DEVELOPMENT OF THE RATE OF EMPLOYMENT AND UNEMPLOYMENT OF MALES AND FEMALES IN COUNTRIES OF EU15

M. Palát, J. Klíma

Received: December 15, 2004

Abstract

PALÁT, M., KLÍMA, J.: *Development of the rate of employment and unemployment of males and females in countries of EU15*. Acta univ. agric. et silvic. Mendel. Brun., 2005, LIII, No. 3, pp. 145-162

The paper is focused on the evaluation the rates of employment and unemployment of women, men and as a whole in countries of EU15. Rates of employment were evaluated in the period 1993–2002. Rates of unemployment were evaluated in the period 1994–2003. Employment of males in fifteen countries of EU is higher then employment of females. Unemployment of females in fifteen countries of EU is higher than unemployment of males and in opposite unemployment of females in Sweden is lower than unemployment of males. Trends of rates of male, female and total employment and unemployment are evaluated. Methods of regression and correlation analysis, development trends and cluster analysis were applied for the mathematical-statistical analysis.

rate of employment, rate of unemployment, countries of EU, statistical processing, development trends

Work as a conscious and useful activity of man belongs to primary production factors. On the market of work, the offer of work of households can be accepted by demanding firms and thus an employment originates in dependent activities or as a household involved in an individual business. From the macroeconomic point of view, employment originates expressed by an indicator of the rate of employment. If part of the offer of work of households is not accepted by demanding firms then unemployment originates expressed by an indicator of the rate of unemployment. Unemployment as one of accompanying phenomena of functioning the market economy has become a serious economic, social and political problem even in modern economics. Therefore, governments try to reduce already often high unemployment by specific tools of macroeconomic policy based on economic theories. Particularly the policy of employment

is an important tool balancing the imbalance on the labour market. Its task is to achieve dynamic balance between labour offer and labour demand and to ensure the productive use of labour sources. However, it is necessary to emphasize that governments do not affect the labour market directly on the level of enterprises but they try to create such conditions the labour market to operate better. It refers particularly to the improvement of services associated with labour market, offering sufficient information and surveys on vacancies, the use of public costs within regional policy, governmental retraining programmes and the creation of public job opportunities. Further it refers to legislative measures, tax, wage and social policy including pension policy and other forms of employment policy. Thus, employment policy can only support or modify the development on the labour market but it cannot modify it in principle.

As a matter of fact, practical macroeconomic policy including employment policy based on theoretical findings of various trends in economic theories does not bring necessary results in the field of reducing the unemployment to a tolerable level. Actually it appears that it is generally little effective or even ineffective. The problem can also consist in a fact that governments of countries with unused production factors deal particularly with problems of unemployment while they ought to shift the main stress to measures of macroeconomic policy maximizing the production and supporting free market. Naturally, civilizational progress is also of great importance. It reduced the need of human labour thus it lowered the rate of employment. The trend will continue certainly also in the future. However, rich countries reaching the high level of productivity can rather afford to keep part of population unemployed (thanks to direct support) than artificially create so-called full employment using various methods. It is necessary to stress that unemployment is not the only problem of present economies and its solution is always related to the improvement of whole economics.

MATERIAL A METHODS

Factographic material, i.e. the rate of male and female employment measured as the proportion of employed persons aged 15–64 years in the whole male and female population of the same age group and the rate of total employment measured as the proportion of employed persons aged 15–64 years in the whole population of the same age group and the rate of female and male unemployment measured as the proportion of unemployed persons in the whole active population of females and males and the rate of total unemployment measured as the proportion of unemployed persons in the whole active population for the reference period was obtained from the archive of structural indicators (SI) of an international comparison compiled by Eurostat. The evaluation is applied to fifteen states of EU (Belgium, Denmark, Finland, France, Ireland, Italy, Luxemburg, Germany, Netherlands, Portugal, Austria, Greece, Spain, Sweden, United Kingdom). Rates of employment were evaluated in the period 1993–2002. Rates of unemployment were evaluated in the period 1994–2003. Problems of unemployment were dealt by Dufek (2002) Klíma, Maca (2002), Sojka, Klíma (2003). Problems of the employment were dealt by Jírová (1999) and development of the rate of employment and unemployment of males and females in associated countries of EU Klíma, Palát (2004). Mathematical-statistical processing of the data comes from the methodology given in papers of Minařík (1995–1996) and Seger et al. (1998) and Klíma, Palát (2003a, 2003b) Palát (2003, 2004) and Palát, Palát (2004).

RESULTS AND DISCUSSION

Rates of male, female and total employment in associated states of EU in the reference periods are given in Figures 1, 2 and 3, respectively. Rates of male, female and total unemployment in the reference periods are given in Figures 4, 5 and 6, respectively.

Parameters of models of development trends of rates of male, female and total employment in the reference periods are given in Table I. Models of development trends of the rates of male, female and total unemployment in the reference periods are given in Table II. An equation for the linear model is $y_t = a_{yt} + b_{yt}t$. An equation for the quadratic model is $y_t = a_{yt} + b_{yt}t + c_{yt}t^2$. An equation for the cubic model is $y_t = a_{yt} + b_{yt}t + c_{yt}t^2 + d_{yt}t^3$ is used only for unemployment. Most of correlation indices I_{yt} are significant on the level of $\alpha = 0.01$ or $\alpha = 0.05$.

Linear trends of the rate of employment are decreasing in Luxemburg for variables males (y_{19}), in Germany for variables males (y_{22}), in Austria for variables males (y_{31}) and in Greece for variable males (y_{35}). Other linear trends are increasing – see negative or positive regression coefficients byt in Table I. The quadratic models show nonlinear in the reference period. Selected developmental trends in the reference period are given in graphical form in Figs. 7–21. Employment of males in all fifteen states of EU is higher than employment of females in the reference period.

Linear trends of the rate of unemployment are increasing in Germany for variables males (y_{67}) and total (y_{69}), in Austria for variables males (y_{76}) and total (y_{77}) and in Greece for variables males (y_{79}), females (y_{80}) and total (y_{81}). Other linear trends are decreasing – see negative or positive regression coefficients byt in Table II. Selected developmental trends of the rate of unemployment in the reference period are given in graphical form in Figs. 22–36. Unemployment of females in all countries of EU15 is higher than unemployment of males except of unemployment of females in Sweden which is lower than unemployment of males.

Cluster analysis were used for evaluation employment and unemployment of males and females in twenty five countries of EU. In dendrogram of the year 2000 (Figure 37) we can find three clusters: (1) – Belgium, Slovenia, France, Germany, Czech Republic, Finland, Ireland, Cyprus, Portugal, Austria, Luxemburg; (2) – Sweden, United Kingdom, Netherlands, Denmark; (3) – Greece, Spain, Italy, Hungary, Malta, Lithuania, Latvia, Estonia, Poland, Slovakia. In dendrogram of the year 2002 (Figure 38) we can find three clusters: (1) – France, Estonia, Belgium, Germany, Czech Republic, Slovenia, Ireland, Luxemburg, Italy, Greece, Hungary, Malta, Lithuania,

Latvia, Spain; (2) – Poland, Slovakia; (3) – Denmark, Netherlands, Sweden, United Kingdom, Austria, Cyprus, Portugal, Finland. In 2002 it is possible to

notice the convergence of the rate of employment and unemployment between ten new countries of EU and the countries of EU15.

1: Rates of the male employment in fifteen states of EU in the reference period 1993–2002

2: Rates of the female employment in fifteen states of EU in the reference period 1993–2002

3: Rates of the total employment in fifteen states of EU in the reference period 1993–2002

4: Rates of the male unemployment in fifteen states of EU in the reference period 1994–2003

5: Rates of the female unemployment in fifteen states of EU in the reference period 1994–2003

6: Rates of the total unemployment in fifteen states of EU in the reference period 1994–2003

I: Models of development trends of the rate of employment of males, females and total in the reference period 1993–2002

Rates of employment		Model type	Model parameters			I_{yt}
			a_{yt}	b_{yt}	c_{yt}	
Belgium	Males (y_1)	1	−461.4048	0.2648	-	0.8193 ⁺⁺
		2	66038.5618	−66.3185	0.0167	0.8296 ⁺⁺
Belgium	Females (y_2)	1	−1834.7024	0.9424	-	0.9563 ⁺⁺
		2	93381.1589	−94.3928	0.0239	0.9583 ⁺⁺
Belgium	Total (y_3)	1	−1131.0552	0.5952	-	0.9358 ⁺⁺
		2	81993.9032	−82.6340	0.0208	0.9395 ⁺⁺
Denmark	Males (y_4)	1	−683.1418	0.3818	-	0.7174 ⁺
		2	−522103.33	522.4557	−0.1307	0.9490 ⁺⁺
Denmark	Females (y_5)	1	−1188.3297	0.6297	-	0.9110 ⁺⁺
		2	92516.1688	−93.1923	0.0235	0.9151 ⁺⁺
Denmark	Total (y_6)	1	−927.7818	0.5018	-	0.9491 ⁺⁺
		2	−214029.94	213.8711	−0.0534	0.9829 ⁺⁺
Finland	Males (y_7)	1	−2010.5800	1.0400	-	0.9717 ⁺⁺
		2	−206044.56	205.3298	−0.0511	0.9792 ⁺⁺
Finland	Females (y_8)	1	−1706.9655	0.8855	-	0.9497 ⁺⁺
		2	373111.028	−374.4024	0.0939	0.9834 ⁺⁺
Finland	Total (y_9)	1	−1870.2485	0.9685	-	0.9799 ⁺⁺
		2	67652.4439	−68.6414	0.0174	0.9809 ⁺⁺
France	Males (y_{10})	1	−580.9848	0.3248	-	0.8655 ⁺⁺
		2	229146.172	−229.6903	0.0576	0.9485 ⁺⁺
France	Females (y_{11})	1	−1147.4412	0.6012	-	0.9615 ⁺⁺
		2	248227.433	−249.0863	0.0625	0.9941 ⁺⁺
France	Total (y_{12})	1	−871.5667	0.4667	-	0.9370 ⁺⁺
		2	234901.042	−235.6015	0.0591	0.9839 ⁺⁺
Ireland	Males (y_{13})	1	−2787.3709	1.4309	-	0.9644 ⁺⁺
		2	−144855.48	143.6771	−0.0356	0.9662 ⁺⁺
Ireland	Females (y_{14})	1	−4155.7642	2.1042	-	0.9889 ⁺⁺
		2	−115996.61	114.0853	−0.0280	0.9894 ⁺⁺
Ireland	Total (y_{15})	1	−3470.9273	1.7673	-	0.9803 ⁺⁺
		2	−133448.13	131.9074	−0.0326	0.9814 ⁺⁺
Italy	Males (y_{16})	1	−70.3291	0.0691	-	0.2059
		2	494145.332	−494.7661	0.1239	0.9559 ⁺⁺
Italy	Females (y_{17})	1	−1469.4745	0.7545	-	0.9419 ⁺⁺
		2	408109.865	−409.3383	0.1027	0.9961 ⁺⁺
Italy	Total (y_{18})	1	−810.5721	0.4321	-	0.8261 ⁺⁺
		2	446552.840	−447.4921	0.1121	0.9882 ⁺⁺
Luxemburg	Males (y_{19})	1	107.5764	−0.0164	-	0.0741
		2	314471.055	−314.7739	0.0788	0.9027 ⁺⁺
Luxemburg	Females (y_{20})	1	−1884.0867	0.9667	-	0.9105 ⁺⁺
		2	498377.026	−499.9216	0.1254	0.9583 ⁺⁺
Luxemburg	Total (y_{21})	1	−866.3042	0.4642	-	0.8220 ⁺⁺
		2	411735.761	−412.6551	0.1034	0.9435 ⁺⁺

Rates of employment		Model type	Model parameters			I_{yt}
			a_{yt}	b_{yt}	c_{yt}	
Germany	Males (y_{22})	1	572.9103	-0.2503	-	0.7329 ⁺
		2	233322.793	-233.2920	0.0583	0.8508 ⁺
Germany	Females (y_{23})	1	-903.5206	0.4806	-	0.9259 ⁺⁺
		2	227312.274	-228.0213	0.0572	0.9669 ⁺⁺
Germany	Total (y_{24})	1	-153.1091	0.1091	-	0.4570
		2	225039.959	-225.3663	0.0564	0.7527
Netherlands	Males (y_{25})	1	-2062.7521	1.0721	-	0.9743 ⁺⁺
		2	-138085.41	137.2653	-0.0341	0.9774 ⁺⁺
Netherlands	Females (y_{26})	1	-3331.8776	1.6976	-	0.9936 ⁺⁺
		2	45031.7345	-46.7267	0.0121	0.9938 ⁺⁺
Netherlands	Total (y_{27})	1	-2676.6145	1.3745	-	0.9892 ⁺⁺
		2	-35926.597	34.6662	-0.0083	0.9893 ⁺⁺
Portugal	Males (y_{28})	1	-474.3152	0.2752	-	0.7155 ⁺
		2	87184.7318	-87.4938	0.0220	0.7300 ⁺
Portugal	Females (y_{29})	1	-1762.0709	0.9109	-	0.9586 ⁺⁺
		2	78340.1617	-79.2917	0.0201	0.9601 ⁺⁺
Portugal	Total (y_{30})	1	-1167.4576	0.6176	-	0.9216 ⁺⁺
		2	72889.3235	-73.5320	0.0186	0.9242 ⁺⁺
Austria	Males (y_{31})	1	590.0422	-0.2567	-	0.8389 ⁺⁺
		2	-68535.452	68.9381	-0.0173	0.8487 ⁺⁺
Austria	Females (y_{32})	1	-782.8567	0.4217	-	0.7834 ⁺⁺
		2	537099.900	-538.0004	0.1347	0.9672 ⁺⁺
Austria	Total (y_{33})	1	-81.4389	0.0750	-	0.4098
		2	225872.522	-226.1055	0.0566	0.8119 ⁺
Greece	Males (y_{34})	1	443.4061	-0.1861	-	0.7962 ⁺⁺
		2	-22227.037	22.5128	-0.0057	0.7986 ⁺⁺
Greece	Females (y_{35})	1	-1175.9085	0.6085	-	0.9859 ⁺⁺
		2	-64653.149	64.1653	-0.0159	0.9880 ⁺⁺
Greece	Total (y_{36})	1	-449.6927	0.2527	-	0.9263 ⁺⁺
		2	-32188.313	32.0311	-0.0080	0.9292 ⁺⁺
Spain	Males (y_{37})	1	-2642.6364	1.3564	-	0.9581 ⁺⁺
		2	396357.163	-398.1436	0.1000	0.9746 ⁺⁺
Spain	Females (y_{38})	1	-3257.7691	1.6491	-	0.9803 ⁺⁺
		2	428992.014	-431.1426	0.1083	0.9937 ⁺⁺
Spain	Total (y_{39})	1	-3012.6339	1.5339	-	0.9738 ⁺⁺
		2	409589.432	-411.5854	0.1034	0.9878 ⁺⁺
Sweden	Males (y_{40})	1	-632.2933	0.3533	-	0.7827 ⁺⁺
		2	253276.670	-253.8739	0.0636	0.8602 ⁺⁺
Sweden	Females (y_{41})	1	-707.7091	0.3891	-	0.6627 ⁺
		2	609882.893	-610.9670	0.1530	0.9348 ⁺⁺
Sweden	Total (y_{42})	1	-688.7806	0.3806	-	0.7384 ⁺
		2	433072.365	-433.9243	0.1087	0.9110 ⁺⁺

Rates of employment		Model type	Model parameters			I_{yt}
			a_{yt}	b_{yt}	c_{yt}	
United Kingdom	Males (y_{43})	1	-962.2000	0.5200	-	0.9669 ⁺⁺
		2	-173257.56	173.0314	-0.0432	0.9880 ⁺⁺
United Kingdom	Females (y_{44})	1	-1004.5345	0.5345	-	0.9936 ⁺⁺
		2	-67504.501	67.1179	-0.0167	0.9967 ⁺⁺
United Kingdom	Total (y_{45})	1	-982.1067	0.5267	-	0.9841 ⁺⁺
		2	-118868.41	118.5608	-0.0295	0.9939 ⁺⁺

Type of the function: (1) – linear, (2) – quadratic

Correlation index I_{yt} significant on the level: + $\alpha = 0.05$

++ $\alpha = 0.01$

II: Models of development trends of the rate of unemployment of males, females and total in the reference period 1994–2003

Rates of unemployment		Model type	Model parameters				I_{yt}
			a_{yt}	b_{yt}	c_{yt}	d_{yt}	
Belgium	Males (y_{46})	1	286.8400	-0.1400	-	-	0.5765
		2	95598.0605	-95.5230	0.0239	-	0.6278
		3	-160691457	241266.6724	-120.7480	0.0201	0.8073
Belgium	Females (y_{47})	1	1253.1836	-0.6218	-	-	0.9226 ⁺⁺
		2	29997.8374	-29.3881	0.0072	-	0.9229 ⁺⁺
		3	-297201237	446153.1924	-223.2518	0.0372	0.9829 ⁺⁺
Belgium	Total (y_{48})	1	680.7127	-0.3364	-	-	0.8516 ⁺⁺
		2	62708.6499	-62.4110	0.0155	-	0.8574 ⁺⁺
		3	-203828304	306004.4065	-153.1329	0.0255	0.9443 ⁺⁺
Denmark	Males (y_{49})	1	403.3188	-0.1994	-	-	0.6063
		2	392238.336	-392.3293	0.0981	-	0.9681 ⁺⁺
		3	16982609.7	-25296.6254	12.5596	-0.0021	0.9689 ⁺⁺
Denmark	Females (y_{50})	1	793.4879	-0.3939	-	-	0.8612 ⁺⁺
		2	318497.556	-318.3371	0.0795	-	0.9671 ⁺⁺
		3	-123721664	185882.0111	-93.0906	0.0155	0.9892 ⁺⁺
Denmark	Total (y_{51})	1	563.8188	-0.2794	-	-	0.7547 ⁺
		2	366679.935	-366.6711	0.0917	-	0.9808 ⁺⁺
		3	-57311995.	86216.4912	-43.2325	0.0072	0.9881 ⁺⁺
Finland	Males (y_{52})	1	2016.2661	-1.0030	-	-	0.9216 ⁺⁺
		2	660117.550	-659.5996	0.1648	-	0.9980 ⁺⁺
		3	-46630194.	70329.2835	-35.3564	0.0059	0.9986 ⁺⁺
Finland	Females (y_{53})	1	1581.6109	-0.7855	-	-	0.9737 ⁺⁺
		2	68148.1776	-67.4021	0.0167	-	0.9751 ⁺⁺
		3	-167696173	251768.5732	-125.9960	0.0210	0.9881 ⁺⁺
Finland	Total (y_{54})	1	1816.5061	-0.9030	-	-	0.9584 ⁺⁺
		2	389112.893	-388.4909	0.0970	-	0.9931 ⁺⁺
		3	-108146030	162536.8159	-81.4269	0.0136	0.9970 ⁺⁺
France	Males (y_{55})	1	664.2158	-0.3279	-	-	0.8201 ⁺⁺
		2	-5387.2903	5.7282	-0.0015	-	0.8202 ⁺⁺
		3	-225138277	337959.3550	-169.1054	0.0282	0.9268 ⁺⁺

Rates of unemployment		Model type	Model parameters				I _{yt}
			a _{yt}	b _{yt}	c _{yt}	d _{yt}	
France	Females (y ₅₆)	1	975.2236	−0.4818	-	-	0.9131 ⁺⁺
		2	−148799.55	149.4057	−0.0375	-	0.9306 ⁺⁺
		3	−196287303	294578.7027	−147.3628	0.0246	0.9733 ⁺⁺
France	Total (y ₅₇)	1	800.1903	−0.3952	-	-	0.8810 ⁺⁺
		2	−79382.265	79.8477	−0.0201	-	0.8882 ⁺⁺
		3	−209242102	314060.1807	−157.1283	0.0262	0.9574 ⁺⁺
Ireland	Males (y ₅₈)	1	2347.9618	−1.1709	-	-	0.9397 ⁺⁺
		2	554547.889	−553.7864	0.1383	-	0.9807 ⁺⁺
		3	−272178755	408854.2252	−204.7196	0.0342	0.9950 ⁺⁺
Ireland	Females (y ₅₉)	1	2571.9261	−1.2830	-	-	0.9517 ⁺⁺
		2	553258.977	−552.3845	0.1379	-	0.9863 ⁺⁺
		3	−243495758	365796.7983	−183.1744	0.0306	0.9959 ⁺⁺
Ireland	Total (y ₆₀)	1	2442.3764	−1.2182	-	-	0.9453 ⁺⁺
		2	547077.921	−546.2636	0.1364	-	0.9825 ⁺⁺
		3	−269240272	404439.4907	−202.5087	0.0338	0.9955 ⁺⁺
Italy	Males (y ₆₁)	1	480.5527	−0.2364	-	-	0.8436 ⁺⁺
		2	−209809.28	210.2117	−0.0527	-	0.9683 ⁺⁺
		3	−66106144.	99129.1461	−49.5493	0.0083	0.9849 ⁺⁺
Italy	Females (y ₆₂)	1	1002.9691	−0.4945	-	-	0.8638 ⁺⁺
		2	−410499.44	411.3176	−0.1030	-	0.9765 ⁺⁺
		3	−104604234	156819.6089	−78.3660	0.0131	0.9864 ⁺⁺
Italy	Total (y ₆₃)	1	648.9188	−0.3194	-	-	0.8330 ⁺⁺
		2	−297387.75	297.9416	−0.0746	-	0.9676 ⁺⁺
		3	−83869446.	125750.4253	−62.8480	0.0105	0.9891 ⁺⁺
Luxemburg	Males (y ₆₄)	1	21.4594	−0.0097	-	-	0.0871
		2	149796.234	−149.8972	0.0375	-	0.8651 ⁺⁺
		3	−42799109.	64321.9730	−32.2227	0.0054	0.9091 ⁺⁺
Luxemburg	Females (y ₆₅)	1	68.0442	−0.0321	-	-	0.1473
		2	210357.87	−210.4802	0.0527	-	0.6281
		3	−199959453	300270.3314	−150.3007	0.0251	0.9431 ⁺⁺
Luxemburg	Total (y ₆₆)	1	34.2515	−0.0158	-	-	0.1090
		2	178553.680	−178.6695	0.0447	-	0.7897 ⁺
		3	−96262671.	144592.1007	−72.3951	0.0121	0.9409 ⁺⁺
Germany	Males (y ₆₇)	1	−326.1345	0.1673	-	-	0.5966
		2	−13942.023	13.7934	−0.0034	-	0.5974
		3	−228402886	342855.1785	−171.5530	0.0286	0.8642 ⁺
Germany	Females (y ₆₈)	1	382.1533	−0.1867	-	-	0.7039 ⁺
		2	7946.5359	−7.7567	0.0019	-	0.7042 ⁺
		3	−175353828	263232.9800	−131.7174	0.0220	0.8677 ⁺
Germany	Total (y ₆₉)	1	−30.1988	0.0194	-	-	0.0905
		2	−12133.210	12.1315	−0.0030	-	0.0974
		3	−211810706	317949.2205	−159.0911	0.0265	0.7643
Netherlands	Males (y ₇₀)	1	762.9800	−0.3800	-	-	0.8006 ⁺⁺
		2	413778.268	−413.7061	0.1034	-	0.9720 ⁺⁺
		3	−138976354	208828.9363	−104.5966	0.0175	0.9977 ⁺⁺

Rates of unemployment		Model type	Model parameters				I _{yt}
			a _{yt}	b _{yt}	c _{yt}	d _{yt}	
Netherlands	Females (y ₇₁)	1	1261.3770	−0.6285	-	-	0.9351 ⁺⁺
		2	203986.830	−203.5065	0.0508	-	0.9544 ⁺⁺
		3	−245395534	368473.1840	−184.4262	0.0308	0.9946 ⁺⁺
Netherlands	Total (y ₇₂)	1	964.8012	−0.4806	-	-	0.8843 ⁺⁺
		2	329259.005	−329.0219	0.0822	-	0.9635 ⁺⁺
		3	−179684026	269894.2346	−135.1310	0.0226	0.9963 ⁺⁺
Portugal	Males (y ₇₃)	1	569.3648	−0.2824	-	-	0.6428 ⁺
		2	319786.30	−319.7396	0.0799	-	0.7905 ⁺
		3	−327921491	492412.9302	−246.4716	0.0411	0.9762 ⁺⁺
Portugal	Females (y ₇₄)	1	532.3861	−0.2630	-	-	0.6157
		2	342442.478	−342.4305	0.0856	-	0.7975 ⁺
		3	−323402379	485640.4775	−243.0885	0.0406	0.9867 ⁺⁺
Portugal	Total (y ₇₅)	1	545.9606	−0.2703	-	-	0.6235
		2	334891.670	−334.8677	0.0837	-	0.7920 ⁺
		3	−329456888	494725.3068	−247.6325	0.0413	0.9836 ⁺⁺
Austria	Males (y ₇₆)	1	−155.1388	0.0794	-	-	0.5562
		2	22538.0089	−22.6308	0.0057	-	0.5652
		3	−119831267	179893.4538	−90.0200	0.0150	0.8566 ⁺
Austria	Females (y ₇₇)	1	188.9242	−0.0921	-	-	0.6462 ⁺
		2	−43684.494	43.8143	−0.0110	-	0.6750 ⁺
		3	−111524778	167391.3750	−83.7477	0.0140	0.9028 ⁺
Austria	Total (y ₇₈)	1	−14.0782	0.0091	-	-	0.0806
		2	−4552.7077	4.5511	−0.0011	-	0.0842
		3	−118617956	178058.6328	−89.0951	0.0149	0.8108
Greece	Males (y ₇₉)	1	−124.1709	0.0655	-	-	0.3331
		2	−230081.40	230.1958	−0.0576	-	0.8128 ⁺
		3	96831345.7	−145471.5773	72.8481	−0.0122	0.8967 ⁺
Greece	Females (y ₈₀)	1	−190.5061	0.1030	-	-	0.2364
		2	−596263.85	596.6250	−0.1492	-	0.8982 ⁺⁺
		3	101736869.	−153018.6618	76.7161	−0.0128	0.9161 ⁺⁺
Greece	Total (y ₈₁)	1	−204.2945	0.1073	-	-	0.3518
		2	−387500.6	387.6952	−0.0970	-	0.8781 ⁺⁺
		3	108767842.	−163468.6115	81.8928	−0.0137	0.9200 ⁺⁺
Spain	Males (y ₈₂)	1	2101.5921	−1.0461	-	-	0.9456 ⁺⁺
		2	403013.8686	−402.2601	0.1004	-	0.9731 ⁺⁺
		3	−293727218.0	441125.3124	−220.8294	0.0368	0.9942 ⁺⁺
Spain	Females (y ₈₃)	1	2712.9345	−1.3473	-	-	0.9635 ⁺⁺
		2	203925.5111	−202.7113	0.0504	-	0.9678 ⁺⁺
		3	−396879639.6	595871.1483	−298.2106	0.0497	0.9920 ⁺⁺
Spain	Total (y ₈₄)	1	2267.4745	−1.1273	-	-	0.9549 ⁺⁺
		2	322997.2958	−322.0985	0.0803	-	0.9703 ⁺⁺
		3	−334585437.2	502418.8375	−251.4791	0.0420	0.9944 ⁺⁺
Sweden	Males (y ₈₅)	1	1400.6939	−0.6970	-	-	0.9325 ⁺⁺
		2	92173.2849	−91.5379	0.0227	-	0.9357 ⁺⁺
		3	−275897184.1	414204.2325	−207.2809	0.0346	0.9776 ⁺⁺

Rates of unemployment		Model type	Model parameters				I_{yt}
			a_{yt}	b_{yt}	c_{yt}	d_{yt}	
Sweden	Females (y_{86})	1	1012.1461	-0.5030	-	-	0.8229 ⁺⁺
		2	-224406.4547	225.0852	-0.0564	-	0.8554 ⁺⁺
		3	-362266625.0	543697.3453	-271.9969	0.0454	0.9685 ⁺⁺
Sweden	Total (y_{87})	1	1222.1958	-0.6079	-	-	0.9015 ⁺⁺
		2	-56267.1118	56.9247	-0.0144	-	0.9031 ⁺⁺
		3	-320389981.7	480919.3185	-240.6263	0.0401	0.9738 ⁺⁺
United Kingdom	Males (y_{88})	1	1271.8855	-0.6327	-	-	0.9489 ⁺⁺
		2	315950.2006	-315.5479	0.0788	-	0.9949 ⁺⁺
		3	-35035496.8	52751.5526	-26.4747	0.0044	0.9957 ⁺⁺
United Kingdom	Females (y_{89})	1	640.1152	-0.3176	-	-	0.9721 ⁺⁺
		2	111080.1008	-110.8407	0.0277	-	0.9954 ⁺⁺
		3	-26712605.2	40154.9851	-20.1204	0.0034	0.9974 ⁺⁺
United Kingdom	Total (y_{90})	1	1003.3576	-0.4988	-	-	0.9580 ⁺⁺
		2	223396.2053	-223.0590	0.0557	-	0.9955 ⁺⁺
		3	-34042699.0	51214.7880	-25.6826	0.0043	0.9968 ⁺⁺

Type of the function: (1) – linear, (2) – quadratic, (3) – cubic

Correlation index I_{yt} significant on the level: + $\alpha = 0.05$

++ $\alpha = 0.01$

7: Rates of the employment of males, females and total in Belgium in the period 1993–2002

9: Rates of the employment of males, females and total in Finland in the period 1993–2002

8: Rates of the employment of males, females and total in Denmark in the period 1993–2002

10: Rates of the employment of males, females and total in France in the period 1993–2002

11: Rates of the employment of males, females and total in Ireland in the period 1993–2002

14: Rates of the employment of males, females and total in Germany in the period 1993–2002

12: Rates of the employment of males, females and total in Italy in the period 1993–2002

15: Rates of the employment of males, females and total in Netherlands in the period 1993–2002

13: Rates of the employment of males, females and total in Luxembourg in the period 1993–2002

16: Rates of the employment of males, females and total in Portugal in the period 1993–2002

17: Rates of the employment of males, females and total in Austria in the period 1993–2002

20: Rates of the employment of males, females and total in Sweden in the period 1993–2002

18: Rates of the employment of males, females and total in Greece in the period 1993–2002

21: Rates of the employment of males, females and total in United Kingdom in the period 1993–2002

19: Rates of the employment of males, females and total in Spain in the period 1993–2002

22: Rates of the unemployment of males, females and total in Belgium in the period 1994–2003

23: Rates of the unemployment of males, females and total in Denmark in the period 1994–2003

26: Rates of the unemployment of males, females and total in Ireland in the period 1994–2003

24: Rates of the unemployment of males, females and total in Finland in the period 1994–2003

27: Rates of the unemployment of males, females and total in Italy in the period 1994–2003

25: Rates of the unemployment of males, females and total in France in the period 1994–2003

28: Rates of the unemployment of males, females and total in Luxembourg in the period 1994–2003

29: Rates of the unemployment of males, females and total in Germany in the period 1994–2003

32: Rates of the unemployment of males, females and total in Austria in the period 1994–2003

30: Rates of the unemployment of males, females and total in Netherlands in the period 1994–2003

33: Rates of the unemployment of males, females and total in Greece in the period 1994–2003

31: Rates of the unemployment of males, females and total in Portugal in the period 1994–2003

34: Rates of the unemployment of males, females and total in Spain in the period 1994–2003

35: Rates of the unemployment of males, females and total in Sweden in the period 1994–2003

36: Rates of the unemployment of males, females and total in United Kingdom in the period 1994–2003

37: Dendrogram from employment and unemployment in twenty five countries of EU in 2000. (1 – Belgium, 2 – Denmark, 3 – Finland, 4 – France, 5 – Ireland, 6 – Italy, 7 – Luxemburg, 8 – Germany, 9 – Netherlands, 10 – Portugal, 11 – Austria, 12 – Greece, 13 – Spain, 14 – Sweden, 15 – United Kingdom, 16 – Czech Republic, 17 – Estonia, 18 – Cyprus, 19 – Lithuania, 20 – Latvia, 21 – Hungary, 22 – Malta, 23 – Poland, 24 – Slovakia, 25 – Slovenia)

38: Dendrogram from employment and unemployment in twenty five countries of EU in 2002. For explanations see Fig. 1.

SUMMARY

The paper is focused on the evaluation the rates of employment and unemployment of women, men and as a whole in fifteen states of EU. The rate of male and female employment measured as the proportion of employed persons aged 15–64 years in the whole male and female population of the same age group and the rate of total employment measured as the proportion of employed persons aged 15–64 years in the whole population of the same age group and the rate of female and male unemployment measured as the proportion of unemployed persons in the whole active population of females and males and the rate of total unemployment measured as the proportion of unemployed persons in the whole active population for the reference period. Rates of employment were evaluated in the period 1993–2002. Rates of unemployment were evaluated in the period 1994–2003. Employment of males in all ten associated countries of EU is higher then employment of females. The smallest differences between the employment of males and females are in Sweden. The smallest employment of females as against the employment of males is in Greece, Spain, Finland, Denmark and in the United Kingdom. It is possible to notice the quicker growth of the employment of females. In countries with the height rate of employment the rate stagnates or slightly decreases while the employment of females increases or intensively increases. Unemployment of females in all countries of EU15 is higher than unemployment of males and in opposite unemployment of females in Sweden is lower than unemployment of males. Trends of rates of male, female and total employment are evaluated. In 2002 it is possible to notice the convergence of the rate of employment and unemployment between ten new countries of EU and the countries of EU15. Methods of regression and correlation analysis, development trends and cluster analysis were applied for the mathematical-statistical analysis.

SOUHRN

Vývoj míry zaměstnanosti a nezaměstnanosti mužů a žen v patnácti zemích EU

Příspěvek je zaměřen na posouzení míry zaměstnanosti a míry nezaměstnanosti žen, mužů a celkem v patnácti zemích EU. Míra zaměstnanosti žen a mužů, měřená jako podíl zaměstnaných osob ve věku 15–64 let na celkové ženské a mužské populaci stejné věkové skupiny a míra zaměstnanosti celkem, měřená jako podíl zaměstnaných osob ve věku 15–64 let na celkovém obyvatelstvu stejné věkové skupiny a míra nezaměstnanosti žen a mužů, měřená jako podíl nezaměstnaných osob na celkové aktivní populaci žen a mužů a míra nezaměstnanosti celkem, měřená jako podíl nezaměstnaných osob na

celkovém aktivním obyvatelstvu za referenční období. Míra zaměstnanosti byla hodnocena v období 1993–2002, míra nezaměstnanosti v období 1994–2003. Zaměstnanost mužů v patnácti zemích EU je vyšší než zaměstnanost žen. Nejnižší zaměstnanost žen oproti zaměstnanosti mužů je v Řecku, Španělsku, Itálii a Lucembursku a je možno pozorovat rychlejší růst zaměstnanosti žen. Nejmenší rozdíly mezi zaměstnaností mužů a žen jsou ve Švédsku, Finsku, Dánsku a Spojeném království. U zemí s vysokou mírou zaměstnanosti mužů tato spíše stagnuje nebo mírně klesá, zatímco zaměstnanost žen je rostoucí nebo silně rostoucí. Nezaměstnanost žen v EU15 je vyšší než nezaměstnanost mužů kromě Švédska. Vyhodnoceny byly tendence míry zaměstnanosti a nezaměstnanosti mužů, žen a celkem v daném referenčním období. V roce 2002 je již možno pozorovat přibližování míry zaměstnanosti a nezaměstnanosti mezi deseti přistoupivšími zeměmi do EU a zeměmi EU 15. Pro statistickou analýzu daného materiálu bylo použito vývojových trendů a metod regresní a korelační analýzy a shlukové analýzy.

míra zaměstnanosti, míra nezaměstnanosti, země EU, statistické metody, vývojové tendence

ACKNOWLEDGEMENT

The paper was prepared thanks to the support from IGA MZLU 2/191/2004, the CR Grant agency (Reg. No. 402/03/1105) and MSM 6215648904.

REFERENCES

- DUFEEK, J.: Analýza současného vývoje nezaměstnanosti v okresech Jihomoravského kraje. *Acta univ. Agric. Et silvic. Mendel. Brun.*, 2002, L, No. 2, pp. 77-86, ISSN 1211-8516
- JÍROVÁ, H.: Trh práce a politika zaměstnanosti. Praha, VŠE, 1999, 95 s. ISBN 80-7079-635-9
- KLÍMA, J., MACA, E.: The development of unemployment under conditions of an economic transformation in the Czech Republic. *Acta univ. Agric. Et silvic. Mendel. Brun.*, 2002, L, No. 2, pp. 53-64, ISSN 1211-8516
- KLÍMA, J., PALÁT, M.: Analysis of the development of an external debt of the Czech Republic. *Acta univ. Agric. Et silvic. Mendel. Brun. (Brno)*, 2003, LI, 6, pp. 47-60
- KLÍMA, J., PALÁT, M.: Labour productivity as a factor forming the economic efficiency and competitive ability of the country. *Agric. Econ.*, 2003, 49, (11): 515-519
- KLÍMA, J., PALÁT, M.: Development of the rate of employment and unemployment of males and females in ten associated countries of EU. *Acta univ. agric. Et silvic. Mendel. Brun. (Brno)*, 2004
- KLÍMA, J., PALÁT, M.: Rates of employment and unemployment in the EU and the associated countries of EU. *AGRI. ECON. – CZECH*, 50, 2004 (7): 285–292. ISSN 0139-570X
- PALÁT, M.: Vývoj hrubého domácího produktu České republiky a vybraných zemí EU. *MendelNet 2003. Sborník příspěvků z konference studentů doktorského studia*. 7 s. MZLU v Brně, Brno 2003. ISBN 80-7157-719-7
- PALÁT, M.: Vývoj míry zaměstnanosti a nezaměstnanosti ve vybraných zemích EU. *MendelNet 2004. Sborník abstraktů z konference studentů doktorského studia*. 7 s. MZLU v Brně, Brno 2004. ISBN 80-7302-088-2 (sborník abstraktů a CD nosič)
- PALÁT, M.: Míry zaměstnanosti a nezaměstnanosti ČR ve srovnání s ostatními zeměmi EU. *Sborník příspěvků ze semináře Karlov 6.- 8.9.2004*. In press
- PALÁT, M.: Podíl žen na vývoji zaměstnanosti a nezaměstnanosti v EU. *Sborník vědeckých příspěvků z mezinárodního vědeckého semináře: Kvantitativní metody v ekonomii*, Nitra 9-10.12.2004, pp. 156-163. Slovenská statistická a demografická spoločnosť 2004. ISBN 80-88946-40-9
- MINAŘÍK, B.: Statistika I, II, III. Učební texty, 1995-1996, MZLU Brno
- SEGER, J., HINDLS, R., HRONOVÁ, S.: Statistika v hospodářství., ECT Publishing Praha, 1998, s. 636, ISBN 80-86006-56-5
- SOJKA, M., KLÍMA, J.: Problematika nezaměstnanosti ve světle soudobých ekonomických teorií. Může pomoci při vysvětlení vývoje nezaměstnanosti v České republice hypotéza hystereze? *Sborník příspěvků z mezinárodní vědecké konference Firma a konkurenční prostředí*, PEF MZLU Brno březen 2003, s. 108-114, ISBN

Address

Ing. Milan Palát, Doc. Ing. Jan Klíma, CSc., Ústav ekonomie, Mendelova zemědělská a lesnická univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: xpalat@node.mendelu.cz, klima@mendelu.cz