

SPEED AND SEQUENCING OF TRANSITION REFORMS AND INCOME INEQUALITY: A PANEL DATA ANALYSIS

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An extensive literature has analyzed the economic effects of transition patterns in Central and Eastern European and former Soviet Union countries. With few recent exceptions, analysis of the impacts of speed and sequencing of reforms has not concerned the dynamics of income inequality. In this paper we analyze the heterogeneous effects of transition reforms on inequality by explicitly considering their speed and sequencing. To this aim we identify eight transition models in which the 27 countries considered are classified. The dynamic panel-data analysis for the period 1989–2009 reveals that balanced transition patterns, which favored a coordination of reforms especially in specific fields, were relatively less pro-inequality.

JEL Codes: C23, D31, P21, P36

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1. INTRODUCTION

A general feature accompanying transition of formerly planned economies has been a rise in economic and social inequality. Although some forms of disparities existed before transition (Milanovic, 1998), the shift toward market economies allowed existing visible and hidden inequalities to develop and new inequalities to unfold. Distributional patterns in the 1990s for Central and Eastern European and post-Soviet Union countries proceeded at a quite different pace, attaining (and in some cases stabilizing at) diversified levels after two decades of reforms.

The drivers of inequality are in general very difficult to discern since distributive outcomes are the converging point of the many economic, demographic, and structural forces into play. This complexity is of course enhanced by the massive institutional and structural change which occurred in formerly socialist countries. The aim of this paper is to investigate whether and to what extent inequality dynamics can be attributed to the different reform approaches adopted.

An extensive literature has analyzed the economic effects of alternative patterns of transition toward market economy. However, in cross-country analyses,

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the impacts on income inequality have received much less attention compared to growth performance. Distributional aspects in transition, on the other hand, have been largely and deeply investigated and discussed, either in theoretical terms or empirically. In this paper we analyze and provide interpretations of the effects of reforms on inequality, explicitly taking into account their speed and sequencing. To this aim, we assembled a panel dataset of 27 transition economies from Central and Eastern Europe (CEE) and the former Soviet Union (FSU) for the years 1989–2009. Income inequality measures are regressed against a set of control variables and indicators of speed and sequencing of transition reforms derived from the European Bank for Reconstruction and Development (EBRD) transition scores.

The paper is organized as follows. In the next section we survey and discuss the main antecedent attempts to identify, classify, and measure the various patterns of transition implemented in CEE and in FSU countries (Section 2.1). Section 2.2 briefly reports on the most important and influential contributions on income inequality dynamics during transition. In Section 3 we provide descriptive evidence on inequality in the countries and years considered and describe the approach adopted to identify the various models of transition. Section 4 presents the empirical model relating reform patterns to inequality, the econometric methods, and the outcomes. Section 5 concludes.

2. EXISTING EMPIRICAL EVIDENCE, APPROACHES, AND INTERPRETATIONS

2.1. *Transition Patterns: Speed and Sequencing of Reforms*

While economic and political theory was familiar with the causes and the processes of transformation of capitalist societies into centrally planned systems, the reverse direction of change has largely taken economists and policy makers by surprise. As a result, actual transition patterns at the beginning of the 1990s turned out quite diversified and were classified by the early and subsequent extensive literature into two main groups which, under different labels, basically reflected the pace of reforms (e.g., Murrell, 1992; Popov, 2000). However, as transition proceeded, scholars became increasingly aware that the emphasis on the speed of reforms only (gradualism—or incremental, versus shock therapy—or big bang approach) would have been a too narrow and limited perspective (Roland, 2000, 2001), since transition involved many other dimensions, related to complementarity/substitutability of reforms, their possible reversibility in view of needed adjustments, and political economy sustainability (Marangos, 2005). Starting from the mid-1990s, the debate has indeed started to increasingly focus also upon which sequencing of reforms was more desirable, even though the focus on their speed remained largely prevalent, especially in growth studies. We will refer here mainly to these contributions since we are not aware of papers directly considering the impact of speed and sequencing of reforms on income inequality. Among the very first contributions, Fischer *et al.* (1996) and de Melo *et al.* (1997) used a cumulative liberalization index (averaging progress in price and trade liberalization, privatization, and banking reforms) in growth regressions, concluding that more speedy reforms were beneficial to growth. The use of this index, which basically does not separate the effect of the reform levels and of earlier

reforms, received various criticisms (e.g., Staehr, 2005). Subsequent attempts to provide more accurate measurement of the speed of reforms were, for example, Berg *et al.* (1999), Wolf (1999), Heybey and Murrell (1999), and Godoy and Stiglitz (2006). We will consider this literature in more depth in Section 3. Aspects related to sequencing were dealt with far less (Havrylyshyn, 2001), also due to the difficulties to proxy it. Only a few studies addressed these aspects explicitly, for example by comparing the effects of aggregate and single reform indicators (Havrylyshyn *et al.*, 1998), by including in the regressions interaction terms of reform indicators (Zinnes *et al.*, 2001), by measuring bundling/unbundling of reforms with their standard deviation (Lora, 2000), or by using principal component analysis to identify sets of reforms implemented simultaneously (Staehr, 2005). One recent paper directly measuring how the probability of reform progress in one area is affected by progress already achieved in other fields is Barlow and Radulescu (2005).

Although we are not aware of studies explicitly considering the effects of reforms' speed and sequencing on income inequality patterns, the vast literature on other aspects of transition inherently touches distributive aspects and provides useful insights. For example, in the optimal speed of transition (OST) literature (Aghion and Blanchard, 1994; Blanchard and Kremer, 1997; Boeri, 2000) it is the wages decline resulting from the shrinking of the public sector that busts the profit prospects of potential newcomers and their entry into the private sector. Therefore, the speed of transition drives the size of the unemployment pool and the extent of wages decline. At the same time, the final equilibrium, as well as the net distributive outcomes during transition, also depend on the countervailing role played by the social support granted to the unemployed in the first place. Similarly, the literature supporting gradualism via political economy arguments in a median voter framework maintains that reform patterns should also aim at preserving acceptable levels of social cohesion and at avoiding excessive inequality, which are most likely to create aversion to further reforms, feed pressures for redistribution, or generate political instability (Roland, 2001). This latter argument implies that not only speed, but also an appropriate sequencing should be designed to avoid inequality outbursts, which are likely to prevent further steps forward of the reform process. In other words, a possible endogeneity of reforms with respect to inequality cannot be ruled out.

2.2. *Income Inequality in Transition*

Although at the early stages of transition inequality received relatively less attention compared to other aspects (Roland, 2001), an extensive literature has been developing on this field in more recent years. We only aim here at recalling the main contributions with empirical cross-country contents and those more relevant to the aims of the paper.¹ Undoubtedly, the first comprehensive work on the subject was the book by Branko Milanovic (1998). Among many insights, his main

¹Comprehensive and reference theoretical models of inequality in transition can be found in Ferreira (1999) and Aghion and Commander (1999). An extensive empirical literature on inequality dynamics in single European or former Soviet Union countries has been emerging in the last decade. See Aristei and Perugini (2012) for a review.

general findings were that: (a) inequality increased remarkably during transition but with significantly different patterns and rates across countries; (b) increasing wage inequality was everywhere the main driver of income inequality surge; (c) private income sources other than wages contributed little to inequality with the exception of a few countries; and (d) social transfers played a minor countervailing role, with pensions that were paradoxically pro-inequality in some countries of Central Europe and especially in Russia. Similar outcomes were provided in Milanovic (1999). A comparably extensive work was that by Flemming and Micklewright (2000), who similarly concluded that there is a generalized increase of inequality during transition. However, while most countries stabilized at OECD average levels at the end of the 1990s, Russia and other former Soviet Union countries went far beyond these levels. Both these works also emphasized the great difficulty in obtaining comparable data; this explains the fact that only a limited literature dealing with cross-country analysis has developed. Among the most important studies, Grün and Klasen (2001) provide an international and intertemporal analysis of well-being during transition, accounting for distributive patterns. They conclude that well-being levels in the countries considered fell sharply during transition since generalized output decline was accompanied by increasing income inequality. The same authors (Grün and Klasen, 2012) also found that well-being after two decades of transition stabilized at levels similar to or lower than those under central planning. Another recent paper considering well-being rankings of European transition countries vis-à-vis the old EU members, but using a multidimensional approach and country specific estimates of inequality aversion parameters, is that by Aristei and Perugini (2010). As regards subjective well-being, Selezneva (2011) provides a comprehensive review of happiness and satisfaction studies on income, work, and family life in transition countries.

Ivaschenko (2003) finds that, during the 1990s, the level of development was associated with higher inequality in Eastern Europe, but with lower inequality in former Soviet Union countries. Beyond hyperinflation and systemic change driven by liberalizations, privatizations and deindustrialization are found to raise income inequality throughout the whole transition region, as well as war episodes. The distinctive feature of the work by Mikhalev (2003) is instead the focus on the distributive consequences of the new capitalistic social structure driven by assets/goods, property, and professional positions. More recently, Mitra and Yemtsov (2006) provide empirical evidence on the variety of components, patterns and size of inequality growth, and summarize the findings of the existing literature into six drivers of inequality in transition: (i) wage decompression and growth of the private sector; (ii) restructuring and unemployment; (iii) changes in government expenditure and taxation; (iv) price liberalization, inflation, and arrears; (v) asset transfer and growth of property income; and (vi) technological change and globalization.

Hölscher (2006) finds that while in the Czech Republic, Hungary, and Poland inequality remained relatively stable in the 1990s, it increased remarkably in Russia, where the share of profits declined as opposed to the share of transfers, while the importance of wage remained relatively stable. Emphasis is also placed on the possible role of informal economy on the true dynamics of inequality (on this point, see also Rosser *et al.*, 2000).

Lastly, we briefly report on three recent papers that explicitly deal with the distributive impact of policy measures. Giammatteo (2006) shows that state transfers and taxes played a vigorous and comparatively stronger role in Poland and Hungary during transition, allowing their governments to contain inequality during the most turbulent years. However, some components of state transfers (e.g., retirement benefits or child and family allowances) proved to be inequality enhancing. Ivanova (2007) provides descriptive empirical evidence for Hungary, Poland, and Bulgaria and points out that the weak social policies, which accompanied reforms strongly biased toward growth concerns, led to a remarkable decline in socioeconomic equality. Milanovic and Ersado (2011) is to the best of our knowledge the only attempt to directly link transition reforms to inequality in a cross-country perspective. A panel approach (on 26 formerly planned economies in the years 1990–2005) is employed to identify the effects exerted on decile income shares by progress in reforms, as measured by the EBRD transition indicators. The analysis reveals that in general reforms were strongly pro-rich and anti-poor. However, if the transition trajectories are considered separately, a statistically significant pro-inequality role is only played by large-scale privatization and infrastructure reforms, whereas small-scale privatization seems beneficial for the income share of the bottom deciles. Various insights for future research on inequality are drawn by the authors, the most intriguing ones being the importance of discriminating the various transition components and considering their possible interactions. Our attempt here is to develop this line of research.

3. INEQUALITY DYNAMICS IN TRANSITION AND REFORM PATTERNS

In this section we first present a brief description of the data used and a snapshot on income inequality patterns during transition (Section 3.1). Then we discuss the approach used to represent quantitatively the various transition patterns (Section 3.2) and their expected effects on inequality (Section 3.3).

3.1. *Data and Descriptive Analysis on Inequality Dynamics*

Our empirical analysis refers to 27 transition countries for the period 1989–2009.² For purely descriptive purposes we classify the countries of our sample into the following groups: (1) New EU Member Countries (NEUM), which joined the EU between 2004 and 2013; (2) Former Soviet Republics (FSR), which are full or associate members of the Commonwealth of Independent States; and (3) Western Balkan Countries (WBK). Our main data source for the Gini coefficient of income inequality (*gini*) is the World Income Inequality Database (WIID), provided by the United Nations University–World Institute for Development Economic Research (UNU–WIDER). The WIID³ combines measures of inequality from a number of primary datasets, i.e. the UNICEF TransMONEE project,⁴ the World

²Information on income inequality after 2009 is unfortunately still very fragmentary at the time of writing. Data for 2010 and 2011 are available only for a very small number of countries (namely a small subset of EU member states for which transition is already or almost completed) and would have only contributed to unbalance the dataset without adding any informative contribution.

³More information is available at: http://www.wider.unu.edu/research/Database/en_GB/database/

⁴See: <http://www.transmonee.org>

Development Indicators (WDI) provided by the World Bank, and Eurostat for the most recent years in the case of NEUM. The latest release of the WIID (Version 2.0c, May 2008) includes data until 2006. In order to extend the data coverage to more recent years, Gini measures from 2007 to 2009 have been drawn directly from Eurostat (Eurostat, 2010) and the World Bank's Povcalnet database⁵ (World Bank, 2013a); when updates for the preceding years were available from these two sources, they have also been used to replace the WIID data. Data on macroeconomic and structural variables are taken from the WDI dataset (World Bank, 2013b) and we use the Transition Indicators database, provided by the EBRD, for the variables describing progress of reforms in the various fields.⁶ In order to consider the effects of political and economic stability, we also included a dummy variable (*war*) that is equal to 1 if the country, in a given year, was at war and 0 otherwise.⁷ Too many missing values prevented the inclusion of other possible reform or institutional proxies (e.g., the OECD labor market institutions indicators). Although we address econometrically the problem of this missing information by exploiting the panel nature of our data, this should be kept in mind when interpreting the outcomes. Table A1 in the Appendix lists the variables used, their abbreviations and sources.

Complete data for the Gini index in the countries considered for the years 1989 to 2009 are reported in Table (i) in the online appendix. As a reference, the average OECD countries' Gini coefficient increased from 29.3 percent in the mid-1980s to 31.6 percent in the late 2000s, whereas for the western EU countries it increased from 27.7 to 29.4 percent (OECD, 2011). The NEUM countries at the outset of transition were characterized by inequality at around 20–25 Gini points, with the exception of the Baltic Countries, and experienced remarkably different rates of inequality increase. The Czech and the Slovak Republics, in particular, were able to keep their inequality growth to a minimum; to a lesser extent this was also the case for Hungary. The two countries of former Yugoslavia that joined the EU (Slovenia and Croatia) were also able to stabilize inequality at a similarly low level. Poland, on the other hand, experienced a steeper increase of disparities, with the Gini index exceeding 30 points already in the mid-1990s and then stabilizing at this level. A sharper rise in inequality was observed for the 2007 EU new members (Romania and Bulgaria), Estonia, and Lithuania, in which inequality approached or exceeded 35 percent in the years 2008/2009. In Latvia the surge in inequality was even steeper, approaching 40 percent in 2006 and then converging toward lower levels. Interestingly enough, after the outburst of the crisis (2008 and 2009), inequality remained stable or slightly declined in all countries.

⁵See: <http://iresearch.worldbank.org/PovcalNet/index.htm>

⁶Progress in transition is measured against the standards of industrialized market economies and refers to nine areas: Large Scale Privatization (LSP), Small Scale Privatization (SSP), Governance and Enterprise Restructuring (GER), Price Liberalization (PL), Trade and Foreign Exchange System (TFE), Competition Policy (CP), Banking Reform and Interest Rate Liberalization (BR), Securities Markets and Non-Bank Financial Institutions (SFI), and Infrastructure (I). More information is available at <http://www.ebrd.com/country/sector/econo/stats/index.htm>. We are aware of the limitations and drawbacks of using EBRD indicators (see EBRD, 2010; Besley *et al.*, 2010); however, differently from *de facto* indicators, they offer the advantage of completeness and full cross-country coverage over the whole transition period.

⁷The variable is provided by the Centre for the Study of Civil War (CSCW) and is available at: <http://www.prio.no/CSCW/>

In the FSR, with the only exceptions of Belarus and Ukraine, inequality in 1989/1990 was relatively higher and has been growing dramatically during the 1990s, exceeding 40 percent for most of the countries and approaching 50 Gini points in the Russian Federation, Georgia, and Azerbaijan. With the only exception of Belarus, Ukraine, and Kazakhstan, inequality levels in the FSR remain remarkably high in the final year available.

Lastly, as far as the Western Balkan Countries are concerned, the uneven patterns of inequality reflect the specific historical events of each country, which also greatly affected their data availability. However, in these countries, the tormented 1990s and the first half of the 2000s did not mean remarkable increases in inequality, which remained in the most recent year available around 35 percent in Albania and Bosnia & Herzegovina and 32 percent in Serbia. The FYR of Macedonia is an exception, since the relatively high levels of inequality reached at mid-2000 experienced a new steep increase in the years of the crisis, exceeding 43 Gini points in 2009.

3.2. Identification of Transition Reform Patterns

The EBRD indicators, largely used as measures of progress in transition, are usually collapsed into one indicator, obtained as the unweighted average or the sum of the specific indices. This choice, which implies perfect substitutability between reform areas, relies on the high correlation between the indices and assumes that the single reform patterns progressed at the same speed. This view cannot be considered as satisfactory: correlation is indeed high, but far from being perfect (and ranges from 0.63 to 0.88) and if we look at the reform patterns for single countries, they are far from overlapping (see Figure (i) in the online appendix for some examples; diagrams for the remaining countries are available upon request). Many studies identify countries such as Russia or Poland as examples of shock therapy strategies and Hungary and Slovenia as gradualist approaches (e.g., Lavigne, 1999). However, transition patterns were very country specific and none of them can be at the end characterized as a full “shock therapy.” In this respect Lin (2005) identifies Poland as an example in which although prices were rapidly liberalized, large-scale enterprises’ privatization lagged behind (p. 241).

EBRD data reveal that each country followed an own path of transition and highlight ex-post country-specific models of speed and sequencing of reforms. The two concepts (speed and sequencing) cannot be separated if one aims at considering the complexity of reform patterns since speed in one dimension cannot be considered aside from what happened in the other ones. Of course a summary indicator of progress of reforms provides an idea on the timing of the transition process, but a variety of possible combinations of single reforms may lie behind. The limited specific literature available provides insights into the inequality effects of single reforms (Milanovic and Ersado, 2011), emphasizing their effects on both wages and profits. Our point is that their effect cannot be easily identified if each single reform is not considered in connection with the other ones. For example, privatization processes are generally expected to drive inequality upwards, via creation of unemployment pools and increase in wage dispersion (Milanovic, 1998, 1999; Ivanova, 2007). However, this effect will be lower in those contexts in which

new entries of businesses is relatively easy and therefore partially able to offset unemployment. This, in turn, depends on the competition policy implemented and on the development of financial markets. Provided that transition increased inequality, our aim here is to find out whether different speeds and sequencings of reforms favored a relatively stronger acceleration of inequality or not.

As already mentioned, the only previous attempt to consider the inequality effects of transition reforms in a cross-country perspective is Milanovic and Ersado (2011). However, they simply use the nine EBRD indicators jointly in their regressions (with a serious threat of multicollinearity, not dealt with in the econometrics), and do not address explicitly speed and sequencing aspects. This is instead done by Staehr (2005), but in order to assess the effects of transition reforms on growth. In that study speed and sequencing are kept separate, which is questionable for the reasons explained earlier; in addition, the empirical approach to represent sequencing seems unsatisfactory. The author indeed carries out a principal component analysis on eight EBRD indicators and derives eight principal components. The first one, which explains nearly 80 percent of the variance, is interpreted as the indicator of general progress of reforms, while the remaining seven components are interpreted as sequencing patterns, according to their correlation with EBRD indices. Due to their low explanatory power and ambiguous interpretation, this approach seems far from being optimal.

In our work, in order to detect similarities across the countries considered in terms of co-movements and synchronies/asynchronies between reforms, and therefore to identify a taxonomy of transition approaches in which we can classify the countries of our sample, we use the complete longitudinal information incorporated in the nine EBRD indicators to perform a cluster analysis over the whole period considered. Their joint consideration indeed allows identifying, at the same time, the progress in transition and the simultaneity in each reform dimension over the whole period considered. The outset of transition (T_0) is set in the year before the first EBRD indicator departed from 1 in each country.⁸ The progress in reforms is identified through the levels of each EBRD score in the 21 following years.⁹ Once the 27 (countries) · 189 (9 EBRD dimensions · 21 time points) matrix is obtained, we implement a cluster analysis in order to detect possible similarities between countries in terms of movements of EBRD indicators during transition. This approach allows considering simultaneously the speed of each

⁸The transition indicators range from 1 to 4.33 (or 4+), with 1 representing little or no change from a rigid centrally planned economy and 4.33 representing the standards of an industrialized market economy. The choice of using the “transition,” instead of the calendar time, is not unusual in the specific literature about speed and sequencing of reforms (see, e.g., Berg *et al.*, 1999), and in our opinion is strongly preferable. EBRD data are available starting from 1989, when some countries had already undertaken some reforms and showed scores higher than 1. For them (Bosnia & Herzegovina, Bulgaria, Croatia, Estonia, Hungary, Lithuania, Poland, Serbia, Slovenia, FYR Macedonia) T_0 was set in 1989. Similarly, T_0 was set in 1989 for Albania, Czech Republic, Latvia, Romania, Russian Federation, and Slovak Republic, since the first EBRD indicators movement was recorded in 1990. T_0 is instead 1990 for Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Ukraine, and Uzbekistan; and 1992 for Turkmenistan.

⁹We therefore used EBRD data from 1989 to 2009 for the countries with T_0 set in 1989; 1990–2010 for those with $T_0 = 1990$; and 1992–2012 for Turkmenistan. Starting from 2010, EBRD only provides comparable data for the first six transition indexes; the missing data for the three remaining indicators were set equal to the latest year available (2009). This should not be considered a major flaw of the dataset, since little progress in transition was observed after 2010 in all fields and countries (see EBRD, 2012).

reform dimension and its temporal interrelation with the others. Methodologically, we use a combination of hierarchical and non-hierarchical methods: we first implement the cluster analysis using Ward's method, which supplied an optimal partition of countries into eight groups using the usual dendrogram cutting rule and the stopping criteria defined by Calinski and Harabasz (1974) and Duda and Hart (2001). Then we check the stability of these outcomes with the k -means method, setting the number of clusters to eight and employing cluster centroids from Ward's solution as initial seeds. This second analysis provides a partition of the countries identical to the previous one, confirming the stability of the hierarchical clustering.

Each of the eight groups provides a different profile of transition/sequencing pattern, as depicted in Figure 1, in which the progress of the nine indicators on a five-year basis since the beginning of transition (T_0) is reported.

A first important piece of information emerging from the cluster analysis is the polarization of the new Central European EU members and the Baltic countries into three groups (1, 2, and 3). The two remaining NEUM of the western Balkan region (Slovenia and Croatia) are classified in cluster 4, along with Macedonia. The other two countries of former-Yugoslavia (Serbia and Bosnia & Herzegovina) are grouped together (cluster 5). The FSU countries belong to clusters 6, 7, and 8, joined by Albania in cluster 7.

3.3. *Models of Transition: Discussion and Expected Impacts on Inequality*

Clusters 1 and 2 contain the Central and Eastern European and the Baltic countries that joined the EU in 2004, respectively. Cluster 1 includes the Czech Republic, Hungary, Poland, and the Slovak Republic, which implemented a very similar pattern of transition as revealed by the EBRD data, with a fast pace of reforms being implemented early in all fields simultaneously (with some gradualism in infrastructure reforms only). This suggests that the implementation of those reforms (in particular privatizations, enterprise restructuring, price liberalization) typically associated with increasing inequality via the shrinking of the state sector, unfolding of unemployment, and wage decompression, marched in step with other dimensions which may have played a counteracting role on inequality. We refer in particular to progress in competition policy which, along with exposure to international competition (TFE), may have prevented the formation of monopolistic positions or eroded the existing ones. Moreover, the early development of private banking and financial sectors may have favored new entries into the most dynamic industries and therefore the creation of employment and the improvement in competitive conditions (lower mark-ups, rents, and profits). Progress in development of financial markets is also usually expected to be pro-equality (Li *et al.*, 1998), increasing the possibility of worse-off agents to undertake investments (first of all in education), which could drive their relative income position upwards. In other words, this balanced approach may have helped, comparatively to patterns of other reforms (see below), in containing the unavoidable adverse distributive effects of transition.

Cluster 2 (Estonia, Latvia, and Lithuania) is relatively similar to the previous one since various reform dimensions (SSP, PL, TFE, BR) remarkably progressed

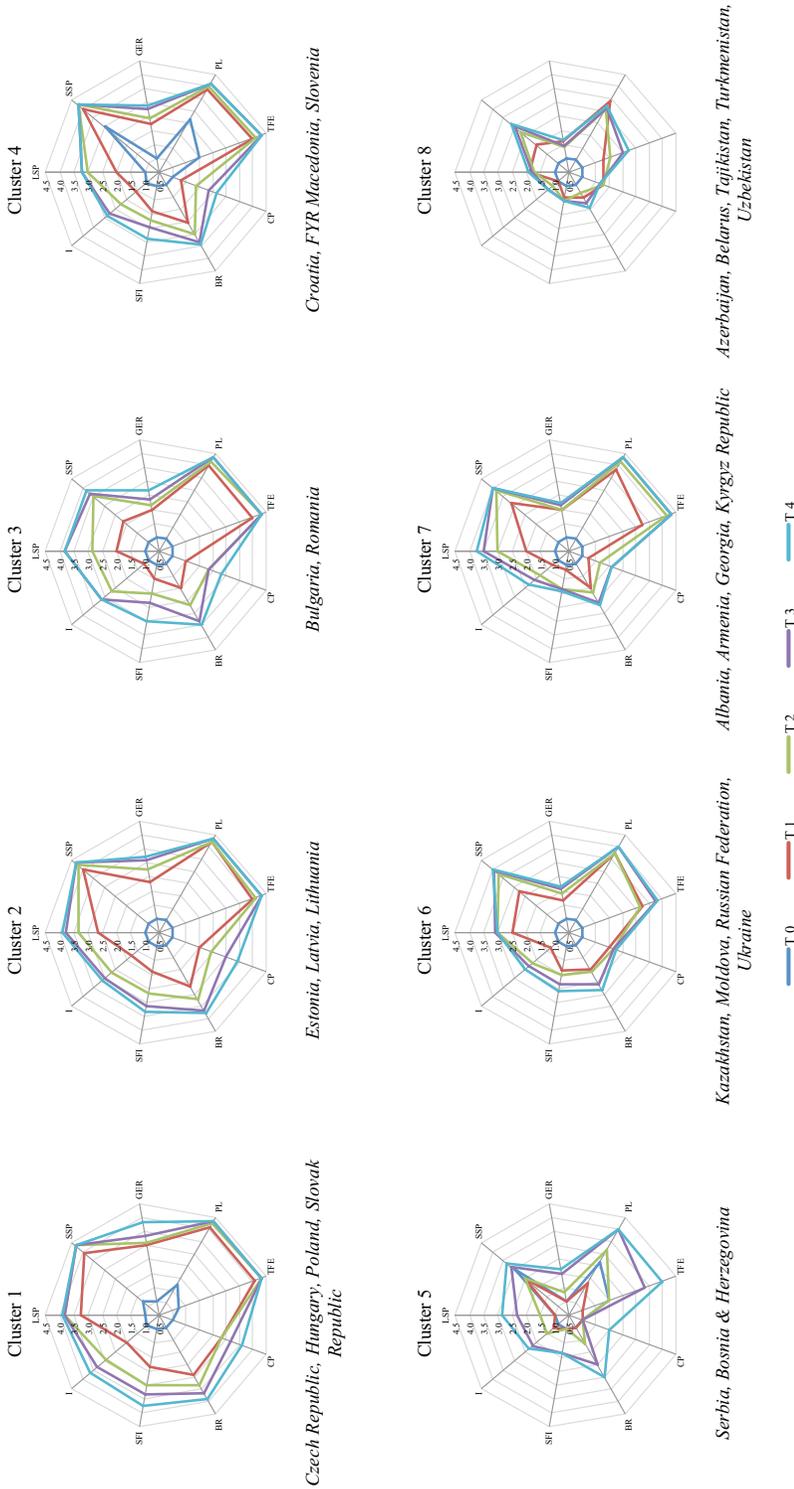


Figure 1. Transition Speed and Sequencing Models: Average EBRD Scores Evolution on a Five-Year Basis

Notes: LSP: Large Scale Privatization; SSP: Small Scale Privatization; GER: Governance and Enterprise Restructuring; PL: Price Liberalization; TFE: Trade and Foreign Exchange System; CP: Competition Policy; BR: Banking Reform and Interest Rate Liberalization; SFI: Securities Markets and Non-Bank Financial Institutions; I: Infrastructure.

in the initial period. Some other reforms, such as large-scale privatization, securities, and non-banking financial sectors intermediation, and especially competition policy, were instead implemented more smoothly compared to cluster 1.

Cluster 3 groups the two countries that joined the EU in 2007 (Bulgaria and Romania). Compared to the previous two clusters their transition model is remarkably less coordinated, with strong initial progress only in price liberalization and in the trade and foreign exchange system. In later stages of transition privatizations also started to progress remarkably, along with deeper reforms of the financial sector and competition policy. This model of transition represents a more gradual and unbalanced approach compared to the first two clusters. However, while the asymmetry between fast PL and TFE on the one side and slow competition policy and financial sector reforms on the other may have favored raising inequality, gradualism on the side of privatization might have cushioned this effect via a less abrupt structural adjustment on the labor market.

Cluster 4 groups three countries of South-Eastern Europe (Croatia, Slovenia, and FYR Macedonia), which, at the very beginning of the 1990s, already showed progress toward market-based economic systems in important institutional dimensions, namely price liberalization, trade and foreign exchange systems, and small firms' privatization. From this point of view, some distributive effects of transition may have unfolded already during the late 1980s and been partly absorbed at the beginning of the period considered. This is confirmed by the relatively high Gini coefficients for Croatia and Macedonia in 1989. In the following years, reforms have gradually progressed in basically all fields, reaching advanced stages at the end of the period considered with the only exceptions of enterprise restructuring and competition policy. In summary, this represents a more gradual approach, which is still under completion at the end of the period under analysis.

Cluster 5 includes two countries (Serbia and Bosnia & Herzegovina) that underwent important transition discontinuities, related to war episodes and political instability. Progress in reforms was quite uneven across the various fields, with the exceptions of price and trade liberalization. A certain advancement in the other dimensions was only implemented in the last period considered.

The pattern of transition revealed by the sixth group of countries (Kazakhstan, Moldova, Russian Federation, and Ukraine) is characterized by a very fast price and trade liberalization during the first stage of transition, accompanied by only a weak progress in competition policy, large enterprises' privatization, firm restructuring, and financial sectors' development. In the following phases, reforms proceeded smoothly in all fields, even though competition policy, enterprise restructuring, development of non-banking financial institutions, and privatizations, especially of large enterprises, were still far from being completed at the end of the 2000s. This could be identified as a model that allowed, at the early stages of transition, the owners of the gradually privatized small and medium enterprises to take advantage of price liberalization, without suffering too much the forces of competition (as weak competition policy and poor development of banking and financial markets did not encourage new entries). A poor initial development of financial markets may also have reduced the emergence of further competitive pressures. This approach may have favored, *ceteris paribus*, the positions of the few who were able to take advantage of monopolistic power in the

small private sectors. At the same time, the gradual shrinking of the state sector (slow privatization and enterprise restructuring) may have smoothed wage decomposition in the initial stage of development, partially compensating for the rise in inequality. Gradualism in privatizations might have tempered the rise in inequality by keeping workers into employment at the earlier stages of transition. However, at the end of the 2000s, the process of privatization (especially LS) is still far from being completed and this might have contributed to create low efficiency/low wage traps, which prevented labor market adjustments and transition of workers toward higher wage levels in the most recent years.

Cluster 7, which includes Albania, Armenia, Georgia, and the Kyrgyz Republic, describes a transition picture similar to group 6. However, some reform dimensions, namely PL, TFE, and LSP, reached a higher progress in transition in later stages. At the same time, progress in competition policy and financial sector reforms were even more gradual compared to cluster 6.

Lastly, cluster 8 puts together the remaining FSU countries in which transition was still lagging behind at the end of the period considered. The only steps forward were undertaken in price and trade liberalization and in small-scale privatization. Other dimensions of reforms are instead, at the end of the period considered, not very far from the starting point.

4. SPEED AND SEQUENCING OF REFORMS AND INEQUALITY: EMPIRICAL EVIDENCE

In this section we show the approach employed to test empirically the impact of reform patterns on inequality. In Section 4.1 we discuss how the information on transition approaches derived in the previous section is included in the empirical model and describe the other control variables considered. Section 4.2 illustrates the econometric methods, while in Section 4.3 the results obtained are presented and discussed. Lastly (Section 4.4), we provide some robustness checks.

4.1. *The Empirical Model: Reform Related Variables and Other Control Variables*

As far as the information about reform patterns is concerned, we include in the regressions a summary indicator of transition (named EBRD and computed as usual in the literature averaging the nine transition indicators), along with the interaction variables obtained as the product of EBRD and the dummy variables (CL1, . . . , CL8) associated with the speed/sequencing models identified. The interpretation of the (seven) interaction terms simultaneously introduced in the regression is straightforward: each of them represents the additional specific (negative or positive) effect produced by a certain pattern of reforms on inequality compared to the reference group (model/cluster 6). The identification of the reference group is of course arbitrary and uninfluential on the outcomes: the choice of cluster 6 is motivated by the fact that it includes the Russian Federation and is therefore an informative benchmark case.

Along with the variables representing reforms speed and sequencing, we obviously include a set of controls accounting for the remaining possible factors affecting inequality during transition. The choice of these explanatory variables

and their ability to represent the intended effects are severely limited by data availability. For example, a crucial role might have been played by the approach followed to implement privatization processes, an aspect only partially captured by the EBRD indices. Following Milanovic and Ersado (2011), we included among the regressors: the growth rate of the economy (*growth*), inflation (*inflation*), government spending as a share of GDP (*govshare*), industry structure (*agrshare*), and a control for war episodes (*war*).

Deriving expectations about the effects of these variables on inequality is a difficult task in general and in particular when specific time periods (such as transition) are considered. For example, the effects of growth clearly depend on the type of growth that has taken place (neutral, relatively more pro-poor, or pro-rich) and the existing literature is controversial. Results from Milanovic and Ersado (2011) and Kimenyi (2006) support the idea that growth was pro-inequality, even though the absolute income levels of the poor increased. Other studies provide opposite outcomes (e.g., Ivaschenko, 2003; Verme, 2006).

Both the specific (e.g., Ivaschenko, 2003; Milanovic and Ersado, 2011) and non-specific (Bulir, 2001) literature on transition support the idea that high inflation increases inequality, since worse-off people are less able to protect themselves from prices growth. However, the empirical evidence is mixed (see Galli and van der Hoeven, 2001, for a review). The countervailing (inequality-reducing) force—i.e., inflation pushing wage earners upwards into higher tax brackets—however, may not be too powerful in the case of transition countries. This is not only because tax evasion has been very high, but also because progressivity in tax structures is relatively weak (Aristei and Perugini, 2010). In our case the inflation variable is also a control for the pace and strength of the stabilization policy imposed externally (i.e., by the World Bank and International Monetary Fund).

Govshare is instead used to control for the possible cushioning effect provided by government spending and welfare state provisions. A negative relationship of *govshare* is expected considering the available literature (e.g., Keane and Prasad, 2002), even though for some countries social transfers were found to increase market income inequality (Milanovic, 1998). Our indicator is too general to capture the direct effects of social transfers. However, higher government spending may also correspond to an aggregate demand stimulus, often beneficial to low-skilled sectors (e.g., construction industry), and this may also represent a buffer to widening inequality.

We include in the analysis an indicator of the industry structure (*agrshare*) in order to account for the structural change not already captured by the other variables (reforms, growth, macroeconomic developments) but which may also control, for example, for demand driven factors such as the industry mix changes related to unconstrained consumer preferences. The presence of wars (*war*) is expected to impact positively on inequality.

A final set of control variables accounts for differences in the characteristics and methods used in the different surveys from which inequality measures are derived. They are dummy variables controlling for the survey: (i) using persons rather than households as units of analysis (*Dpers*); (ii) computing inequality on the basis of income, gross earnings (*Dearn*), or consumption (*Dcons*); (iii) using equivalence scales (*Deqs*) or not; and (iv) covering the whole population (*Dpop*) or not.

The inclusion of these control variables, along with time-specific effects and the use of a panel approach, should assure correct identification of the effects of the reform patterns, which remain the focus of the paper.

4.2. *Econometric Methods*

In order to assess the impact of transition reforms on income inequality, we consider the following dynamic model:

$$(1) \quad \begin{aligned} gini_{i,t} = & \alpha_i + \tau_t + \gamma gini_{i,t-1} + \beta_1 growth_{i,t} + \beta_2 govshare_{i,t} + \\ & \beta_3 agrshare_{i,t} + \beta_4 inflation_{i,t} + \beta_5 war_{i,t} + \\ & \delta EBRD_{i,t} + \sum_{j=1}^7 \varphi_j EBRD_{i,t} \cdot CL_j + \varepsilon_{i,t} \end{aligned}$$

where subscripts i , t , and j refer to countries, years, and clusters, respectively ($i = 1, \dots, 27$; $t = 1989, \dots, 2009$; $j = 1, \dots, 7$); α_i and τ_t are country and time specific effects, respectively, and ε_{it} is the idiosyncratic error term. The acronyms indicate the variables as described in the previous sections and in Table A1.

The dynamic specification (1) allows accounting for the fact that within-country income inequality is characterized by high inertia and can be viewed as a time-persistent phenomenon (see, among others, Mookherjee and Ray, 2003). However, the presence among the right-hand side variables of $gini_{i,t-1}$, which is correlated with the composite error ($\alpha_i + \varepsilon_{i,t}$), leads to inconsistent parameter estimates when country heterogeneity is accounted for by means of conventional fixed- or random-effects estimators (Baltagi, 2001). Moreover, specification (1) can be characterized by the presence of other endogenous regressors and reverse causality issues. A large body of literature has analyzed the effect of inequality on growth, pointing out that a possible problem of reverse causality may arise. Although the specific features of transition (namely the output dynamics driven by structural and systemic changes) suggest that such a possibility can be ruled out (Ivaschenko, 2003), a recent study has provided support for inequality being detrimental for growth in transition countries (Sukiassyan, 2007). Similarly, a concern of inverse direction of causality may arise between transition reforms and inequality, as emphasized by political economy literature: in transition (see Section 2.1) distributive patterns may have affected the pace of reforms. However, other authors (e.g., Milanovic and Ersado, 2011) emphasize that transition dynamics was in most cases dictated from outside (e.g., by WB or IMF constraints) and that therefore the role of inequality could be considered irrelevant. Lastly, concerns of reverse causality can be raised, as already discussed, with respect to the link between economic inequality and government spending.

To deal with all these issues simultaneously, Generalized-Method-of-Moments (GMM) estimation techniques can be employed. First, the first-difference GMM estimator proposed by Arellano and Bond (1991), which is based on first-differencing the regression equation to eliminate the country-specific effect and uses lagged dependent variables as instruments, can be considered. For the aims of the present analysis, the main issue of using this estimator is related to the specific nature of inequality persistency: the cross-sectional variation embodies a

large part of the information since within-country inequality is quite persistent. In this respect, although the first-difference GMM estimator allows controlling for possible measurement errors, country-specific heterogeneity, and endogeneity bias, it does not exploit the variation in levels, which is predominant. Ignoring cross-sectional variation may affect the precision of the estimates and give rise to estimation biases.¹⁰ Moreover, as pointed out by Blundell and Bond (1998), the lagged levels of the explanatory variables are weak instruments for the variables in differences when explanatory variables are persistent.¹¹

The system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) allows addressing these shortcomings, by fully exploiting the cross-country variation in the data. In the system GMM approach, specifications in first-differences and in levels are combined. Based on mild stationarity restrictions on the initial condition processes, the system estimator augments the difference GMM by including an equation in levels and by estimating simultaneously in differences and levels, with the two equations distinctly instrumented. Adding the original equation in levels preserves the cross-country dimension and allows exploiting additional moment conditions that may improve both consistency and efficiency of the estimates.

The system GMM estimator uses internal instruments (i.e., lagged values of the endogenous explanatory variables) and thus requires a more stringent set of restrictions than the difference GMM. Variables in levels are instrumented with lagged first differences and, in order to consider these additional moments as valid instruments for levels, the identifying assumption that past changes of the explanatory variables are uncorrelated with current errors in levels, which include fixed effects, is required (Roodman, 2009). If the moment conditions are valid, Blundell and Bond (1998) show that the system GMM estimator performs significantly better than the first-difference GMM estimator. The validity of the moment conditions can be tested by means of the test of overidentifying restrictions proposed by Sargan (1958) and Hansen (1982) and by testing the null hypothesis of no second order serial correlation in the error term. Furthermore, the validity of the additional moment conditions associated with the level equation can be tested with the difference Sargan/Hansen test.

Specification (1) can be further extended by introducing lagged regressors to control for the existence of a time persistent relationship between income inequality and some potential endogenous regressors, like GDP growth and government spending. We then obtain:

$$(2) \quad gini_{i,t} = \alpha_i + \tau_i + \gamma gini_{i,t-1} + \sum_{k=0}^q \beta_{1k} growth_{i,t-k} + \sum_{k=0}^q \beta_{2k} govshare_{i,t-k} + \beta_3 agrshare_{i,t} + \beta_4 inflation_{i,t} + \beta_5 war_{i,t} + \delta EBRD_{i,t} + \sum_{j=1}^7 \varphi_j EBRD_{i,t} \cdot CL_j + \varepsilon_{i,t}$$

¹⁰Deiningering and Squire (1996) and Li *et al.* (1998) show that in non-transition countries most of the variation in inequality (close to 90 percent) is usually due to variation across countries. For transition economies the time dimension is more relevant, but cross-country variability still remains a substantial source of variation in the period considered.

¹¹Bond *et al.* (2001) show that in small samples such weak instruments issue further translates into a large finite sample bias.

In the application, due to data constraints, we will include only one lag of *growth* and *govshare* (i.e., $\beta_{1k} = \beta_{2k} = 0$ for $k > 1$) as additional regressors. This also provides a robustness check for the empirical model as it allows us to verify whether the inclusion of additional lagged controls substantially changes empirical results.

System GMM estimation requires several specification choices. In particular, given the structure of our panel, in which N is only slightly larger than T , we use the one-step estimator¹² and correct the standard errors to account for small-sample bias and heteroscedasticity, by applying the Huber and White robust variance estimator which produces standard error estimates that are consistent to any pattern of heteroscedasticity and autocorrelation within panels. Furthermore, Roodman (2009) discusses the problem of the overfitting bias caused by instrument proliferation in dynamic panels. In fact, system GMM uses all available instruments and the number of instruments increases quadratic to the number of time points. To overcome this issue, we use a combined strategy obtained by collapsing instruments (i.e., creating one instrument for each variable and lag distance only, with 0 substituted for any missing values) and restricting the number of lags used as instruments. By doing this the number of instruments used turns to be invariant in T .

4.3. Outcomes and Interpretations

Outcomes of the estimation of equations (1) and (2) are reported in Table 1. All specifications presented include country fixed effects and time-specific dummies, the latter to account for potential common time-related shocks and cross-individual (contemporaneous) correlation (Roodman, 2009). Controls for the features of the surveys from which inequality measures are obtained, the estimated coefficients of which are not reported, are also included. In the estimations we treat GDP growth, the share of government spending on GDP, and transition reform index as endogenous variables. The instruments set used includes levels of the explanatory variables lagged two periods and further lags until four for the differenced equation and explanatory variables in first differences lagged one period for the level equation. The first two columns of Table 1 show estimation results for the dynamic model (1), while the last two present the estimates of the augmented specification (2), which includes further lagged regressors. All the specifications pass the test for the overall significance of the regression, the Arellano–Bond tests for serial correlation,¹³ and the Sargan test for overidentifying restrictions. Furthermore, the difference-in-Sargan test for the validity of the additional restrictions does not reject the null that the additional moment

¹²As pointed out by Roodman (2009), in the two-step variant the number of elements to be estimated for the optimal weighting matrix is quadratic in the number of instruments and quadratic in T . Moreover, the optimal weighting matrix has a rank of N at most and therefore, if the number of instruments exceeds N , it is singular and the two-step estimator can be computed only by means of a generalized inverse of the weighting matrix, which significantly affects its asymptotic efficiency.

¹³Estimations consistency requires that the error term must be serially uncorrelated. If $\varepsilon_{i,t}$ are serially uncorrelated, then $\Delta\varepsilon_{i,t}$ are correlated with $\Delta\varepsilon_{i,t-1}$, but they will not be correlated with $\Delta\varepsilon_{i,t-k}$ for $k \geq 2$. Thus if the model is correctly specified, we expect to reject the null hypothesis of no first order autocorrelation and not to reject the hypothesis of no second order autocorrelation.

TABLE 1
THE EFFECT OF TRANSITION REFORMS ON INEQUALITY

Variable	Dynamic Model GMM-SYS		Dynamic Model GMM-SYS	
	(1)	(2)	(3)	(4)
Gini _(t-1)	0.5887*** (0.1126)	0.5309*** (0.1422)	0.5571*** (0.1479)	0.5154*** (0.1646)
Growth	-0.0655** (0.0331)	-0.0829** (0.0339)	-0.0797** (0.0354)	-0.1170*** (0.0384)
Growth _(t-1)			-0.0250 (0.0373)	-0.0401 (0.0385)
Govshare	-0.2163** (0.0886)	-0.2101** (0.0856)	-0.2172** (0.0897)	-0.2085** (0.0861)
Govshare _(t-1)			-0.0671 (0.1004)	0.0958 (0.0991)
Agrshare	0.1448*** (0.0487)	0.1125*** (0.0419)	0.1409*** (0.0494)	0.1145*** (0.0441)
Inflation	-0.5898 (0.4549)	-0.3676 (0.4763)	-0.7561 (0.5011)	-0.2045 (0.5313)
War	3.3769*** (0.9305)	3.0607*** (0.8524)	4.1024*** (1.1997)	3.2908*** (1.0077)
EBRD	2.8896*** (0.9949)	7.2680*** (2.0302)	3.0291*** (0.9947)	9.4918*** (2.2282)
EBRD*CL1		-2.6669*** (0.7855)		-3.2948*** (0.8337)
EBRD*CL2		-1.3893*** (0.5142)		-1.8517*** (0.5579)
EBRD*CL3		-1.2142*** (0.4381)		-1.3367*** (0.4692)
EBRD*CL4		-1.8046*** (0.5647)		-2.1269*** (0.6041)
EBRD*CL5		0.1019 (0.4845)		0.3320 (0.5122)
EBRD*CL7		-0.6827** (0.3103)		-0.6584** (0.3220)
EBRD*CL8		1.6783** (0.7179)		2.6666*** (0.9378)
Time dummies	Yes	Yes	Yes	Yes
[joint significance]	[0.001]	[0.000]	[0.000]	[0.000]
Controls for survey differences	Yes	Yes	Yes	Yes
No. of observations	342	342	334	334
No. of countries	27	27	27	27
Wald test	[0.000]	[0.000]	[0.000]	[0.000]
A-B AR(1) test	-4.05 [0.000]	-3.86 [0.000]	-3.45 [0.001]	-3.34 [0.001]
A-B AR(2) test	-0.06 [0.953]	0.26 [0.793]	-0.49 [0.622]	-0.29 [0.774]
Sargan over-identification test	35.83 (27) [0.119]	33.48 (29) [0.259]	36.57 (28) [0.129]	28.83 (27) [0.369]
Difference-in-Sargan test	4.64 (4) [0.327]	3.08 (4) [0.544]	2.40 (4) [0.663]	0.85 (4) [0.931]

Notes: Robust standard errors are reported in parentheses below the estimates. A-B AR(1) and AR(2) are tests for first- and second-order serial correlation in the first-differenced residuals (Arellano and Bond, 1991). P-values of these tests and of the over-identification test are reported in brackets. *Growth*, *Govshare*, and *EBRD* are treated as endogenous. *p < 0.10, **p < 0.05, ***p < 0.01.

conditions associated with the level equation are valid. All specification tests thus indicate a well-specified model across all the four different options considered. As it can be noticed comparing the two sets of estimates, the lagged values of *growth* and *govshare* have no statistically significant impact on income inequality,¹⁴ while the size and significance of all the other coefficients remain substantially unchanged. Since the two countries belonging to cluster 5 (Serbia and Bosnia & Herzegovina) represent very peculiar cases, we also tested the robustness of our results to their exclusion (see Section 4.4). As will be discussed in more detail later, this check confirms that the outcomes presented in Table 1 have high stability. Similarly, robustness checks implemented, restricting the sample to the countries having a minimum number of observations (namely, 7, 10, 13, and 16) or to the years before the outburst of the global crisis (1989–2007), confirm the outcomes obtained with the general model and presented in Table 1.

A first remarkable piece of information emerging from the outcomes is the positive and highly significant effect of the lagged dependent variable, which is a clear-cut indication and confirmation of the high persistence of income inequality and of the appropriateness of a dynamic approach. Results related to the control variables reveal that both *govshare* and *growth* have a negative impact on inequality. This suggests that higher government shares of GDP may have played a buffer role toward the inequality generated and fed by other forces. Similarly, the results for GDP growth support the idea that output growth has been relatively more pro-poor (or that output collapse affected relatively more the better-off segments). The industry structure variable (*agrshare*) is significant and its positive sign suggests that, for those countries in which de-industrialization took place more intensively, the effects on the labor market hit the poor relatively more. Also the dummy variable *war* is significant and, in line with the findings of Ivaschenko (2003), supports the evidence that civil conflicts and wars are associated with rising income inequality. On the other hand, *inflation* is prevalently non-significant. This is contrary to the evidence provided by Milanovic and Ersado (2011) and Bhattacharya *et al.* (2005), but in line with other empirical findings (e.g., Gustafsson and Johansson, 1999; Nikoloski, 2010).

Lastly, it is worth remarking that the time dummies are jointly significant and, among the variables controlling for the surveys differences, *Dearn* and *Dpers* proved to be steadily significant.

Turning to the analysis of the effects of reforms on inequality, the indicator summarizing transition reforms (EBRD) has a positive and significant impact on inequality (columns 1 and 3 of Table 1), revealing that the reforms associated with the transition process, once fundamental macroeconomic factors are controlled for, led to an increase in income inequality. Namely, each one-point increase in the aggregate EBRD transition progress produced an increase of income inequality of about three Gini points. However, the main interest here is on the different patterns of reforms speed and sequencing, which we conjecture to have heterogeneous impacts on inequality. In particular, in columns 2 and 4 we present the results obtained by including interactions between the average EBRD index and

¹⁴The Wald tests for the joint significance of the two lagged regressors are equal to $\chi^2_{(2)} = 0.78$ ($p = 0.6774$) and $\chi^2_{(2)} = 2.32$ ($p = 0.3282$) for the specifications reported in columns 3 and 4, respectively.

dummies for groups of countries as identified by the cluster analysis. The estimated coefficients of these interaction variables should be interpreted as the difference in the average impact of reforms on inequality with respect to the omitted group (measured now by the “EBRD” coefficient). For example, from column 2 it is possible to point out that each point of transition progress for the countries of group 6 (the reference group) produced an increase of income inequality of 7.2 Gini points. For countries of cluster 1 (the interaction term coefficient of which is -2.6) the effect of a one-point progress in transition increased inequality by 2.6 Gini points less compared to the model of transition of cluster 6. In other terms, should countries of cluster 1 had undertaken a transition process similar to those of cluster 6, they would have experienced an increase in inequality, all other things being equal, of about 2.6 Gini points higher for every EBRD point progress in transition.

Results reveal remarkable heterogeneity in the estimated effects of reform approaches on inequality. First of all, the impact of reforms was significantly less pro-inequality in the countries identified with cluster 1 (Hungary, Poland, the Czech and the Slovak Republics), in which the various transition dimensions marched in step. This could be interpreted as empirical evidence of the counter-vailing role hypothesized for specific reforms (financial sector development, competition policy, exposure to competitive pressures) implemented simultaneously with those typically inequality enhancing. Also the interaction variable associated with cluster 2 (composed of the three Baltic countries) has a negative sign, even though of a smaller size compared to cluster 1. This outcome is in line with our interpretative framework, since the stronger inequality-curbing role of reforms in the countries of cluster 1 may be connected to the relatively more coordinated timing of reforms in competition policy and financial sector (with respect to other transition dimensions and compared to cluster 2). The evidence of such a remarkable role of reform patterns in holding down inequality, particularly in the Czech and the Slovak Republics is, in our opinion, a distinctive outcome of our study, since it helps in shedding light on the causes of the surprisingly small rise in inequality observed in these countries during transition.

Results also indicate that the countries belonging to cluster 3 (Bulgaria and Romania) undertook a reform approach relatively more pro-inequality compared to earlier new EU members and the Baltic countries, but still weaker compared to the benchmark group. This model of transition represents a more gradual and unbalanced approach compared to the first two clusters. However, while the asymmetry between fast price and trade liberalization on the one side and slow competition policy and financial sector reforms on the other may have favored raising inequality, gradualism on the side of privatization might have cushioned this effect via a less abrupt structural adjustment on the labor market.

We have already commented on the fact that in the countries classified in cluster 4, some distributive effects could have unfolded before the beginning of the period considered here, as a result of privatizations and liberalizations previously implemented. This, along with the balanced transition approach followed afterwards, could explain the relatively weak (compared to the reference group, but also to clusters 2 and 3) increase in inequality associated with transition of these countries.

The transition model identified with cluster 7 (Albania, Armenia, Georgia, Kyrgyz Republic) is the one most similar to the benchmark group and confirms the stronger pro-inequality effects of reforms compared to the first four clusters. This could be justified with the remarkably weaker and later role played by some reform dimensions (namely, financial sector and competition policy development), as explained in Section 3.3. However, the transition impact of this approach is still significantly different and lower compared to the benchmark case. This might depend on the fact that in Russia, and in the remaining countries classified in cluster 6, the potentially inequality-compensating reforms proceeded even more slowly and at the end of the period were much further from being completed. In addition, across the whole period, progress in privatizations (especially large-scale) was really weak and this favored the well-known stagnation of large sections of the economy into low-productivity/low-wage traps, not triggering any dynamism of the private sector which has normally compensated, in later stages of transition, the initial rise in inequality associated with entering into market systems.

Clusters 5 and 8 include those countries whose transition patterns produced inequality effects not statistically different and stronger than the reference group, respectively. With reference to cluster 5 (Serbia and Bosnia & Herzegovina), in which the transition process has been and still is very unbalanced, the role of some reforms already implemented at the beginning of the period (as for cluster 4) could have been compensated by the social and political instability experienced during most of the period under scrutiny here. As discussed earlier, cluster 8 puts together countries in which transition is still lagging behind and is almost exclusively identified with price and trade liberalization. The interpretation proposed to explain the strong pro-inequality effect of transition for the countries of cluster 6 are reinforced here, since no compensating institutional dimensions seem to be entered into force yet.

4.4. *Robustness checks*

As a first robustness check, we restrict the sample to the years preceding the outburst of the global financial crisis (1989–2007). The recent literature has emphasized how the crisis is impacting remarkably on all forms of inequalities (Atkinson and Morelli, 2011; UNCTAD, 2012). Despite the fact that we already control for time-specific effects in our estimates, it is worth double checking whether any impact of the shock introduced by this major event is visibly affecting the outcomes of our analysis, also considering that toward the most recent years the sample tends to be substantially balanced, and dropping two years means reducing the sample by a relatively high number of observations. Again, outcomes reported in Table 2 highlight a very high stability of the evidence previously obtained, in terms of both statistical significance and size of the coefficients.¹⁵

A second robustness check, as already mentioned, is carried out by excluding from the sample the two countries belonging to cluster 5 (Serbia and Bosnia & Herzegovina), due to their very peculiar transition pattern and to the political and

¹⁵It is worth remarking that specification tests indicate a well-specified model in all the robustness check considered, confirming the results obtained for the main specifications reported in Table 1.

TABLE 2
TRANSITION REFORMS AND INEQUALITY: RESTRICTED SAMPLE (1989–2007), EXCLUDING
THE FINANCIAL CRISIS YEARS

Variable	Dynamic Model GMM-SYS		Dynamic Model GMM-SYS	
	(1)	(2)	(3)	(4)
Gini _(t-1)	0.5454*** (0.1434)	0.4928*** (0.1491)	0.5592*** (0.1564)	0.5095*** (0.1609)
Growth	-0.0612* (0.0357)	-0.1029*** (0.0376)	-0.0808** (0.0402)	-0.1414*** (0.0441)
Growth _(t-1)			-0.0306 (0.0402)	-0.0559 (0.0424)
Govshare	-0.2207** (0.0942)	-0.2686*** (0.0934)	-0.2194** (0.1020)	-0.2780*** (0.0965)
Govshare _(t-1)			-0.0383 (0.1020)	0.0677 (0.1055)
Agrshare	0.1645*** (0.0578)	0.1180*** (0.0417)	0.1588*** (0.0558)	0.1014** (0.0434)
Inflation	-0.5066 (0.4684)	-0.5333 (0.4886)	-0.5999 (0.5361)	-0.4735 (0.5543)
War	3.3091*** (1.0083)	2.5605*** (0.8691)	3.9074*** (1.1710)	2.7684*** (1.0015)
EBRD	3.4584*** (1.1358)	7.6162*** (2.0297)	3.8739*** (1.2771)	9.2163*** (2.2858)
EBRD*CL1		-2.9884*** (0.8121)		-3.3791*** (0.8683)
EBRD*CL2		-1.5972*** (0.5366)		-1.8943*** (0.5883)
EBRD*CL3		-1.5626*** (0.5000)		-1.6014*** (0.5764)
EBRD*CL4		-2.1023*** (0.6051)		-2.2691*** (0.6481)
EBRD*CL5		0.1138 (0.5921)		0.4114 (0.5994)
EBRD*CL7		-1.0856*** (0.3630)		-0.9409** (0.4025)
EBRD*CL8		1.4596* (0.7555)		2.3511** (0.9828)
Time dummies	Yes	Yes	Yes	Yes
[joint significance]	[0.001]	[0.000]	[0.001]	[0.000]
Controls for survey differences	Yes	Yes	Yes	Yes
No. of observations	302	302	294	294
No. of countries	27	27	27	27
Wald test	[0.000]	[0.000]	[0.000]	[0.000]
A-B AR(1) test	-3.27 [0.001]	-3.74 [0.000]	-3.19 [0.001]	-3.38 [0.001]
A-B AR(2) test	-0.04 [0.965]	0.33 [0.745]	-0.48 [0.633]	-0.34 [0.736]
Sargan over-identification test	32.22 (27) [0.224]	26.25 (26) [0.449]	31.67 (25) [0.168]	22.12 (23) [0.513]
Difference-in-Sargan test	5.34 (4) [0.254]	1.84 (4) [0.766]	2.02 (4) [0.733]	1.02 (4) [0.907]

Notes: Robust standard errors are reported in parentheses below the estimates. A-B AR(1) and AR(2) are tests for first- and second-order serial correlation in the first-differenced residuals (Arellano and Bond, 1991). P-values of these tests and of the over-identification test are reported in brackets. *Growth*, *Govshare*, and *EBRD* are treated as endogenous. *p < 0.10, **p < 0.05, ***p < 0.01.

socio-economic events they experienced throughout the period considered here. Results shown in Table 3 indicate that the exclusion of cluster 5 is substantially uninfluential on the results of the main models estimated in Table 1.

The third robustness check is related to the nature of our panel dataset. As in most empirical studies on inequality, the estimation of models (1) and (2) is based on an unbalanced and unequally spaced panel dataset. The use of a panel of unequally spaced spells, while allowing the sample size to be kept reasonably high, could lead to an over-representation of countries with a large number of observations and to inconsistent estimates if one period in the theoretical model has to perfectly correspond to a certain time span in empirical data (Tamm *et al.*, 2007). This robustness check is therefore aimed at assessing the impact of the structure of the data on our results. To this aim, we have progressively restricted the sample to those countries with a higher availability of data on income inequality, thus keeping countries with at least 7, 10, 13, and 16 observations for the Gini index.¹⁶ By doing so, the sample is not only trimmed down to those countries with a similar number of observations, but also to those with the same temporal structure of data on inequality (see Table (i) in the online appendix). The outcomes on these restricted samples are reported in Table 4 and provide further support for the stability of the results obtained with the complete sample.¹⁷ Fortunately, all clusters remain represented after the restriction of the sample, having one or more countries with observations above the thresholds. Besides supporting the stability of the estimated coefficients for the lagged dependent variable and the remaining control variables, outcomes indicate that the effect of the average EBRD indicator and the hierarchy of the interaction variables remain substantially unchanged.

5. FINAL REMARKS

This paper attempts to measure the effects of different models of transition on income inequality. The specific original contribution of the paper lies in the identification of common patterns of transition, defined on the basis of the speed of reform of each dimension and on the temporal structure of their implementation. One intermediate outcome of our analysis is that patterns of transition toward a market economy were strongly diversified across countries, in terms of both speed and sequencing of reforms. Consequently, the shock therapy/gradualism juxtaposition can be only considered as a conceptualization useful to providing reference points, whereas the actual reform patterns always implied a complex mix of speed and timing of the single reforms components.

Using a cluster analysis on the dynamics of each of the nine EBRD transition indicators, we have been able to identify eight different models of transition, as revealed *ex-post* by progress in reforms observed starting from 1989/1990. The use

¹⁶This means progressively dropping in the four sub-samples the following countries: (i) Turkmenistan, Albania, Bosnia & Herzegovina; (ii) Tajikistan, Uzbekistan; (iii) Azerbaijan, Georgia, Kazakhstan; (iv) Armenia, Croatia.

¹⁷For the sake of brevity we only report outcomes of the full empirical models, i.e., with lagged explanatory variables (*growth* and *govshare*) and interaction variables. The results of the more parsimonious models, which again show high stability of signs, significance, and size of the coefficients, are available upon request.

TABLE 3
TRANSITION REFORMS AND INEQUALITY: RESTRICTED SAMPLE, EXCLUDING SERBIA AND BOSNIA & HERZEGOVINA (CLUSTER 5)

Variable	Dynamic Model GMM-SYS		Dynamic Model GMM-SYS	
	(1)	(2)	(3)	(4)
Gini _(t-1)	0.5895*** (0.1093)	0.5392*** (0.1223)	0.5641*** (0.1269)	0.5601*** (0.1457)
Growth	-0.1270*** (0.0428)	-0.0929*** (0.0342)	-0.1174*** (0.0450)	-0.1202*** (0.0384)
Growth _(t-1)			0.0089 (0.0396)	-0.0126 (0.0395)
Govshare	-0.2563** (0.0998)	-0.2502*** (0.0870)	-0.2203** (0.0980)	-0.2279** (0.0886)
Govshare _(t-1)			-0.0704 (0.0966)	0.1362 (0.1106)
Agrshare	0.1310*** (0.0462)	0.1228*** (0.0390)	0.1469*** (0.0449)	0.1230*** (0.0412)
Inflation	-0.4374 (0.7321)	-0.3213 (0.5552)	-0.3403 (0.7511)	-0.0818 (0.6707)
War	3.9962*** (1.0418)	3.6658*** (0.9461)	4.9190*** (1.2383)	3.5797*** (1.2240)
EBRD	2.8659*** (1.0547)	9.5594*** (2.7243)	3.4587*** (1.0441)	11.0293*** (3.0404)
EBRD*CL1		-3.1776*** (0.8420)		-3.5384*** (0.8976)
EBRD*CL2		-1.7981*** (0.6409)		-2.1063*** (0.7233)
EBRD*CL3		-1.4911*** (0.4792)		-1.4032*** (0.4804)
EBRD*CL4		-2.0293*** (0.5496)		-2.1625*** (0.5704)
EBRD*CL7		-0.8247** (0.3229)		-0.7388** (0.3247)
EBRD*CL8		2.6159** (1.0415)		3.4565** (1.3487)
Time dummies	Yes	Yes	Yes	Yes
[joint significance]	[0.002]	[0.000]	[0.001]	[0.000]
Controls for survey differences	Yes	Yes	Yes	Yes
No. of observations	327	327	320	320
No. of countries	25	25	25	25
Wald test	[0.000]	[0.000]	[0.000]	[0.000]
A-B AR(1) test	-3.77 [0.000]	-3.91 [0.000]	-3.41 [0.001]	-3.53 [0.000]
A-B AR(2) test	-0.44 [0.657]	0.04 [0.972]	-0.71 [0.477]	-0.41 [0.680]
Sargan over-identification test	35.38 (29) [0.192]	37.36 (30) [0.167]	37.86 (29) [0.125]	33.34 (29) [0.264]
Difference-in-Sargan test	4.23 (4) [0.376]	6.29 (4) [0.179]	6.17 (4) [0.187]	4.45 (4) [0.349]

Notes: Robust standard errors are reported in parentheses below the estimates. A-B AR(1) and AR(2) are tests for first- and second-order serial correlation in the first-differenced residuals (Arellano and Bond, 1991). P-values of these tests and of the over-identification test are reported in brackets. *Growth*, *Govshare*, and *EBRD* are treated as endogenous. *p < 0.10, **p < 0.05, ***p < 0.01.

TABLE 4

TRANSITION REFORMS AND INEQUALITY: RESTRICTED SAMPLES, INCLUDING COUNTRIES WITH SIMILAR AVAILABILITY OF DATA ON INCOME INEQUALITY

Variable	Dynamic Model GMM-SYS $t \geq 7$	Dynamic Model GMM-SYS $t \geq 10$	Dynamic Model GMM-SYS $t \geq 13$	Dynamic Model GMM-SYS $t \geq 16$
Gini _(t-1)	0.4981*** (0.1391)	0.4992*** (0.1431)	0.5103*** (0.1387)	0.4764*** (0.1450)
Growth	-0.1587*** (0.0441)	-0.1610*** (0.0434)	-0.1926** (0.0776)	-0.2278** (0.0966)
Growth _(t-1)	-0.0639 (0.0396)	-0.0480 (0.0390)	-0.0892 (0.0766)	-0.1747** (0.0784)
Govshare	-0.2173** (0.0874)	-0.2626*** (0.0926)	-0.2952* (0.1791)	-0.4453** (0.1774)
Govshare _(t-1)	0.0662 (0.0955)	0.1070 (0.0932)	0.2622** (0.1229)	0.3012** (0.1360)
Agrshare	0.0949** (0.0426)	0.1118** (0.0440)	0.1274** (0.0556)	0.1500** (0.0644)
Inflation	-0.3139 (0.5562)	-0.4836 (0.5478)	-0.0750 (0.6498)	0.2099 (0.8588)
War	3.1735*** (0.9197)	3.1983*** (0.9193)	3.3128*** (0.9510)	4.5809*** (1.0907)
EBRD	9.6364*** (2.3497)	8.7903*** (2.4007)	8.4869*** (2.6184)	9.9204*** (2.9770)
EBRD*CL1	-3.4035*** (0.8176)	-3.0754*** (0.8235)	-2.9118*** (0.8926)	-3.0879*** (0.9373)
EBRD*CL2	-1.9154*** (0.5760)	-1.6394*** (0.5721)	-1.4790** (0.5841)	-1.4835** (0.6346)
EBRD*CL3	-1.4319*** (0.4445)	-1.2503*** (0.4458)	-0.9741* (0.5776)	-1.1422** (0.5797)
EBRD*CL4	-2.2268*** (0.5689)	-2.0102*** (0.5753)	-1.9042*** (0.6336)	-1.7813*** (0.6363)
EBRD*CL5	0.1916 (0.6170)	0.0546 (0.6396)	0.0733 (0.6916)	0.5452 (0.7833)
EBRD*CL7	-0.5316* (0.3163)	-0.5736* (0.3313)	-0.8279* (0.4944)	-1.1449** (0.5689)
EBRD*CL8	2.7270*** (0.9309)	2.8104*** (1.0064)	2.4012* (1.4211)	3.3536* (1.7764)
Time dummies	Yes	Yes	Yes	Yes
[joint significance]	[0.000]	[0.001]	[0.000]	[0.001]
Controls for survey differences	Yes	Yes	Yes	Yes
No. of observations	328	323	303	282
No. of countries	24	22	19	17
Wald test	[0.000]	[0.000]	[0.000]	[0.000]
A-B AR(1) test	-3.97 [0.000]	-4.12 [0.000]	-3.76 [0.000]	-3.19 [0.001]
A-B AR(2) test	-0.42 [0.673]	-0.38 [0.703]	-0.78 [0.434]	-1.36 [0.174]
Sargan over-identification test	25.07 (27) [0.571]	29.38 (27) [0.343]	22.15 (25) [0.627]	22.69 (24) [0.538]
Difference-in-Sargan test	6.11 (4) [0.191]	6.52 (4) [0.164]	6.57 (4) [0.160]	6.68 (4) [0.154]

Notes: Robust standard errors are reported in parentheses below the estimates. A-B AR(1) and AR(2) are tests for first- and second-order serial correlation in the first-differenced residuals (Arellano and Bond, 1991). P-values of these tests and of the over-identification test are reported in brackets. *Growth*, *Govshare*, and *EBRD* are treated as endogenous. *p < 0.10, **p < 0.05, ***p < 0.01.

of EBRD information, although guaranteeing full cross-country coverage over the whole transition period, has well-known limitations highlighted by the existing literature (e.g., Besley *et al.*, 2010). With specific reference to the study of inequality patterns, although including the pace of small-scale and large-scale privatizations, EBRD indicators do not provide information on the approach adopted to implement the privatization processes, which is likely to have played a role in shaping income distribution. These aspects, not dealt with here, deserve further attention and will be the focus of future research efforts. Our econometric results provide evidence that, once other macroeconomic and structural factors are controlled for, transition reforms in general have significantly increased income inequality and this corroborates the existing empirical and theoretical literature. Our original result is that different patterns of transition affected inequality with different strengths, with some models of transition having favored a relatively higher increase in inequality. In particular, transition was relatively more pro-inequality when price and trade liberalizations and privatizations were not accompanied by progress in competition policy and development of financial markets, which lagged behind or were implemented in later stages. From this point of view (i.e., the ability of keeping inequality growth relatively low), the transition pattern of the formerly planned economies which joined the EU in the first wave of eastwards enlargement in 2004, can be considered relatively more successful. Our outcomes suggest that more balanced and coordinated transition approaches were more effective in restraining the unavoidable rise in inequality associated with giving up central planning. On the other hand, where transition proceeded unevenly in the various reform fields, this either paved the way for the explosion of rents and profits associated with market power or prevented labor market adjustments able to counteract the pro-inequality effects of qualitative and quantitative structural change. Both factors contributed to increase inequality, but affecting the two opposite ends of the income distribution. The investigation of which of them (at the upper or at the lower tail) was stronger and/or prevailed is a matter of empirical research, which is even now scarce especially under a comparative perspective. The contribution provided by this study is that radical institutional change should be implemented favoring a coordinated, balanced progress in all dimensions that characterize and shape a market economic system. However, the feasibility of this approach strongly depends on specific social, political, and economic circumstances. In situations in which *de iure* reforms do not march in step with *de facto* institutional change (Acemoglu and Robinson, 2010), the persistence in power of former elites and interest groups can only favor, by definition, a conservative approach and therefore social and economic polarization and a deepening of inequality. From this point of view, as it is also apparent from the variety of experiences and performances after more than 20 years of transition, the success of institutional change strongly depends on the quality and efficiency of democratic institutions able to counteract the conservative pressures of the existing elites.

Our study originally contributes to a body of literature in which the investigation on the most desirable patterns of transition has been so far almost completely confined to their effects on growth. This has been done in light of the more or less tacit belief that, sooner or later, output growth would have also impacted on poverty

and inequality. The experience of transition toward capitalistic systems of countries that abandoned economic planning at the beginning of the 1900s tells us that this might not be necessarily the case. In addition, if income inequality has any (positive or negative) impact on subsequent growth, as emphasized by a very extensive literature, the distributive consequences of transition cannot be neglected. Especially if, as recently shown with specific reference to transition countries (Sukiassyan, 2007), higher inequality may be harmful for future growth.

APPENDIX

TABLE A1

LIST OF VARIABLES, ABBREVIATIONS, AND SOURCES

Abbreviation	Variable	Source
Gini	Gini coefficient	WIID*
Govshare	General government final consumption expenditure as a % of GDP	WDI
Agrshare	Value added of agriculture as a % of GDP	WDI
Inflation	Annual % change of the GDP deflator	WDI
Growth	Annual GDP growth in PPP, constant 2005 international \$	WDI
LSP	Progress in Large Scale Privatization	EBRD
SSP	Progress in Small Scale Privatization	EBRD
GER	Progress in Governance and Enterprise Restructuring	EBRD
PL	Progress in Price Liberalization	EBRD
TFE	Progress in Trade and Foreign Exchange System	EBRD
CP	Progress in Competition Policy	EBRD
BR	Progress in Banking Reform and Interest Rate Liberalization	EBRD
SFI	Progress in Securities Markets and Non-Bank Financial Institutions	EBRD
I	Progress in Infrastructure	EBRD
EBRD	Unweighted average of the 9 EBRD transition indicators	EBRD
War	Dummy variable, 1 if the country is at war in a given year and 0 otherwise	CSCW
Dpers	Dummy variable, 1 if the survey calculated inequality with persons as units of analysis and 0 if it used households	WIID*
Dearn	Dummy variable, 1 if the survey calculated inequality on the basis of earnings and 0 otherwise	WIID*
Dcons	Dummy variable, 1 if the survey calculated inequality on the basis of consumption and 0 otherwise	WIID*
Deqs	Dummy variable, 1 if the survey calculated inequality using an equivalence scale and 0 otherwise	WIID*
Dpop	Dummy variable, 1 if the survey calculated inequality on the whole population and 0 otherwise	WIID*

Notes: WIID: World Income Inequality Database, United Nations University–World Institute for Development Economic Research

WDI: World Development Indicators, The World Bank

EBRD: European Bank for Reconstruction and Development

CSCW: Centre for the Study of Civil War

*WIID database has been integrated using data from Eu-Silc (Eurostat, 2010) and Povcalnet (World Bank, 2013).

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table (i): Inequality in Transition Countries (Gini Index, 1989–2009)

Figure (i): Transition Reforms Patterns by Country, EBRD Indicators (Selected Countries)