Social welfare dynamics in post-socialist countries: unveiling the secrets of success

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Abstract

Since the global collapse of the socialist command economy, a significant differentiation in social and economic development within the former socialist world has been observed. Economists have pointed out a number of factors which could explain this disparity. One of the most important is market reform of the economy freeing Smith's "invisible hand" that with the support of inclusive political and economical institutions makes it possible for the national economy to thrive and thus achieve higher welfare for the nation. In this article, the influence of various factors on social well-being in the post-socialist countries of Central and Eastern Europe is analyzed. Our analysis has revealed that such factors as the level of economic freedom, intensity of economic reform, fostering of human capital, and level of national economy output play a significant role in creating a positive social welfare dynamics in transitional nations. It appears that the importance of these factors may vary within the cross-section of selected countries; thus, different policy patterns with regard to social welfare could be applied depending on factor combinations existing in some specific countries.

Keywords: market transformation, social welfare, the Sen Social Welfare Index, post-socialist countries

1 INTRODUCTION

Social welfare is characterized by the quality of life and standard of living in a given country and is a product of economic, social, environmental, cultural and institutional factors that are on the one hand predetermined by historical development and on the other hand are subject to a nation's public choice. Its estimation allows us to lay down a desired trajectory of social development. It is the commonly perceived wisdom that any society should be striving for higher social welfare, i.e. the nation-wide human community aims to reach higher well-being for society as a whole. From a theoretical point of view it is fascinating to investigate why different countries, despite comparable initial conditions, reach different levels of social welfare. This issue is even more important in practical terms.

At the end of the 20th century major modifications were initiated in the countries of Central and Eastern Europe (further referred to as CEE). These modifications brought about fundamental transformations of their socio-economic systems. The demise of socialism in these countries is quite a persuasive historical fact that reveals the advantages of a market over a state-controlled socialist economy. Nowadays, after almost 30 years of political, social and economic transformations, significant differentiations of socio-economic development in separate CEE countries and in their achieved level of social welfare can be seen. That is why this group of countries provides important empirical material for studying the influence of the building of a market economy on economic growth and social well-being.

Having in mind that an increase in social welfare itself is the ultimate goal of the socio-economic development of the country, the objectives of our research were,

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firstly, to assess the scale of variation in social welfare characteristic of CEE countries. Secondly, to find out which economic and political factors determine the success in achieving this goal; this will give an opportunity for a researcher to find an explanation of why some of the countries have made considerable socio-economic progress while others have not.

The material of the study is structured in the following way: (i) firstly, we provide a short review of economic literature on the factors affecting social welfare; (ii) we present data on dynamics and divergences of CEE countries with regard to social welfare; (iii) we divide countries into clusters and perform a regression analysis that explains the social welfare dynamics in these countries; (iv) finally, we outline the policy patterns that may be implemented in separate countries in order to ensure sufficient dynamics in their economic and social development.

2 THE THEORETICAL BASICS OF RESEARCH

Numbers of modern economists mentioned the existence of a direct link between economic growth, social welfare and economic freedom on the empirical level. The methodological foundations for these conclusions are laid in the writings of classical writers, Adam Smith, David Ricardo, John Stuart Mill, and by later writers like Friedrich August von Hayek (Hayek, 1960), Milton Friedman (Friedman, 1962), James McGill Buchanan (Buchanan, 1975) and a number of other modern economists. The core argumentation in favor of an idea that expansion of economic freedom promotes social welfare growth is the acknowledgement of the fact that greater economic freedom provides more powerful incentives for effective interaction among economic actors; this, in turn, contributes to increasing the level of social welfare. In contrast, restrictions on economic freedom have a negative impact on socio-economic development.

Some economists suggest that "regardless of the sample of countries, level of economic liberty and aggregation level, there are sustainable positive interactions between economic liberty (the development level of market relations) and economic growth. Meanwhile, economic liberty has considerably greater impact on economic growth, than political liberty" (Doucouliagos, 2006:75).

It has been concluded that with a high level of economic freedom in a society all strata of the population benefit more or less equally. If the level of economic freedom is low, only specific population strata may benefit (Berggren, 2003). At the same time, a positive correlation between the level of economic freedom and average income has been revealed (Grubel, 1998). These conclusions have found support in studies made by many other authors (Hanke, 1997; Leschke, 2000).

Empirical proof that economic freedom has a positive impact on economic development was found: countries that have advanced market institutions and have shaped open policies in the area of trade and investment tend to be more successful in economic development; on the contrary, countries that slide towards internal

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markets in conjunction with a high level of state control demonstrate slow growth rates (Bhagwati, 1999).

However, studies that did not show a statistically significant correlation between economic liberty and the increase of social welfare should be also mentioned. For instance, it was found that economic and social development could not be forecast accurately according to the expansion of economic freedom (Gwartney, Lawson and Holcombe, 1998); there exists an ambiguity of the linkage between an increase in economic freedom and the specific socio-economic results achieved (Geiets, 2010).

The ambiguity mentioned above could be explained by the large number of interrelated variables that affect the economic and social development of any country. This fact may explain the inconsistency of the results obtained by the economists in their empirical studies – depending on the set of variables in a model, the time horizon and the size of a sample, the impact assessment of a separate variable will noticeably vary.

In particular, Babetskii and Campos (2007) presented in their paper the results of a meta-regression analysis where 43 empirical studies on countries with economies in transition were analyzed with a view to identifying the link between market reforms and economic growth. They found that out of 321 coefficients characterizing the influence of reforms on socio-economic growth approximately one third turned out to be positive and statistically significant, the second third – negative and statistically significant, the rest – negative and statistically insignificant. Among the reasons that have affected results the authors mentioned model specification, choice of simulation method, etc.

While referring to the studies on evolution of the post-socialist economy, we could distinguish in modern economic literature three directions in socio-economic development research that are dedicated to different stages of its evolution in the transformation process: (i) the transformation recession; (ii) recovery; and (iii) growth.

The main principles of the first direction were formulated by Kornai (1990), Fischer and Gelb (1991), Blanchard (1997), Kremer and Chamon (2009). Kornai distinguished two types of the necessary changes that had to happen during the period of the transformational recession: firstly, a shift from the seller's market to the buyer's market (in the course of price liberalization) and, secondly, the imposition of hard budget constraints for entrepreneurs (with the help of privatization and eradication of budget support mechanisms, such as budget subsidies, soft loans and tax benefits). Such changes kick-start the market mechanism start and launch the primary economic incentives for all economic agents.

Blanchard (1997), Kremer and Chamon (2009), while explaining the process of transformational recession, emphasized the disorganization caused by the demise of the command economy. Disorganization causes the following structural modifications: redeployment of resources from obsolete economic activities to new

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ones (through closure and bankruptcy of ineffective enterprises and the simultaneous emergence of new ones), and the restructuring of the enterprises which "survived" under these conditions.

Studies of the second direction are focused on the phase of the economic recovery that follows a transformational recession (Fisher and Gelb, 1991; Havrylyshyn, 2001, among others). Here, special attention has been paid to the creation of an effective institutional environment for future socio-economic development.

Studies of the third direction lay emphasis on a phase of transformational economic growth, and find reflections in the documents of international organizations (IMF, EBRD, the World Bank). In particular, they aim to formulate recommendations concerning specific steps for securing economic growth.

The studies mentioned above applied different methodologies, but got similar results concerning factors which affect the efficacy of economic transformation. Actually, they have all outlined the three main blocks of variables which explain socio-economic development during the transformational change: initial conditions, macroeconomic policy, and structural policy (Havrylyshyn, 2001).

It should be mentioned that many empirical studies offered by modern economists suffer from the methodological flaw of improper identification of economic growth and social welfare. We assume that economic growth is only one of the components of social well-being, so studies aiming to uncover the influence of market restructuring on social welfare must take into account a range of other factors.

3 RESEARCH METHODOLOGY

3.1 SOCIAL WELFARE INDEX

The main problem with the indexes of social welfare used in most empirical studies is that they mostly have been calculated on the basis of mean values, for example, per capita GDP. Namely, per capita GDP was considered a social welfare index by Arthur Pigou (1932) and many other economists (Nordhaus and Tobin, 1973; Beckerman, 1994; Dodds, 1997, among others). As a result, one gets a correlation that does not correspond to reality, for we cannot measure welfare by GDP or another similar index because it really does not capture the social component of social welfare. That is why we have chosen the Sen Social Welfare Index (further referred as SSWI) elaborated by Amartya Sen (Sen, 1974) as an output indicator for our models. The advantages of Sen's approach to evaluating social welfare is that it takes into consideration not only the economic component that is measured by average income, but also the social one – the grade of equitable distribution within the nation measured by the Gini index (Atkinson, 1999).

SSWI is calculated according to the formula (Sen, 1974, 1976, 1997):

$$SSWI = E(1 - G), \tag{1}$$

where E is per capita national income, G is the Gini index.

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Equation (1) means: the smaller the disparities in incomes achieved, the higher social welfare can be reached at an existing level of per capita income.

Table A1 demonstrates the SSWI values for CEE countries for year 2016.

3.2 SOCIAL WELFARE FACTORS AND DATA SOURCES

As a result of synthesizing the foregoing approaches regarding social welfare determinants with regard to transition economy, we selected the following factors that probably influence the social welfare dynamics:

- freedom concerning economic decision making;
- development of market economy institutions;
- state policy concerning development of human capital;
- the country's economic dynamics.

The index of economic freedom was chosen as a factor that reflects the level of liberty in economic decision making; it has been calculated by the Heritage Foundation (HF). This index is generally used in economists' academic writings for describing the level of economic freedom. Annual publication of this index allows for the way the recent transformations in the governmental policy affect economic freedom. The main indicators on which the index is built include (HF, 2017):

- corruption in the judiciary, customs and government bureaucracies;
- fiscal burden which covers personal income tax rate, corporate income tax and government expenses as a percentage of GDP;
- the rule of law, efficiency of the judiciary and the possibility of contract execution;
- responsibility of business in relation to health care, industrial safety provision and environment protection;
- limitations for banks relating to financial services (sale of securities and insurance);
- regulation of the labor market;
- "black market" activity.

It is worth mentioning that tracking the progress in the development of market institutions is a very tricky thing, as it is rather difficult to choose adequate indexes for its statistical assessment. Thus, such evaluation is often subjective. One should have the numerical characteristics of these processes for comparing the countries that have different levels of socio-economic development, but similar development vectors. Thus, the European Bank for Reconstruction and Development (EBRD) annually publishes the Report on the progress in post-socialist transformation (Transition Report) that encompasses data for 25 countries of CEE and the former USSR (EBRD, 2017).

In the Transition Report, the evaluation of success in reforms that must be initiated on the early stage of transformation is performed by the use of such indicators as: market and trade liberalization, small-scale privatization, price and trade liberalization, free access to foreign currency, the rate at which the economic costs of

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utilities are covered by the population. The second set of the reform indicators includes: privatization of large enterprises and the institutional reforms which are necessary for development of the competitive markets and for providing an environment for their effective functioning. The scale of the indicators ranges from 1 to 4+, where 1 means few changes in comparison with the administrative command economy or their absence, and 4+ is a standard for the developed market economy.

The mean value of the six market reform indexes in the transition economy which are presented in the Transition Report was chosen as a combined market reform success factor for our model specification.

Two indicators (government spending on education and healthcare as a percentage of GDP) were chosen as indicators of the degree to which the state promotes human capital development. These indicators could be considered a good proxy for public investment into the society's human capital and have been published on an annual basis by the World Bank.

Per capita GDP at PPP was chosen as an indicator for a country's economic dynamics. This indicator depicts not only economic output, but also average income and price levels in the country, and thus is better suited for international comparison than per capita GDP in USD at current exchange rates due to its being less volatile (Schreyer and Koechlin, 2002). This leads us to assume that it is among the best for comparing and gauging irregularities in national economic development. World Bank economic data bank served as the data source for this indicator (World Bank, 2017).

Generalized cluster-wide statistics of social welfare factors are presented in table A2.

3.3 BASIC HYPOTHESES CONCERNING FACTOR IMPACT ON SOCIAL WELFARE

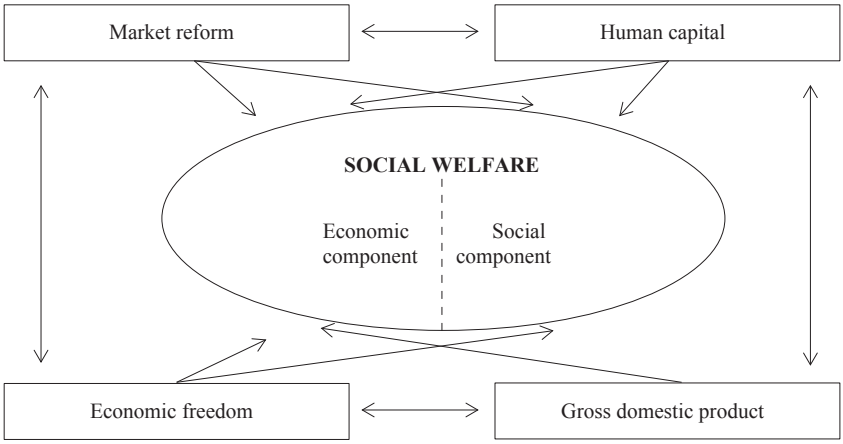
According to theoretical and empirical studies, the following hypotheses about the impact of the above mentioned factors on social welfare were articulated (see graph 1).

1) Soaring economic freedom positively affects social welfare through its economic component (Barro, 1991; Hanke, 1997; Leschke, 2000; Scully, 1988, 1992);
2) Development of effective market institutions promotes social welfare: market reforming positively influences both its economic and social components (Buchanan, 1975; Friedman, 1962; Hayek, 1960);
3) An increase in governmental spending on human capital has a positive impact on social welfare (Schultz, 1961; Stiglitz, 1999);
4) An increase in per capita GDP supports social welfare growth as it means an increase in personal income (Fisher and Gelb, 1991; Havrylyshyn, 2001).

The impact of chosen factors on social welfare and their interconnection is schematically presented in graph 1.

Graph 1

The interaction of social welfare factors



Source: designed by the authors.

Creation of effective market institutions has a positive impact both on the economic component of social welfare (due to increased productivity), and its social component (increase in the level of education, health improvement of the population, unemployment reduction, higher equality in income distribution). Economic freedom stimulates economic development within a country because it reveals opportunities for development of its economic capacity and may contribute to a reduction of social disparities. As some authors pointed out (Leitner and Holzner, 2008; Milanovic, 1999), an expanding private sector triggers growing income inequality during the first phases of post-socialist transformation. GDP dynamics is an economic growth indicator, but as far as equality is concerned, its influence is negligible, at least among CEE countries (Szeles, 2013). All these factors, in turn, are interrelated.

3.4 CLUSTERING AND MODELING

The CEE region was chosen as the object of this study. We are convinced that the transition to the market economy that started and still continues in these countries provides a good opportunity for empirically verifying the hypothesis that economic development must contribute to the welfare.

For assessing factors influencing social welfare dynamics, balanced panel data of 20 CEE countries for the time period 1995-2016 (the Human Development Report database, Index of Economic Freedom database, EBRD and The World Bank statistical databases were the data sources) was analyzed.

The biggest advantage of panel data is the large number of observations, which increases the number of the degrees of freedom and decreases the interdependence among the explanatory variables and, accordingly, the standard errors of estimate.

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In our study, we used a method of cluster analysis that allows for multi-dimensional (in our case two-dimensional) classification of data containing sample information; as a result, objects have been grouped into relatively homogeneous cohorts. In this way, the issue of data classification with the application of a specific mathematic apparatus could be solved. We have chosen a hierarchical approach to clustering since in our case the number of clusters is a priori unknown.

According to an approach suggested by Okun (1975), the sample of 20 CEE countries has been split into four clusters (this categorization is valid for 2016) basing on economic efficiency (per capita income) and social fairness (Gini index) criteria and analyzed with regard to the influence of separate factors on social welfare. The distance between the objects (countries) was calculated according to the formula of the Euclidian distance:

$$d_{ij} = \sqrt{\sum_{i=1}^{n} (x_i - y_i)^2}, \quad (2)$$

where x_i, y_i represent the value of the i-variable of the first and the second observations; n – the number of variables. The clustering was committed by single linkage (nearest-neighbor linkage).

For each cluster, a fixed effects regression model was built in order to estimate the impact of selected factors on social welfare. It should be mentioned that the relations within a correlation model could be very complex. To define them all and the functional relations among them is a highly problematic task because functions of higher complexity involve a higher number of predictors, which diminishes the accuracy of estimation and makes result interpretation difficult. That is why while choosing a model type we stand by multiple fixed effects regression; its verification for specification errors with a Ramsey RESET test was successful: no specification errors were present.

4 SOCIAL WELFARE DYNAMICS IN CEE COUNTRIES

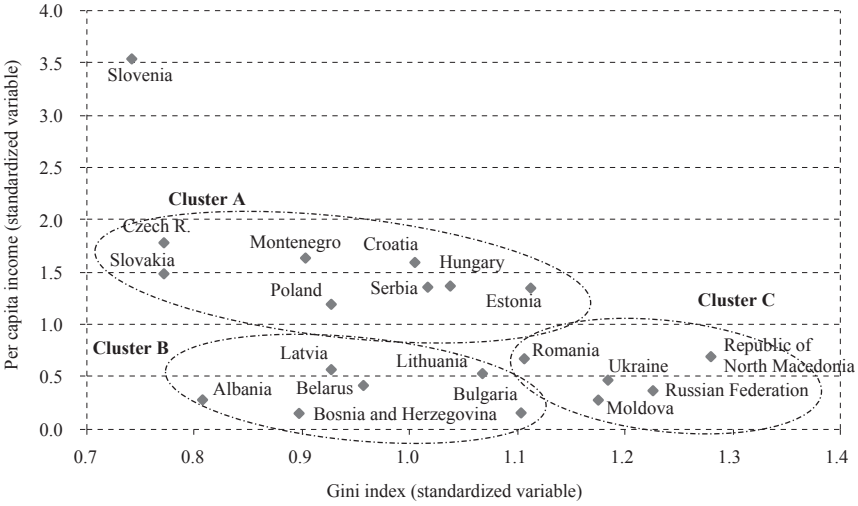
To enhance the reliability of the results, the dynamics of some countries were analyzed with regard to standardized per capita income and Gini index values. Our graphs 2 and 3 support the finding that there is no correlation between economic growth and equality in income distribution for CEE countries (Szeles, 2013); however, the division of countries by these two measures gives us the possibility to split them into clusters. The initial division of countries into clusters that was carried out according to the data of 1995 is presented in graph 2.

According to graph 2, there were grounds for distinguishing three country clusters in 1995: (a) countries with considerably higher per capita income and relatively low level of disparities in income distribution; (b) countries with low per capita income and at the same time low disparities in income distribution; (c) countries with low per capita income and high disparities in income distribution. As for the year 1995, Slovenia was not included in any cluster because this country differed

significantly by indicators from the other countries sampled. According to graph 2, at the initial stage of economic transformation, the clusters included fairly dissimilar countries.

Graph 2

Division of CEE countries by clusters, 1995



Source: calculated by the authors basing on World Bank (2017).

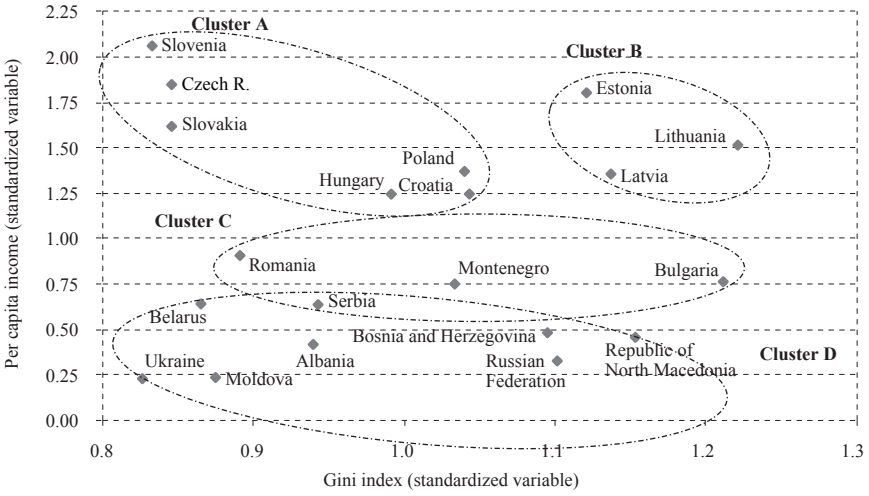
The countries' division by clusters as of 2016 is presented in graph 3. As one can see from it, after more than 20 years of post-socialist economic transformations the differentiation among clusters deepened and, simultaneously, the clusters themselves became more endogenous (in 1995, the Euclidian distance for cluster A was 2,564, 2,120 for cluster B, and 2,611 for cluster C; in 2016, it was respectively 2,531 for A, 1,654 for B, 1,433 for C, and 2,160 for D cluster). As of 2016, four clusters in the CEE region could be distinguished instead of three in 1995.

The soaring differentiation among the clusters can be explained by the fact that some countries appeared to stick to different phases of post-socialist socio-economic transformation, as seen in Brzezinski (1995), see table A3. By the year 2016, cluster A and B countries were starting or finalizing the third phase, cluster C countries appeared to be at a certain stage of the second phase, cluster D countries were still in the first phase. In order to validate our observations, we review the social welfare dynamics of the countries in each cluster for the period 1995-2016.

The clusters' SSWI averages are depicted in graph 4. It appeared that the average SSWI value for the cluster cross-section differs significantly with no trend towards convergence. In addition, a clear upward trend could be observed for A and B clusters, whereas both C and D clusters have almost flat trend lines.

GRAPH 3

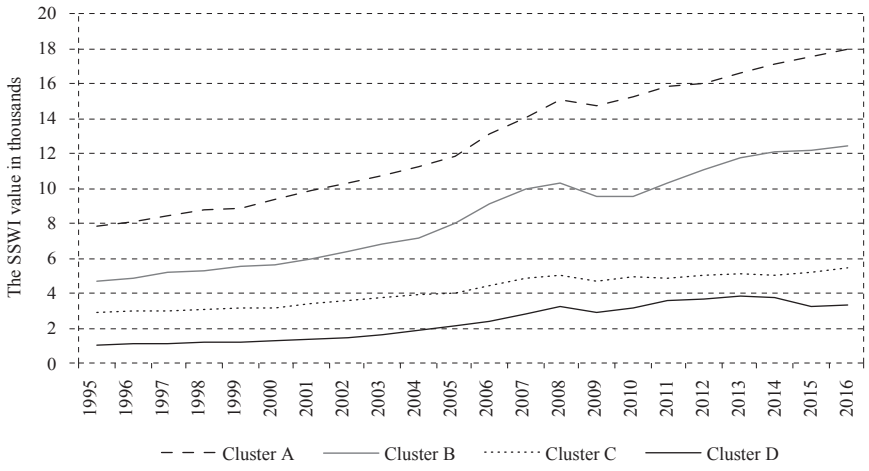
Division of CEE countries by clusters, 2016



Source: calculated by the authors basing on World Bank (2017).

GRAPH 4

Social welfare dynamics by clusters, 1995-2016



Source: calculated by the authors on the basis of information UNDP (2017); World Bank (2017).

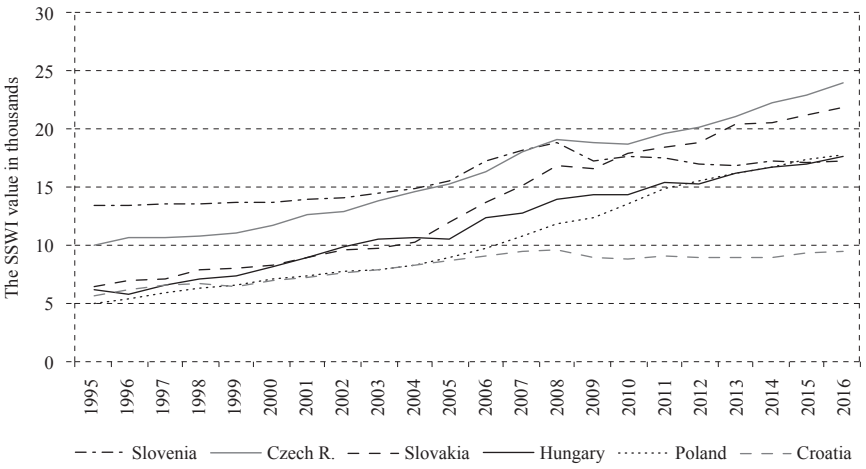
Cluster A is represented by Croatia, the Czech Republic, Hungary, Poland, Slovakia, and Slovenia. A short (by historical standards) period of existence of the command economy – approximately 40 years, in its less rigorous version – is typical for this group of CEE countries. Starting opportunities for this group of countries were very favorable. The elements of private property and private initiative, relatively well-balanced national economy, high willingness of the population to appreciate the market economy remained. Transition towards the market economy

occurred relatively fast and successfully due to close economic and historical proximity with Western Europe. The reforms were carried out in both evolutionary and radical versions. A mainly evolutionary character of the reforms is characteristic for Hungary, Slovakia, and Slovenia. A quite radical approach was implemented in Poland and, somewhat less radically – in the Czech Republic.

What could the reason be for the relatively successful development of these countries? It is appropriate to mention here the last findings on the role of institutional factors of economic development in separate countries: extractive and inclusive political and economic institutions play the key role in achieving economic and social development of a nation (Acemoglu and Robinson, 2013:79-81). Inclusive economic institutions encourage economic activity, contribute to an increase in productivity and social well-being. If such institutions exist, the economic environment facilitates competition, entrepreneurship and innovativeness. On the contrary, extractive economic institutions have the opposite nature: they aim mainly to redistribute income and wealth from some groups of people to others. And the dominance of redistributive social coalitions would hamper the economic and social progress of a nation (Olson, 1982). For cluster A countries, the existence of inclusive political and economic institutions which contribute to a rapid exit from the transformational recession and achievement of relatively high social prosperity is very typical. Graph 5 shows the SSWI dynamics for cluster A countries.

Graph 5

Social welfare dynamics for cluster A countries, 1995-2016



Source: calculated by the authors basing on UNDP (2017); World Bank (2017).

The cluster A countries are characterized by a smooth social welfare dynamics that was slightly broken due to the financial crisis of 2008-2009. There is a certain differentiation of countries in this cluster observed; however, it is not critical. The highest SSWI dynamics was shown by the countries which had previously been

practicing a radical approach to reforming – Czech Republic, Poland, and Slovakia; in general, a convergence of the social welfare levels is typical (Croatia is somewhat isolated in this regard, lagging behind the pace of social welfare growth of other cluster A countries).

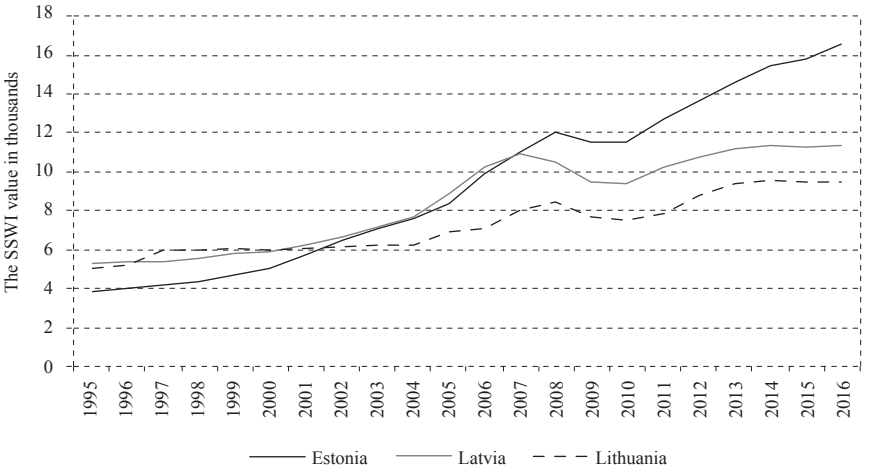
The Baltic states – Estonia, Latvia, and Lithuania – comprise cluster B. After all, they were the last ones annexed by the USSR and were the first ones to leave it. Immediately after gaining their independence, these countries very clearly identified their priorities: building up democratic states, integrating into European structures. An important fact is that these priorities were chosen by all of them at the same time. This became possible due to the effective external support rendered by the Western world and the internal political and social consensus concerning directions in reforming.

Here the economic transformations of the 1990s were conducted more actively than in the other post-socialist countries. They embraced total liberalization of the economy, rapid institutional transformations (in particular, privatization and land reform), introduction of national currencies (later replaced by the euro), a comprehensive integration into the global economic space and joining the EU. The effective implementation of reforms contributed to the fast development of the human-centered market economy and to an increase in social welfare; all this allowed these countries to outpace some other CEE countries which began their economic transitions earlier.

The SSWI dynamics for countries of this cluster is depicted in graph 6.

Graph 6

Social welfare dynamics for cluster B countries, 1995-2016



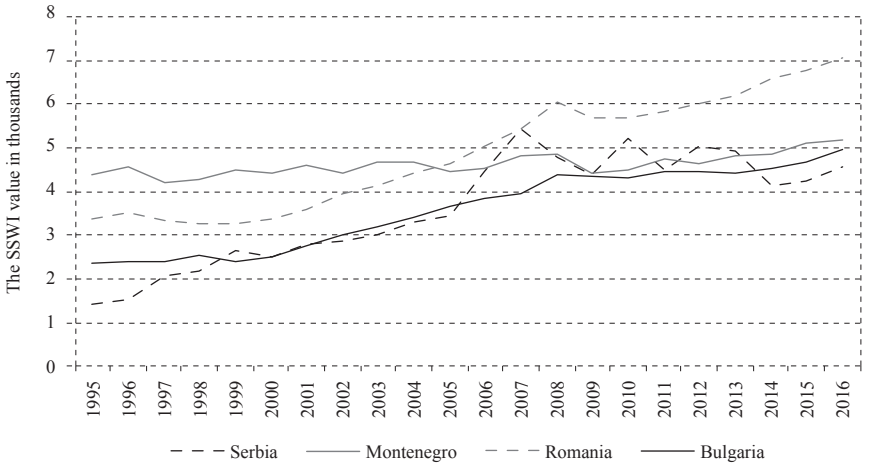
Source: calculated by the authors basing on UNDP (2017); World Bank (2017).

A high and positive social welfare dynamics (with some fluctuations caused by the recession of 2008-2009) is typical for cluster B countries. Nevertheless, an increasing differentiation of these countries is also obvious: while there was almost no difference among them in 1995, by 2016 the difference between the highest (Estonia) and the lowest (Lithuania) indicators of social welfare was nearly twofold, which demonstrates the differing effectiveness in market transformation in these countries. For example, a new Estonian government took on the responsibility for implementing market reforms, which laid the foundations of the successful transition from the command to a market economy, from the very first days of Estonian independence. The primary reforming activities included monetary reform, the establishment of free trade zones, balancing the public budget, privatization of state-owned companies and introducing favorable profit taxation (like abolishing corporate income tax on retained and reinvested profits). As a result, Estonia joined the club of the lead countries with regard to economic freedom.

Cluster C includes Bulgaria, Montenegro, Romania, and Serbia. These countries are characterized by incompleteness of structural reforms and the sharp economic downturn in the 1990s, which remains partly unresolved even now. Bulgaria and Romania are the least integrated members of the EU, and Serbia and Montenegro are candidates for entry. The countries of this group are characterized by an upward trend with regard to social welfare (see graph 7). However, they also demonstrate quite significant SSWI value fluctuations (Serbia in particular); a convergence in social welfare indicator generally is not observed.

Graph 7

Social welfare dynamics in the cluster C countries, 1995-2016



Source: calculated by the authors on the basis of information UNDP (2017); World Bank (2017).

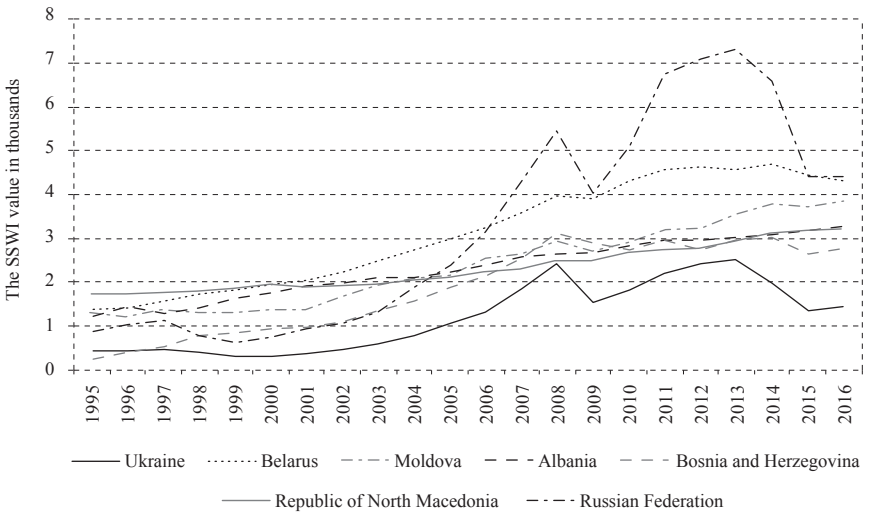
Cluster D includes some of the Balkan countries and most of the post-Soviet countries from the CEE region (except for the Baltic states that shaped cluster B): Albania, Bosnia and Herzegovina, Belarus, Republic of North Macedonia,

Moldova, the Russian Federation, Ukraine. Most of these countries endured a significantly longer dominance of the command economy (for more than 70 years) than the countries of the A, B, and C clusters.

The reform launching period was characterized here by more or less homogeneous level of social welfare within the cluster and its positive dynamics in all the countries (graph 8). Then, in particular, since the mid 2000s, an increase in turbulence started and their SSWIs have demonstrated a diverging trend with high fluctuations. The most remarkable fluctuations happened in indicators for Ukraine and the Russian Federation (with a negative dynamics since 2014). Concerning Ukraine, this fact could be explained by economic losses due to contraction of economic activities caused by the Russian military aggression and illegal annexation of part of its territory (the Crimean Peninsula and parts of Donetsk and Luhansk regions); with respect to Russia, it was a result of numerous economic sanctions that were introduced by most Western countries due to the many-fold violation of international law by this country, economic wars with Ukraine and other countries; and by the economic burden of supporting the temporarily occupied territories of Ukraine (Åslund, 2018; Slukhai, 2018). The SSWI value generally is quite low for all cluster D countries in comparison with the other clusters, which testifies to the low rate and inefficiency in reforming the economy and other spheres of social life.

Graph 8

Social welfare dynamics in cluster D countries, 1995-2016



Source: calculated by the authors on the basis of information UNDP (2017); World Bank (2017).

A common feature for the countries of C and D clusters is the preservation of the extractive political and economic institutions that were inherited from the socialist past or established in the course of ill-designed post-socialist transformations.

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These institutions prepared the ground for the significant deformations occurring during socio-economic transformations in these countries, and have a negative impact on both economic development of these countries and the dynamics of their social welfare.

Thus, our analysis testifies that a considerable diversity in the social welfare dynamics among the clusters as well as among the countries in each separate cluster is present; the differentiation among them soaring over time is very typical for the CEE countries. This fact justifies the question: what are the reasons behind such developments? An approach to answering it with help of the econometric techniques is presented in the next chapter.

5 ESTIMATION RESULTS AND DISCUSSION

Having applied the least squares method, multiple linear regressions were built with individual and time fixed effects on the basis of panel data for each separate cluster and the CEE countries in total.

A dependent variable of the model (y) is the SSWI value; the independent variables include:

x_1 – index of economic freedom (one year lagged);
x_2 – EBRD transition indicator (one year lagged);
x_3 – public expenditures on education (per cent to GDP);
x_4 – public expenditures on healthcare (per cent to GDP);
x_5 – per capita GDP at PPP.

With regard to the high probability of heteroscedasticity and autocorrelation of residuals, a fixed effects multiple linear regression model was chosen to estimate the impact of factors on social welfare. A logarithmic regression equation has the following form:

$$\log y^t = c_1 * \log x_1^{t-1} + c_2 * \log x_2^{t-1} + c_3 * \log x_3^t + c_4 * \log x_4^t + c_5 * \log x_5^t + c_6 + \left[CX = F, PER = F\right] \quad (3)$$

In order to validate the inclusion of both individual and time-fixed effects, the Redundant Fixed Effects – Likelihood Ratio Test was applied. Its results permit the conclusion that all the effects have to be included into the model (respective p-values are less than 0.05). To account for heteroscedasticity in the model, the robust White cross-section method of evaluating the co-variance matrix was applied. The validation of applying the fixed effects model was carried out with the Hausman test. The zero hypothesis in this test prioritizes a model with random effects. In our models the zero hypothesis is rejected (p-value is less than 0.05), so the application of the fixed effects model is justified.

The determinants "The Index of Economic Freedom" and "EBRD transition indicator" were included into the model (3) with a one-year lag, so their values are

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calculated on the basis of the previous year's data; the reason is that these factors may have an impact on social welfare in the subsequent time periods, but not in the immediate one. The results of regression analysis are presented in table 1. In table 1 the values of coefficients characterizing the effect of each separate factor are presented; the brackets contain p-values that show whether the factor's effect is significant.

Table 1

Results of regression analysis

	x_1^{t-1}	x_2^{t-1}	x_3^t	x_4^t	x_5^t	c_6	R^2
The whole sample (N=440)	0.4993 (0.5990)	0.0753 (0.3502)	0.8381* (0.0760)	0.0414** (0.0165)	0.0354 (0.4220)	3.5573 (0.0000)	0.483
Cluster A (N=132)	0.1615** (0.0392)	0.0475*** (0.0036)	1.2538** (0.0195)	0.0648** (0.0299)	0.1411*** (0.0004)	7.667 (0.0001)	0.836
Cluster B (N=66)	1.8375*** (0.0051)	2.9436*** (0.0000)	0.8009** (0.0344)	0.5018** (0.0154)	0.1370** (0.0381)	16.07 (0.0000)	0.869
Cluster C (N=88)	0.3662 (0.1117)	0.0411** (0.0311)	0.7958*** (0.0000)	0.0120*** (0.0022)	0.0499** (0.0428)	2.8553 (0.0000)	0.879
Cluster D (N=154)	-0.026 (0.8461)	0.4096*** (0.0004)	0.7749*** (0,0000)	0.0662* (0.0614)	-0.3553*** (0.0000)	1.3923 (0.1072)	0.683

Source: calculated by the authors basing on EBRD (2017); HF (2017); UNDP (2017); World Bank (2017).

The regression model for the CEE country cross-section (table A4) did not give us adequate results. The influence of factors appeared to be insignificant and the determination coefficient too low. However, it is important to stress that all the regression coefficients proved to be positive; this means that these factors have a positive effect on social welfare, which supports our theoretical hypotheses as formulated in chapter 3.

Cluster A and B countries are characterized by a high degree of influence of the considered factors on social welfare (tables A5 and A6). All the coefficients have a positive correlation.

Cluster C countries' figures are similar to those for A and B clusters (see table A7). However, a coefficient by x_1 (the index of economic freedom) appeared insignificant. This could be explained by a generally insufficient level of economic freedom in the countries included in this cluster and by missing a certain tendency in its dynamics. This also could mean that particularly this factor could become a significant trigger of positive changes in the cluster C countries in the future. All other factors have a strong positive correlation with the social welfare value.

While estimating the social welfare factors for cluster D countries (table A8), it turned out that the impact of determinants x_1 (index of economic freedom) and x_2 (EBRD transition indicator) is quite low. This could be explained by a low level

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of economic freedom in countries that experienced no significant positive changes (or even a down-sloping trend) and issues in the market reform of the economy, such as serious political and economic influence of the oligarchic structures ("redistribution coalitions", according to Olson) that impede reforms in economy and the reallocation of funds for the sake of fostering human capital. As mentioned earlier, dominance of exclusive institutes in policy and economy that is typical for these countries hampers social development in general. We also found a negative correlation between the value of social welfare and per capita GDP which could be explained by the significant depreciation of the national currency experienced by these countries that finally led to the GDP drop in terms of US dollars (especially in Ukraine and the Russian Federation). Besides, there is no sustainability in GDP dynamics in the countries of this cluster; this fact could be explained by instability of their economic institutions.

6 CONCLUSIONS

Our analysis has shown that the progress in social welfare that the CEE countries demonstrate differs widely in specific countries and in their clusters. It appeared that social welfare in the CEE countries as measured by the Sen Social Welfare Index depends on several factors. Monitoring the patterns in the correlation of social welfare with economic freedom, the intensity of market reforms, the fostering of human capital and economic output has made it possible to identify the potential sources of social welfare growth for separate countries and their clusters. These sources should be taken into account in the course of policy making on the national level. As these factors are of a varying nature, balancing state intervention in the economy with market self-regulation still seems to be a burning issue for the majority of CEE countries.

We have aimed to involve into our analysis factors that are most relevant for CEE countries. However, we assume that not all of them have been captured in our study. For example, the national mentality and cultural peculiarities, as well as the historical background, a country's innovation capacity and its realization, the level of support from international organizations and governments of other countries could also be important for the estimation of the development of social welfare. Besides, certain other social welfare indexes could be tested as well. Within these limitations we assume that our study results could be considered as relevant for most CEE countries with regard to their specific features.

The study showed a significant and positive correlation between social welfare and such factors as market reform, expenditure on human capital development, national economic output in those CEE countries which have already reached a considerably high level of social welfare (clusters A and B). As the institutions for further sustainable development in these countries are present, policies aiming to strengthening them are likely to enhance the nation's well-being. Further improvement of inclusive economic and political institutions and the implementation of active policies to develop human capital would maintain and enhance social welfare in these countries.

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In the less fortunate countries (clusters C and D), the impact of the above-mentioned factors on social welfare seems to be less significant. This finding could be explained by poor levels of economic freedom, incompleteness in implementing market reforms, deformations observed in policy making and implementation. All these problems persist because of a weak institution-building capacity that does not create a springboard for the driving forces of social welfare.

Focusing on improving the governmental policy in a certain nation belonging to clusters C and D would enhance their social welfare. The following policy measures could be considered as beneficial: (i) increasing the level of economic freedom (through better protection of property rights, minimizing corruption at all governmental levels and sectors of the economy, increasing the efficiency of government spending, securing economic freedom by reducing governmental interventions and so on); (ii) raising the efficiency of market institutions (dismissing those inherited from the command economy as they hamper normal economic development; and making concerted efforts in planting those that have proved to enhance markets); (iii) rearranging the public spending policy: instead of securing social benefits, paying more attention to increasing expenditures enhancing human capital.

Generally, the majority of CEE countries managed to achieve significant progress on the way to building a market economy and ensuring a high level of social welfare. On the other hand, there still are problematic areas in developing a high-quality and competitive business environment, corporate governance and a reliable legal system. The main reason for the majority of post-Soviet countries, including Ukraine, lies in the poor performance of market institutions, which reforms that have a partial and inconsistent nature are incapable of establishing.

In light of the above-mentioned, further research to identify the ways to improve the country-specific institutional environment becomes particularly relevant.

Disclosure statement
No potential conflict of interest was reported by the authors.

ANNEX

Table A1

SSWI crosscut for CEE countries, 2016 (in descending order)

Country	SSWI
Cluster A	
Slovenia	11,854
Czech Republic	10,574
Slovakia	9,260
Poland	7,209
Hungary	6,697
Croatia	6,547
Cluster A average	8,690
Cluster B	
Estonia	9,128
Lithuania	7,310
Latvia	6,818
Cluster B average	7,752
Cluster C	
Romania	5,104
Montenegro	3,971
Bulgaria	3,712
Serbia	2,944
Cluster C average	3,933
Cluster D	
Belarus	3,654
Bosnia and Herzegovina	2,620
Albania	2,456
Republic of North Macedonia	2,295
Russian Federation	2,262
Moldova	1,354
Ukraine	1,344
Cluster D average	2,284
Whole sample average	5,665

Source: calculated by the authors basing on World Bank (2017).

Table A2

Generalized cluster-wide statistics on social welfare factors, 2016

		Index of economic freedom	EBRD transition indicator	Public expenditures on education (per cent to GDP)	Public healthcare expenditures (per cent to GDP)	Per capita GDP at PPP, $
Cluster A	Average value	62.17	3.55	4.57	5.18	19,464
	Standard deviation	5.85	0.56	0.63	0.72	7,034
Cluster B	Average value	64.10	3.60	5.35	4.24	16,174
	Standard deviation	7.62	0.47	0.63	0.64	7,687
Cluster C	Average value	55.77	3.04	3.77	4.32	11,039
	Standard deviation	8.77	0.66	0.65	0.89	5,092
Cluster D	Average value	53.86	2.92	3.85	4.21	7,222
	Standard deviation	8.77	.56	1.48	1.02	4,226

Source: calculated by the authors basing on EBRD (2017); HF (2017); UNDP (2017); World Bank (2017).

TABLE A3

Phases of postcommunist transformations according to Z. Brzezinski

Political	Legal/regulatory	Economic	Western aid
Phase one: 1-5 years Political goal: transformation Economic goal: stabilization			
Basic democracy; free press; end of one-party state & police system; initial democratic coalition for change	Elimination of arbitrary state controls	Elimination of price controls and subsides; end of collectivization; haphazard privatization	Currency stabilization; emergency credits & aid
Phase two: 3-10 years Political goal: from transformation to stabilization Economic goal: from stabilization to transformation			
New constitution & electoral law; elections; decentralized regional self-government; stable democratic coalition – new political elite	Legal/regulatory framework for property & business	Banking system; small & middle scale privatization; demonopolization; new economic class appears	Infrastructural credits; technical & managerial assistance; trade preferences & access; initial foreign investment
Phase three: 5-15 (+) years Political goal: consolidation Economic goal: sustained take-off			
Formation of stable democratic parties; democratic political culture takes	Independent judiciary & legal culture emerges	Large-scale privatization; capitalist lobbies; entrepreneurial culture emerges	Major foreign investment; inclusion in key western organs (e.g. EC, NATO, etc.)

Source: Brzezinski, 1995.

TABLE A4

Model for the total sample

variable	Coefficient	Std. error	t-statistic	Prob.
log x_1^{t-1}	0.4993	0.1045	4.7766	0.5990
log x_2^{t-1}	0.0753	0.0805	0.9353	0.3502
log x_3^t	0.8381	0.0259	32.287	0.0760
log x_4^t	0.0414	0.0171	2.4072	0.0165
log x_5^t	0.0354	0.0440	0.8037	0.4220
c_6	3.5573	0.5634	6.3135	0.0000
Effects specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.4831	Mean dependent var		8.7481
Adjusted R-squared	0.4812	S.D. dependent var		0.7089
S.E. of regression	0.0971	Akaike info criterion		-1.7276
Sum squared resid	3.8706	Schwarz criterion		-1.3034
Log likelihood	441.7758	Hannan-Quinn criter.		-1.5605
F-statistic	518.7867	Durbin-Watson stat		0.1808
Prob(F-statistic)	0.0799			

TABLE A5

Model for the cluster A countries

Variable	Coefficient	Std. error	t-statistic	Prob.
log x_1^{t-1}	0.1615	0.3432	0.4703	0.0392
log x_2^{t-1}	0.0475	0.1203	0.3951	0.0036
log x_3^t	0.2538	0.1067	2.3762	0.0195
log x_4^t	0.0648	0.0423	1.5279	0.0299
log x_5^t	0.1411	0.1646	0.8573	0.0004
c_6	7.6670	1.8886	4.0596	0.0001
Effects specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.8369	Mean dependent var		9.1685
Adjusted R-squared	0.8170	S.D. dependent var		0.4053
S.E. of regression	0.1167	Akaike info criterion		-1.2486
Sum squared resid	1.2940	Schwarz criterion		-0.5507
Log likelihood	109.6620	Hannan-Quinn criter.		-0.9651
F-statistic	47.0890	Durbin-Watson stat		0.1364
Prob(F-statistic)	0.0000			

TABLE A6

Model for the cluster B countries

Variable	Coefficient	Std. error	t-statistic	Prob.
$\log x_1^{t-1}$	1.8375	0.6143	2.9907	0.0051
$\log x_2^{t-1}$	2.9436	0.5273	5.5821	0.0000
$\log x_3^{t}$	0.8009	0.3638	2.2013	0.0344
$\log x_4^{t}$	0.5018	0.1970	2.5463	0.0154
$\log x_5^{t}$	0.1370	0.1601	0.8554	0.0381
c_6	16.078	1.9041	8.4439	0.0000
Effects specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.8697	Mean dependent var		8.9936
Adjusted R-squared	0.8464	S.D. dependent var		0.3472
S.E. of regression	0.0803	Akaike info criterion		-1.9032
Sum squared resid	0.2260	Schwarz criterion		-0.9506
Log likelihood	87.9509	Hannan-Quinn criter.		-1.5285
F-statistic	41.5770	Durbin-Watson stat		1.1599
Prob(F-statistic)	0.0000			

TABLE A7

Model for the cluster C countries

Variable	Coefficient	Std. error	t-statistic	Prob.
$\log x_1^{t-1}$	0.3662	0.2261	1.6192	0.1117
$\log x_2^{t-1}$	0.0411	0.0267	1.5347	0.0311
$\log x_3^{t}$	0.7958	0.0849	9.3647	0.0000
$\log x_4^{t}$	0.0120	0.0222	0.5391	0.0022
$\log x_5^{t}$	0.0499	0.1138	0.4386	0.0428
c_6	2.8553	0.5266	5.4215	0.0000
Effects specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.8977	Mean dependent var		8.7190
Adjusted R-squared	0.8965	S.D. dependent var		0.9681
S.E. of regression	0.0578	Akaike info criterion		-2.6130
Log likelihood	85.1509	Hannan-Quinn criter.		-1.5285
F-statistic	41.5770	Durbin-Watson stat		1.1599
Prob(F-statistic)	0.0000			

TABLE A8

Model for the cluster D countries

Variable	Coefficient	Std. error	t-statistic	Prob.
$\log x_1^{t-1}$	-0.0260	0.1337	-0.1947	0.8461
$\log x_2^{t-1}$	0.4096	0.1099	3.7254	0.0004
$\log x_3^{t}$	0.7749	0.0693	11.1711	0.0000
$\log x_4^{t}$	0.0662	0.0348	1.8990	0.0614
$\log x_5^{t}$	-0.3553	0.0606	-5.8575	0.0000
c_6	1.3923	0.8540	1.6302	0.1072
Effects specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.6830	Mean dependent var		7.9037
Adjusted R-squared	0.6764	S.D. dependent var		0.4253
S.E. of regression	0.0653	Akaike info criterion		-2.3843
Sum squared resid	0.3199	Schwarz criterion		-1.6261
Log likelihood	155.1799	Hannan-Quinn criter.		-2.0771
F-statistic	149.5601	Durbin-Watson stat		0.4974
Prob(F-statistic)	0.0000			

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