ANALYSIS OF THE POPULATION MOVEMENT IN THE CZECH REPUBLIC THROUGH EXTERNAL MIGRATION IN THE PERIOD 1993–2003

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Abstract

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The paper presents partial findings obtained during the study of external migration according to countries in a defined territorial unit and time period. Applied methodical procedures of the statistical processing of empirical data make possible, in addition to the exact description of the proportion of selected country groups and aggregated particular countries on the total number of immigrants, emigrants and derived values of migration increases or decreases, also the description of developmental trends of the analysed time series of assessed events and point short-term extrapolation prediction.

population movement, indicators of mechanical movement, cluster of countries, specification, structure of migration, development trends of indicators, Czech Republic

If we start from an aspect that basic indicator characterizing the reproduction of population or its positive and negative components are numbers of born and dead persons or numbers of immigrants and emigrants and differences between the extent of positive and negative components of each type of movement quantify absolute changes in natural increases or decreases and migration changes, the sum of which quantifies the total increase or decrease of population, it is not possible to ignore the analytical significance of elementary characteristics of the way of population reproduction by natural changes quantified by the index of migration effectiveness. Mutual comparing of both indicators adequate for the Czech Republic is made possible by values presented in Table I.

I: *Indices of natural movement and migration effectiveness in the Czech Republic in the reference period 1993–2003*

1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1993–2003
Indices of natural movement effectiveness											
0.01	−0.05	−0.10	−0.11	−0.11	−0.09	−0.10	−0.09	−0.08	−0.07	−0.08	−0.07
Indices of migration effectiveness											
0.26	0.94	0.90	0.87	0.88	0.80	0.79	0.72	−0.25	0.16	0.27	0.58

As already stated, changes in the distribution of population are caused partly by the reproduction of population and partly by its spatial movement. According to the direction of the spatial movement of population (migration) we can differentiate emigration and immigration. The actual phenomena are indicated as

emigration and immigration. While the result of internal (domestic) migration does not cause changes in the number of the country population but only changes in it spatial distribution external migration changes the number of the country population. *Gross migration* is the total number of immigrants and emigrants who come or leave the given region „i" (territorial unit) – gross immigration I_i and gross emigration E_i, respectively. Their sum (I_i+E_i) is considered to be the *migration turnover* of the territorial unit.

Migration increase (increase by migration, migration balance, mechanical increase) is created by a difference between the total number of immigrants and emigrants ($I_i–E_i$). In all cases, migration balance is a positive value if it refers to net immigration. If it is a negative value it refers to net emigration.

The suitability of migration is characterized by the above mentioned *index of migration effectiveness* which is given by the migration balance/migration turnover ratio, ie ($I_i–E_i$)/(I_i+E_i). The number of immigrants gives the extent of gross immigration and the number of emigrants gives the extent of gross emigration. An *increase/decrease through migration* as an indicator of the population movement is given by a difference $I_i–E_i$. By analogy, it is possible to define this indicator and general measures of particular components of migration in relation to the mid-year population (in ‰).

The paper presented is aimed at the presentation of results obtained in the study of the percentage proportion of selected groups of countries in forming the number of immigrants, emigrants and migration balance in the defined interest field and time interval. A description is also given of developmental trends of studied events by adequate trend functions.

MATERIAL AND METHODS

The volume data of the number of immigrants, emigrants and on this basis constructed increase or decreases through migration in the Czech Republic countries in the reference period 1993–2003 were obtained from Czech statistical office. Methodical procedures of processing the factual data of analysed time series are based on the methods presented in papers of MALYPETR (1974), CYHELSKÝ, KAŇOKOVÁ and NOVÁK (1979), PALÁT, MACA (2005), CYHELSKÝ, KAHOUNOVÁ and HINDLS (2001) and ROUBÍČEK (1996).

The structure of studied phenomena according to countries is characterized by percentage proportions in the total number of particular variants:

$$p_i = \frac{n_i}{\sum\limits_{i=1}^{k} n_i} \cdot 100$$

Analysis of the trend of assessed time series is based on the application of models of developmental tendencies of the following type:

$$y' = a_{yt} + b_{yt} \cdot t \qquad (1)$$
$$y' = a_{yt} + b_{yt} \cdot t + c_{yt} \cdot t^2 \qquad (2)$$
$$y' = a_{yt} \cdot e^{b_{yt} \cdot t} \qquad (3)$$
$$y' = a_{yt} + b_{yt} \cdot \ln t \qquad (4)$$
$$y' = a_{yt} \cdot t^{b_{yt}} \qquad (5)$$
$$y' = a_{yt} + b_{yt} \cdot \frac{1}{t} \qquad (6)$$

Informative abilities and accuracy of applied analytical functions were tested by means of correlation indices I_{yt}. The statistical significance of correlation indices was tested on the significance level P = 0.05 and P = 0.01. Determination indices I_{yt}^2 were used for verification of the indicators developmental trend models and their short-term point extrapolation prediction.

RESULTS AND DISCUSSION

According to the conception of the analysis in question and the fundamental intention of the exact evaluation of external migration in the defined territorial unit and time interval with differentiation according to country groups it is possible to present results of the study in two separate mutually conditioned and supplemental units. The first of them makes possible to evaluate the dynamics of the number of immigrants, emigrants and increase or decreases through migration. The second unit serves for the description of developmental trends of presented phenomena.

The initial basis of calculations of percentage proportions of grouping particular countries in forming the total number of specified indicators is created by data included in Table II.

An ascending order of the number of immigrants to the Czech Republic compiled on their basis for the period 1993–2003 proved 109 persons from Finland, 156 persons from Spain, 159 persons from Denmark, 400 persons from Belgium, 618 persons from Greece, 682 persons from Sweden, 937 persons from Netherlands, 1 425 persons from France, 1 620 persons from Italy, 1 886 persons from United Kingdom, 159 persons from Denmark, 2 392 persons from Austria, and 10 234 persons from Germany. From other countries of EU 15 immigration did not occur (Ireland, Luxembourg and Portugal). As for other countries of market economy, immigration occurred of 1 263 persons from Australia, 2 859 from Canada and 4 980 from the USA. As for European countries with transitive economy and the Federation of Independent States (FIS), the number of immigrants from Hungary amounted to 313 persons, from Bulgaria 3 017 persons, from Poland 5 193 persons, from Russia 9 497 persons, from the Ukraine 37 924 persons and from Slovakia

71 472 persons. As for the total number of immigrants amounting to 46 298 persons migration from Vietnam amounted to 16 769 persons.

From the total number of emigrants from the Czech Republic to EU countries amounting to 10 246 persons emigration did not occur to Ireland, Luxembourg and Portugal. On the other hand, the highest number of emigrants headed to Germany (4 649 persons) and then in descending order to Austria (1 448 persons), the United Kingdom (1 146 persons), France (772 persons), Italy (733 persons), the Netherlands (490 persons), Greece (285 persons), Belgium (224 persons), Sweden (152 persons), Spain (142 persons), Denmark (109 persons) and Finland (96 persons).

To other market economy countries, in total 2 692 persons emigrated from the Czech Republic. Of this number, 1 838 persons to the USA, 628 to Canada and 226 to Australia.

To European countries with transitive economy and countries of the FIS, in total 74 607 persons emigrated from the Czech Republic in the evaluated time period. Of this number (in descending order) to Slovakia 50 434 persons, the Ukraine 15 885 persons, Russia 4 018 persons, Poland 2 734 persons, Bulgaria 1 420 persons and Hungary 116 persons. To other countries, external migration reached 13 945 persons. Of this number, 3 022 persons to Vietnam.

In the total increase of population migrating to the Czech Republic from EU countries, Germany participated by 5 585 persons and then (in descending order) Austria, Italy, the United Kingdom, France, Sweden, the Netherlands, Greece, Belgium, Denmark, Spain and Finland by 13 persons. From other countries with market economy, the highest increase by migration amounting to 3 142 persons was from the USA, 2 231 from Canada and 1 037 from Australia.

European countries with transitive economy and countries of the FIS participated by 52 769 immigrated persons. Of this most markedly the Ukraine 22 039 persons and then (in descending order) Slovakia, Russia, Poland, Bulgaria and Hungary.

Other countries participated by 32 374 persons in the increase by migration to the CR. The proportion of Vietnam was not negligible, viz 13 747 persons.

Quantification of the proportion of assessed indicators of the external migration according to countries within the defined territorial unit and time period is presented by percentage values contained in Table III.

Immigration reached (in ascending order) 0.05% in persons from Finland, from Denmark and Spain 0.08%, from Hungary 0.15%, from Belgium 0.20%, from Greece 0.30%, from Sweden 0.33%, from Netherlands 0.46%, from Australia 0.62%, from France 0.70%, from Italy 0.80%, from the United Kingdom 0.93%, from Austria 1.17%, from Canada 1.40%, from Bulgaria 1.48%, from the United States

2.45%, from Poland 2.55%, from Russia 4.67%, from Vietnam 8.24%, from the Ukraine 18.64% and from Slovakia 35.13%.

In the specification of immigrants to the Czech Republic according to groupings, EU 15 countries participated roughly by 10.1%, other countries with market economy by 4.47%, countries with transitive economy and countries of the FIS 62.63% and other countries 22.77%.

In the total number of emigrants from the Czech Republic, EU 15 countries participated roughly by 10% (10.09%), other countries with market economy 2.67%, European countries with transitory economy and the FIS countries 73.50% and other countries 13.74%.

Quantification of the structure of emigrants according to particular countries is made possible by values arranged in ascending order: Finland 0.09%, Denmark and Hungary 0.11%, Belgium and Australia 0.22%, Greece 0.28%, Netherlands 0.48%, Canada 0.62%, Italy 0.72%, France 0.09%, the United Kingdom 1.13%, Bulgaria 1.40%, Austria 1.43%, the United States 1.81%, Poland 2.69%, Vietnam 2.98%, Russia 3.96%, Germany 4.58%, the Ukraine 15.65% and Slovakia 49.69%.

In the total number of immigrants to the Czech Republic in the given time period (in descending order) participated the Ukraine (21.62%), Slovakia (20.63%), Vietnam (13.48%), Germany (5.48%), Russia (5.37%), the United States (3.08%), Poland (2.42%), Canada (2.19%), Bulgaria (1.53%), Australia (1.02%), Austria (0.92%), Italy (0.87%), the United Kingdom (0.72%), France (0.65%), Sweden (0.53%), Netherlands (0.45%), Greece (0.34%), Hungary (0.19%), Belgium (0.17%), Denmark (0.04%), Spain (0.02%) and Finland (0.01%).

From EU - 15, following countries participated in the increase by migration (in the ascending order): Finland (0.12%), Spain (0.21%), Denmark (0.40%), Belgium (1.69%), Greece (3.36%), Netherlands (4.30%), Sweden (5.10%), France (6.31%), the United Kingdom (7.12%), Italy (8.53%), Austria (9.08%) and Germany (53.72%).

As for other countries with market economy, it refers to the USA (49.02%), Canada (34.80%) and Australia (16.18%).

In the grouping of countries with transitive economy and in the FIS countries, the Ukraine participated most markedly (41.77%) in the increase by migration followed by Slovakia (39.86%), Russia (10.38%), Poland (4.66%), Bulgaria (2.96%) and Hungary (0.37%). In the grouping of other countries, it was Vietnam (42.46%). An illustration on the structure of external migration in the Czech Republic according to the grouping of countries in the given time period is given by its graphical depiction in Fig. 1–3.

II: *External migration in the Czech Republic according to particular countries in the reference period 1993–2003*
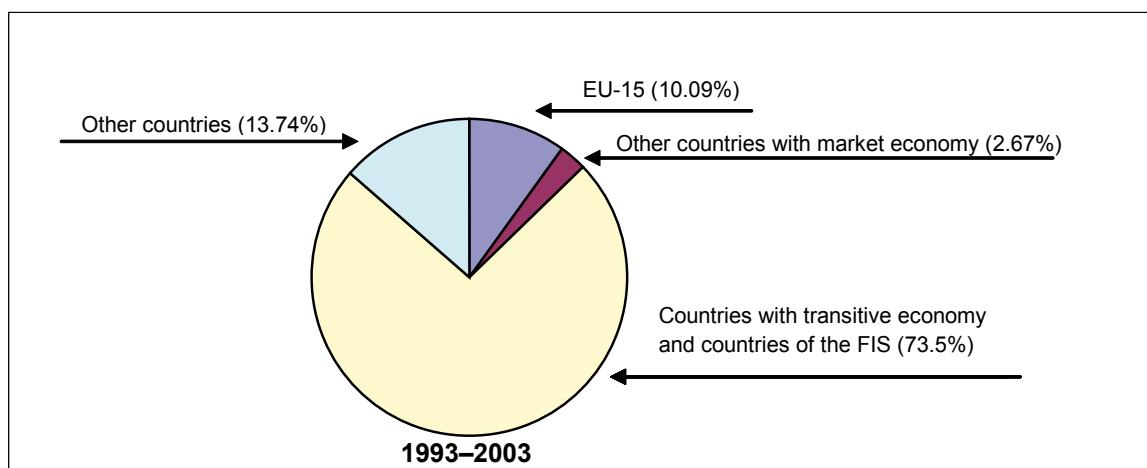
Country	Immigrants	Emigrants	Increase/decrease through migration
EU15	20 621	10 246	10 375
of this: Belgium	400	224	176
Denmark	159	109	50
Finland	109	96	13
France	1 428	772	656
Ireland	-	-	-
Italy	1 620	733	887
Luxemburg	-	-	-
Germany	10 234	4 649	5 585
Netherlands	937	490	447
Portugal	-	-	-
Austria	2 392	1 448	944
Greece	618	285	333
United Kingdom	1 886	1 146	740
Spain	156	142	22
Sweden	682	152	530
Other countries with market economy	9 102	2 692	6 410
of this: Australia	1 263	226	1 037
Canada	2 859	628	2 231
United States	4 980	1 838	3 142
Countries with transitive economy and countries of the FIS	127 416	74 607	52 809
of this: Bulgaria	3 017	1 420	1 597
Hungary	313	116	197
Poland	5 193	2 734	2 459
Russia	9 497	4 018	5 479
Slovakia	71 472	50 434	21 038
Ukraine	37 924	15 885	22 039
Other countries	46 298	13 942	32 356
of this: Vietnam	16 769	3 022	13 749
Total	203 437	101 487	101 950

III: *Structure of external migration in the Czech Republic according to particular countries in the reference period 1993–2003*

Country	Immigrants		Emigrants		Increase/decrease through migration	
	%	%	%	%	%	%
EU-15	100.00	10.13	100.00	10.09	100.00	10.20
of this: Belgium	1.94	0.20	2.19	0.22	1.69	0.17
Denmark	0.77	0.08	1.06	0.11	0.46	0.04
Finland	0.53	0.05	0.94	0.09	0.12	0.01
France	6.92	0.70	7.53	0.76	6.31	0.65
Ireland	-	-	-	-	-	-
Italy	7.86	0.80	7.15	0.72	8.53	0.87
Luxemburg	-	-	-	-	-	-
Germany	49.63	5.03	45.38	4.58	53.72	5.48
Netherlands	4.54	0.46	4.78	0.48	4.30	0.45
Portugal	-	-	-	-	-	-
Austria	11.60	1.17	14.14	1.43	9.08	0.92
Greece	3.00	0.30	2.78	0.28	3.36	0.34
United Kingdom	9.15	0.93	11.19	1.13	7.12	0.72
Spain	0.76	0.08	1.38	0.14	0.21	0.02
Sweden	3.30	0.33	1.48	0.15	5.10	0.53
Other countries with market economy	100.00	4.47	100.00	2.67	100.00	6.29
of this: Australia	13.88	0.62	8.39	0.22	16.18	1.02
Canada	31.41	1.40	23.33	0.62	34.80	2.19
United States	54.71	2.45	68.28	1.81	49.02	3.08
Countries with transitive economy and countries of the FIS	100.00	62.63	100.00	73.50	100.00	51.76
of this: Bulgaria	2.37	1.48	1.90	1.40	3.02	1.53
Hungary	0.25	0.15	0.16	0.11	0.37	0.19
Poland	4.07	2.55	3.66	2.69	4.66	2.42
Russia	7.45	4.67	5.38	3.96	10.38	5.37
Slovakia	56.10	35.13	67.60	49.69	39.84	20.63
Ukraine	29.76	18.64	21.30	15.65	41.73	21.62
Other countries	100.00	22.77	100.00	13.74	100.00	31.75
of this: Vietnam	36.22	8.24	21.67	2.98	42.49	13.48
Total	x	100.00	x	100.00	x	100.00
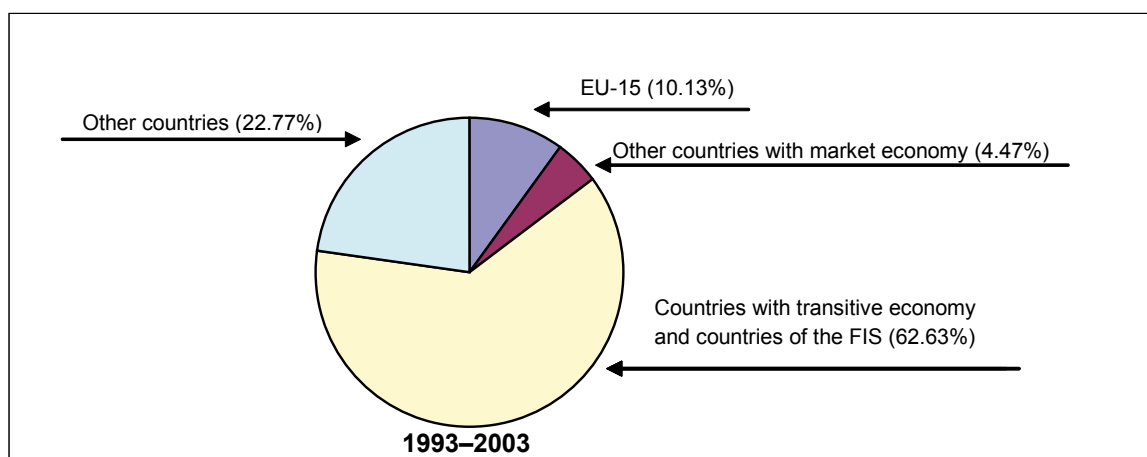
1: *Immigrants structure in the Czech Republic according to the grouping of countries in the reference period 1993–2003*

2: *Emigrants structure in the Czech Republic according to the grouping of countries in the reference period 1993–2003*
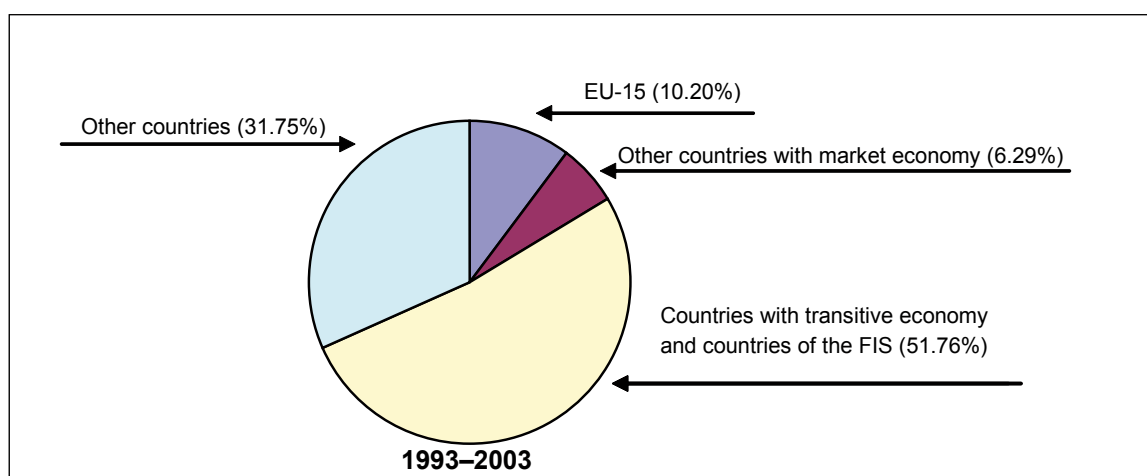
3: *Increase/decrease migration structure in the Czech Republic according to the grouping of countries in the reference period 1993–2003*

Selected most suitable analytical functions obtained in the study of trends of time series of population movement are presented in Tables IV, V and VI.

Developmental trends expressed by the selected functions were used also for short-time point extrapolation prediction.

Results of the study of developmental trends of emigrants from the Czech Republic according to groups of countries as well as of increases by migration presented in Tabs. IV and V show the same interpretation. It is also possible to state the differentiated intensity of the dependence of both phenomena on a time variable. Differences in selected most suitable analytical functions are also marked. While the degree of dependence of emigrants from the Czech Republic on the time variable (%) ranges in an interval $\langle 74.67^{++}, 95.28^{++}\rangle$, in the indicator of increase through migration a statistics (the percentage value of the coefficient of determination) is given in an interval $\langle 11.01, 91.43^{++}\rangle$.

IV: *Parameters of development functions of time series of immigrants to the Czech Republic according to particular countries in the reference period 1993–2003*

Country	Model type	Model parameters			I_{yt}^2 (%)
		a_{yt}	b_{yt}	c_{yt}	
EU-15	2	3662.4545	−877.5804	75.6014	70.37[++]
in this: France	2	226.6303	−88.3343	9.4172	75.27[++]
Italy	2	259.2667	−61.6524	5.5536	68.26[++]
Germany	2	1943.6606	−376.7049	27.1072	80.80[++]
Austria	2	436.7636	−98.0993	8.0280	69.02[++]
United Kingdom	2	241.9151	−87.7042	9.9079	77.30[++]
Other countries with market economy	2	1471.2606	−327.1860	28.6806	61.62[++]
in this: Canada	2	609.7151	−116.2210	7.5548	82.37[++]
United States	2	615.1636	−169.7371	18.6084	74.67[++]
Countries with transitive economy and countries of the FIS	2	19433.3091	−8087.7636	884.2727	82.63[++]
of this: Slovakia	2	13603.9273	−5196.1965	523.2762	80.91[++]
Ukraine	2	3845.6303	−2198.5440	278.1165	83.36[++]
Other countries	2	3215.0788	−969.6091	148.0757	69.74[++]
of this: Vietnam	2	776.2333	−301.6899	66.4924	63.22[++]
Total	2	27782.1030	−10262.1392	1136.6305	80.32[++]

Type of the function: (2) – quadratic
Determination index significant on the level: $\alpha = 0.05$, ++ $\alpha = 0.01$

Indices of the dynamics of actual values of the population movement achieved in the analysed time period are presented in Table VII.

On the basis of values of basic indices included in Table VII it is possible to state not only the percentage increase of assessed indicators as against the basic period until 2003 but also changes between particular years. These reached a decrease in immigrants as against the previous year in 1998 amounting to −16.70%, in 1999 a value −7.63% and in 2000 a value −21.27%.

In emigrants, a decrease occurred in 1994 as against 1993 amounting to −96.43% and in 1999 as against the previous period by −8.46%. A decrease in migration occurred as against the previous period in 1998 (−21.43%), in 1999 (−7.53%) and in 2000 (−25.47%).

From the analytical point of view and the intention of study in the field of external migration according to countries, fitted (theoretical) values of immigrants and increases by migration presented in Table VIII can be considered to be significant. Values of basic

indices included in Table IX make possible to assess their dynamics.

For description of developmental trends of to the Czech Republic the selected functions $y' = 27\,782.10303 - 10\,262.13916\ t + 1\,136.630536\ t^2$

($I_{yt} = 0.8962^{++}$) were used for total immigration and $y' = 14\,341.096 - 7615.242657\ t + 882.0967366\ t^2$ ($I_{yt} = 0.9575^{++}$) for total number of emigrants. Both functions we used also for short-time point extrapolation prediction.

V: *Parameters of development functions of time series of emigrants from the Czech Republic according to particular countries in the reference period 1993–2003*

Country	Model type	Model parameters			I_{yt}^2 (%)
		a_{yt}	b_{yt}	c_{yt}	
EU-15	3	87.3039	0.3100	-	94.09++
in this: France	2	72.1333	–47.9783	6.2156	84.07++
Italy	2	37.0000	–21.6259	3.4650	88.89++
Germany	3	71.1411	0.2467	-	95.28++
Austria	3	15.1806	0.2888	-	89.74++
United Kingdom	3	1.3009	0.5186	-	87.68++
Other countries with market economy	2	207.3454	–123.9150	16.9755	92.39++
in this: Canada	2	609.7151	–116.2210	7.5548	82.37++
United States	2	615.1636	–169.7371	18.6084	74.49++
Countries with transitive economy and countries of the FIS	2	12581.1939	–6480.3944	719.0116	91.56++
of this: Slovakia	2	10580.7273	–6001.9196	522.0804	93.00++
Ukraine	2	1320.1030	–975.6357	129.9522	84.38++
Other countries	2	995.0970	–733.4699	101.5967	81.87++
of this: Vietnam	2	203.6333	–175.5864	27.6439	79.78++
Total	2	14341.0970	–7615.2427	882.0967	91.68++

Type of the function: (2) – quadratic, (3) – exponential

Graphic depiction of fitted values of immigrants into a defined territorial unit and of an increase through migration according to countries is presented in Figs 4–5.

It is based on a condition that patterns determined in the period of observation will be in force also in the near future. According to prediction based on the method of extrapolation of values of time series it is possible to expect the number of immigrants from all countries amounting to 106 892 in 2006, the number of emigrants from the Czech Republic amounting to 80 619 persons and a total increase through migration 26 273 persons.

As against the actual number of indicators in 2003, an increase of immigrants by 78.1% would occur in the predicted year, of emigrants by 135.5% and an increase through migration by 1.9%.

In comparing the predicted values of assessed indicators which could reach the number of immigrants 106 892 persons in 2006, of emigrants 80 619 persons and an increase in the number of inhabitants of the Czech Republic through migration 26 273 persons with mean values for the period 1993–2003 in the same order of assessed indicators of external migration ($\bar{y}_1$ 18 494; $V_y = 92{,}74$ %; $\bar{y}_2 = 9\,226$; $V_y = 145{,}66$ %; $\bar{y} = 9\,268$; $V_y = 50{,}66$ %), an increase occurred in the number of immigrants by 477.98%, in the number of emigrants by 773.82% and an increase of population through migration by 183.48%, ie about 2.8-times.

VI: *Parameters of development functions of time series of increase/decrease through migration in the Czech Republic according to particular countries in the reference period 1993–2003*

Country	Model type	Model parameters			I_{yt}^2 (%)
		a_{yt}	b_{yt}	c_{yt}	
EU-15	2	3123.7333	−598.6832	30.7471	84.18[++]
in this: France	2	153.5697	−39.9846	3.1911	26.28
Italy	4	183.7439	−64.2877	-	69.40[++]
Germany	2	1796.4485	−339.1315	16.2584	91.43[++]
Austria	2	391.6788	−80.8105	3.9289	85.32[++]
United Kingdom	4	116.7871	−29.0052	-	39.24[+]
Other countries with market economy	2	1262.9879	−202.8993	11.6946	61.48[++]
in this: Canada	2	588.8242	−108.3930	5.7646	86.34[++]
United States	2	434.2121	−56.6154	4.1725	16.65
Countries with transitive economy and countries of the FIS	2	6796.0364	−1595.4599	164.6678	11.01
of this: Slovakia	2	1174.0436	181.7403	−11.1070	39.93[+]
Ukraine	2	3452.1167	−1685.1856	208.3144	55.23[+]
Other countries	2	2255.4667	−248.7406	47.3928	29.89
of this: Vietnam	5	183.0365	1.0555	-	57.24[++]
Total	2	13440.0788	−2646.5252	254.5233	11.70

Type of the function: (2) – quadratic, (4) – logarithmic, (5) – power

VII: *Basic (i_b) and chain (i_{ch}) indices of selected indicators of the population movement in the Czech Republic in the period 1993 to 2003*

Indices	Immigrants		Emigrants		Increase by migration	
	i_b	i_{ch}	i_b	i_{ch}	i_b	i_{ch}
1993	100.00	-	100.00	-	100.00	-
1994		79.12		3.57		181.55
1995	81.70	103.26	7.29	204.15	182.60	100.57
1996	84.16	103.07	9.81	134.56	184.97	101.30
1997	99.84	118.63	10.84	110.58	220.51	119.21
1998	83.17	83.30	16.72	154.16	173.26	78.56
1999	76.82	92.37	15.30	91.54	160.23	92.47
2000	60.48	78.73	17.01	111.18	119.41	74.53
2001	100.14	165.57	289.18	1699.84	.	.
2002	346.35	345.87	436.27	150.86	224.43	187.95
2003	465.23	134.32	461.02	105.67	470.94	209.84

i_b– basic indices, i_{ch}– chain indices

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VIII: *Fitted values of indicators of external migration according to country grouping in the Czech Republic in the reference period 1993–2003*

| Year	Immigrants				
	EU 15	Other countries with market economy	Countries with transitive economy and countries of the FIS	Other countries	Total
1993	2 860	1 173	12 230	2 393	18 657
1994	2 210	932	6 795	1 863	11 804
1995	1 710	748	3 128	1 639	7 225
1996	1 362	621	1 231	1 706	4 920
1997	1 164	552	1 101	2 069	4 887
1998	1 119	541	2 740	2 728	7 128
1999	1 224	586	6 148	3 683	11 642
2000	1 480	689	11 325	4 935	18 429
2001	1 888	850	18 270	6 483	27 490
2002	2 447	1 067	26 983	8 327	38 824
2003	3 157	1 343	37 465	10 467	52 431
	Increase by migration				
1993	2 555	1 071	5 365	2 054	11 048
1994	2 049	902	4 263	1 947	9 165
1995	1 604	759	3 491	1 935	7 791
1996	1 220	638	3 049	2 018	6 926
1997	898	540	2 935	2 196	6 570
1998	638	465	3 151	2 469	6 723
1999	439	415	3 696	2 836	7 386
2000	302	387	4 571	3 298	8 557
2001	226	384	5 774	3 855	10 237
2002	211	403	7 308	4 507	12 427
2003	258	446	9 170	5 253	15 125
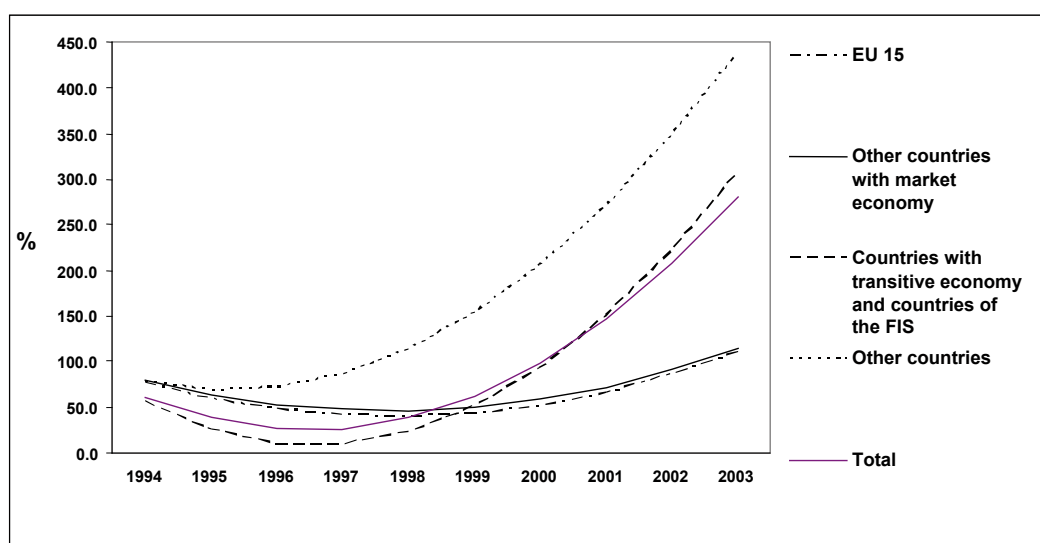
4: *Development functions of immigrants in the Czech Republic according to the grouping of countries in the reference period 1993–2003*

IX: *Dynamics of fitted values of indicators of external migration according to country grouping in the Czech Republic in the reference period 1993 to 2003 (1993 = 100)*

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Immigrants										
EU 15	77.2	59.8	47.6	40.7	39.1	42.8	51.8	66.0	85.5	110.4
Other countries with market economy	79.4	63.8	53.0	47.1	46.1	50.0	58.8	72.5	91.0	114.5
Countries with transitive economy and countries of the FIS	55.6	25.6	10.1	9.0	22.4	50.3	92.6	149.4	220.6	306.3
Other countries	78.0	68.5	71.3	86.4	114.0	153.9	206.2	270.8	347.9	437.3
Total	60.0	38.7	26.4	26.2	38.2	62.3	98.8	147.3	208.1	281.0
Increase/decrease by migration										
EU-15	80.2	62.8	47.8	35.2	25.0	17.2	11.8	8.9	8.3	10.1
Other countries with market economy	84.3	70.9	59.6	50.5	43.5	38.8	36.2	35.8	37.6	41.8
Countries with transitive economy and countries of the FIS	79.5	65.1	56.8	54.7	58.7	68.9	85.2	107.6	138.2	170.9
Other countries	94.8	94.2	98.3	106.9	120.2	138.9	160.6	187.7	219.4	255.8
Total	83.0	70.5	62.7	59.5	60.9	66.8	77.5	92.7	112.5	136.9
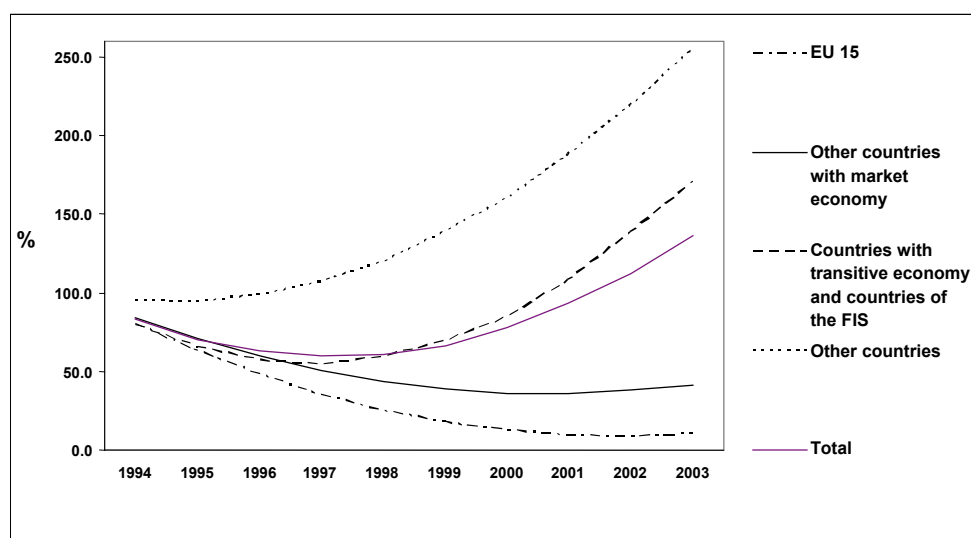
5: *Development functions of increase/decrease migration structure in the Czech Republic according to the grouping of countries in the reference period 1993–2003*

SUMMARY

If we proceed from an aspect that an increase or decrease of population derived from the difference between the number of live births and deaths in the studied time series and an increase/decrease through migration rank among the important indicators of the population movement it is very important to study time series of both phenomena both from the viewpoint of average level and structure according to defined territorial units and, last but not least, from the viewpoint of their developmental trends.

The fundamental objective of the paper was to contribute to the general knowledge of the average level, structure and trends of external migration in the Czech Republic according to countries in the reference period 1993 to 2003.

According to the conception of the analysis and the aim of research, results of the exact evaluation of assessed phenomena can be presented in two separate mutually conditioned units. The first of them (Table II) is aimed at the quantification of the number of immigrants, emigrants and increases by migration in the Czech Republic according to countries in the defined time interval and their structure (Table III). Data included in Tabs. IV to VI are aimed at the evaluation of developmental trends of assessed phenomena.

Percentage values included in Tab. III demonstrate how particular groups of countries participated in the number of immigrants to the Czech Republic and in the number of emigrants from the given territorial unit to selected countries as well as in an increase through migration in the studied territorial sphere with differentiation according to particular countries.

From EU 15 countries, Ireland, Luxembourg and Portugal did not participated in immigrated persons. The lowest proportion showed Finland (0.53%) and then Denmark and Spain (0.77%), Belgium (l.94%), Greece (3.00%), Sweden (3.30%), Netherlands (4.54%), France (6.92%), Italy (7.86%), the United Kingdom (9.15%), Austria (11.60%) and Germany (49.63%) followed in an increasing order. From other countries with market economy, the proportion of immigrants was as follows: USA (54.71%), Canada (31.41%) and Australia (13.88%). In the total number of immigrants to the Czech Republic coming from countries with transitive economy and the FIS, particular countries participated as follows: Slovakia (56.10%), the Ukraine (29.76%), Russia (7.45%), Poland (4.07%), Bulgaria (2.37%) and Hungary (0.25%). As for other countries, it was most markedly Vietnam (36.22%).

In the total number of immigrants to the Czech Republic particular countries participated (in ascending order) throughout the whole reference period as follows: Finland (0.05%), Denmark and Spain (0.08%), Hungary (0.15%), Belgium (0.20%), Greece (0.30%), Sweden (0.33%), Netherlands (0.46%), Australia (0.20%), France (0.70%), Italy (0.80%), the United Kingdom (0.93%), Austria (1.17%), Canada (1.40%), Bulgaria (1.48%), the United States (2.45%), Poland (2.55%), Russia (4.67%), Germany (5.03%), Vietnam (8.24%), the Ukraine (18.64%), Slovakia (35.13%).

In the total number of emigrants from the Czech Republic, particular countries with transitive economy and the FIS participated by 73.50%, of this Slovakia 49.69% and the Ukraine 15.65%. Some 13.74% inhabitants emigrated to other countries, to EU 15 countries 10.09% (of this to Germany 4.58%) and to other countries with market economy (Australia, Canada and the USA) only 2.67%.

In the increase of population through migration, countries with transitive economy and the FIS countries participated by 51.76%, viz the Ukraine 21.62% and Slovakia 20.63%.

From EU 15 countries, the proportion of this indicator reached following values (in ascending order): Finland (0.12%), Spain (0.21%), Denmark (0.40%), Belgium (1.69%), Greece (3.36%), the Netherlands (4.30%), Sweden (5.10%), France (6.31%), the United Kingdom (7.12%), Italy (8.53%), Austria (9.08%) and Germany (53.72%). The total proportion of EU 15 countries in the increase by migration amounts to 10.20%.

In the total number of immigrants to the Czech Republic particular countries participated (in descending order) throughout the analysed period as follows: the Ukraine (21.62%), Slovakia (20.63%), Vietnam (13.48%), Germany (5.48%), Russia (5.37%), the United States (3.08%), Poland (2.42%), Canada (2.19%), Bulgaria (1.33%), Australia (1.02%), Austria (0.92%), Italy (0.87%), the United Kingdom (0.72%), France (0.65%), Sweden (0.53%), the Netherlands (0.45%), Greece (0.34%), Hungary (0.19%), Belgium (0.17%), Denmark (0.04%), Spain (0.02%) a Finland (0.01%).

Providing that patterns found in the period of observation are in force in the nearest future it is possible, on the basis of the most suitable models of developmental trends of the overall migration and the number of emigrants, to expect according to prediction based on the method of extrapolation for 2006, the total number of immigrants amounting to 106 892 persons, the number of emigrants from the Czech Republic 80 619 persons and an increase through migration 26 273 persons. As against reality achieved in 2003, an increase of immigrants would be 78.1%, that of emigrants 135.5% and through migration 1.9%.

SOUHRN

Analýza pohybu obyvatelstva České republiky zahraniční migrací v období let 1993–2003

Vycházíme-li z aspektu, že k významným indikátorům pohybu obyvatelstva patří jeho přirozený přírůstek, resp. úbytek odvozený z rozdílu mezi počtem živě narozených a zemřelých v pozorované časové řadě a přírůstek/úbytek stěhováním, jeví se vysoce aktuálním nezbytnost studia časových řad obou jevů a to jak z hlediska průměrné úrovně, tak i struktury podle definovaných zájmových územních celků a v neposlední řadě i z hlediska jejich vývojových tendencí.

Přispět k všestrannému poznání průměrné úrovně, struktury a trendu zahraničního stěhování v České republice podle zemí v referenčním období let 1993 až 2003 bylo stěžejním záměrem prezentované stati. V souladu s koncepcí předmětné analýzy a vytyčeného cíle zkoumání lze výsledky exaktního hodnocení posuzovaného jevu prezentovat ve dvou samostatných, vzájemně se podmiňujících a doplňujících celcích. První z nich (Tab. II) je zaměřen na kvantifikaci počtu přistěhovalých, vystěhovalých a přírůstku stěhováním v České republice podle zemí v již definovaném časovém intervalu a jejich struktury (Tab. III). Na hodnocení vývojových tendencí posuzovaných jevů jsou zaměřeny údaje obsažené v tabelárních přehledech (Tab. IV až VI).

Do jaké míry se jednotlivá seskupení zemí podílela na počtu přistěhovalých do České republiky a počtu vystěhovalých z daného územního celku do vybraných zemí, jakož i přírůstku stěhováním v zájmové územní sféře s diferenciací podle jednotlivých zemí, poskytují procentuální hodnoty obsažené v Tab. III. Ze zemí EU 15 se u přistěhovalých nepodílelo Irsko, Lucembursko a Portugalsko. Nejnižší podíl pak u Finska (0,53 %) v následném vzestupném pořadí u Dánska a Španělska (0,77 %), Belgie (l,94 %), Řecka (3,00 %), Švédska (3,30 %), Nizozemska (4,54 %), Francie (6,92 %), Itálie (7,86 %), Spojeného království (9,15 %), Rakouska (11,60 %) a Německa (49,63 %). Z ostatních zemí s tržní ekonomikou se za celé posuzované období na počtu přistěhovalých podílely Spojené státy (54,71 %), Kanada (31,41 %) a Austrálie (13,88 %). Na celkovém počtu přistěhovalých do České republiky ze zemí s tranzitivní ekonomikou a zemí SNS nejvíce podílelo Slovensko (56,10 %), v následném sestupném pořadí Ukrajina (29,76 %), Rusko (7,45 %), Polsko (4,07 %), Bulharsko (2,37 %) a Maďarsko (0,25 %). Z ostatních zemí pak nejvýrazněji Vietnam (36,22 %).

Na celkovém počtu přistěhovalých do České republiky se za celé referenční období podílelo ve vzestupném pořadí Finsko (0,05 %), Dánsko a Španělsko (0,08 %), Maďarsko (0,15 %), Belgie (0,20 %), Řecko (0,30 %), Švédsko (0,33 %), Nizozemsko (0,46 %), Austrálie (0,62 %), Francie (0,70%), Itálie (0,80 %), Spojené království (0,93 %), Rakousko (1,17 %), Kanada (1,40 %), Bulharsko (1,48 %), Spojené státy (2,45 %), Polsko (2,55 %), Rusko (4,67 %), Německo (5,03 %), Vietnam (8,24 %), Ukrajina (18,64 %), a Slovensko (35,13 %).

Na celkovém počtu vystěhovalých z České republiky se během posuzovaného časového intervalu podílely země s tranzitivní ekonomikou a země SNS (73,50 %) z toho Slovensko 49,69 % a Ukrajina 15,65 %. Do ostatních zemí se vystěhovalo 13,74 % obyvatel, do zemí EU 15 dosáhl podíl 10,09 % (z toho do Německa 4,58 %) a do ostatních zemí s tržní ekonomikou (Austrálie, Kanady a Spojených států) pouze 2,67 %.

Na přírůstku stěhováním se v České republice v definovaném časovém intervalu nejvýrazněji podílely země s tranzitivní ekonomikou a země SNS (51,76 %) z toho Ukrajina (21,62 %) a Slovensko (20,63 %). Ze zemí EU 15 dosáhl podíl tohoto indikátoru ve vzestupném pořadí hodnot: Finsko (0,12 %), Španělsko (0,21 %), Dánsko (0,40 %), Belgie (1,69 %), Řecko (3,36 %), Nizozemí (4,30 %), Švédsko (5,10 %), Francie (6,31 %), Spojené království (7,12 %), Itálie (8,53 %), Rakousko (9,08 %) a Německo (53,72 %). Celkový podíl zemí EU 15 na přírůstku stěhováním je roven hodnotě 10,20 %.

Na celkovém počtu přistěhovalých do České republiky se v analyzovaném období podílely (v sestupném pořadí) Ukrajina (21,62 %), Slovensko (20,63 %), Vietnam (13,48 %), Německo (5,48 %), Rusko (5,37 %), Spojené státy (3,08 %), Polsko (2,42 %), Kanada (2,19 %), Bulharsko (1,33 %), Austrálie (1,02 %), Rakousko (0,92 %), Itálie (0,87 %), Spojené království (0,72 %), Francie (0,65 %), Švédsko (0,53 %), Nizozemsko (0,45%), Řecko (0,34 %), Maďarsko (0,19 %), Belgie (0,17 %), Dánsko (0,04 %), Španělsko (0,02 %) a Finsko (0,01 %).

Za předpokladu, že zákonitosti zjištěné v období pozorování budou platit i v nejbližší budoucnosti, lze na podkladě nejvhodnějších modelů vývojových tendencí celkové migrace a počtu vystěhovalých očekávat podle predikace, založené na metodě extrapolace na rok 2006 celkový počet přistěhovalých ve výši 106 892 osob, počet vystěhovalých osob z České republiky (80 619 osob) přírůstek stěhováním 26 273 osob. Proti skutečnosti, dosažené v roce 2003, by došlo k nárůstu přistěhovalých o 78,1 %, vystěhovalých o 135,5 % a přírůstku stěhováním o 1,9 %.

pohyb obyvatelstva, indikátory mechanické měny, seskupení zemí, specifikace, struktura migrace, vývojové tendence indikátorů, Česká republika

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