

EMPLOYMENT GROWTH DETERMINANTS: CASE STUDY OF POST-SOVIET COUNTRIES

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Abstract: *This work is provided with the empirical verification of factors that determine dynamics of employment growth. To achieve this goal, authors use a regression analysis, which allows to define the existence, direction and strength of the connection. The informational background is the international databases, including the World Bank, the European Union, the Organization for Economic Co-operation and Development (OECD) and the United Nations (UN). It allows forming a statistical range of data required for this study during 2000-2018 for 13 Post-Soviet countries. The STATA 11 software package is used for this analysis. The results of this study allow to empirically identify statistically significant and relevant factors among selected economics, social, political, educational groups that determine dynamics of employment growth. This allows forming more sound approaches to the formation of government development programs and government operational actions with a focus on employment growth.*

Key words: *employment growth, Post-Soviet countries, regression analysis.*

JEL Classification: *E24, J21, C22*

1. INTRODUCTION AND PROBLEM FORMULATION

We live in a time of uncertainty and volatility. The emergency with the COVID-19 pandemic and mass quarantine measures, political instability and escalation of military conflicts in some regions, environmental problems and many other factors negatively affect the economic situation of countries and in particular their labor markets. The transition to remote work is not possible for all companies, interruptions in production and work processes have a negative impact on the economic results of a business, which leads to layoffs and, consequently, to rising unemployment. At the same time, ensuring full and effective employment is universally recognized as one of the Sustainable Development Goals declared by the United Nations, the achievement of which is a benchmark for most countries of the world. The situation is particularly aggravated for many Post-Soviet countries, which are already experiencing deterioration in economic and social development. All this leads to a sharpening of scientific attention to the selection of factors that contribute to employment growth. Understanding them is very important at both the state and local levels, as it will allow adjusting government development programs and government operational actions with a focus on employment growth.

In this regard, some issues of regulation and operation of the labor market are the subject of numerous scientific studies, such as (Przytuła, 2018; Rollnik-Sadowska, Dąbrowska, 2018;

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Snieska, et al. 2020). Not escape scientific attention and more specific areas of research in the context of labor relations, such as (Dave, 2018; Kleinschmidt, 2017; Pelinescu, 2019; Shpak, et al. 2018; Shvets, et al. 2018; Vorontsova, et al. 2020; Zayukov, et al. 2020), employment and unemployment analyses (Chocholatá, Furková, 2018; Cyrek, 2017; Gupta, Guha, 2018; Tatarczak, Boichuk, 2018), and so on. In the context of our study, special attention is paid to the study of the link between various labour indicators (employment rate in particular) and factors of national economies (as Economic Development (Dave, 2019; Marcel, 2019; Ugbaka, et al. 2019) or gross domestic product (Palova, Vejicka, 2018), foreign direct investment (Marcel, 2019[24]), migration (Cohen, 2017), wage changes (Alas, Edwards, 2016), fiscal decentralization (Chygryn, et al. 2018[6]), inflation (Sasongko, Dolfriandra, 2019[37]), business activities (Berzin, et al. 2018; Kasztelnik, Gaines, 2019; Khan, Yusuf Hossein, 2018; Meyer, Meyer, 2019). It should be noted that separate works are devoted to influencing on employment such determinants as the global economic crisis (Qerimi, Sergi, 2017), macroeconomic stability and social progress (Lyulyov, et al. 2018; Vasylieva; 2019), organizational factors (Leonov, et al. 2017), politics and social factors (Nikulin, et al. 2015; Osabohien, et al. 2020), technological factors (fourth industrial revolution) (Safrankova, et al. 2020; Vasylieva, et al. 2019) sectoral competitiveness (Dimian, et al. 2018) or national economic competitiveness (Fyliuk, et al. 2019) and so on. Numerous studies are devoted to the relationship between the labor market (in particular through youth employment) and the education system in the country (Bardy, et al. 2017; Buchynska, et al. 2020; Dum, Nwafor, 2019; Rayter, Davlikanova, 2017; Vasilieva, et al. 2017; Volchik, et al. 2018; Vorontsova, et al. 2020; Vorontsova, et al. 2020), or areas of its reform.

Based on a thorough analysis, it can be noted that there is no single consensus on the selection of factors influencing employment growth. As part of our study, it is decided to identify key indicators for four blocks: macroeconomic, social, political, educational, the study of which will be given below. The purpose of this article is to provide the empirical verification of factors that determine the dynamics of employment growth in Post-Soviet countries.

2. METHODOLOGY

First of all, indicators that could potentially be related to employment growth were analyzed and selected. This allowed us to form four blocks of macroeconomic, social, political and educational indicators (table. 1).

Table 1: Set of the factors (independent variables) that determine the dynamics of employment growth

Block of indicators	Indicators	Units of measurement	Source Datasets	Symbol
Macroeconomic	GDP	current US\$	World Bank	<i>gdp</i>
	GDP per capita	current US\$	World Bank	<i>gdppc</i>
	Inflation	annual %	World Bank, Eurostat	<i>infl</i>
	Exports of goods and services	current US\$	World Bank, Eurostat	<i>exp</i>
	Imports of goods and services	current US\$	World Bank, Eurostat	<i>imp</i>
	Foreign direct investment	BoP, current US\$	World Bank, OECD	<i>fdi</i>
Social	Personal remittances	current US\$	World Bank	<i>remit</i>
	Poverty headcount ratio at national poverty lines	% of population	World Bank, UN	<i>pov</i>
	Human Development Index (HDI)	index	United Nation Development Programme	<i>hdi</i>
Political	Corruption Index	index	Trading Economics	<i>corrupt</i>

	Military expenditure	US \$	World Bank	<i>military</i>
Educational	Government expenditure on education	PPP\$	Unesco, World Bank	<i>exp educ</i>
	Government expenditure on education	% of GDP	World Bank, OECD	<i>exp educ2</i>
	Compulsory education, duration	years	World Bank	<i>educ</i>

Source: author's calculations.

The informational background of the research was obtained at the international databases, including the World Bank, the European Union, the Organization for Economic Co-operation and Development (OECD) and the United Nations (UN). It allowed forming a statistical range of data required for this study during 2000-2019 for 13 Post-Soviet countries: Armenia, Bulgaria, Belarus, the Czech Republic, Georgia, Hungary, Lithuania, Latvia, Moldova, Poland, Romania, the Russian Federation, Ukraine. For providing the empirical verification of factors that determined the dynamics of employment growth we used regression analyses for panel data in the STATA/SE 11.1 software.

For research goals, we chose the two most suitable techniques for regression analyses of panel data: a model with fixed effects (FE) or random effects (RE). From a mathematical point of view, the regression model with FE was presented as the next equation (1). In the FE model, we assumed that there was a connection between predictor and outcome variables within chosen entities and their individual characteristics.

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}, \quad (1)$$

where α_i – the unknown intercept for each entity (n entity-specific intercepts, $i = 1 \dots n$);
 Y_{it} – the dependent variable, where i = entity and t = time;
 X_{it} – represents one independent variable;
 β_1 – the coefficient for that independent variable;
 u_{it} – the error term.

On the other hand, a model with RE could be described by the next formula (2). In the RE model, we assumed that the variation across those entities was random and uncorrelated with the predictor or independent variables.

$$Y_{it} = \beta X_{it} + \alpha + u_{it} + \varepsilon_{it}, \quad (2)$$

where u_{it} – the between-entity error term;
 ε_{it} – the within-entity error term.

To determine which model was most appropriate to use for our data, we used the Hausman test. It involved the verification of whether the unique errors (u_i) were correlated with the regressors or not. For this purpose, we run a FE model and a RE model for performing the test and compared results.

3. RESULTS

General information as descriptive statistics on the set of dependent variables among 13 countries over the period 2000-2019 is presented in table 2. As we can see, our data is slightly unbalanced, but it does not affect the feasibility of empirical results.

Employment to population ratio is one of the main indicators on labour market and in the analyze sample its value on average is 51,5% (details on figure 1). The share of the lowest and highest value is determined at 38.48% in 2012 in Moldova and at 61.45% in 2018 in Belarus respectively.

Employment connect with the economic situation of the country closely, so we choose to analyze some macroeconomic indicators. The selected sample includes as developing countries as developed countries, which is reflected at the level of their GDP. GDP value in average is 183 billion US \$. In 2019 the largest amount of GDP is in the Russian Federation (1.397 billion US \$) and Poland (413.778 billion US \$). The minimal rate of GDP per capita is 440,67 US \$ in Moldova in 2000, which reach a point to 3.78 thousand US \$ in 2019. The maximum rate of the GDP per capita is in 2018 in the Czech Republic (23.06 thousand US \$). The maximal inflation rate considere the highest consumer prices in Belarus in 2012 (59.21annual %), in Ukraine in 2015 (48.69 annual %), in Romania in 2000 (45.66 annual %).

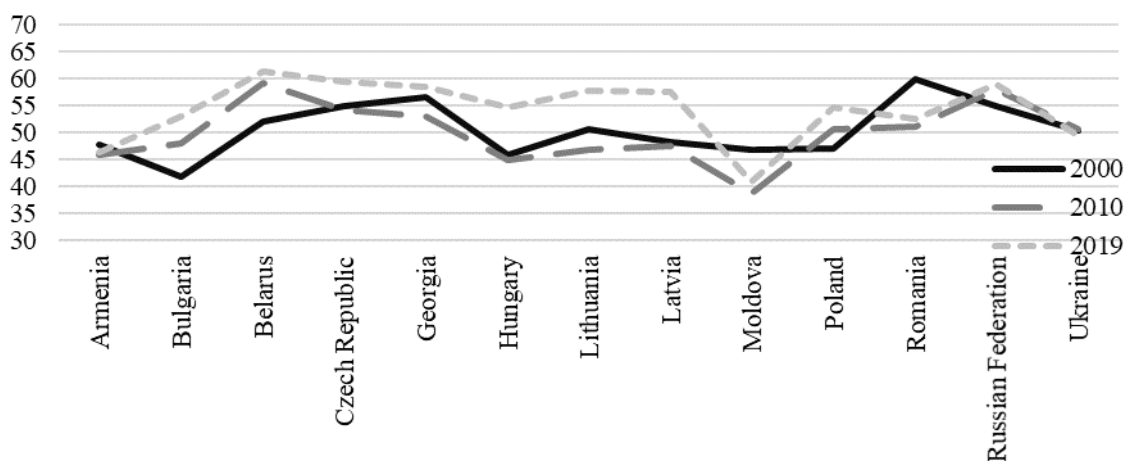
Table 2: Descriptive statistics for the set of variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum	
empl	overall	260	51.446	5.156	38.483	61.455
	between			4.582	42.210	57.846
gdp	overall	247	1.83e+11	3.77e+11	1.29e+09	2.30e+12
	between			3.20e+11	1.29e+09	1.26e+12
gdppc	overall	247	7551.063	5519.725	440.672	23069.380
	between			4687.192	440.672	16999.410
infl	overall	253	6.449	7.997	-1.545	59.219
	between			7.791	2.156	31.299
exp	overall	247	7.31e+10	1.13e+11	4.47e+08	5.94e+11
	between			9.72e+10	6.39e+08	3.67e+11
imp	overall	247	6.63e+10	8.79e+10	9.66e+08	4.69e+11
	between			7.47e+10	9.86e+08	2.64e+11
fdi	overall	259	6.13e+09	1.36e+10	-6.55e+10	7.51e+10
	between			7.86e+0	1.28e+08	3.01e+10
remit	overall	260	2.51e+09	2.76e+09	4.99e+07	1.59e+10
	between			2.07e+09	1.78e+08	6.49e+09
pov	overall	171	20.635	12.606	1.300	83.300
	between			6.771	9.420	32.367
hdi	overall	247	0.774	0.059	0.609	0.891
	between			0.065	0.609	0.855
corrupt	overall	255	39.275	11.535	15.000	62.000
	between			9.548872	25.250	51.700
military	overall	247	5266.114	14687.760	5.091	88352.9
	between			12451.440	5.091	49102.39
expeduc	overall	207	14003.980	24983.640	365.088	150950
	between			23202.080	365.088	90243.330
expeduc2	overall	207	4.5196	1.343	1.983	9.509
	between			1.148	2.727	6.747
educ	overall	248	9.972	1.336	6.000	13.000
	between			1.139	8.211	12.789

Source: author's calculations.

Note: empl – %, gdp – US\$, gdppc – US\$, infl – %, exp – US\$, imp – US\$, fdi – US\$, remit – US\$, pov – %, military – US\$, expeduc – US\$, expeduc2 – %, educ – years.

Figure 1: The employment to population ration in 2000, 2010, and 2019, %



Source: author's calculations based on data of the World Bank Database (2018)

Concerning, international trade, in 2018, the highest value of export and import of goods and services is in the Russian Federation (344.262 billion US \$ / 509.551 billion US \$), in contrast, the lowest value is in Armenia (6.649 billion US \$ / 4.700 billion US \$). The foreign investments flow has a progressive tendency in half of the selected countries, especially it is picked in the Czech Republic (up by 4.34 billion US \$), Latvia (up by 5.75 billion US \$), and Romania (up by 5.84 billion US \$).

Analyzing the social indicators we can see next tendencies. In 2019 the highest line of personal remittances is 16.918 billion US \$ in Ukraine and the bottom line is 1.13 billion US \$ in Latvia. As for the poverty headcount ratio, the maximum pick is reached in Armenia – 29.8 % of population (2015), minimum pick is reached in Belarus – 5.10 % of population (2015) for the same period. The HDI in average is 0.774. It varies from 0.609 (Moldova, 2000) to 0.891 (the Czech Republic, 2019).

The average value of the Corruption Index is 39. In 2000 all the selected countries are with a high corrupting scores. Many of these countries are below middle corrupted ranking in recent years: Armenia (42 in 2019), Bulgaria (45 in 2019) Belarus (43 in 2019), Moldova (32 in 2019), Romania (44 in 2019), the Russian Federation (28 in 2019) and Ukraine (30 in 2019). The average amount of military expenditures are 5266 US \$. The biggest amounts in military force are in Poland (11.596 thousand US \$ in 2018) and the Russian Federation (88.353 thousand US \$ in 2013). Georgia (316.50 US \$ in 2018) and Moldova (33.958 thousand US \$ in 2018) spend a minor amount of money on military force.

Concerning absolute values of the government expenditures for education, it is the minimum in 2000 in Moldova (365.08 US \$) and is the maximum at 150.95 thousand US\$ (in the Russian Federation in 2014). As for the relative values, the maximum level is in Moldova in 2009 (9.5%), the minimum – 1.98% in Georgia in 2012. Moreover, pupils in a lot of chosen countries spend 11 years at school (Armenia, Hungary, Latvia, and Ukraine), which is more than 2 years than in the Czech Republic and Georgia.

In the next stage of our research, we can present the main result of the regress analyses. The Hausman test confirms, that the most suitable and adequate for our research is the regression with RE.

Statistical results for our set of macroeconomic, social, political and educational independent variables, that determine the dynamics of employment growth are presented in table 3-6.

Table 3: Macroeconomic determinants of employment ratio: regress analyses with RE

Dependent variable	Coef.	Std. Err.	z	P>z	95% Conf. Interval
gdp	3.45e-12	1.19e-12	2.89	0.004	1.11e-12 – 5.79e-12
gdpp	0.00033	0.00009	3.31	0.001	0.0001 – 0.0005
exp	1.67e-11	6.32e-12	2.64	0.008	4.32e-12 – 2.91e-11
imp	2.06e-11	6.98e-12	2.94	0.003	6.87e-12 – 3.42e-11

Source: author's calculations.

As we can see in the table above, most of the factors have a significant and adequate relationship with the employment ratio. Inflation (*infl*) and Foreign direct investment (*fdi*) are statistically insignificant. As a result, testing the influence of macroeconomic determinants on employment ratio allows to confirm the existence of a weak, but adequate connection with GDP, GDP per capita, exports and imports of goods and services. Thus, the increase of these macroeconomic indicators per unit will lead to a slight employment growth (by the value of the coefficient of the regression equation).

Table 4: Social determinants of employment ratio: regress analyses with RE

Dependent variable	Coef.	Std. Err.	z	P>z	95% Conf. Interval
remit	3.00e-10	8.40e-11	3.57	0.000	1.35e-10 – 4.64e-10
hdi	31.166	4.571	6.82	0.000	22.206 – 40.126

Source: author's calculations.

Testing the influence of social determinants on employment ratio allows to confirm the existence of a weak, but adequate positive connection with personal remittances. One percent increase in the Human Development Index will result in 31.2 % increase in the employment growth indicator.

Table 5: Political determinants of employment ratio: regress analyses with RE

Dependent variable	Coef.	Std. Err.	z	P>z	95% Conf. Interval
corrupt	0.09979	0.023074	4.32	0.000	0.0546 – 0.1451
military	0.00008	0.00002	3.52	0.000	0.00003 – 0.0001

Source: author's calculations.

Testing the influence of political determinants on employment ratio allows to confirm the existence of a weak, but adequate positive connection with military expenditures. One percent increase in the Corruption Index will result in 0.09 % increase in the employment growth indicator.

Table 6: Educational determinants of employment ratio: regress analyses with RE

Dependent variable	Coef.	Std. Err.	z	P>z	95% Conf. Interval
expeduc	0.00006	0.00001	4.34	0.000	0.00003 – 0.00008
expeduc2	0.52433	0.2461	-2.13	0.033	-1.0067 – -0.04198

Source: author's calculations.

Testing the influence of educational determinants on employment ratio allows to confirm the existence of a weak, but adequate positive connection with government expenditure on education in absolute values (PPP\$) and in relative values (% of GDP).

4. CONCLUSION

Summing up the study, it should be noted that employment growth should be an important guideline for public policy at both operational and strategic levels. However, the employment rate is not an isolated value, which confirms the need for empirical confirmation of its main

determinants. Based on previous research by the authors, thorough analysis of the scientific literature, groups of economics, social, political, educational indicators are formed that determine the dynamics of employment growth. The Hausman test confirms the feasibility of using a regress model with RE. The conducted empirical analysis allows to confirm the presence of a direct positive impact of the following indicators on employment growth: macroeconomic (GDP, GDP per capita, exports and imports of goods and services), social (personal remittances, the Human Development Index), political (the Corruption Index, military expenditures) and educational (public expenditure on education). At the same time, the greatest impact is observed for the Human Development Index, which confirms the need to pay attention not so much to economic growth, but more to social well-being and development.

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