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Inequality and growth: What does the transition economy data say?

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Despite an extensive literature on inequality and growth, there remains considerable disagreement on the effect of inequality on subsequent growth. This paper attempts to empirically evaluate that relationship with data from the transition economies of Central and Eastern Europe and the Commonwealth of Independent States. One attractive feature of this group of countries is that their starting points were remarkably similar. Yet, they subsequently have experienced substantial divergence in growth rates and income inequality. Hence, this data set offers considerable advantages for investigating the inequality and growth relationship. Since the existing literature has virtually ignored transition economies, the paper fills an important gap on the theme. Our estimations indicate that the effect of inequality on growth is negative, strong, and rather robust. *Journal of Comparative Economics* **35** (1) (2007) 35–56. California State University, Fullerton, USA; University of Southern California, USA.

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1. Introduction

Despite the vast existing literature on the effects of initial inequality on subsequent growth, there are still unresolved issues. Indeed, different cross-country empirical studies arrive at different conclusions on the subject, even when they share common sources of data. This paper attempts to evaluate this relationship for a quite different set of countries, namely, the relatively sizeable group of transition countries from Central and Eastern Europe (CEE) and the Commonwealth of Independent States (CIS). There are several reasons for focusing on the transition economies.

First, they began their transitions to market economy chronologically at the same time after the collapse of the socialistic systems and shared many initial characteristics. On account of the former political regime, all these countries inherited relatively low levels of income inequality, similar levels of per capita GDP and GDP growth rates, common policies towards education, social security, employment, family planning, healthcare, and political structure. Yet, despite these many initial similarities, subsequently enormous changes have taken place over the course of the transition. These changes have brought about significant and dramatic increases in the inequality levels both within and across these countries. No other group of countries in the past has seen such sharp increases in inequality in such a short period of time.

Second, as changes in the political system were taking place, these countries shared similar transition objectives, such as creating new financial markets, investment mechanisms, privatizing the industrial and agricultural sectors, creating market mechanisms for intra and inter-industry trade, and in some cases creating their own central banks. Yet, the speed of implementing these policies and other external shocks were sufficiently diverse across the countries, yielding substantial differences in growth rates. Their subsequent policy and other differences provide a thus far unexplored opportunity to identify the factors most effective in promoting (or inhibiting) growth.

Third, since most existing papers on growth and inequality have been international cross-section studies, they suffer from two econometric problems: measurement error and omitted variable bias. Our use of various data sources allows us to obtain an extensive list of variables characterizing macro, financial, social, and political features and the speed and depth of liberalization and market reforms in the sample transition economies and thereby to mitigate the omitted variable bias problem. Similarly, measurement error, which may arise because countries have different definitions of key variables, particularly of inequality, and/or varying standards and degrees of accuracy in data collection, is mitigated for the transition economies because, from the outset, these countries shared similar measurement standards and rules.

Fourth, the existing literature has largely omitted these countries from cross-country growth-inequality analyses, making it important to correct this neglect.

Our econometric estimates for the transition economy sample show that the effect of inequality on growth is negative and strong. Surprisingly, the result is rather robust to the use of the different sources of inequality data on transition economies and the different specifications and estimation methods that have been applied in the relevant literature. While our results extend existing knowledge of the effect of inequality on growth by investigating it in important and largely neglected set of countries, the paper does not intend to resolve existing controversies that have arisen in broader sets of countries.

The following section summarizes the existing findings and remaining controversies in previous empirical work. Section 3 describes the data and compares the cross-regional change of several key variables over the period of transition. Section 4 focuses on the model and the estimation methods. Section 5 examines the main results. Section 6 analyzes the existence of possible

nonlinearities. Section 7 summarizes and compares the results with current findings in the literature.

2. The existing controversies on the effect of inequality on subsequent growth: a brief literature review

There remains considerable controversy in the existing literature on the effect of initial inequality on subsequent growth. Even when using relatively similar data sets, various authors studying the effect of inequality on growth obtain quite different results.

Specifically, the major source of data on inequality for existing studies is Deininger and Squire's (1996) comprehensive cross-country inequality data. Since such data has observations over time as well as across countries, it affords an opportunity to use a variety of estimation techniques. Since these different observations vary in the quality ratings, assigned by Deininger and Squire, it also affords an opportunity to average the sample over different sub-periods, use different numbers of observations, and of course employ different functional forms.

Most of the recent cross-country studies have drawn their country samples from the Deininger and Squire data set, but by exploring different acceptable qualities of data they arrive at different sample sizes. For example, Barro's (2000) sample consists of 84 countries from that data set, while Forbes's (2000) sample contains only the 45 countries whose income inequality data was deemed to be of "high quality." Banerjee and Duflo (2003) use both the 45 country high quality sample of Deininger and Squire (1996), as Forbes does, and a 50 country sample from Barro. Other studies, such as Alesina and Perotti (1996), Perotti (1996), Persson and Tabellini (1994), etc., use various earlier sources of inequality data than that provided by Deininger and Squire (1996).

Surprisingly, however, though based on essentially the same database, these studies obtain quite conflicting results. In large part this seems to be the result of different estimation techniques and empirical specifications. Table 1 lists the data sources used, the estimation methods, and the results obtained in some of the well-known works on the theme. From the table, Alesina and Perotti (1996), Perotti (1996), and Persson and Tabellini (1994), though not correcting for time-invariant omitted variable bias, find significant negative effects of income inequality on subsequent economic growth. Forbes (2000) and Li and Zou (1998), on the other hand, use panel analysis and find a positive relationship. Barro (2000) uses 3SLS, claiming that the use of fixed effects eliminates the main (cross-sectional) source of variation in the data. With random effects, no significant relationship between inequality and growth is found for the whole sample. Yet, when the sample is divided into sub-samples of poor and rich countries, the inequality-growth relationship is negative in the sample of poor countries but positive in the sample of rich countries. These results suggest that the inequality-growth relationship is likely to vary across samples.

Banerjee and Duflo (2003) further emphasize that the existing relationships between variables might be far from linear. To account for non-linearities, they introduce both linear and squared terms for Gini coefficients and the first differences therein. Their results on inequality and growth are inconclusive for different samples and specifications (both Perotti and Barro) and estimation methods. Once again, these results depend on specific choices of the sample countries, the specifications, estimation methods, and the underlying assumptions about the existing relationships.

This paper attempts to evaluate the inequality-growth relationship (including nonlinearities therein) for transition countries of Central and Eastern Europe and the former Soviet Union. Due to the lack of reliable data on these transition countries in earlier years, they have largely been

Table 1
Summary review of the empirical literature

Author	Data source	Estimation method	Specification/ Model	Inequality effect on growth	Coverage of transition economies	Accounting for nonlinearities
Persson and Tabellini (1994)	Heston and Summers (1991), Maddison (1982), World Bank (1984), other sources	OLS	Political Economy Model	Negative	None	No
Perotti (1996)	Various sources as listed in Perotti (1996)	OLS	Perotti	Negative	None	No
Alesina and Perotti (1996)	Various sources as listed in Alesina and Perotti (1996)	2SLS, 3SLS	Sociopolitical Stability Model	Negative	None	No
Li and Zou (1998)	Deininger and Squire (1996), Barro and Lee (1996), other sources	Panel, fixed effects	Lee and Zou	Positive	None	No
Barro (2000)	Deininger and Squire (1996), Barro and Lee (1996), other sources	3SLS	Barro	Whole Sample: Insignificant; Poor: Negative; Rich: Positive	Three* countries	Yes
Forbes (2000)	Deininger and Squire (1996), Barro and Lee (1996), other sources	Panel, fixed effects	Perotti (lag 1)	Positive	Three* countries	No
Banerjee and Duflo (2003)	Deininger and Squire (1996), Barro and Lee (1996), other sources	Fixed, Random Panel; First Difference; Arellano and Bond	Perotti, Barro	Inconclusive: Positive for Perotti, Mixed for Barro Specifications	Three* countries	Yes

* Those are Bulgaria, Hungary, and Poland.

omitted from the growth-inequality literature. For instance, despite its worldwide cross-country coverage, for transition economies the Deininger and Squire (1996) database has observations only for Bulgaria, Hungary, and Poland, and even in those cases for at most two or three years.

There are several considerations concerning the initial conditions and the transition pattern that have implications for the effect of income inequality on growth. While real GDP declined in virtually all transition economies in the initial years, the speed and extent of the recovery has varied widely across these countries. In the literature the differences between the more and less

the second equation of the structural form, namely, the relationship between the change in inequality and past inequality and Eq. (6.4), where the dependent variable is the quadratic term of the inequality change. In both specifications, the coefficient of the one period lag of inequality is negative and significant at the one percent significance level in those equations where the dependent variable is the change in Gini.[21] The coefficient of the one period lag of inequality is positive and insignificant in those equations where the dependent variable is the square of the change in the Gini coefficient. These results are inconsistent with the results found in Banerjee and Duflo (2003), as their results suggest that the coefficient of the one period lag of inequality is positive and significant in those equations where the dependent variable is the square of the change in the Gini coefficient.

Our results are generally inconsistent with those found in Banerjee and Duflo (2003). Their results show a significant, negative value for the coefficient of the quadratic change in inequality, while in our results we observe only negative but insignificant effect of the quadratic change in inequality on growth, as columns (2), (3), (5), and (6) in Table 6 show. Consequently, the transition economy results do not support Banerjee and Duflo's conclusion that changes in inequality in both directions reduce growth.[22] Our results show that there is at most only a strong, negative relationship between the linear change term and growth, columns (2), (3), and (6) in Table 6, meaning that an increase in inequality reduces growth. The results in Table 6 indicate that there are no significant non-linearities involved for the effect of the initial inequality on subsequent growth. We continue to find, however, a strong, linear, and negative effect of contemporaneous inequality on growth, although our results in Table 7, panel (a) do not indicate significant effect of the Gini lagged term.

7. Concluding remarks

In this paper we have reexamined various dimensions of the growth-inequality debate in the specific context of countries undergoing transition from centrally planned to market systems. While at the beginning of the transition these countries shared many similar characteristics and specifically, had low levels of income inequality, over time they diverged considerably. Hence, the transition economies provide a potentially rich experience for examining the relation between income inequality and growth.

We apply the several different specifications and estimation methods that had been employed in the literature on inequality and growth in arriving at very different conclusions even with the same data sets. In contrast to the conflicting results obtained in the earlier studies, that had included at most only three transition economies, our empirical findings for transition countries indicate a strong, negative contemporaneous growth-inequality relationship for all these specifications, estimation methods, and different inequality data sets in the short to medium run.

[21] Also, the results show that the coefficient of the one period lag of log GDP is negative and significant when the dependent variable is the linear change in inequality. These results suggest that the transition economy data supports Kuznets' (1955) inverted-U hypothesis according to which income inequality first increases and then decreases with development. From the kernel density charts for the Gini coefficient in Section 2 we observe that inequality increases over the entire period of the data, while the real income decreases for most of the countries, especially in the first and second phases of transition. This further supports the Kuznets' hypothesis and we would expect inequality to decrease in the late phases of transition, when a substantial rebounding in the real GDP is under way.

[22] In Banerjee and Duflo (2003) this result is essential to explain their political economy "hold-up" model, where there exists a certain output sharing rule between two classes, running as competing political parties.

We find a negative relationship between the change in inequality and initial income, but do not find a significant relationship between lagged inequality and growth, although our results show a significant, negative effect of lagged inequality on the linear term of the inequality change.

We also have found some evidence of a significant effect of structural change and liberalization, and policy variables on growth, but leave open the question of whether or not these variables are a separate channel affecting economic growth.

In light of the present controversies on growth and inequality, our findings demonstrate even more dramatically than those of Barro (2000) that the empirical results are sensitive to the specific choice of sample of countries. In the case of transition economies, there is clear evidence that inequality has a negative and significant effect on growth. The results are surprisingly robust to the use of three alternative inequality data sources, different specifications, and estimation methods.

Our results show that the initial conditions, at least with respect to inequality, affect the subsequent rate of growth. This effect, however, becomes weaker in the course of transition, as the effect of inequality on growth changes from being negative insignificant to negative and significant in late transition. In this regard we support the results found in De Melo et al. (1997) and Godoy and Stiglitz (2004) that both initial conditions and economic policy jointly determine the large differences in economic performance.

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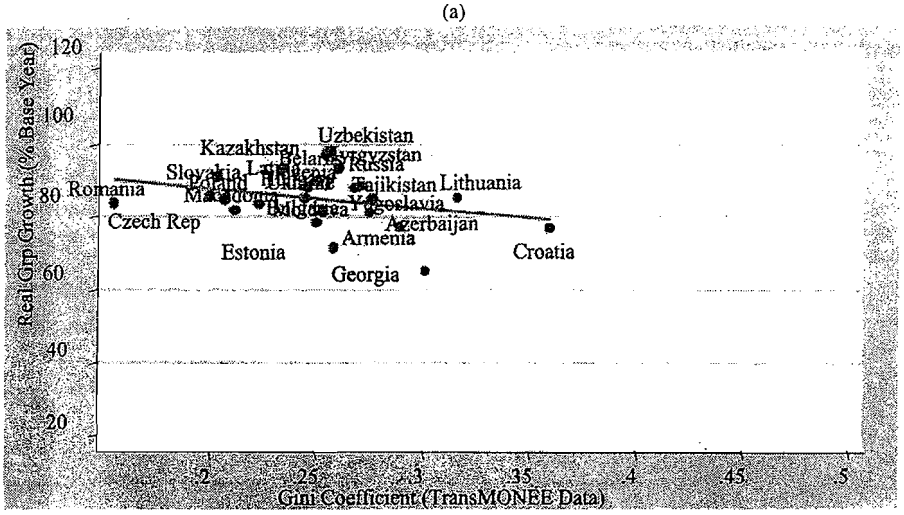
(a)



(b)

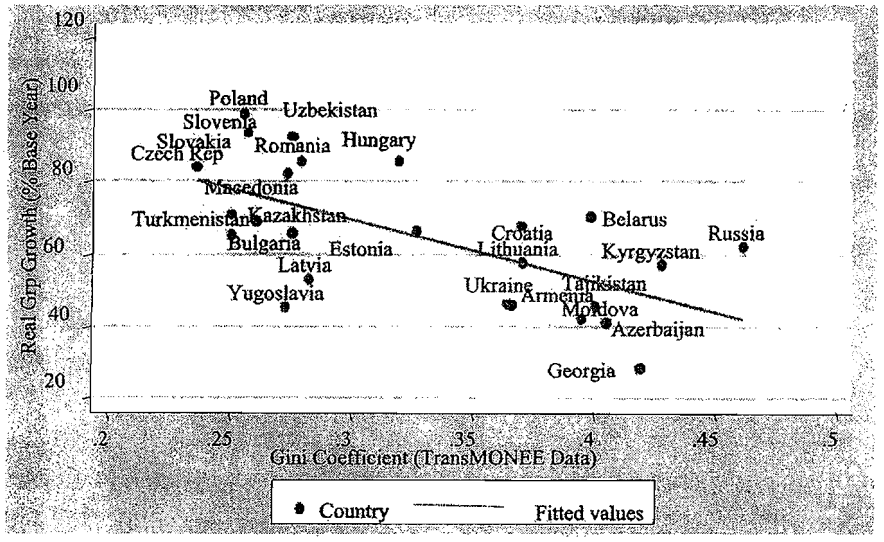


Fig. 3. Cross-country scatter plot of inequality, Gini coefficient, and growth by transitional phase. Panel (a) 1988–1992, initial phase; Panel (b), 1993–1997, stabilization; and Panel (c), 1998–2002, recovery phase of transition.

(c)