: analyza nekterych problemu", Institute for Philosophy and Sociology, Prague, mimeo.

Ve...ernik, Jiri (1993), "Recent changes in household income distribution: the Czech republic 1988-1993", mimeo.

Ve...ernik, Jiri (1994), "Changing Earnings Inequality under the Economic Transformation: The Czech and Slovak Republics in 1984-92", mimeo.

Vodopivec, Milan and Peter Orazem (1995), "Winners and Losers in Transition: Returns to Education, Experience and Gender in Slovenia", *The World Bank Economic Review*, vol. 9, No. 2, May.