PROGRESS OF TRANSFORMATION IN THE FORMER SOVIET REPUBLICS

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Abstract

The aim of the paper is the presentation of the progress in transition in fourteen former Soviet republics (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan) in the years, from 2000 to 2014. The Wroclaw taxonomy method is used to establish similarities and differences in the evaluation of the progress in transition achieved by the examined countries. The study is based on six indices used by the European Bank for Reconstruction and Development (large scale privatisation, small scale privatisation, governance and enterprise restructuring, price liberalisation, trade and forex system, and competition policy). In 2014, among the former Soviet republics the Baltic states achieved the highest average transition indicator score. According to the evaluation results, Armenia, Belarus, Latvia, and Lithuania experienced the biggest progress in transition towards open market-oriented economy during the analysed period. The following groups of countries: Latvia-Lithuania, Georgia-Kyrgyz Republic-Armenia, and Russian Federation-Ukraine-Kazakhstan showed the smallest differences in the evaluation of the transition in the years 2000-2014.

Key words: transition, Wroclaw taxonomy method, EBRD, Soviet republics

JEL Code: C02, P21, P51.

Introduction

In the early 1990s, the Soviet republics started their transition from centrally planned economy to market-oriented economy. Some republics implemented radical transition policies but others were late and slow in market reforms. As a result, the former Soviet republics achieved different levels of progress in the transition towards an open market economy. In 2004, three Baltic states (Estonia, Latvia, and Lithuania) became members of the European Union (EU). They have also been member states of the Eurozone. Estonia adopted the euro on

January 1, 2011, and Latvia on January 1, 2014. Lithuania joined the Eurozone on January 1, 2015. On the other hand, Belarus and two republics of Central Asia (Uzbekistan and Turkmenistan) have taken a cautious approach to economic reforms and their economies still remain state-controlled.

The aim of the paper is the presentation of the progress in transition in fourteen former Soviet republics over the period 2000-2014. The study includes the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan[1]. The analysis is based on six indicators used by the European Bank for Reconstruction and Development (EBRD) to evaluate progress in transition in its countries of operations.

In order to establish similarities and differences in the assessment of the progress in transition achieved by the former Soviet republics the Wroclaw taxonomy method is applied[2]. By this method, groups of countries with the most similar EBRD indicators in the period of fifteen years were identified.

1   The EBRD assessment of progress of transformation in the former Soviet republics in the years 2000-2014

The European Bank for Reconstruction and Development uses six main indicators to evaluate progress of transformation. They are the following: large scale privatisation, small scale privatisation, governance and enterprise restructuring, price liberalisation, trade and forex system, and competition policy. The measurement scale for the indicators ranges from 1 to 4.33. Transition indicator score one means little or no change from a centrally planned economy and 4.33 represents standards of the industrialised market economy (Nowak, 2016).

In 2014, among the former Soviet republics the Baltic states achieved the highest average transition indicator score. Latvia and Lithuania had the average score 3.94, Georgia 3.50, Armenia 3.44, and Kyrgyz Republic 3.39. Three countries: Moldova, Russian Federation, and Ukraine reached the same level 3.28. Kazakhstan had the score 3.06, Tajikistan 2.95, and Azerbaijan 2.89. The remaining three republics Uzbekistan (2.28), Belarus (2.17), and Turkmenistan (1.78) gained the lowest scores. Fifteen years earlier the

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[1] The EBRD data for Estonia that cover the years 2000-2014 were not available.
[2] There are a number of theoretical and empirical studies on progress in transition in former communist economies. Researches present different approaches to the evaluation of the state of market reforms and progress in transition. Some of them construct econometric models, others analyse trends of basic economic indices in transition economies (Kaser 2003; Kołodko and Tomkiewicz, 2009; Tridico, 2012; Gurgul and Lach, 2014).

ranking of the former Soviet republics according to the average scores was the following: Latvia (3.50), Lithuania (3.45), Georgia (3.33), Kyrgyz Republic (3.28), Kazakhstan (3.06), Moldova (3.06), Russian Federation (3.00), Armenia (2.94), Ukraine (2.89), Tajikistan (2.72), Azerbaijan (2.67), Uzbekistan (2.17), Belarus (1.67), and Turkmenistan (1.56). In the years 2000-2014, the biggest changes in the average transition indicator scores were observed in Armenia, Belarus, Lithuania, and Latvia. On the other hand, Kazakhstan did not make the progress in transition and Kyrgyz Republic and Uzbekistan made very small one. Differences between the Baltic republics with the highest average scores and Turkmenistan increased over the considered period. Trends of the average transition indicators in the years 2000-2014 are presented in Figure 1, Figure 2, and Figure 3.

Fig. 1: Average transition indicator scores in Latvia, Lithuania, Georgia, Armenia, and Kyrgyz Republic over the period 2000-2014
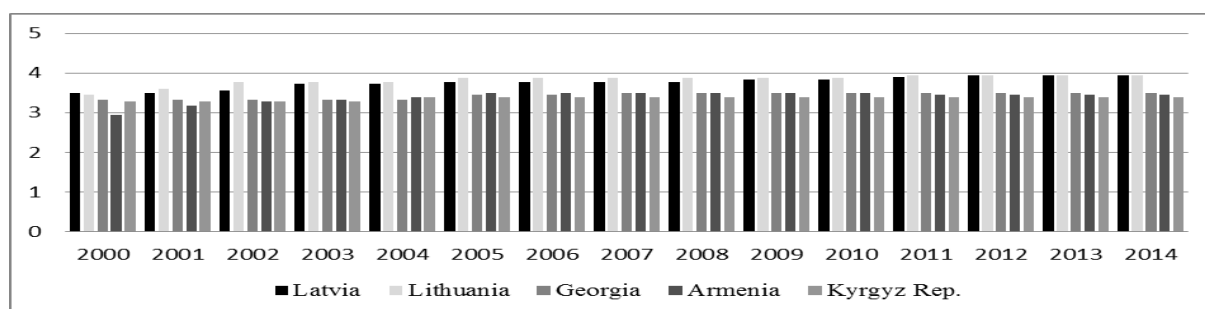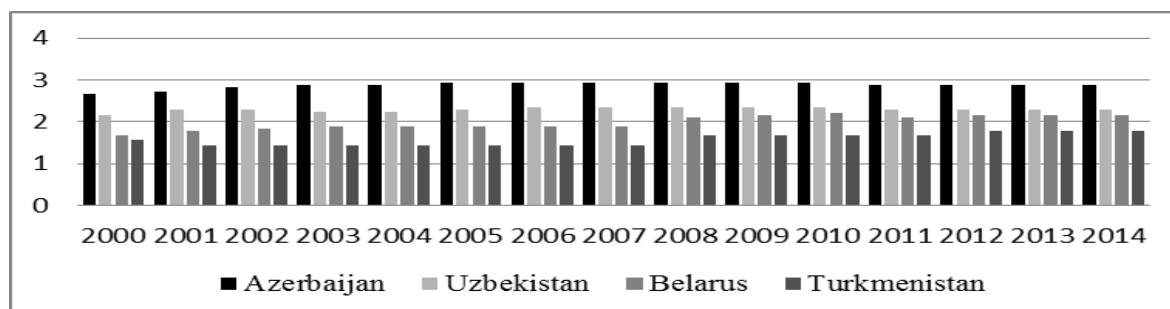

Source: Own calculation based on the EBRD data (www.ebrd.com/pages/research/economics/data, accessed 28 Feb. 2016)

Fig. 2: Average transition indicator scores in Moldova, Russian Federation, Ukraine, Kazakhstan, and Tajikistan over the period 2000-2014
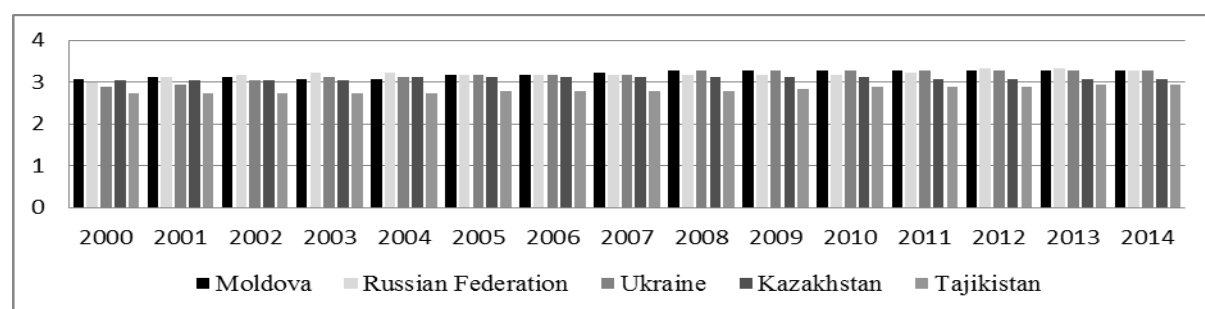
Source: Own calculation based on the EBRD data (www.ebrd.com/pages/research/economics/data, accessed 28 Feb. 2016)

Fig. 3: Average transition indicator scores in Azerbaijan, Uzbekistan, Belarus, and Turkmenistan over the period 2000-2014

Source: Own calculation based on the EBRD data (www.ebrd.com/pages/research/economics/data, accessed 28 Feb. 2016)

The former Soviet republics had the highest levels of indicators of progress in transition in those areas in which the implementation of economic reforms was comparatively easy. In 2014, six countries (Armenia, Georgia, Kyrgyz Republic, Latvia, Lithuania, and Moldova) showed standards of industrialised market economy in the area of trade and forex system. Among the former Soviet republics Azerbaijan, Belarus, Kazakhstan, Turkmenistan, and Uzbekistan were not members of the World Trade Organisation (WTO)[3]. Kyrgyz Republic (1998), and Latvia (1999) were the first members of the WTO. Russian Federation joined to the WTO in 2012 and Tajikistan in 2013.

Four republics (Georgia, Kyrgyz Republic, Latvia, and Lithuania) achieved the highest level of the indicator of progress in transition in the price liberalisation. A small number of administrated prices remained in Armenia, Azerbaijan, Moldova, Russian Federation, Tajikistan, and Ukraine. Those countries had a score of 4.0 in the area of the price liberalisation. On the other hand, non-market prices for the majority of products were in Belarus (2.33) and Turkmenistan (2.33).

Only Latvia and Lithuania completed the privatisation process of small companies. Armenia, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russian Federation, Tajikistan, and Ukraine achieved a score of 4.0 in that area. A programme of small-scale privatisation was almost ready in Azerbaijan (3.67).

In 2014, more than 50 per cent of state-owned enterprises and farms were in private hands in Georgia and Lithuania. Those countries had a score of 4.0 in the area of the large scale privatisation. A high level of that indicator of progress in transition was also achieved

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[3] The WTO granted observer status to Azerbaijan, Belarus, and Uzbekistan. Kazakhstan became a member of the WTO on November 30, 2015.

by Armenia (3.67), Kyrgyz Republic (3.67), and Latvia (3.67). On the other hand, very little private ownership was allowed in Turkmenistan (1.0) and Belarus (1.67).

The former Soviet Republics had the greatest problem with governance and enterprise restructuring, and competition policy. Only, the Baltic states made some progress in promoting corporate governance and a competitive environment. Latvia and Lithuania achieved scores of 3.33 and 3.0, respectively in the field of governance and enterprise restructuring, and the same score of 3.67 in the competition policy. Turkmenistan had a sore of 1.0 in both areas. It was the only country in the analysed group with soft budget constraints and a lack of competition legislation and institutions.

2 The application of the Wroclaw taxonomy method to the evaluation of progress of transformation in the former Soviet republics

The Wroclaw taxonomy method was invented by Wroclawian mathematicians: K. Florek, J. Łukaszewicz, J. Perkal, H. Steinhaus, and S. Zubrzycki (Florek et al., 1951) in the early 1950s. It is used to find groups of the most similar objects.

In the method, a set of N objects $\Omega = \{O_1, O_2, \ldots, O_N\}$ with n selected characteristics X_k $(k = 1, 2, \ldots, n)$ each is split into typological groups by means of the Wroclaw taxonomy graph. The objects are compared between themselves by using a measure of distance. Very often the Euclidean metric is implemented in the method.

The Euclidean distance between the pair of objects O_i and O_j is given by the formula

$$d_{ij} = \left[\sum_{k=1}^{n} \left(z_{ik} - z_{jk} \right)^2 \right]^{\frac{1}{2}}$$

(1)

where z_{ik} is the standardised value of X_{ik} i.e. characteristic X_k of object O_i and z_{jk} is the standardised value of characteristic X_k of object O_j, $i, j = 1, 2, \ldots, N$, $k = 1, 2, \ldots, n$. The standardisation procedure is needed to eliminate the influence of different units of measurement of characteristics of the analysed objects. The variable z_{ik} is calculated in the following way

$$z_{ik} = \frac{X_{ik} - \overline{X}_k}{\sigma_k}$$

(2)

where $\overline{X}_k$ is the mean of characteristics X_k and σ_k is the standard deviation of X_k.

After computing distances for all pairs of objects, the shortest distances are selected and such pairs are linked by the line segments. The smaller the distance the more similar are the objects. Each object (represented by a vertex in the graph) is connected with its nearest neighbour in the set. All objects are connected to single joint graph. The Wroclaw taxonomy graph can be branching but cannot contain closed chains. It is the shortest spanning tree. The form of the graph does not depend on the vertex one starts with. Then K groups of the most similar objects are formed. In order to do this, $K-1$ longest links are removed from the graph. The number K can be calculated using various methods or determined by the researcher (Nowak, 2015, 2016).

In our case Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan are objects in the Wroclaw taxonomy method. More precisely, we deal with 14×15 objects because the progress in transition in fourteen former Soviet republics is analysed over the period from 2000 to 2014. Each country in a given year is characterised by the values of the EBRD transition indicators (large scale privatisation, small scale privatisation, governance and enterprise restructuring, price liberalisation, trade and foreign exchange system, competition policy). In the method fourteen objects with six characteristics each is examined during fifteen years. The formula (1) is used to calculate the distance between each pair of objects. In the case of the EBRD transition indicators, the standardisation of data is not needed.

Among the former Soviet republics, Armenia, Latvia, Turkmenistan, Lithuania, and Russian Federation experienced the biggest changes in the evaluation of the transition in the analysed fifteen years. In Armenia the Euclidean distance between 2014 and 2000 was 1.73, in Latvia 1.64, in Turkmenistan 1.56, in Lithuania 1.53, and 1.46 in Russia. The distance between the beginning and the end of the considered period was 1.38 in Belarus, 1.29 in Ukraine, 0.96 in Tajikistan, 0.94 in Azerbaijan, 0.82 in Uzbekistan, and 0.75 in Georgia. The changes of the EBRD assessment of the transition in Kazakhstan (0.47), Moldova (0.66), and Kyrgyz Republic (0.67) were considerably smaller than in Armenia.

Three groups of the former Soviet republics: Latvia-Lithuania, Georgia-Kyrgyz Republic-Armenia, and Russian Federation-Ukraine-Kazakhstan showed the smallest differences in the evaluation of the transition in the years 2000-2014. The Wroclaw taxonomic graphs for the analysed countries are presented in Figures 4-7. Numbers between vertices (boxes) in the Figures show the smallest distances between the countries.

Fig. 4: The Wroclaw taxonomic graph for Latvia and Lithuania in the years 2000-2014
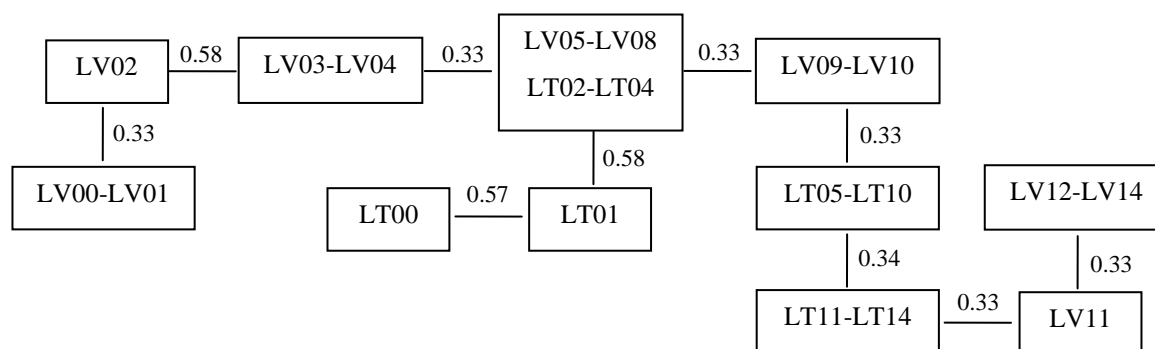
Note: LV is Latvia, LT – Lithuania. Numbers in the boxes indicate years i.e. 00 stands for 2000, 01 – 2001, etc. For example: LV02 stands for Latvia in 2002, LV03-LV04 – Latvia in the years 2003-2004.

Source: Own calculation.

In Latvia and Lithuania the biggest changes of the EBRD evaluation were observed before their accession to the EU. Latvia improved first of all its indicators in the area of the large scale privatisation, governance and enterprise restructuring, and competition policy. Lithuania made the progress in transition in all areas except small scale privatisation where it had already achieved score of 4.33.

**Fig. 5: The Wroclaw taxonomic graph for Armenia, Georgia, and Kyrgyz Republic in the years 2000-2014**
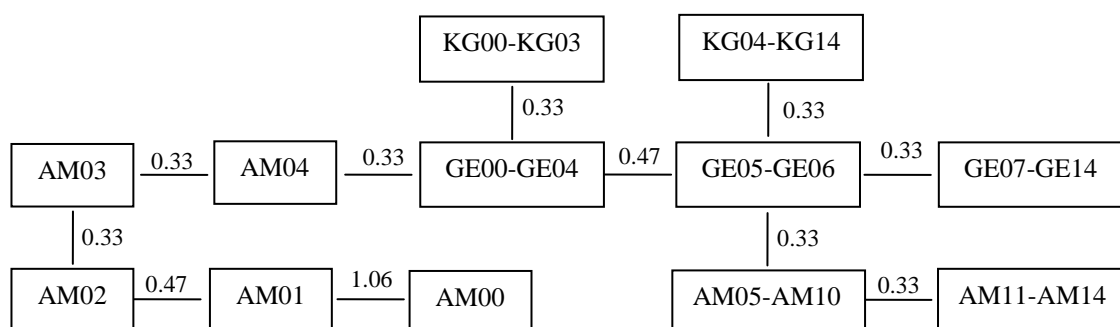
Note: AM is Armenia, GE – Georgia, KG – Kyrgyz Republic.

Source: Own calculation.

In the years 2000-2014, the EBRD changed its evaluation of the progress in transition achieved by Armenia seven times. Armenia made the biggest improvements in the area of competition policy, large scale privatisation, and small scale privatisation. Since the

beginning of the 21st century, Kyrgyz Republic made the progress only in the area of large scale privatisation. It happened between 2003 and 2004. Georgia improved its scores in the large scale privatisation and governance and enterprise restructuring.

Fig. 6: The Wroclaw taxonomic graph for Kazakhstan, Russian Federation, and Ukraine in the years 2000-2014
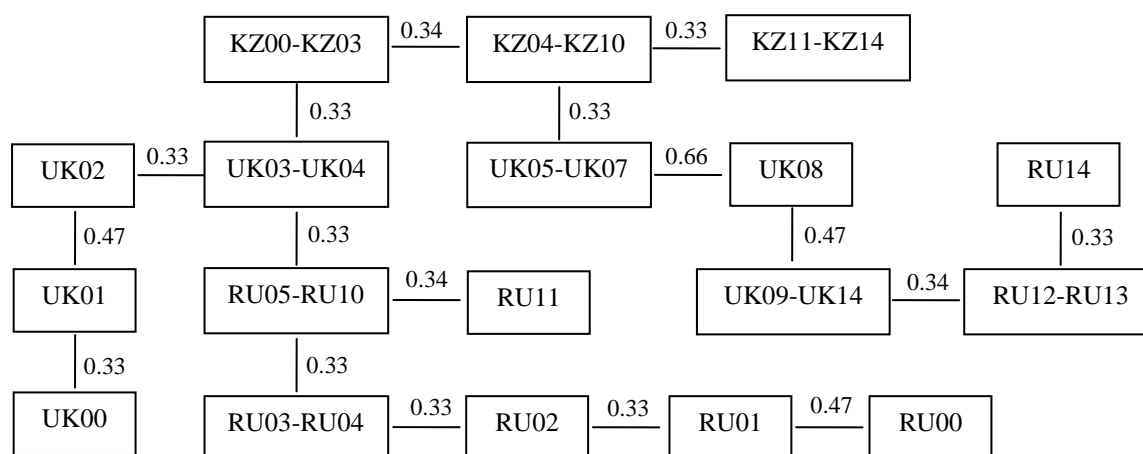
Note: KZ is Kazakhstan, RU – Russian Federation, UK – Ukraine.
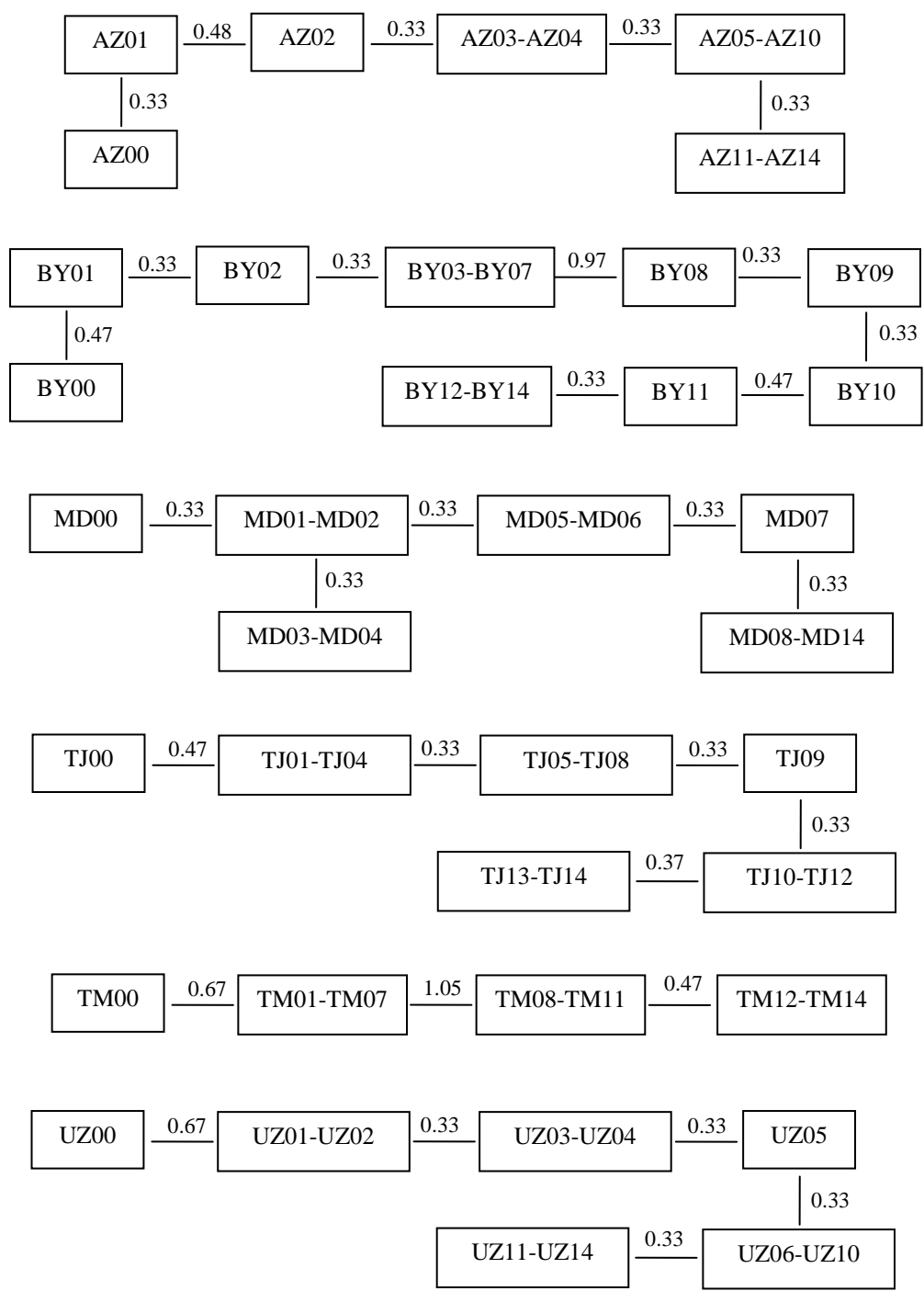Source: Own calculation.

Kazakhstan made the progress in the trade and forex system in 2004. However, it was downgraded in the area of price liberalisation in 2011. The EBRD changed its assessment of the progress in transition in Ukraine and Russian Federation several times. Ukraine made the biggest progress in the area of trade and forex system and small scale privatisation. Russia improved its score first of all in trade and foreign exchange system. Russian Federation was downgraded in large scale privatisation in 2005.

In the case of such former Soviet republics as Azerbaijan, Belarus, Moldova, Tajikistan, Turkmenistan, and Uzbekistan there are not many similarities in the evaluations of their transition to market economy. Among those countries Belarus and Turkmenistan experienced the biggest changes in transition. The EBRD changed its evaluation of the progress in transition in Belarus nine times. Belarus did not improve its scores only in the competition policy. In Turkmenistan the biggest changes in the transition to market economy were observed in 2000 (downgrading in large scale privatisation) and 2008 (rise in evaluation of the trade and forex system). Azerbaijan and Uzbekistan improved their scores mainly in the trade and forex system. Moldova made a small progress in the area of small scale

privatisation, price liberalisation, trade and forex system, and competition policy. Tajikistan improved its score the most in the small scale privatisation.

Fig. 7: The Wroclaw taxonomic graphs for Azerbaijan, Belarus, Moldova, Tajikistan, Turkmenistan, and Uzbekistan in the years 2000-2014

Note: AZ is Azerbaijan , BY – Belarus, MD – Moldova, TJ – Tajikistan, TM – Turkmenistan, UZ – Uzbekistan.
Source: Own calculation.

Conclusion

The differences in market reforms in the former Soviet Republics in the years 2000-2014 were driven by various economic, political and social factors. Latvia and Lithuania displayed the smallest differences in the levels of six EBRD transition indicators over the studied period. Besides, two groups of three countries: Georgia-Kyrgyz Republic-Armenia, and Russian Federation-Ukraine-Kazakhstan showed the smallest differences in the evaluation of the transition. The remaining six former Soviet republics did not show similarities in the evaluations of their transition to market economy.

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