Articles

CONVERGENCE PROCESS OF CENTRAL AND EASTERN EUROPEAN COUNTRIES TOWARD THE EUROPEAN UNION AS MEASURED BY MACROECONOMIC POLYGONS

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Abstract:
The article analyses the economic development of transition economies (the CR, Hungary, Poland, Slovakia and Slovenia) in the nineties by means of the original graphical method based on a multidimensional view, with the intention to assess convergence or divergence of their economic level vis-à-vis the average level of the EU countries. The polydimensional aspect is based in the first step on four basic objectives of economic policy depicted by the macroeconomic (magic) tetragon. In the second step, an each quadrant of the magic tetragon is extended by six detailed indicators to get a multidimensional convergence polygon. The polygon framework allowed carrying out more detailed analysis of the convergence process. The detailed results of the multidimensional convergence analysis varied across individual countries and over time; the time path of these differences partly reflected the uneven progress in macroeconomic stabilization and recovery of economic growth.

Keywords: convergence, macroeconomic (magic) tetragon, macroeconomic (magic) polygon, transformation process, European Union

JEL Classification: B490, E200, E310, E610, O110, O570

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1. Convergence Definition

At the beginning of the nineties, in the context of the changes of Central and Eastern European former planned economies into market economies, the term "convergence" together with the empirical results of its measurement became especially important for transition countries. Nowadays, the enlargement process of the European Union opens pressing questions about the preparedness of the candidate countries for integration. It poses questions about the readiness, not only from the point of view of formal harmony of business and civil laws, technical norms, functionality of competent administrative and judicial institutions, but also questions about manufacturing performance and the general economic levels of the candidate countries toward the performance and economic level of the present EU Member States.

The term economic convergence means diminishing the differences in living standards (in opposite case we talk about divergence), in economic level and the manufacturing performance of particular countries or their regions. Therefore, the category of economic convergence is a phenomenon of international economic comparisons, which mainly concerns how the differences in economic power and performance change over time. It is not only question if they narrow or widen but also how quickly it occurs. In this concept, economic convergence is narrowly connected with the studies of long term economic growth. The goal of this theory is to learn and clear up the factors influencing the rates of economic growth in countries and the differences in these rates and in the levels of their real per capita income.

However, we can still consider this definition of economic convergence as too broad. In this definition, everyone can distinguish the term economic convergence as a category of macroeconomic theories in the sense of a generally formed thesis, presumptions and fictions in model contemplation. We can also consider convergence as concrete analytical knowledge resulting from description and cross-country comparison in real time and as a concrete goal of economic policy of a particular government.

This is the reason why we are concerned with the problems of economic convergence measurements. We mean convergence as a result of an immediate comparison of the development of two or more national economies at a particular time or over a period of time. In this context, we change and shift the contemplation itself about the term convergence, as well as the ways and the time period of measurement. Instead of convergence "without attributes" which we can find in growth theory, we talk about nominal, real, technological, price or exchange rate convergence or convergence in manufacturing.

The use of a multidimensional view of convergence does not at all mean that a comparison of average figures of real gross domestic product per capita or the monitoring their dynamics has lost its explanatory value. So far transition economies have not developed well functioning markets and the connected institutions. In our opinion, a simple comparison of GDPs used to measure economic convergence is too raw to closely express the process of change in the differences of economic performance among transitive and developed countries. However, GDP comparison remains the starting point for our next comparisons and has a place as one proposed parameter of multidimensional views.

The multidimensional view provides a much more plastic point of view for international comparison. At the same time, it presents an analytical benefit for international comparison with a big potential for the transition economies. Indeed, by recognizing the crucial differences in the partial aspects of comparison, we can adopt

effective policies when diagnosing the causes of trouble in each transitive economy.

2. Methodology of a Multidimensional View of Convergence

An economic efficiency of national economies and its changes are observed in the form of a vector of quantitative features, which alongside the average GDP per capita characterise to what extent the main economic policy objectives are met. In this vector not only direct factors influencing immediately the production efficiency of the given economy are present (as e.g. the disposable resources of production factors) but also other quantitative features of the factors that form a convenient (optimal) macroeconomic environment and in this way they support meeting these basic objectives.

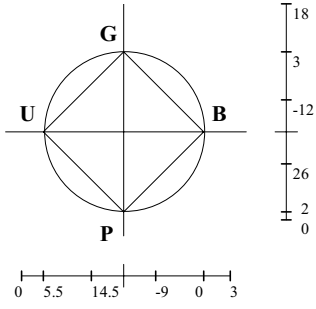
In our opinion, the measurement of convergence should start from the most comprehensive measure of real GDP per capita, which expresses an economic level of the given national economy and at the same time it reflects the living standards of its inhabitants. Dynamics of its change represents the most general level of economic convergence measurement. This scalar feature is gradually supplemented by means of tetragons and twenty-four-angle polygons with parallel view of other characteristic economic variables and relationships and this way we deepen the comparison of national economies.

At the first degree of desaggregation we start from the well-known graphical comparison of meeting the basic economic policy goals on the basis of the so-called macroeconomic (magic) tetragon. Using this term and the way of solution of this problem in literature was due to a mutual conflict of particular goals of economic policy: stable and sufficient GDP growth rate; the balance of current account of the balance of payments; low inflation rate and natural unemployment rate.

Mutual functional relationships are such that improvement in one area can take place only at the expense of worsening another area. The basic objectives should be met in certain harmony and mutual relations, which can be changeable depending on a particular international economic situation and the actual position of the given national economy. An optimal meeting of objectives must be understood as a kind of a compromise between higher fulfilment of one of them and lower fulfilment of the rest.

The basis of the graphical method is an equilateral tetragon (rhombus), the angles of which correspond to the goals; corresponding half-axles represent expertly set values of the corresponding reference parameters: in case of real GDP growth

Figure 1
Macroeconomic Tetragon



the parameter is set at G = 3 %, in case of the current account balance (in terms of percentage of GDP) the parameter is set at B = 0 %, in case of the rate of inflation the parameter is P = 2 % and in case of the rate of unemployment the parameter is set at U = 5.5 % (see Figure 1).

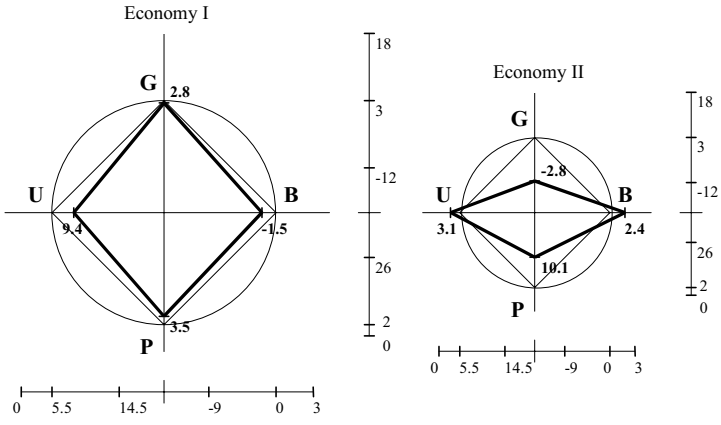
As it is obvious, all the parameters are in terms of percents and consequently it is possible to compare the national economies. Values of the parameters G, B, P and U observed in the individual national economies under comparison are recorded in corresponding scales on the half-axles of the rhombus. Their connection lines make up the corresponding tetragons, the deformation of which as against the "ideal" rhombus suggests the extent at which the reference parameter values of the basic objectives either are not met or, on the contrary, are exceeded.

The method of graphical comparison in the suggested form states only in general the deformation of proportions during an uneven fulfilment of the four basic economic policy objectives but it disregards the size and the current force of the production efficiency of the national economies under a comparison. Therefore, when applied on a four-dimensional view of the convergence process, it is necessary to give it a certain dimension that would enable to measure and compare the size of the tetragons of the economies and of their changes over time. This is done by differentiating the length of the half-axles that serve as the basis for recording the values of the four macroeconomic features and that represent a radius of circles circumscribed to the rhombi. The differentiation of the length of the half-axles is done according to the real relations of average GDP per capita (in terms of purchasing power parity of the national currency).

The resulting tetragons, the sides of which connect the parameter values on the corresponding half-axles, differ not only in their shape but also in their size. Therefore, not only the extent of lagging behind the benchmark base for the particular characteristics can be deduced from them but also the size of the area of the irregular tetragons of the compared economies can be numerically counted in fictitious "square percentage points". On the ground of their economic force expressed this way, it is possible to draw conclusions concerning their convergence or divergence.

Figure 2 gives an example: we consider two economies, which meet to a different extent the four basic economic policy objectives (the placement of the apexes of the tetragons). The size of these two graphs is determined by the given different level of GDP per capita (GDP per capita is higher in economy I).

Figure 2
Comparison of the Macroeconomic Tetragons

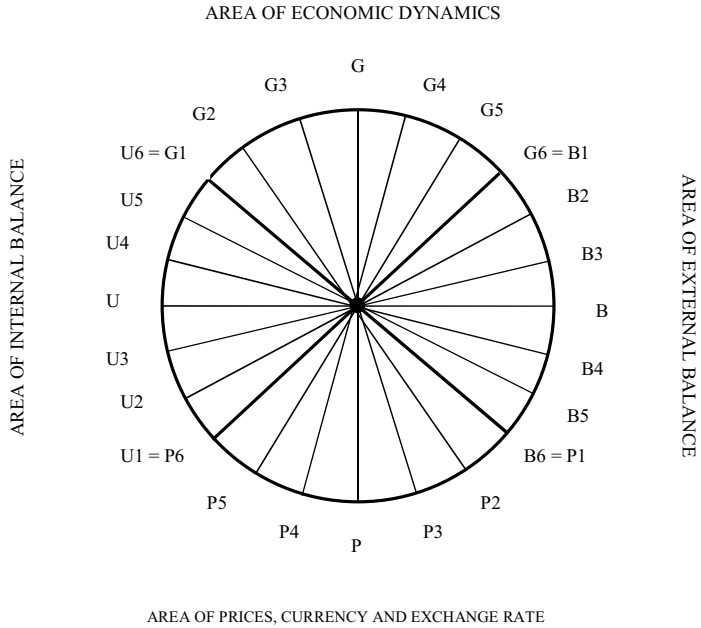


The differentiation of the length of the half-axles of the basic scheme in a graph makes it possible to deepen the analysis of the gap among the considered economies in the sense that it makes possible to differentiate between the influence of changing volume of GDP per capita (which is the only differentiating feature in the global view) and the influence of changing proportionality between fulfilment of the basic economic policy objectives. Moreover, if we record the production capacity of a national economy not by means of an abscissa but by means of an area of a rhomb, of which the given abscissa is a half-axles, we get a possibility of differentiating the characteristics of the considered economies in a more expressive way. The observed parameter is measured in squared units.

If e.g. the rhombus featuring parameters of meeting the economic policy goals in the reference economy I (e.g. the EU) represents a production capacity of 100 % in Figure 2, then the production capacity of the other economy in comparison, the GDP per capita of which reaches two thirds of the former economy, is represented nor by 66.7 % but only by 44.4 % of the area of the rhomb corresponding to the economy I. The difference resulting from lower GDP per capita as against the basic economy I is not –33.3 but –55.6 percentage points. It is then corrected by the difference resulting from other proportionality of meeting the basic economic policy objectives (i.e. from the difference of their tetragons from the rhomb).

However, let us return to the idea of deepening the multicriterial aspect of the convergence process measurement. Following the method of magic tetragon we consequently enhanced the number of observed aspects. We do not mean to create other goals of stabilization economic policy, we intend to make the net of the scheme, with the help of which we observe and compare the national economies, in bigger detail.

Figure 3
Macroeconomic Polygon



A view of each basic area (G, B, P, and U) is widened by six other parameters. We chose the parameters lying in graphical expression on the boundaries of basic areas in such a way that they represent widening the view on both neighbouring areas. They are the parameters common to both areas so they form mutual links within the polygon. The magic tetragon is in this way changed at a further degree of desaggregation of the view of the convergence process into an equilateral scheme with 24 apexes (see Figure 3 and Chapter 4 which contains a list of additional parameters).

The capability of the comparative analysis to differentiate further grows by using a twenty-four-angle polygon for its area approaches more to the one of a circle. However, its qualities are highly dependent on how much the changes of the chosen parameters depicted on rays connecting the apexes with the centre give true picture of the factors influencing the productive efficiency of the corresponding area and by means of that of the national economy as a whole. Whereas in case of the tetragon when setting up the apex values of parameters we could rely on expert estimates stated in literature or used by international institutions and organizations (e.g. OECD), in case of the apexes enlarging the tetragon into the twenty-four-angle polygon we had in many cases to determine the apex values ourselves. Alongside the choice of the parameters this can be another factor of a potential limitation of the method's expressive capability. We mostly chose the apex values close to the average values observed within the complex of the EU.

3. The Process of Convergence as Measured by Macroeconomic Tetragons

Basic economic policy objectives are usually defined as a stability of an adequate economic growth, external balance, price level and optimal usage of own economic resources. Following indicators are used as their concrete statistical characteristics: growth rate of real GDP, ratio of the current account of the balance of payments to the nominal GDP, rate of inflation in terms of CPI and the rate of registered unemployment. It is convenient when expressing the overall character of economic policy to assess policy achievements in a comprehensive way, which is what we do by the graphical comparison of macroeconomic rhombi on the axes of which we record the level of particular macroeconomic variables.

The rhombi (polygons in general), which form the base of their graphical comparison, mutually differ in their size. The size is determined by the length of their half-axles, which at the same time represent the radii of circumscribed circles, scaled according the volume of GDP per capita in terms of the purchasing power parity. We chose average GDP per capita in the EU in 1991 – 1993 as a base for ratios of the half-axles.

We attributed a coefficient of 1 to this benchmark variable, stated in the first row and in the third column of Table 1, and consequently we related the observed average real GDP per capita values of both the EU and the transition economies in three years' periods of the nineties (see the last column of Table 1) to this coefficient.

The length of the half-axles of the macroeconomic polygons obviously affects the area of the polygons, which is moreover influenced by irregularities of the parameter values. This approach thus enables to assess the process of convergence or divergence according to a change of the size of the macroeconomic polygons resulting from a change of both GDP per capita and the specifics of particular apexes.

The n-angle polygons, together with circumscribed circles and scales on adjacent lines making up a scheme of all the graphs, make possible comparisons both in space (between national economies) and over time (between the three years'

periods) and their mutual combinations. Let us add that – as it is usual in graphical expression – its information contribution lies in depicting proportionality or its deformations, not in accuracy of details, which are, however, posited by the numerical computations of the areas.

A concrete numerical base of our graphical comparison on the basis of the macroeconomic tetragon is formed by the following parameter values in individual countries in the chosen benchmark three years' period of the nineties:

– gross domestic product per capita determining the length of the half-axles of the tetragon is in terms of purchasing power standards (PPS) of the current years. There holds from definition an identity of this aggregate in the EU (EU-15) with GDP per capita in terms of ECU or in terms of EUR after January 1, 1999. This aggregate is received for the transition economies from GDP in terms of current units of national currencies by adjusting them by their purchasing power as against EUR;

– average GDP growth rates (G) are deduced from GDP time series. These time series for EU-15 in 1991 to 1996 are in terms of ECU and they are derived on the basis of conversion of national currency data and in 1990 prices using constant exchange rates of the same year. In the time period of 1997 – 1999, the data in terms of ECU are deduced from the national currency data of the member countries in 1995 prices and on the basis of conversion using 1995 exchange rates. In case of the Czech economy, the starting point for deducing the growth series was the GDP series in terms of CZK in 1995 prices. In case of other transition economies, the series are mostly in 1990 prices and they were constructed by applying growth rates published by national statistical authorities;

– balances of the current account of the balance of payments in terms of per cent of GDP (B) are ratios of the balance of the current account of the balance of payments in terms of USD millions or billions to the nominal GDP;

Table 1
Average Parameter Values for Tetragonal Graphs

Economy	Period	GDP per capita in terms of PPS	Parameters of the tetragonal apexes				Ratio of the half-axles
			G	B	P	U	
EU-15	1991-1993	15,761	1.2	0.0	4.2	9.4	1.000
	1994-1996	17,342	2.4	0.7	2.8	10.9	1.100
	1997-1999	20,210	2.6	0.9	1.8	11.6	1.282
Czech Republic	1991-1993	9,012	-4.2	2.1	29.5	3.4	0.572
	1994-1996	11,062	4.1	-4.0	9.3	3.2	0.702
	1997-1999	12,124	-0.8	-3.5	7.0	7.4	0.769
Poland	1991-1993	4,808	-0.3	-4.5	50.8	14.3	0.305
	1994-1996	6,544	6.1	-0.2	27.0	14.7	0.415
	1997-1999	7,829	4.6	-5.2	11.4	11.2	0.497
Hungary	1991-1993	6,918	-5.3	-3.2	26.9	10.6	0.439
	1994-1996	7,848	1.9	-6.4	23.7	10.6	0.498
	1997-1999	9,719	4.6	-3.8	14.2	8.8	0.617
Slovenia	1991-1993	7,883	-4.0	3.7	118.0	13.0	0.500
	1994-1996	11,416	4.3	1.4	14.8	14.4	0.724
	1997-1999	13,823	4.2	-0.9	7.5	14.1	0.877
Slovakia	1991-1993	6,430	-8.4	-3.5	31.5	12.2	0.408
	1994-1996	7,795	6.3	-1.3	9.8	13.1	0.495
	1997-1999	9,747	4.1	-8.5	7.8	15.8	0.618

– the year-on-year changes of consumer price index (P) are derived from the values of the base index of these prices, which is one of the basic indicators measured and published by central statistical authorities in all countries;

– rate of unemployment (U) is also a usual part of the basic statistical characteristics of the national economy that is published by the Ministry of Labour and Social Affairs or by the statistical authority of the country.

It is clear after seeing Table 1 that the measured values of some parameters are so high (particularly the rate of inflation in Poland and Slovenia in 1991 – 1993) that they cannot be depicted in the macroeconomic tetragonal graph given the chosen scales. These are examples of parameters that reduce the tetragonal area. The selected scale of the corresponding half-axle limits the depict ability of the measured parameter values. An unusually high parameter value "bites" through the centre of the scheme into the other half of the graph and it results in a concave shape of the tetragon. In cases when the measured parameter value exceeds a double of the scale on the corresponding half-axle, which is the case of average inflation rate in the first period of 1991 – 1993 in Slovenia, the depicted area becomes a hardly imaginable "negative area".

An easy solution would be to adjust the scale of the corresponding half-axle according to the measured values but this would mean that it would not be possible to depict within the graph changes ranging from units to tens of per cents, which are more usual in real economic life than changes reaching hundreds of per cents. Therefore we discarded this solution.

In order to use the graphical illustration of at least the three remaining goals, we chose the following procedure: if the observed parameter value exceeds the maximum of the corresponding half-axle (i.e. 40 % in case of the P apex), the graph will depict this maximum level of inflation and this level of inflation will be taken in account when computing the area of the scheme. In such cases the tetragon changes its shape into a triangle because one of its half-axles are eliminated.

We wanted the graphs to make possible comparisons both in space (between regions) and over time, i.e. between average parameter values of the same economy in the particular three years' periods. Therefore we depict the parameter changes in each graph of a national economy by a different kind of line: the first period (1991 – 1993) by a dotted line, the second period (1994 – 1996) by a dashed line and the third period (1997 – 1999) by a full line. We have to make a note on a certain inaccuracy that arises by our depicting the graphs into a single figure and by applying the principle of distinguishing the size in particular reference periods. This inaccuracy follows from the fact that each graph of a particular period has its own scale and therefore the graphs are, strictly speaking, mutually incommensurable. The scheme consisting of a rhomb and a circumscribed circle is drawn only for one of them so that the proportions of the two remaining tetragons are not in line with the scheme, which corresponds in our graphs always to the period of 1997 – 1999. We deliberately admitted this because the goal of the graphs is seen mainly in expressing the proportions whereas the accuracy of details is subject to numerical computations of the areas.

Further it must be noted that given the size of the graphs it would not be possible to place them into particular figures in such a way that they could be visually compared at the same time. The EU graph took the whole of the Figure 4. Figures 5 and 6 make possible to compare couples of economies: the Czech Republic and Hungary, Slovakia and Poland, respectively. Figure 7 contains the graph of the most successful transitive economy – the economy of Slovenia.

The economic complex of the EU depicted in Figure 4 and which serves as the basis of the comparisons and can be considered as a model for transition econo-

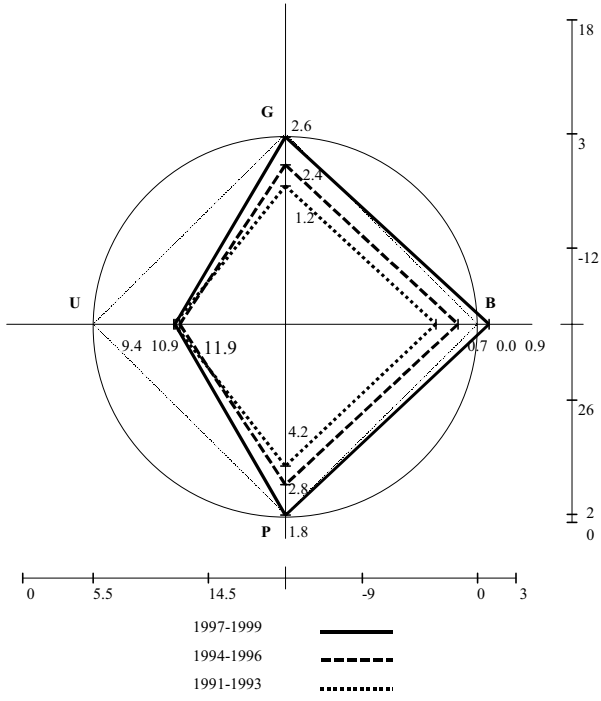
mies for its development is (obviously due to its size and economic level) very even and balanced. The only uneven field of development was the labour market, which causes the half-axle corresponding to U apex to be shorter and it results in a certain tetragon deformation in all three reference time periods.

The computed EU graph area increased by 21.0 % between the first and the second period and by 35.8 % between the second and third period. An exclusive factor of this increase was the GDP per capita growth due to which the half-axles of the scheme lengthened. Influence of the change of the shape, suggesting proportions between the main economic policy goals, can be estimated on the whole at one or two percentage points.

Areas of the tetragons in particular reference periods were covering only slightly changing portions of regular rhombi: in the first period the area corresponded to 84.6 % of the regular rhomb, in the second period 82.5 % and in the third period it was 87.8 %.

The economies of the Czech Republic and Hungary are graphically characterised in Figure 5. The Czech Republic and Hungary were changing the shape of their macroeconomic tetragons in a similar way during the nineties. In the first period, the macroeconomic tetragons of the Czech Republic and Hungary were flattened alongside their horizontal axis due to a loss of economic dynamics and due to a transiti-

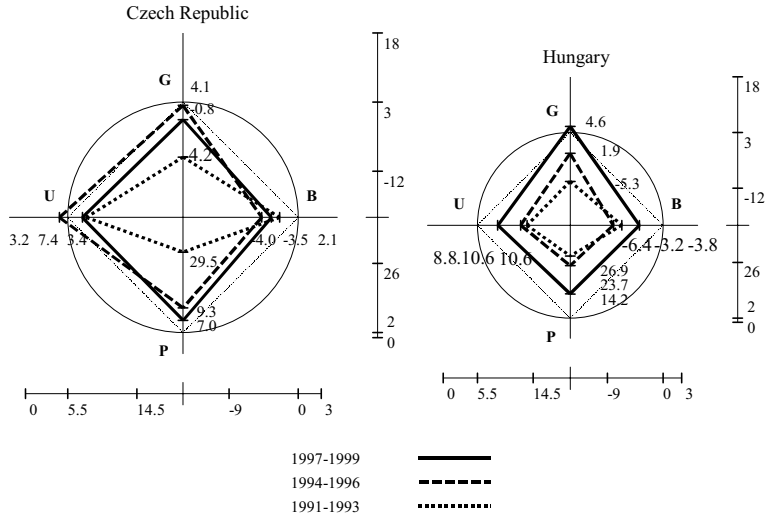
Figure 4
Tetragon of the European Union



Computed tetragonal areas of the European Union

Period	1991-1993	1994-1996	1997-1999
Area	16,919	19,960	28,876

Figure 5
Convergence Tetragons of the Czech Republic and Hungary



Computed tetragonal areas of the Czech Republic and Hungary

Period	1991-1993	1994-1996	1997-1999
Area CR	3,821	8,654	8,355
Area HUN	931	2,162	5,112

Note: A seeming paradox can be seen from the graph of the Czech Republic, that in case of graphs from different reference periods, distinguished by different lengths of half-axles and depicted "one over another", the graphs with better parameter values are inside the graphs with worse parameter values (particularly, the value of average economic growth in period 1994 – 1996 of 4.1 % can be paradoxically found within a circumscribed circle with an extreme value of 3 %). This pertains to the fact that the scheme consisting of a rhomb and of a circumscribed circle corresponds to the last period's graph (i.e. 1997 – 1999) so that a graph corresponding to an earlier period is exact as far as the shape is concerned but it has its own scale the scheme of which is not depicted for the reasons of higher lucidity.

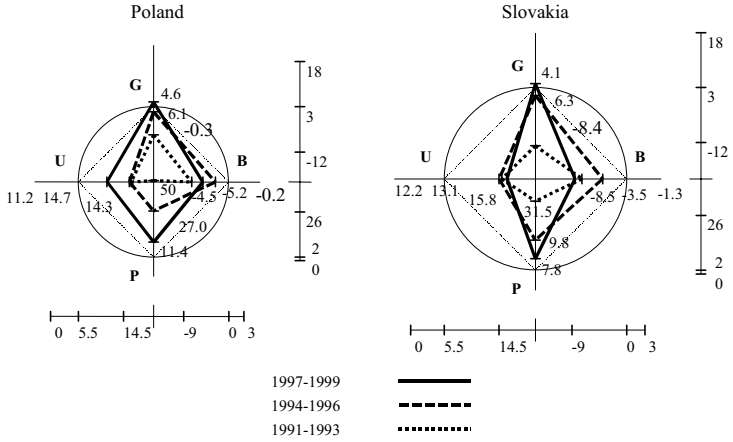
on price level surge. Lengthening of their vertical axis in the second period was caused, among other things, by economic recovery, stagnation of the level of unemployment in both economies and a rise (in case of the Czech Republic) or deepening of the external imbalance. The development of inflation was, however, different in both economies: in Hungary it persisted on a level exceeding 20 % whereas in the Czech Republic it lowered below 10 %. The tendency to lengthening the vertical axis continued in the third period in case of Hungary faster partly due to higher economic growth (in contradistinction to a loss of growth in the Czech Republic) and partly due to a faster lowering of inflation even though its final level was still more than twice as high as that of the Czech Republic. The average annual external imbalance was reduced more in Hungary in the second period than in the Czech Republic and the rate of unemployment doubled in the Czech Republic to 7.4 % whereas it dropped slightly in Hungary down to 8.8 %.

There are clear differences in all the aspects of the graphical comparison between the expansionary orientation of the Hungarian economic policy and an anti-inflationary orientation of the Czech economic policy.

As for the convergence or divergence of both economies toward the EU, the following results can be drawn from applications of the tetragonal graph: first, in comparison with the global view they increase the level of transition economies in relation to the EU-15. While a comparison of GDP per capita in terms of constant ECU indicates that the Czech Republic was reaching during the nineties only 15.6 % to 22.3 % of EU level and Hungary only 15.7 % to 19.9 %, mutual comparison of the computed tetragonal areas led to higher ratios. Ratios of tetragonal areas expressed in terms of square units derived from percentage values characterising the apex parameters reached in case of the Czech economy in the first to the third period 22.6 %, 43.4 % and 28.9 % respectively and in case of the Hungarian economy 5.5 %, 10.8 % and 17.7 % respectively.

At the first look there are more differences in the shape of the Polish and Slovak tetragons than between the Czech and Hungarian ones, though the tendency towards flattening the scheme alongside the vertical axis is apparent even here.

Figure 6
Convergence Tetragons of Poland and Slovakia



Computed tetragonal areas of Poland and Slovakia

Period	1991-1993	1994-1996	1997-1999
Area POL	449	1,705	2,876
Area SVK	886	3,183	2,708

An important difference in shape starts already in the first period when shortening the vertical axis of the Polish scheme was due to an average inflation of 50 %, which changed the tetragon of this economy into a triangle. The annual rate of inflation was only 31 % on average in Slovakia, however, the annual decline of production exceeded 8 %, which caused flattening of the Slovak scheme alongside its horizontal axis.

In the second period the vertical axis of both economies' tetragons were lengthened partly by growth acceleration to 6.1 % in Poland and 6.3 % in Slovakia and partly by lowering the rate of inflation in both economies by more than 20 percentage points. In case of the Polish economy there remained a bigger handicap in form

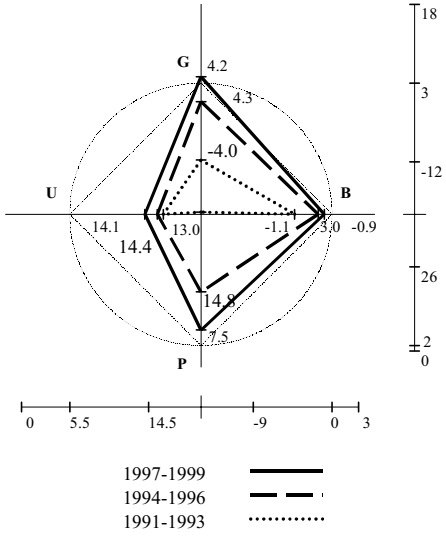
of a rest of the formerly very high inflation, which was reduced only to 27 %, whereas it was reduced down to 10 % in Slovakia.

The decisive change took place in the last three years' period when the rate of inflation in Poland was reduced by 15 percentage points while it continued to have nearly 5 % dynamics of real GDP growth, whereas the Slovak GDP growth rate of more than 4 % was accompanied by lowering the inflation only by two percentage points. A decisive difference between the two economies was in the level of external imbalance – the Polish deficit reaching -5.2 % of GDP was compared to a hardly sustainable Slovak deficit of -8.5 %.

This development is indicated by increments of tetragonal areas of both countries. While the area of the Slovak scheme grew by 259 % between the first and the second period, it was reduced by nearly 15 % between the second and the third period so that its cumulative rise during the two three years' periods was 206 %, the area of the Polish scheme grew by 280 % and 69 % respectively, so that it increased in the same time period by 540 %.

Ratios of areas of the Polish and EU-15 tetragons were rising in all the reference periods: from 2.7 % in the first period to 10.4 % in the second period and to 15.8 % in the third period. However, the same conclusion cannot be drawn about the ratios of areas of the Slovak and EU-15 tetragons because this ratio rose only in the second period: from 5.2 % in the first period to 15.9 % in the second and in the third period it declined down to 9.4 %. Thus Slovakia did not converge towards the EU-15 level between the second and the third period.

Figure 7
Convergence Tetragon of Slovenia



Computed tetragonal areas of Slovenia

Period	1991-1993	1994-1996	1997-1999
Area	1,572	6,809	10,041

The last figure of the series of tetragons represents a graphical depiction of Slovenia – the leader of the group of transition economies. In the first reference three years' period, there was a high rate of inflation in Slovenia (average annual increase of consumer prices was 118 %), which deformed the tetragon into a triangle, however, in the two next periods the prices rose only by 15 % and 7.5 % respectively. Since the second period the Slovenian economy could have been depicted by true tetragons with a tendency to lengthening the vertical axis due to both average annual economic growth exceeding 4 % and the mentioned lowering inflation.

A relatively low external imbalance and a stable, though not low (around 14 %), rate of unemployment are successes of the Slovenian economy. The Slovenian tetragon, covering in particular periods 31 %, 65 % and again 65 % of its base, resembles most the EU scheme in the second and the third period.

The area of the Slovenian tetragon increased by more than 333 % between the first and the second period and it increased more than six-fold between the first and the third period, which means Slovenia takes the first place among other transition countries. Its share in the corresponding EU tetragonal areas grew from 9.3 % in the first period to 34.1 % in the second and to 34.8 % in the last reference period. The gap between the Slovenian and EU economies was thus gradually narrowing in the second and the third period.

4. The Process of Convergence as Measured by Macroeconomic Polygons

We extended each quadrant of the magic tetragon by six detailed indicators to get a multidimensional convergence polygon. As margins of the each quadrant are identical to interconnect the four main goals of economic policy, the magic tetragon becomes a polygon with 24 indicators.

The quadrant of economic dynamics (G), formerly described only by the real GDP growth, was extended by the following six indicators:
G1 – Effectiveness of fixed investment (change of GDP_t / gross fixed capital $formation_{t-1}$),
G2 – Growth of labour productivity (GDP / labour force),
G3 – Growth of unit labour costs (compensation of employees / real GDP),
G4 – Growth of real domestic demand,
G5 – Growth of real gross fixed capital formation,
G6 – Growth of real exports of goods and services.

The quadrant of external balance (B), formerly described only by the current account balance as the percentage of GDP, was extended by the following six indicators:
B1 – Growth of real exports of goods and services,
B2 – Ratio of nominal imports of goods and services to nominal exports of goods and services,
B3 – Gross foreign debt as a percentage of income from exports of goods and services,
B4 – Openness of the economy [0.5 (exports + imports)/GDP],
B5 – FOREX reserves as a percentage of payments for imports of goods and services,
B6 – Terms of trade of goods and services.

The quadrant of prices, currency and exchange rate development (P), formerly described only by the inflation measured by the CPI, was extended by the following six indicators:
P1 – Terms of trade of goods and services,
P2 – Comparative price level (CPL = purchasing power parity / nominal exchange rate),
P3 – Real effective exchange rate,
P4 – Appreciation of domestic currency via EUR (ECU until January 1, 1999),
P5 – Rate of monetatization (M2/GDP),
P6 – Net foreign debt as a percentage of GDP.

The quadrant of internal balance (U), formerly described only by the unemployment rate, was extended by the following six indicators:

U1 – Net foreign debt as a percentage of GDP,
U2 – Central budget expenditures as a percentage of GDP,
U3 – Public budgets balance as a percentage of GDP,
U4 – Public debt as a percentage of GDP,
U5 – Gap between domestic supply and domestic demand as a percentage of GDP,
U6 – Effectiveness of fixed investment (change of GDP_t / gross fixed capital $formation_{t-1}$).

We use the same scaling methodology, which was developed for the analysis of the magic tetragon. However, the analysis done by polygons becomes more complex as the polygon has higher resolution than a tetragon and graphical visualisation of the polygon is smoother as the detailed polygon tends to be more rounded than the rough tetragon.

The problem with extremely high indicator values exceeding the scale towards the centre of the figure remains. It was a case of inflation in some countries in the tetragonal framework during the first period and it increased with the number of involved indicators. In this respect, we keep the same solution to give the edging value to the exceeding indicator and remove the indicator axis from the graphical exposition.

The margin indicators interconnecting the four basic quadrants of the polygon are bolded in the graphical visualisation, though; we don't mark the individual apexes of the polygon nor their values. It would be confusing and it would be also difficult to print and read marks and values for all 24 apexes (especially in smaller figures).

Figure 8 shows three irregular polygons of the European Union according to average values in the periods 1991 – 1993, 1994 – 1996 and 1997 – 1999. Areas of the irregular polygons in particular reference period were covering almost stable portions of regular polygon: in the first period the area corresponded to 85.8 % of the regular polygon, in the second period 86.8 % and in the third period it was 87.5 %. It indicates stability and maturity of the economic development in the European Union.

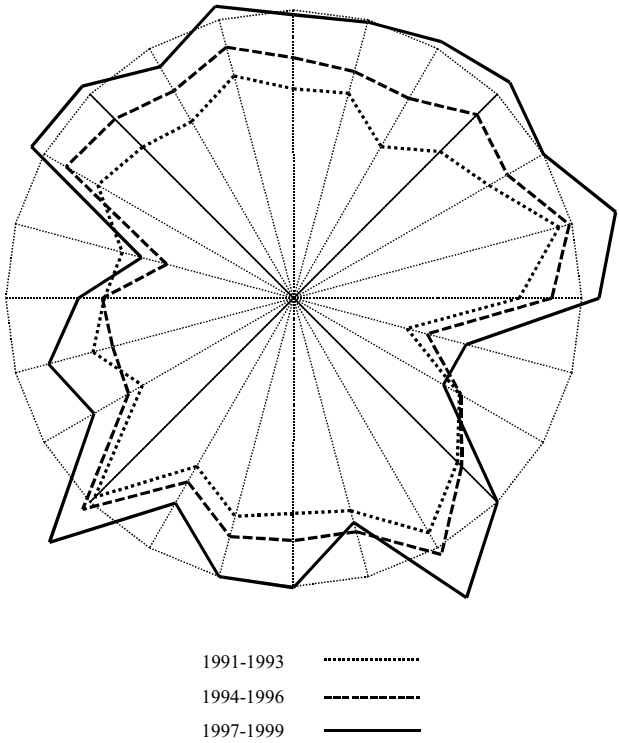
The polygons also allow us to analyse the structure of the economic development within the main four quadrants. Apparently, the structure of individual quadrants shows lower stability than the broad ratio of irregular to regular polygons. In the first period 1991 – 1993, the quadrant P was the largest one (P 30.1 %, B 24.6 %, G 24.5 % and U 20.8 %), though, its share decreased gradually in favour of the quadrant G, which became the largest quadrant the third period (G 28.5 %, P 28.1 %, B 22.3 %, U 21.1 %).

As can be expected from the graphical exposition, the computations proved that the lower ratio of irregular to regular ones showed the quadrant U (71.5 %, 67.8 % and 73.7 %) and the quadrant B (84.3 %, 79.0 % a 77.9 %) over the whole decade. However, this measure would be biased due to arbitrary delimitation of the individual indicator scales. Most indicators scales are based on the averages of the EU to identify the level of candidate countries convergence, though, in some cases it was not suitable as the candidate countries values would exceed the EU based scales systematically or the EU average reference rates would be too soft base for the candidate countries values. Therefore, we based some indicator scales on the values usual for the small and open (transition) economies instead of the EU average. This is the case of the following indicators: openness of the economy (B4), FOREX reserves as a percentage of payments for imports of goods and services (B5), central budget expenditures as a percentage of GDP (U2), public budgets balance as a percentage of GDP (U3) and public debt as a percentage of GDP (U4).

The EU polygon increased by 22.5 % between the first and the second period, which is also close to the result computed in the tetragonal framework (18.0 %). The difference widened between the second and the third period as the EU polygon area increased by 36.8 % but the EU tetragonal area picked up by 44.7 %. Between the first and the third period the highest dynamics was achieved in the quadrant G, whose area increased by 95.4 %, followed by quadrant U up by 69.5 %, quadrant P up by 56.5 % and finally quadrant B up by 51.9 %.

We shift our attention to the candidate countries polygons now to compare the structure and growth of the EU polygons with the corresponding measures of the candidate countries.

Figure 8
Polygon of the European Union



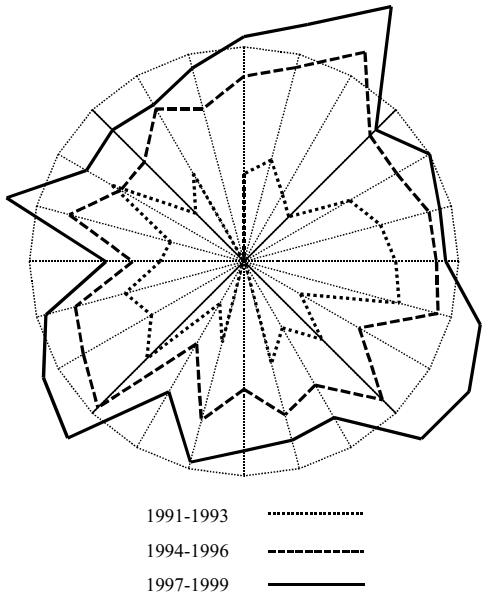
Computed areas of the polygons of the European Union (EU-15)

Period	1991-1993	1994-1996	1997-1999
Regular polygon	31,059	37,581	51,046
Irregular polygon	26,638	32,639	44,649
of which:			
quadrant G	6,521	9,173	12,739
quadrant B	6,542	7,422	9,940
quadrant P	8,022	9,674	12,558
quadrant U	5,553	6,370	9,411

Looking at the Figure 9, we can observe remarkable progress in transition and convergence process of the Slovenian economy during the nineties. Indeed, the starting position of the Slovenian economy was relatively weak. In the period 1991 – 1993 two indicators (P – inflation and G3 – growth of unit labour costs) exceeded their scales towards the centre of the polygon and must have been eliminated from the figure. As can be seen in the Figure 9, there are two cuts in the Slovenian polygon resulting it to a "butterfly" shape. Therefore, the irregular polygon area covered only 57.9 % of the regular one and amounted to only 16.9 % of the corresponding EU measure.

The rapid stabilization of the Slovenian economy is obvious from the consolidation and area jump of the polygon during the second period 1994 – 1996. Moreover, the indicator G5 (growth of real gross fixed capital formation) slightly overreached its reference value. The irregular polygon covered 91.4 % of the regular one and reached 45.6 % of the corresponding EU measure. The worst result kept quadrant P with share only 18 % on the polygon area, followed by quadrant U making 21 %, quadrant B 29 % and quadrant G 32 %. The quadrants area increased considerably between the first and the second period: quadrant G jumped by 637 %, quadrant P

Figure 9
Convergence Polygon of Slovenia



Computed areas of the polygons of Slovenia

Period	1991-1993	1994-1996	1997-1999
Regular polygon	7,765	16,280	23,888
Irregular polygon	4,497	14,877	22,812
of which:			
quadrant G	638	4,699	6,427
quadrant B	1,800	4,273	6,759
quadrant P	597	2,726	4,756
quadrant U	1,462	3,179	4,871

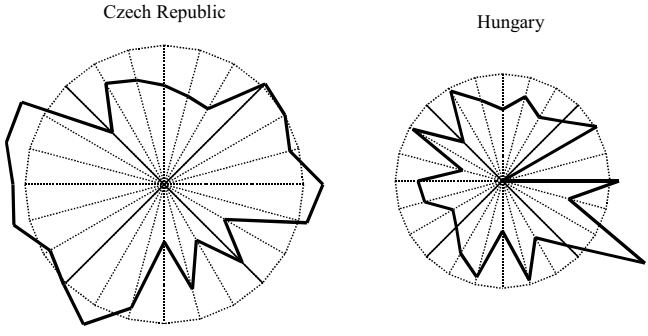
by 357 %, quadrant B by 137 % and quadrant U by 117 %. The convergence towards the EU continued in the third period 1997 – 1999 as the irregular polygon covered 95.5 % of the regular one and its area reached 51.1 % of the EU polygon.

In the first period 1991 – 1993 any shape similarity between the Czech Republic and Hungary polygons emerged contrary to the corresponding tetragons.

The Czech polygon tends to have consolidated shape covering 76 % of the regular one. It is slightly horizontally flattered as the worst results recorded the upper quadrant G with only 53 % and the lower quadrant P with 58 % of the regular one. It is associated with the transition recession and the collapse of the eastern export markets also played a role. It is also result of inflation jump and weakened price competitiveness after currency devaluation and the price liberalization at the beginning of the transition. The quadrant B covered 81 % of the regular one, though, there were markedly low level of B5 – FOREX reserves to payments for imports of goods and services (12.5 %) and also drop of B6 – terms of trade of goods and services (89.8 %). On the contrary, quadrant U exceeded the base area by 11 % due to favourable fiscal performance and excess of domestic demand over sluggish domestic demand. Therefore, structure of the polygon area is very uneven ranging from 18 % (quadrant G) to 37 % (quadrant U).

The Hungarian irregular polygon covered 53 % of the regular one and the polygon was very heterogeneous even at the individual indicators level in the period 1991 – 1993. The indicator B3 was eliminated from the polygon due to high ratio of gross foreign debt to income from exports of goods and services. However, the share of the quadrant B is the largest amounting to 29 % of the polygon as the high foreign debt was more than counterbalanced by high level of FOREX reserves (B5). We have to bear in mind that these two indicators are interdependent as the high level of FOREX reserves was necessary to manage the high foreign debt during the

Figure 10
Convergence Polygons of the Czech Republic and Hungary in 1991 – 1993



Computed areas of the polygons of the Czech Republic and Hungary

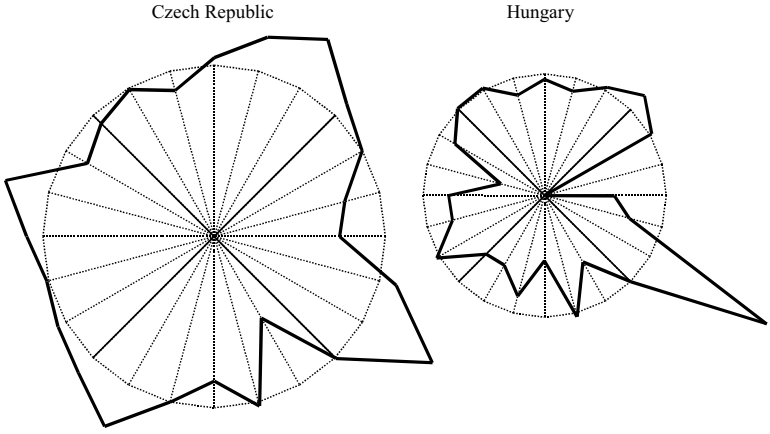
Period	1991-1993	
	CR	HUN
Regular polygon	10,162	5,986
Irregular polygon	7,706	3,195
of which:		
quadrant G	1,345	856
quadrant B	2,059	927
quadrant P	1,483	760
quadrant U	2,820	652

whole nineties. The lowest share showed quadrant U with only 20 % of the polygon. It implies similar conclusions to the magic tetragon analysis as the Hungarian economic policy promoted more the economic growth recovery contrary the Czech economic policy, which emphasised regaining of macroeconomic stability.

In the second period 1994 – 1996 the Czech and Hungarian economies converged towards the EU as the Czech polygon grew by 117 %, the Hungarian by 79 % but the EU polygon increased only by 23 %. The Czech irregular polygon even exceeded by 9 % the area of the regular one and its ratio to the EU polygon jumped to 51 %. In 1994 and 1995 high economic growth driven by domestic demand was financed by high inflow of foreign capital.[1)] As the exchange rate was fixed, the real exchange rate appreciation continually weakened the price competitiveness. However, the current account deficit remained below 3 % of GDP until 1996, when the course reversed. In 1996 the GDP growth decelerated to 4.3 % and the current account deficit more than doubled to 7.4 % of GDP despite of the monetary restriction.

The Hungarian economy showed similar patterns with approximately two years advance. The domestic demand recovered in 1992 and accelerated in 1993 and 1994, when the twin deficit escalated: both the fiscal and current account deficits exacerbated to the levels of 10 % of the GDP. The foreign capital inflow was sizeable with financial account surplus amounting to 16 % of GDP in 1993, 9 % of GDP

Figure 11
Convergence Polygons of the Czech Republic and Hungary in 1994 – 1996



Computed areas of the polygons of the Czech Republic and Hungary

Period	1994-1996	
	CR	HUN
Regular polygon	15,306	7,703
Irregular polygon	16,648	5,714
of which:		
quadrant G	4,486	1,822
quadrant B	4,351	1,772
quadrant P	3,501	1,014
quadrant U	4,310	1,107

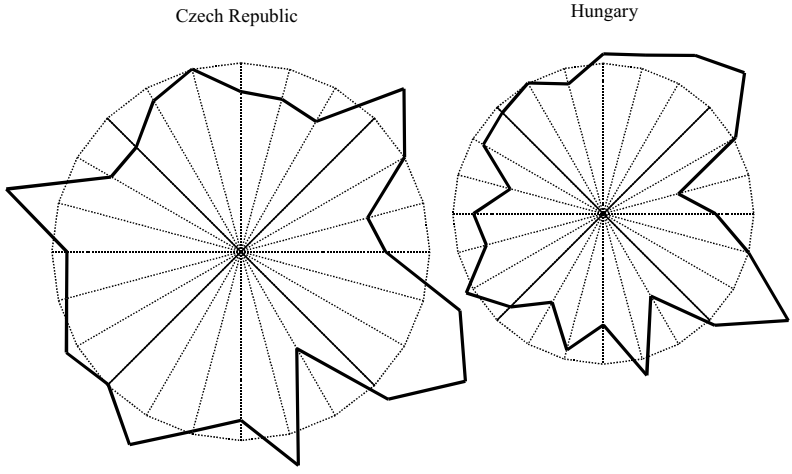
1) In 1994 the financial account surplus amounted to 8.6 % of GDP. In 1995 the foreign capital inflow was liberalized and jumped to 16.2 % of the GDP. The resulting high monetary base (M2) growth powered the real wages growth, investment activity and import demand (see Jonáš, 2000).

in 1994 and 18.4 % of GDP in 1995. Contrary to the speculative foreign portfolio investment and bank loans inflow to the Czech Republic, the Hungarian foreign capital inflow was powered by privatization. The Bokros stabilization package, introduced in March 1995, reduced the twin deficit gradually. It is particularly remarkable that the stabilization was achieved without recession, although there was a period of slowdown in 1995 and 1996. The economic growth fuelled by soaring domestic demand was replaced by deep restructuring efforts with sound competitiveness gains and the economic growth recovered thereafter. However, positive outcomes of the reform are not fully observable in the second period as the polygon area increased only moderately by 79 %. The quadrant G contributed to the increase by 38 % and its share increased to nearly one third (31.9 %) of the polygon.

In the third period 1997 – 1999 Hungarian economy continued to converge toward the EU. In the third period the area of the Hungarian polygon increased by 83 % compared to the second period and by 228 % over the whole period. Therefore, it more than doubled the growth of the corresponding EU polygon, which increased by 37 % between the second and the third period and by 68 % over the whole period. With the exception of the quadrant P (160 %), the growth of the remaining Hungarian quadrant areas was relatively balanced over the whole period: quadrant B by 216 %, quadrant U by 231 % and quadrant G by 229 %.

On the contrary, the Czech economy diverged from the EU in the third period as the Czech polygon area increased only by 5.4 % compared to the second period and by 128 % over the whole period. The Czech polygon area decreased from 51.0 % of

Figure 12
Convergence Polygons of the Czech Republic and Hungary in 1997 – 1999



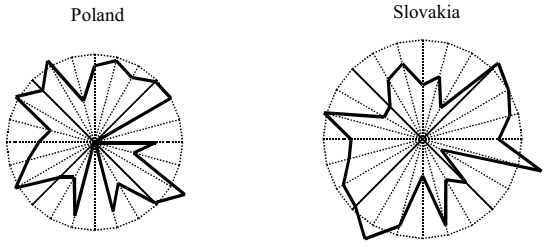
Computed areas of the polygons of the Czech Republic and Hungary

Period	1997-1999	
	CR	HUN
Regular polygon	18,367	11,824
Irregular polygon	17,544	10,471
of which:		
quadrant G	3,721	3,413
quadrant B	5,216	2,923
quadrant P	4,257	1,978
quadrant U	4,350	2,157

the EU level in the second period to only 39.3 % of the EU polygon in the third period. However, it remained above the starting level of 28.9 % of the EU polygon in the first period. The mixed picture of the Czech economy can be also displayed by development within the quadrants in the third period: quadrants B and P increased by 20 and 22 % but quadrant U remained stable and quadrant G even decreased by 17 %. Nevertheless, over the whole period all the quadrants increased: quadrant P by 187 %, quadrant G by 177 %, quadrant B by 153 % and quadrant U by 154 %.

Figures 13 to 15 show the Polish and Slovak polygons. The starting position in 1991 –1993 was clearly more favourable for Slovakia. In the Polish polygon two indicators had to be eliminated from the computations as they exceeded the polygon scale due to high inflation (P) and high level of gross foreign debt as a percentage of income from exports of goods and services (B3). The Slovak polygon was relatively uneven too, though, no indicator was eliminated and its area (2,935) more than doubled the Polish polygon area (1,396). As a result the Polish polygon reached only 5.2 % and the Slovak polygon 11 % of the corresponding EU measure.

Figure 13
Convergence Polygons of Poland and Slovakia in 1991 – 1993



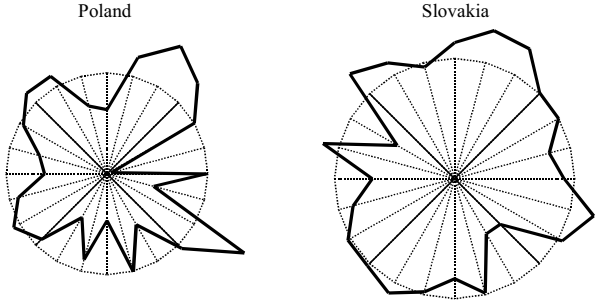
Computed areas of the polygons of Poland and Slovakia

Period	1991-1993	
	POL	SVK
Regular polygon	2,889	5,170
Irregular polygon	1,396	2,935
of which:		
quadrant G	543	474
quadrant B	265	1,016
quadrant P	150	721
quadrant U	438	725

In the second period 1994 – 1996 the Slovak polygon increased by 142 % and Polish polygon by 171 % compared to the first period and both significantly converged towards the EU as their increase more than seven times exceeded the EU polygon growth (22.5 %). On the contrary, the convergence slowed in the third period when the Polish polygon increased by 65 % but the Slovak polygon only by 36 % compared to EU polygon growth by 37 %. As a result, the Polish economy continued to converge but the Slovak economic slightly diverged in the third period.

In the first period the Slovak polygon covered 57 % and Polish polygon 48 % of the regular one. In the second period the coverage rate increased to 93 % in Slovakia and 71 % in Poland as the deficits and surpluses of the indicator scales were relatively counterbalanced (the surpluses were computed mainly in the quadrant G). In the third period the area of the irregular polygons covered the regular one nearly by the same pace in both countries (by 82 % in Slovakia and 81 % in Poland).

Figure 14
Convergence Polygons of Poland and Slovakia in 1994 – 1996



Computed areas of the polygons of Poland and Slovakia

Period	1994-1996	
	POL	SVK
Regular polygon	5,349	7,610
Irregular polygon	3,781	7,104
of which:		
quadrant G	1,736	2,493
quadrant B	609	1,803
quadrant P	631	1,456
quadrant U	806	1,353

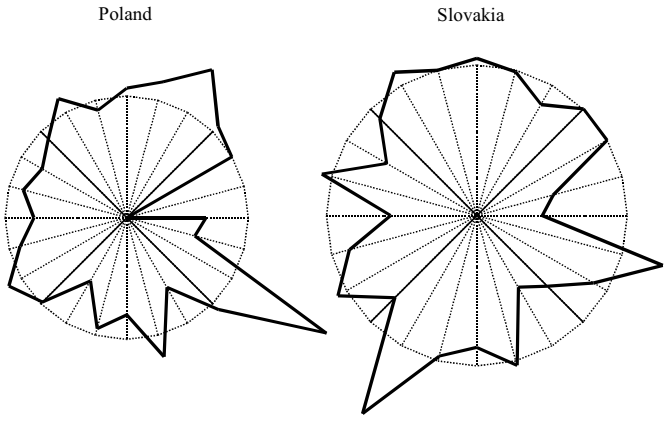
The Polish economy showed the best performance in the quadrant G, whose share on the polygon amounted to 39 % in the first and 46 % in the second period. Shares of quadrants U and B, biased by high foreign debt but high level of FOREX reserves, ranged from 16 % to 31 %. The lowest share recorded the quadrant P (11 %, 17 % and 22 %) mainly due to high inflation and related measures. Meanwhile, we have to bear in mind that the high economic growth in Poland could be also explained by low starting economic level in 1989 due to sluggish growth performance during the eighties.

The structure of Slovak polygon is similar to the Czech one as both countries were parts of Czechoslovakia until 1993. The GDP dropped as the monetary and fiscal policies were restrictive with fixed exchange rate, relatively low inflation and balanced public budgets. In this respect, the polygon structure was dominated by quadrant B amounting to 35 %, followed by quadrants P 25 % and U 24 % but quadrant G recorded only 16 % of the polygon. The recovery of Slovak domestic demand was slightly postponed to 1995 and 1996, as evident in the second period. The domestic demand was mainly fuelled by investment but the current account remained in surplus and fiscal policy remained restrictive until 1996. However, the cumulated imbalances exploded in 1996 as the domestic demand jumped by 25 % (investment demand by 34.5 % and government investment demand by 50%) and imports rocketed while exports dropped. The current account surplus 2.1 % of GDP in 1995 turned to deficit amounting to 10.6 % of GDP in 1996 and the public deficit also widened due to high government investment expenditures in 1996. Taking into account our three period framework this development is not purely evident because there are mixed the successful development until 1996 with imbalances in 1996.

Graduating fiscal easing exacerbated the monetary restriction in the second half of 1996. Therefore, even the slowdown of domestic demand didn't help reduce current account deficit in 1997. The current account deficit remained at the level of 10 %

of GDP until the year of parliamentary elections in 1998. Thereafter the stabilization program coordinated by the new government and the National Bank of Slovakia reduced the current account deficit to 5.9 % of GDP in 1999 but as can be expected also the GDP growth fell to 1.9 % in 1999. This development is also indicated by the uneven increase of the polygon quadrants over the whole period: quadrant G by 515 %, quadrant P by 262 % but quadrant U only by 149 % and quadrant B by 131 %.

Figure 15
Convergence Polygons of Poland and Slovakia in 1997 – 1999



Computed areas of the polygons of Poland and Slovakia

Period	1997-1999	
	POL	SVK
Regular polygon	7,672	11,862
Irregular polygon	6,243	9,674
of which:		
quadrant G	1,678	2,914
quadrant B	1,705	2,342
quadrant P	1,365	2,612
quadrant U	1,496	1,807

4. Conclusions

The view of convergence of transition countries taking account of the four basic economic policy goals does not make it possible, in the form in which it was applied, to assess directly development between 1990 and the three years' period of 1991 – 1993. However, it can be assumed about that period that it meant widening the gap between the level of EU and economic level of each of the Central and Eastern European economies under comparison.

Between the periods of 1991 – 1993 and 1994 – 1996, the method indicates convergence in case of all the economies under observation, i.e. reduction of the gap between their economic level and the EU average. Between the second and the third reference period, the method can confirm convergence only in case of Poland, Hungary and Slovenia; on the contrary a divergence was recorded in case of the Czech Republic and Slovakia (see Table 2).

Table 2
Areas of the Transition Economies' Tetragons (in per cent of the EU-15 tetragon in the corresponding period)

Country	1991-1993	1994-1996	1997-1999
Czech Republic	22.6	43.4 ↗	28.9 ↘
Poland	2.7	10.4 ↗	15.8 ↗
Hungary	5.5	10.8 ↗	17.7 ↗
Slovenia	9.3	34.1 ↗	34.8 ↗
Slovakia	5.2	15.9 ↗	9.4 ↘

The polygon framework allowed carrying out more detailed analysis of the convergence of the candidate countries towards the EU. The polygon framework showed slightly different picture compared to the tetragon framework mainly between the second and third period. As shown in Table 3, the convergence of the Hungarian, Polish and Slovenian economy was more pronounced, the divergence of the Czech economy was lower and the Slovak economy diverged in the tetragon framework but almost remained at the same level in the polygon framework. In the case of Slovak economy, the different results are due to drop of Slovak tetragon area by 15 % and increase of the EU tetragon by 45 % in the third period, though, the polygon area growth was almost equalised (the Slovak polygon was up by 36.2 % and the EU polygon was up by 36.8 %).

Table 3
Areas of the Transition Economies' Polygons (in per cent of the EU-15 polygon in the corresponding period)

Country	1991-1993	1994-1996	1997-1999
Czech Republic	28.9	51.0 ↗	39.3 ↘
Poland	5.2	11.6 ↗	14.0 ↗
Hungary	12.0	17.5 ↗	23.5 ↗
Slovenia	16.9	45.6 ↗	51.1 ↗
Slovakia	11.0	21.8 ↗	21.7 ↘

The detailed results of the multidimensional convergence analysis vary across individual countries and over time; the time path of these differences partly reflects the uneven progress in macroeconomic stabilization and recovery of economic growth. A cross-country comparison shows that Slovenia is a convergence leader with polygon area around 50 % of the EU measure in 1997 – 1999. Slovenia's performance stands out in both rankings as the gains in absolute terms went together with relative increases. An uneven pattern of convergence emerged in the second half of the nineties as previously similar trends across the analysed countries discontinued around 1995 – 1997. The polygons of Hungary recorded the most stable convergence progress. In Poland, the Czech Republic and Slovakia, the successful second period was followed by the slowdown of the convergence or even the diver-

gence toward the EU in the third period. As shown in Table 3, only the Czech Republic (slightly also Slovakia) diverged in the third period, while the remaining analysed countries continued to converge towards the EU levels.

Let us add that the rank of transition economies differs if it is done according to absolute increments in terms of square units or if it is done according to increments relatively to the area in the first three years' period (see Tables 4 and 5).

Table 4
Rank of Transition Economies according to the Absolute and Relative Changes of Tetragon Areas

Rank according to the absolute value of tetragonal increments between the first and the third period:	Rank according to relative increments (in %)
1. Slovenia (8,469)	1. Poland (540)
2. Czech Republic (4,534)	2. Slovenia (539)
3. Hungary (4,180)	3. Hungary (449)
4. Poland (2,427)	4. Slovakia (206)
5. Slovakia (1,822)	5. Czech Republic (119)

Table 5
Rank of Transition Economies according to the Absolute and Relative Changes of Polygon Areas

Ranking by the polygon area increase in absolute terms between the first and the third period:	Ranking by change in per cent between the first and the third period:
1. Slovenia (18,315)	1. Slovenia (407)
2. Czech Republic (9,837)	2. Poland (347)
3. Hungary (7,278)	3. Slovakia (230)
4. Slovakia (6,739)	4. Hungary (228)
5. Poland (4,848)	5. Czech Republic (128)

In principle, the polygon areas are larger compared to the tetragon areas in line with our expectations as the polygon analysis is more sophisticated and shows more realistic picture of the convergence process. Table 6 summarizes detailed comparisons of the numeric computations results of the tetragon and polygon frameworks in the three periods.

Table 6
The Results Overview of the Tetragon and Polygon Frameworks

	Computed Areas			Absolute and Relative Changes					
	Period I (1991 -1993)	Period II (1994 -1996)	Period III (1997 -1999)	II. - I.	II. / I.	III. - II.	III. / II.	III. - I.	III. / I.
	Area	Area	Area	Absolute	Relative (%)	Absolute	Relative (%)	Absolute	Relative (%)
EU Tetragon	16,919	19,960	28,876	3,040	18	8,916	45	11,956	71
EU Polygon	26,638	32,639	44,649	6,000	23	12,010	37	18,010	68
Index Polyg./Tetr.	157	164	155	197	125	135	82	151	96
CR Tetragon	3,821	8,654	8,355	4,832	126	-299	-3	4,534	119
CR Polygon	7,706	16,648	17,544	8,941	116	896	5	9,837	128
Index Polyg./Tetr.	202	192	210	185	92	-300	-156	217	108
HUN Tetragon	931	2,162	5,112	1,231	132	2,950	136	4,180	449
HUN Polygon	3,195	5,714	10,474	2,519	79	4,759	83	7,278	228
Index Polyg./Tetr.	343	264	205	205	60	161	61	174	51
POL Tetragon	449	1,705	2,876	1,256	279	1,171	69	2,427	540
POL Polygon	1,396	3,781	6,243	2,385	171	2,462	65	4,848	347
Index Polyg./Tetr.	311	222	217	190	61	210	95	200	64
SVK Tetragon	886	3,183	2,708	2,297	259	-475	-15	1,822	206
SVK Polygon	2,935	7,104	9,674	4,169	142	2,570	36	6,739	230
Index Polyg./Tetr.	331	223	357	182	55	-541	-242	370	112
SLO Tetragon	1,572	6,809	10,041	5,237	333	3,232	47	8,469	539
SLO Polygon	4,497	14,877	22,812	10,380	231	7,935	53	18,315	407
Index Polyg./Tetr.	286	218	227	198	69	246	112	216	76

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