MONASH UNIVERSITY



Department of Economics Discussion Papers ISSN 1441-5429

Economic Reform, Growth and Inequality in Human Development in Transitional Economies

J. Ram Pillarisetti & Mark McGillivray

No. 05/99

Monash University Clayton, Victoria 3168 Australia

Economic Reform, Growth and Inequality in Human Development in Transitional Economies

by

J. Ram Pillarisetti* Monash University and Mark McGillivray** RMIT University

Abstract

This paper examines the behaviour of the following indicators of development in and among Transitional Economies: real per capita income, the Human Development Index, the Gender-related Development Index and the Gender Empowerment Measure. The specific concern of the paper is the growth and inequality records of this group of countries. Growth rates and various inequality indices relating to the above indicators are reported for these countries and compared to those of other country groups for 1992-94. In contrast to experience elsewhere, the transitional economies record strongly negative growth and increasing inter-group inequality. Those with limited reform programs experience the poorest growth performances.

JEL Classification Code: F01, O57

Key Words: per capita income, Human Development Index, Gender-related Development Index, Inequality and Transitional Economies

** Associate Professor of International Development, School of Social Science and Planning, RMIT University, GPO Box 2476V, Melbourne, 3001, Australia. Tel: +613 9905 3466, Fax: +613 9905 1087, E-mail: Mark.McGillivray@rmit.edu.au.

^{*} Lecturer in Economics, School of Business and Electronic Commerce, Monash University, Churchill, 3842, Australia. Tel: +613 9902 6612, Fax: +613 9902 6524, Email Ram.Pillarisetti@buseco.monash.edu.au.

Economic Reform, Growth and Inequality in Human Development in Transitional Economies

I. Introduction

The dynamics of transition and restructuring are occurring at different rates of intensity and speed in the transitional economies (TEs) of Eastern Europe and Central Asia. As is widely known, the fundamental justification of reforms underway in these countries is that they will result in substantial and sustained improvements in the standards of living experienced by their citizens. Yet there are valid concerns that living standards may drop and that there will be increasing polarisation among the TEs. For example, the World Bank (1996, p. iii) asserts that "transition has had and will continue to have a profound impact on people's lives" and that in "some countries undergoing reform there has been a short-term drop in living standards; in others human welfare has improved dramatically" It is certainly the case that the impression of a relatively homogenous group of countries, in so far as living standards are concerned, is being challenged increasingly over time. Irrespective of how grounded these views are, there is certainly plenty of interest in the quality of human life in the TEs.

While the transitional economies have grappled with their programs of reform, there have been significant developments in development and quality of human life indicators. Purchasing power parity (PPP) estimates of income per capita are now available for most countries and the UNDP has developed its Human Development Index (HDI), Gender-related Development Index (GDI) and Gender Empowerment Measure (GEM) (UNDP, 1997).¹ The HDI, in particular, has been the subject of considerable critical appraisal (see, for example, Gormely, 1995, McGillivray, 1992 and Srinivasan, 1994) and since 1995 the UNDP has published comparable yearly estimates of this index, based on identical versions of each, for most countries. This also applies to the GDI and GEM, which have remained unchanged since their introduction in 1995.

This paper takes advantage of these developments by looking at growth and inequality in these indicators for the TEs. Using 1992 to 1994 values of PPP GDP per capita, the HDI, GDI and GEM, this paper attempts to answer the following questions: (i) what has happened to levels of human development in the TEs?; (ii) what has happened to levels of inequality among the TEs? and; (iii) how do these experiences compare with those of other countries? In a sense, therefore, part of what the paper aims to do is see whether there is empirical support for the concerns of TE polarisation. The paper is structured as follows. Section II briefly outlines the HDI, GDI and GEM. Section III provides details of the data and methodology used to answer the above questions. Section IV outlines results and Section V concludes. The conclusion argues for ongoing monitoring of human development indicators in the TEs.

II. Composite Development Indicators

It is helpful from the outset to describe the construction and component indices of the HDI, GDI and GEM as this aids interpretation of the results reported below. The HDI is defined as follows:

$$HDI_{i} = \frac{1}{k} \sum_{j=1}^{k} I_{j,i}$$
(1)

where $I_{j,i}$ is the *j*th index of a specific dimension of human development in country *i*, and i = 1, ..., n. There are three dimensions and hence indices: longevity $(I_{1,i})$, educational attainment $(I_{2,i})$ and income $(I_{3,i})$. Each of the variables comprising these indices are scaled within the range of zero to one using the equation:

$$X_{j,i} = \frac{x_{j,k,i} - x_{j,k}^{min}}{x_{j,k}^{max} - x_{j,k}^{min}}$$
(2)

where $X_{j,k,i}$ is the *k*th component of $I_{j,i}$ for country *i*, $x_{j,k,i}$ is the value of that component prior to scaling and the denominator contains the difference between the maximum and minimum values of this variable (although these values are fixed at values determined by the UNDP) (UNDP, 1997).

The longevity index $(I_{1,j})$ is a linear function one variable only: the number of years a newborn infant would be expected to live based on current mortality patterns. The minimum and maximum values used to scale this variable are 25 and 85 years, respectively. The educational attainment index $(I_{2,j})$ is defined as follows:

$$I_{2,i} = \alpha_1 X_{2,1,i} + \alpha_2 X_{2,2,i}$$
(3)

where α_1 and α_2 are weights set at 2/3 and 1/3 respectively, $x_{2,1,i}$ is country *i*'s adult literacy rate and $x_{2,2,i}$ is that county's combined primary, secondary and tertiary enrolment ratio. The maximum and minimum values of these variables used in scaling 0% and 100% for each, respectively. The material income index ($I_{2,i}$) is also based on a single variable ($x_{3,1,i}$) based by adjusting purchasing power parity (PPP) GDP per capita (y_i) as follows:

$$\begin{aligned} x_{3,1,i} &= y_i & \text{for } 0 < y_i \le y^*, \\ &= y^* + 2 [(y - y^*)^{1/2}] & \text{for } y^* \le y \le 2y^* & \text{and} \\ &= y^* + 2 [(y - y^*)^{1/2}] + 3 [(y - 2y^*)^{1/3}] & \text{for } 2y^* \le y \le 3y^* \end{aligned}$$
(4)

and so on, where y^* is the average PPP per capita world income of \$5,711. The minimum and maximum values of $x_{3,1}$ used to obtain $X_{3,1,i}$ are \$100 and \$6400, respectively (UNDP, 1997).

The GDI is defined as follows:

$$GDI_{i} = \frac{1}{k} \sum_{j=1}^{k} I_{j,i}^{g}$$
(5)

where $I_{j,i}^{g}$ is the *j*th gender-disparity adjusted indicator of human development in country *I*, *i* = 1, ..., *p*. These indicators are adjusted indices of longevity ($I_{1,i}^{g}$), educational attainment ($I_{2,i}^{g}$) and income ($I_{3,i}^{g}$) The adjusted longevity and educational attainment indices are defined as:

$$I_{j,i}^{g} = \left[p_{i}^{f} \left(I_{j,i}^{f} \right)^{1-\varepsilon} + p_{i}^{m} \left(I_{j,i}^{f} \right)^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \qquad j = 1, 2$$
(6)

where p_i^f is the share of females in the total population of *i*, p_i^m is the male share of population in *i*, $I_{1,i}^f$ is the female value of the particular index of human development in *i*, $I_{1,i}^m$ is the male value of that index in *i* and ε is an inequality aversion parameter set at two. $I_{1,i}^f$ and $I_{1,i}^m$ are obtained in the same manner as their aggregate counterparts in the HDI. That is, the longevity index is based solely on life expectancy and educational attainment is defined on the basis of literacy and combined school enrolment rates and each of these variables are scaled with the range of zero and one. In the case of life expectancy, for women the maximum value is 87.5 years and the minimum is 27.5 years; for men the corresponding values are 82.5 and 22.5 years. In the case of school enrolment ratios the maximum and minimum values are 100 and zero percent, respectively, in all instances (UNDP, 1997).

The gender-disparity adjusted income index is defined as follows:

$$I_{3,i}^{g} = \frac{x_{3,1,i}^{g} y_{i} - x_{3,1}^{min}}{x_{3,1}^{max} - x_{3,1}^{min}}$$
(7)

4

where $x_{3,1,i}^g$ is an equally distributed equivalent income index, y_i is unadjusted PPP GDP per capita and $x_{3,1}^{max}$ and $x_{3,1}^{min}$ are "maximum" and "minimum" values of PPP GDP per capita adjusted according to equation (4), respectively, the corresponding values being those used to obtain the HDI's $X_{3,1,i}$. $x_{3,1,i}^g$ is defined as follows:

$$\chi_{3,1,i}^{g} = \left(p_{i}^{f}\left[\frac{w_{i}^{f}}{w_{i}}a_{i}^{f}\frac{1}{p_{i}^{f}}\right]^{1-\varepsilon} + p_{i}^{m}\left[\frac{w_{i}^{m}}{w_{i}}a_{i}^{m}\frac{1}{p_{i}^{m}}\right]^{1-\varepsilon}\right)^{1-\varepsilon}$$
(8)

where w_i^f and w_i^m denote average female and male wages, respectively, in *i*, w_i is the average wage in *i* and a_i^f and a_i^m denote the ratios of economically active females and males, respectively, to the economically active total population in *i* (UNDP, 1997).

The GEM is defined as:

$$GEM_{i} = \frac{1}{k} \sum_{j=1}^{k} G_{j,i}$$
(9)

where $G_{j,i}$ is the *j*th index of gender empowerment in country *i* and i = 1, ..., q. . Empowerment is defined in terms of indices of: economic participation and decision-making power $(G_{1,i})$, political decision-making power $(G_{2,i})$ and power over economic resources $(G_{3,i})$. The first of these indices is defined as follows:

$$G_{1,i} = \beta_1 g_{1,1,i} + \beta_2 g_{1,2,i}$$
(10)

where β_1 and β_2 are weights each set at 0.5 and

$$g_{1,1,i} = \frac{1}{50} \left[p_i^f \left(a m_i^f \right)^{1-\varepsilon} + p_i^m \left(a m_i^m \right)^{1-\varepsilon} \right]^{1-\varepsilon} \quad \text{and} \tag{11}$$

$$g_{1,2,i} = \frac{1}{50} \left[p_i^f \left(p t_i^f \right)^{1-\epsilon} + p_i^m \left(p t_i^m \right)^{1-\epsilon} \right]^{1-\epsilon}$$
(12)

where am_i^f and am_i^m are the shares of administrative and managerial positions held by females and males, respectively, and pt_i^f and pt_i^m are the shares of professional and technical positions held by females and males, respectively. ε has the same interpretation as in the GDI and is again set to two. As the maximum value of $g_{1,1,i}$ and $g_{1,2,i}$ (and $G_{1,i}$) are 50, which implies perfect equality between men and women, each is multiplied by 1/50 to show the degree of inequality in empowerment (UNDP, 1997).

The political decision-making power index $(G_{2,i})$ is defined as:

$$G_{2,i} = \frac{1}{50} \left[p_i^{f} (pr_i^{f})^{1-\varepsilon} + p_i^{m} (pr_i^{m})^{1-\varepsilon} \right]^{1-\varepsilon}$$
(13)

where pr_i^f and pr_i^m are the shares of total parliamentary seats held by women and men, respectively, in country *i*. The power over economic resources index $(G_{3,i})$ is defined as:

$$G_{3,i} = \frac{x_{3,1,i}^g y_i - y^{min}}{y^{max} - y^{min}}$$
(14)

where y^{min} and y^{max} are the minimum and maximum values of actual PPP GDP per capita, respectively. The corresponding values used by the UNDP are \$100 and \$40,000 respectively (UNDP, 1997).²

III. Data and Methodology

We consider 23 TEs for which comparable data are available for PPP GDP per capita and the HDI, GDI and GEM. All data were taken from UNDP (1995-97) and relate to the years 1992, 1993 and 1994. While GDP and HDI data were available for each of the 23 TEs, data on the GDI and GEM are available for eight and three countries, respectively. Results for the latter should, therefore, be treated with some caution. To facilitate comparison with the experiences of the TEs, Data were also collected on each of these indicators for all other countries for which data were available

Growth in human development is assessed in terms of percentage change in each indicator. Rates were calculated for TEs sub-groups according to the extent to which they have liberalised, as measured by the Cumulative Liberalization Index (CLI) (de Melo et al. 1996). The CLI measures progress in three areas: (i) liberalizing internal markets including freeing of domestic prices; (ii) liberalization of external markets comprising easing foreign trade regimes, including the elimination of export controls and taxes and currency convertibility; and, (iii) facilitating private sector entry including privatizing of enterprises and reforms in the banking sector. It is calculated by summing annual progress in these areas (measured by yearly sub-indices) since 1989. Countries are classified into four broad categories, as follows: (i) Advanced Reformers registering a CLI of greater than three (Poland, Hungary, Czech Republic and Slovakia); (ii) High Intermediate Reformers with a CLI between two and three (Albania, Bulgaria, Estonia, Lithuania, Latvia, Romania and Mongolia); (iii) Low Intermediate Reformers with a CLI ranging between 1.3 and two (Russia, Kyrgyzstan, Moldova, Kazakhstan, Armenia and Georgia); and, (iv) Slow Reformers recording a CLI of less than 1.3 (Uzbekistan, Belarus, Ukraine, Turkmenistan, Azerbaizan, and Tadjikistan).³ Average growth rates for all developing countries and industrial countries (excluding the TEs) and the rest of the world. The "world" is defined here as all countries for which data are available.

Group averages were the subject of a number of reasonably standard hypothesis tests. Where appropriate, these averages were submitted to the null hypotheses that they are equal to zero, that those for the TEs are equal to corresponding averages for the developing country, industrial country and rest of the world groups, and that the differences between averages for the TEs and these groups are equal to zero. These nulls were evaluated using *t* ratios.⁴ They were not evaluated for the TE sub-samples for all variables and for the GEM for all samples owing to limited degrees of freedom.

The following positive measures were to assess the extent of inequality: (i) the Coefficient of Variation; (ii) Theil's entropy measure (7); (iii) the Theil-Bourguignon measure (a modified version of Theil's entropy) (L); and, (iv) Wolfson's exponential index (W). T, L and W are defined as follows:

$$T = \sum_{i=1}^{n} d_{i} \ln \left(\frac{d_{r,i}}{p_{i}} \right), \qquad (15)$$

$$L = \sum_{i=1}^{n} p_{i} \ln \left(\frac{p_{i}}{d_{r,i}} \right), \quad \text{and}$$
(16)

$$W = \sum_{i=1}^{n} p_i e^{\left(\frac{-D_{ij}}{d_r}\right)}$$
(17)

where p_i is the ratio of the population of country *i* to total population, $D_{r,i}$ is the *r*th human development indicator (income per capita, the HDI, the GDI and the GEM) for country *i*, $d_{r,i}$ is that country's share of the relevant group value of indicator *r* and d_r is the group average of indicator *r*.⁵

IV. Empirical Results

Average rates of growth in human development are shown in Table 1. Appendix Tables 1 and 2 shows levels and growth rates of each indicator for each individual TE. 1993 appears to have been a particularly bad year for the TEs. Each of the groups shown in Table record negative growth in each of the human development indicator between 1992 and 1993; the only exception is the High Intermediate Reformer group which recorded positive GEM growth. These

			Indica	itor	
		PPP GDP			
Country Group	Period	Per Capita	HDI	GDI	GEM
	1992-93	-4.23	-1.31	-1.40	-0.02
Advanced Reformers	1993-94	8.86	1.06	1.00	0.53
	1992-94	4.13	-0.27	-0.42	0.51
	1992-93	-13.73	-5.78	-6.13	1.04
High Intermediate	1993-94	19.23	2.34	2.44	0.21
Reformers	1992-94	1.95	-3.64	-3.90	1.25
T Trans Street	1992-93	-21.54	-7.74	-3.82	n.a.
Low Intermediate	1993-94	-14.14	-3.85	-1.52	n.a.
Keformers	1992-94	-32.18	-11.26	-5.35	n.a.
	1992-93	-19.55	-7.12	n.a.	n.a.
Slow Reformers	1993-94	-6.68	-1.43	n.a.	n.a.
	1992-94	-24.81	-8.47	n.a.	n.a.
	1992-93	-15.63 ^{*@} #	-5.87 ^{**@}	-3.78 ^{*@}	0.34
All I ransitional	1993-94	1.97 ^{&}	-0.48	1.36	0.42
Economies	1992-94	-13.55 ^{*@}	-6.30# [@]	-2.52* [@]	0.76
	1992-93	4.59	-1.06*	2.97*	4.82*
Developing Countries ^a	1993-94	13.02*	1.19	0.57	2.97*
1 0	1992-94	15.43*	0.05	3.54*	7.84*
	1992-93	3.82	-0.06	1.85*	5.55*
Industrial Countries ^a	1993-94	8.65*	0.87*	1.31*	4.39*
	1992-94	12.96*	0.77*	3.15*	10.25*
	1992-93	4.45*	-0.88*	2.75*	5.02*
World ^ª	1993-94	12.23*	1.14*	0.71	3.37*
	1992-94	14.98*	0.18	3.47*	8.51*

Table 1Average Rates of Growth in Human Development Levels

a: excluding Transitional Economies. *: significantly different from zero. #: significantly different from developing and industrial country and world averages. &: significantly different from developing country and world averages. @ differences between this mean and corresponding developing country, industrial country and world means are significantly different from zero. Note that significance tests were not conducted for the TE sub-groups owing to small sample sizes.

countries and the Advanced Reformer group in 1994, especially in PPP GDP per capita.⁶ They also show positive overall growth in PPP GDP per capita for 1992-94, but not in the HDI, GDI and GEM. The Slow and Low Intermediate Reformers exhibit by far the poorest performance. Both groups record negative growth in all indicators in all instances. The Low Intermediate Reformers show the worst growth of all groups. PPP GDPs per capita fell among this group by an average of 32 percent between 1992 and 1994. That the extent if reform seems negatively correlated, albeit in a rather loose sense, is consistent with the views that rapid reform to preferable to slow reform (see Sachs, 1990 and 1996 and Sachs and Warner, 1995).

The TE group as a whole records negative PPP GDP growth in 1993 and for 1992-94 as a whole. This is also the case with the HDI and GDI. Slightly positive GEM growth is recorded throughout. Each of the GDP per capita, HDI and GDI growth rates shown in Table 1 for the TE group as a whole are significantly different from zero (that is, the zero null hypothesis is rejected at the 95 percent level of confidence). These rates are often in sharp contrast with those exhibited elsewhere in the world. The developing and industrial country groups and the rest of the world typically record positive and statistically significant growth, especially in income per capita. The main exception to this is the HDI, which on average fell slightly in 1993. The contrasts between the experience of the TEs and other country groups is emphasised by results from evaluating the above-mentioned hypothesis tests. In almost all cases the relevant null hypotheses were rejected at the 95 percent level of confidence or greater. Thus, most of the TE averages are judged to be significantly different from the corresponding non-TE group averages and the differences between them are significantly different from zero.

<u></u>		Trai	nsitional	Economi	es	Developing Countries ^a				Industrial Countries ^a				World ^a			
Inequality Measure	Period	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM
Coefficient of	1992	0.2825	0.0751	0.0352	0.0812	0.8434	0.2707	0.2646	0.3254	0.2637	0.0400	0.0539	0.2362	1.2715	0.3128	0.3206	0.3511
Variation	1993	0.3029	0.0936	0.0420	0.0859	0.8352	0.2755	0.2684	0.3133	0.2833	0.0630	0.0731	0.2392	1.2572	0.3164	0.3182	0.3465
	1994	0.3588	0.0936	0.0423	0.0859	0.7994	0.2754	0.2702	0.3184	0.2753	0.0467	0.0576	0.2327	1.2487	0.3123	0.3162	0.3571
Theil Entropy	1992	0.0421	0.0028	0.0006	0.0022	0.2583	0.0367	0.0354	0.0541	0.0543	0.0008	0.0014	0.0292	0.6019	0.0491	0.0511	0.0626
	1993	0.0443	0.0032	0.0008	0.0024	0.2536	0.0381	0.0366	0.0503	0.0483	0.0021	0.0027	0.0303	0.5862	0.0503	0.0506	0.0607
	1994	0.0627	0.0043	0.0008	0.0024	0.2400	0.0385	0.0374	0.0518	0.0443	0.0014	0.0017	0.0287	0.5000	0.0495	0.0504	0.0640
Theil-Bourguignon	1992	0.0478	0.0029	0.0007	0.0022	0.2395	0.0385	0.0375	0.0580	0.0556	0.0008	0.0015	0.0333	0.6131	0.0516	0.0534	0.0672
0 0	1993	0.0478	0.0033	0.0009	0.0024	0.2405	0.0399	0.0389	0.0540	0.0684	0.0022	0.0029	0.0351	0.5962	0.0529	0.0532	0.0648
	1994	0.0696	0.0044 -	0.0008	0.0024	0.2311	0.0409	0.0401	0.0552	0.0597	0.0012	0.0017	0.0331	0.5862	0.0527	0.0536	0.0679
Wolfson Index	1992	0.3830	0.3689	0.3681	0.3687	0.4513	0.3812	0.3807	0.3875	0.3822	0.3682	0.3684	0.3784	0.5565	0.3856	0.3863	0.3904
	1993	0.3837	0.3691	0.3682	0.3688	0.4493	0.3817	0.3811	0.3861	0.3845	0.3686	0.3689	0.3788	0.5515	0.3860	0.3861	0.3897
	1994	0.3901	0.3695	0.3682	0.3688	0.4457	0.3818	0.3814	0.3867	0.3832	0.3683	0.3685	0.3782	0.5488	0.3857	0.3861	0.3909

Table 2Inequality in Human Development Levels

a: excluding transitional economies

	Transitional Economies			Developing Countries ²				Industrial Countries ^a				World*					
Inequality Measure	Period	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM	PPP GDP Per Capita	HDI	GDI	GEM
Coefficient of	1992-93	7.22	24.63	19.32	5.79	-0.97	1.77	1.44	-3.72	7.43	57.50	35.62	1.27	-1.12	1.15	-0.75	-1.31
Variation	1993-94 1992-94	18.45 27.01	0.00 24.63	0./1 20.17	0.00 5.79	-4.29 -5.22	-0.04 1.74	0.67 2.12	1.63 -2.15	-2.82 4.40	-25.87 16.75	-21.20 6.86	-2.72 -1.48	-0.68 -1.79	-1.30 -0.16	-0.63 -1.37	3.06 1.71
Theil Entropy	1992-93	5.23	14.29	33.33	9.09	-1.82	3.81	3.39	-7.02	-11.05	162.50	92.86	3.77	-2.61	2.44	-0.98	-3.04
	1993-94 1992-94	41.53 48.93	34.38 53.57	0.00 33.33	0.00 9.09	-5.36 -7.08	1.05 4.90	2.19 5.65	2.98 -4.25	-8.28 -18.42	-33.33 75.00	-37.04 21.43	-5.28 -1.71	-14.70 -16.93	-1.59 0.81	-0.40 -1.37	5.44 2.24
Theil-Bourguignon	1992-93	0.00	13.79	28.57	9.09	0.42	3.64	3.73	-6.90	23.02	175.00	93.33	5.41	-2.76	2.52	-0.37	-3.57
	1993-94 1992-94	45.61 45.61	33.33 51.72	-11.11 14.29	0.00 9.09	-3.91 -3.51	2.51 6.23	3.08 6.93	2.22 -4.83	-12.72 7.37	-45.45 50.00	-41.38 13.33	-5.70 -0.60	-1.68 -4.39	-0.38 2.13	0.75 0.37	4.78 1.04
Wolfson Index	1992-93	0.18	0.05	0.03	0.03	-0.44	0.13	0.11	-0.36	0.60	0.11	0.14	0.11	-0.90	0.10	-0.05	-0.18
	1993-94 1992-94	1.67 1.85	0.11 0.16	0.00 0.03	0.00 0.03	-0.80 -1.24	0.03 0.16	0.08 0.18	0.16 -0.21	-0.34 0.26	-0.08 0.03	-0.11 0.03	-0.16 -0.05	-0.49 -1.38	-0.08 0.03	0.00 -0.05	0.31 0.13

Table 3
Percentage Changes in Estimates of Inequality in Human Development Levels

a: excluding transitional economies

12

Inequality levels are shown in Table 2. There is widespread agreement between these measures, with each indicating that the extent of inequality among TEs is lower than that among the developing and industrial countries and the rest of the world. The only exceptions to this are with respect to inequality in income per capita and the HDI among industrial countries. More pertinent, given our current purposes, are changes in equality. These are shown in Table 3. Two striking messages are conveyed from this table. The first is the inequality among the TEs. All measures are higher in 1994 compared with 1992 and most record larger percentage rises in 1994 than in 1993. This is especially the case with PPP GDP per capita and the HDI. The second message is that the experience of the TEs is typically in sharp contrast to that elsewhere. While the HDI often exhibits increasing inter-country inequality, the most common observation is declining inequality, especially to income per capita among developing countries and the rest of the world.

V. Conclusion

This paper examined growth and inequality in human development in 23 transitional economies during the early to mid-1990s. It looked specifically at four indicators: PPP GDP per capita, the Human Development Index (HDI), the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM). Countries in which the extent of reform is relatively great show far better growth performance than those in which the extent of reform is less extensive. Overall, however, the transitional economies record negative growth in PPP GDP per capita, the HDI and the GDI and positive yet negligible growth in the GEM. The polarization of transitional economy growth performance is reflected in inequality measurements. A broad spectrum of measures reflect increases in inequality in income and human development across all transitional

economies. This is typically in contrast to the experience elsewhere in the world. Finally, it ought to be emphasised the process of reform in the transitional economies is far from complete. Combined with the results reported in this paper, this suggests that human development levels in the transitional economies should remain a subject of intense scrutiny.

Notes

- 1. PPP GDP per capita measures the material component of human development. As UNDP (1995, p.18) notes, it measures the "ability to have access to the resources needed for a decent for a decent standard of living".
- 2. See Pillarisetti and McGillivray (1998) for a critique of the GEM.
- 3. The World Bank (1996) also reports liberalisation indices for these countries, citing De Melo *et al.* (1996). However, there are some discrepancies between these sources.
- 4. The corresponding ratios are:

$$t = \frac{d_{TE,r} - 0}{s_{\overline{d}_{TE,r}}}$$

$$t = \frac{\overline{d}_{TE,r} - \overline{d}_r}{s_{\overline{d}_{TE,r}}}$$

and

$$t = \frac{\left(\overline{d}_{TE,r} - \overline{d}_r\right) - 0}{s_{\overline{d}_{TE,r}} - \sigma_{s,r}}$$

where $d_{TE,r}$ and d_r are mean values of the *r*th indicator for the TE sample and relevant sample of non-TE countries, respectively, and the denominators of the ratios are the standard error of TE sample means and the standard error of the difference between TE and non-TE sample means, respectively. The first ratio has $n_{TE,r}$ -1 degrees of freedom (where $n_{TE,r}$ is the TE sample size), while the second has $n_{TE,r} + n_r - 2$ degrees of freedom (where n_s is the non-TE sample size).

- 5. These preceding measures, which are applied to each of the abovementioned groups, satisfy several desirable properties of inequality measures (see, for example, Pillarisetti, 1997, Wolfson, 1986 and 1994 and Cowell, 1977). We prefer to consider positive measures of inequality, as normative measures require explicit consideration of a social welfare function. As it is more appropriate to assign different inequality aversion parameter values for different human development indicators, the inequality measures across them may not be comparable among the indicators. The Wolfson Index is particularly advantageous in comparing inequality in absolute and composite indexes. Wolfson's index is additionally advantageous over other bottom-sensitive indices like Theil Entropy and Theil-Bourguignon indices since it does not explode at zero or near-zero incomes
- 6. It should, though, be emphasised that a finding that PPP GDP per capita growth records larger absolute growth than its composite counterparts is not entirely surprising. GDP per capita is an upwardly continuous variable in the sense that it has no statistical upper limit. This is not the case with the other component variables the UNDP's indices, as the discussion of Section II above should reveal. Life expectancy has an upper biological limit, and the remaining variables are expressed as percentages and as such have upper theoretical limits of 100. Many countries are as close to reaching this limit as one could reasonably expect. Moreover, as McGillivray and White (1993) demonstrate, the transformation of PPP GDP per capita dictates that the HDI increases only very negligibly with

increases in unadjusted PPP GDP per capita above y^* (see equation (4) above). Indeed, in practical terms this transformation effectively caps PPP GDP per capita at y^* . These statistical characteristics and the composite nature of the UNDP's indices combine to suggest that there is greater scope for higher growth in PPP GDP per capita than in the HDI, GDI and GEM. That growth is constrained also leads one to expect that inequality in these indices will be lower than in PPP GDP per capita.

<u> </u>	PPP GDP Per Capita			HDI			GDI		GEM				
Country	1992	1993	1994	1992	1993	1994	1992	1993	1994	1992	1993	1994	
Albania	3500	2200	2788	0.739	0.633	0.655	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Armenia	2420	2040	1737	0.715	0.680	0.651	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Azerbaijan	2550	2190	167 0	0.696	0.665	0.636	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Belarus	6440	4244	4713	0.866	0.773	0.806	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Bulgaria	4250	432 0	4533	0.796	0.773	0.780	n.a.	n.a.	n.a.	0.481	0.486	0.487	
Czech Rep.	7690	8430	9201	0.872	0.872	0.882	0.858	0.853	0.859	n.a.	n.a.	n.a.	
Estonia	6690	3610	4294	0.862	0.749	0.776	0.839	0.740	0.764	n.a.	n.a.	n.a.	
Georgia	2300	1750	1585	0.709	0.645	0.637	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Hungary	6580	6059	6437	0.856	0.855	0.857	0.836	0.835	0.837	0.506	0.507	0.510	
Kazakstan	4270	3710	3284	0.798	0.740	0.709	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Kyrgyzstan	2850	2320	1930	0.717	0.663	0.635	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Latvia	6060	5010	3332	0.857	0.820	0.711	0.833	0.806	0.702	n.a.	n.a.	n.a.	
Lithuania	3700	3110	4011	0.769	0.719	0.762	0.750	0.709	0.750	n.a.	n.a.	n.a.	
Moldova	3670	2370	1576	0.757	0.663	0.612	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Mongolia	2389	2090	3766	0.604	0.578	0.661	0.596	0.572	0.650	n.a.	n.a.	n.a.	
Poland	4830	4702	5002	0.855	0.819	0.834	0.838	0.802	0.818	0.432	0.431	0.433	
Romania	2840	3727	4037	0.703	0.738	0.748	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Russia	6140	4760	4828	0.849	0.804	0.792	0.822	0.790	0.778	n.a.	n.a.	n.a.	
Slovakia	6690	5620	6389	0.872	0.864	0.873	0.855	0.850	0.859	n.a.	n.a.	n.a.	
Tajikistan	1740	1380	1117	0.643	0.616	0.580	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Turkmenistan	3400	3128	3469	0.731	0.695	0.723	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Ukraine	5010	3250	2718	0.842	0.719	0.689	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Uzbekistan	2650	2510	2438	0.706	0.679	0.662	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	

Table A1: Human Development Indicators, Transitional Economies, 1992-94

Source: UNDP (1995-97)

Appendix: Data on Individual Countries

	PPP GDP Per Capita		HDI				GDI	,	GEM			
Country	1992-93	1993-94	1992-94	1992-93	1993-94	1992-94	1992-93	1993-94	1992-94	1992-93	1993-94	1992-94
Albania	-37.14	26.73	-20.34	-14.34	3.48	-11.37	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Armenia	-15.70	-14.85	-28.22	-4.90	-4.26	-8.95	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Azerbaijan	-14.12	-23.74	-34.51	-4.45	-4.36	-8.62	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Belarus	-34.10	11.05	-26.82	-10.74	4.27	-6.93	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bulgaria	1.65	4.93	6.66	-2.89	0.91	-2.01	n.a.	n.a.	n.a.	1.04	0.21	1.25
Czech Rep.	9.62	9.15	19.65	0.00	1.15	1.15	-0.58	0.70	0.12	n.a.	n.a.	n.a.
Estonia	-46.04	18.95	-35.81	-13.11	3.60	-9.98	-11.80	3.24	-8.94	n.a.	n.a.	n.a.
Georgia	-23.91	-9.43	-31.09	-9.03	-1.24	-10.16	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hungary	-7.92	6.24	-2.17	-0.12	0.23	0.12	-0.12	0.24	0.12	0.20	0.59	0.79
Kazakstan	-13.11	-11.48	-23.09	-7.27	-4.19	-11.15	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Kyrgyzstan	-18.60	-16.81	-32.28	-7.53	-4.22	-11.44	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Latvia	-17.33	-33.49	-45.02	-4.32	-13.29	-17.04	-3.24	-12.90	-15.73	n.a.	n.a.	n.a.
Lithuania	-15.95	28.97	8.41	-6.50	5.98	-0.91	-5.47	5.78	0.00	n.a.	n.a.	n.a.
Moldova	-35.42	-33.50	-57.06	-12.42	-7.69	-19.15	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Mongolia	-12.52	80.19	57.64	-4.30	14.36	9.44	-4.03	13.64	9.06	n.a.	n.a.	n.a.
Poland	-2.65	6.38	3.56	-4.21	1.83	-2.46	-4.30	2.00	-2.39	-0.23	0.46	0.23
Romania	31.23	8.32	42.15	4.98	1.36	6.40	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Russia	-22.48	1.43	-21.37	-5.30	-1.49	-6.71	-3.89	-1.52	-5.35	n.a.	n.a.	n.a.
Slovakia	-15.99	13.68	-4 .50	-0.92	1.04	0.11	-0.58	1.06	0.47	n.a.	n.a.	n.a.
Tajikistan	-20.69	-19.06	-35.80	-4.20	-5.84	-9.80	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Turkmenistan	-8.00	10.90	2.03	-4.92	4.03	-1.09	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ukraine	-35.13	-16.37	-45.75	-14.61	-4.17	-18.17	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Uzbekistan	-5.28	-2.87	-8.00	-3.82	-2.50	-6.23	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table A2: Human Development Indicators, Growth (%), Transitional Economies, 1992-94

Source: Calculated from data in UNDP (1995-97)

19

References

- Cowell, F.A., Measuring inequality: techniques for the social sciences, (New York: John Wiley & Sons, 1977).
- De Melo, Martha, Cevdet Denizer and Alan Gelb, From Plan to Market: Patterns of Transition, Policy Research Working Paper Series (Washington D.C.:World Bank, 1996).
- McGillivray, Mark, The Human development index: yet another redundant composite development indicator?, *World Development*, Vol.19, No. 10, 1991, pp.1461-1468.
- McGillivray, M. and H. White, Measuring development? The UNDP's human development index, *Journal of International Development*, Vol. 5, 1993, pp.183-192.
- Pillarisetti, J. Ram, An empirical note on inequality in the world development indicators, *Applied Economics Letters*, Vol.4, No.3, 1997, pp.145-147.
- Pillarisetti, J. Ram and M. McGillivray, Human development and gender empowerment: conceptual and methodological issues, *Development Policy Review*, Vol. 18, 1998.
- Sachs, Jeffrey, Eastern Europe's economies: what is to be done?, *The Economist*, 1990, 21-26.
- Sachs, Jeffrey, Reforms in Eastern Europe and former Soviet Union in light of East Asian experience, NBER Working Paper Series No. 5404: 1-71, 1996, (Cambridge, Mass: National Bureau of Economic Research).
- Sachs, Jeffrey and Andrew Warner, Economic Reform and the process of global integration, *Brookings Papers on Economic Activity 1*, 1995.
- Streeten, Paul, Human development: the debate about the index, *International Social Science Journal*, Vol. 47, No. 1, 1995, pp. 25-37.
- Theil, Henry, *Economics and information theory*, (Amsterdam: North-Holland, 1967).

- United Nations Development Programme 1997, 1996, 1995, Human Development Report 1997, 1996, 1995 (New York: Oxford University Press, 1994).
- Wolfson, Michael C., Stasis amid change-income inequality in Canada 1965-1983, *Review of Income and Wealth*, Vol.32, No.4, 1986, pp.337-69.
- Wolfson, Michael C., When inequalities diverge, American Economic Review, papers and proceedings, Vol. 84, No.2, 1994, pp. 353-358.
- World Bank, *World Development Report 1996*, (New York: Oxford University Press, 1996).

Titles in the Department of Economics Discussion Papers (New Series commenced October 1999)

01-99

Should China be Promoting Large-Scale Enterprises and Enterprise Groups? *Russell Smyth*

02-99

Division of Labor, Coordination, and Underemployment *Heling Shi*

03-99

Attitude Choice, Economic Change, and Welfare Yew-Kwang Ng and Jianguo Wang

04-99

Economic Reform, Overlapping Property Rights, and Polarisation in the Real Estate Market

J. Ram Pillarisetti

05-99

Economic Reform, Growth and Inequality in Human Development in Transitional Economies

J. Ram Pillarisetti and Mark Mcgillivray

06-99

Efficiency and Liquidity in the Electricity Market: A Preliminary Analysis *Barry A. Goss* and *S. Gulay Avsar*

Requests for addition (or deletion) of names for the mailing list for these Discussion Papers should be addressed to: Mrs Elizabeth Kwok, Department of Economics, Monash University, Clayton, Vic 3168, Australia.

Email: Elizabeth.Kwok@BusEco.monash.edu.au