

UDC 331

## THE ANALYSIS OF GLOBAL TRENDS ON LABOUR MARKET

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*The article examines the general trends of automation of professions according to various estimates. Global trends in the structure of employment by profession are also analyzed. The output per employee and the dynamics of this indicator by country for the period from 2011 to 2018 are considered. As a result, the corresponding trends in the labor market for that period were determined.*

More than a half of all current jobs are expected to either change significantly or disappear completely. This is partly the result of technological changes in computing, mechanics, and biochemistry, where a much larger range of tasks is at risk of replacing humans with robots compared to previous waves of technological changes. Let's look at the summary results of some studies in the field of replacing people with robots, which are given in the report of the International labor organization in 2017, in table 1.

Table 1. – Estimates of the impact of digital technologies on employment

Organization	Estimate
University of Oxford	47% of workers in the United States are at high risk of replacing jobs with automation.
Pricewaterhouse Coopers	38% of jobs in the US, 30% of jobs in the UK, 21% in Japan, and 35% in Germany are at risk of automation.
International labour organization	ASEAN-5*: 56% of jobs are at risk of automation in the next 20 years.
McKinsey	60% of all professions have at least 30% technically automated operations.
OECD	OECD average**: 9 % of jobs at high risk of automation over the next five years. Low risk of full automation, but a significant share (50-70 %) of automated tasks.
Roland Berger	Western Europe: by 2035, 8.3 million jobs will be lost in industry, but at the same time, 10 million new jobs will be created in the service sector.
World bank	Two-thirds of all jobs in developing countries subject to automation.

\* - countries: Indonesia, Malaysia, Philippines, Thailand, Vietnam.

\*\* - OECD-Organization for economic cooperation and development (OECD)

Source: [1]

This report rightly notes that great care should be taken when interpreting these estimates, since many studies consider the likelihood that the work can be automated, rather than the likelihood that it (or the tasks in it) will be automated. Due to the significant financial costs associated with the introduction of advanced technologies, the difference between “may be” and “will be” will be significant, especially in developing countries. In addition, destroying certain tasks within a profession does not necessarily mean that the entire profession will disappear. Employees will be required to adapt to a new work environment where they work together with machines and robots. Thus, some of the current estimates of technological unemployment may be overstated [1].

We analyzed the dynamics of the structure of the distribution of the labor force by profession in some countries (in total of 38 countries from all regions of the world: USA, China, Germany, Argentina, South Africa, Russia, etc.) for the period from 2011 to 2018. In accordance with the methodology of the International labor organization, the following groups of professions have been distinguished:

1) managers; 2) specialists; 3) technical specialists and junior specialists; 4) office employees (clerks); 5) service and sales workers; 6) artisans and related professions; 7) plant and machine operators, assemblers; 8) elementary professions and skilled workers in agriculture, forestry, and fisheries.

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Categories 1-3 according to the methodology of the international labor organization belong to professions with a high level of skills, 4-7 – to middle-level professions, elementary – to the minimum level, qualified workers in agriculture, forestry and fisheries – to the average level [3].

Also, we examined the rates of labor productivity for the same countries during the corresponding period. In table 2, we analyze the output per employee, calculated in constant 2011 prices in US dollars for the period from 2011 to 2018.

Table 2. – Output per employee US dollars for the period from 2011 to 2018

Country	2011	2012	2013	2014	2015	2016	2017	2018
Qatar	174190	169057	164912	161633	158960	157675	156433	158013
Saudi Arabia	138657	136474	132619	131617	130505	128546	123786	123506
United States	108667	109142	109753	110642	112080	111941	112677	114990
Belgium	101055	100975	100868	101584	102617	103133	103229	103712
Sweden	89536	88769	88871	90521	93597	95488	96449	98265
Italy	95753	93740	94495	94859	95228	94866	95245	95991
France	90155	90199	90883	92352	93151	93704	94504	95846
Austria	90058	89771	89290	90048	90672	91395	93508	95137
Finland	88281	86736	87027	86803	87329	88820	90277	91937
Australia	82623	85011	86659	88322	88757	89983	90194	91559
Germany	86557	86373	85870	86898	87942	88612	89748	91358
Canada	80520	80976	81874	83735	83893	84553	85696	86437
Spain	80465	81812	82645	82844	83538	83980	84530	85510
United Kingdom	77546	77725	78316	78933	79627	80164	80848	81334
Japan	72143	73422	74234	73962	74642	74617	75235	76419
Turkey	60227	61542	64678	66878	68644	68896	71389	73147
Korea, Republic of	63144	63569	64546	65295	66478	67821	69179	70802
Czech Republic	61496	60734	59802	60905	63353	63724	65469	67719
Poland	52806	53560	54314	54891	56280	56894	58502	60538
Latvia	46162	47135	47556	48678	49575	50764	52725	55844
Russian Federation	48744	50108	51324	51726	50663	50669	51813	53012
Chile	45714	47207	48171	48475	48861	49119	49239	50669
Kazakhstan	42053	43528	45604	46918	47095	47347	49019	50619
Argentina	46784	45869	46581	45361	46003	44634	45357	46753
Mexico	39002	39031	38903	39567	39792	40063	40066	40163
Turkmenistan	25727	28013	30343	32874	34381	36037	37755	39540
Egypt	33506	33601	33595	33926	35917	36804	37439	38285
Belarus	33953	34440	34704	35284	33987	33254	34304	35758
Azerbaijan	33733	33785	35099	35120	34905	33202	32779	33307
Brazil	33430	33273	33738	33438	32328	32041	32254	32578
Thailand	22970	24587	25791	26231	27089	28201	29225	30115
China	18347	19732	21209	22719	24267	25878	27645	29499
Venezuela, Bolivarian Republic of	39882	41569	41730	39238	36464	32896	29706	27550
Indonesia	19465	20011	20967	21679	22589	23441	23933	24849
Georgia	15216	16123	17035	17486	17845	18675	19736	20733
Ukraine	19047	19262	19094	18816	17001	17631	18294	19095
Tajikistan	8965	9395	9841	10222	10550	10992	11502	11936
Congo, Democratic Republic of the	2036	2154	2262	2390	2472	2453	2457	2467

Source: own development based on data from the ILOSTAT database [2]

Also, to continue the analysis, let's look at the change in the output per employee by country over the analyzed period in table 3.

Table 3. – Dynamics of changes in output per employee in USD for 2011-2018

Country	Absolute change							Total change
	2012 to 2011	2013 to 2012	2014 to 2013	2015 to 2014	2016 to 2015	2017 to 2016	2018 to 2017	
Turkmenistan	2286	2330	2531	1507	1656	1718	1785	13813
Turkey	1315	3136	2200	1766	252	2493	1758	12920
China	1385	1477	1510	1548	1611	1767	1854	11152
Latvia	973	421	1122	897	1189	1961	3119	9682
Australia	2388	1648	1663	435	1226	211	1365	8936
Sweden	-767	102	1650	3076	1891	961	1816	8729
Kazakhstan	1475	2076	1314	177	252	1672	1600	8566
Poland	754	754	577	1389	614	1608	2036	7732
Korea, Republic of	425	977	749	1183	1343	1358	1623	7658
Thailand	1617	1204	440	858	1112	1024	890	7145
United States	475	611	889	1438	-139	736	2313	6323
Czech Republic	-762	-932	1103	2448	371	1745	2250	6223
Canada	456	898	1861	158	660	1143	741	5917
France	44	684	1469	799	553	800	1342	5691
Georgia	907	912	451	359	830	1061	997	5517
Indonesia	546	956	712	910	852	492	916	5384
Austria	-287	-481	758	624	723	2113	1629	5079
Spain	1347	833	199	694	442	550	980	5045
Chile	1493	964	304	386	258	120	1430	4955
Germany	-184	-503	1028	1044	670	1136	1610	4801
Egypt	95	-6	331	1991	887	635	846	4779
Japan	1279	812	-272	680	-25	618	1184	4276
Russian Federation	1364	1216	402	-1063	6	1144	1199	4268
United Kingdom	179	591	617	694	537	684	486	3788
Finland	-1545	291	-224	526	1491	1457	1660	3656
Tajikistan	430	446	381	328	442	510	434	2971
Belgium	-80	-107	716	1033	516	96	483	2657
Belarus	487	264	580	-1297	-733	1050	1454	1805
Mexico	29	-128	664	225	271	3	97	1161
Congo, Dem.	118	108	128	82	-19	4	10	431
Italy	-2013	755	364	369	-362	379	746	238
Ukraine	215	-168	-278	-1815	630	663	801	48
Argentina	-915	712	-1220	642	-1369	723	1396	-31
Azerbaijan	52	1314	21	-215	-1703	-423	528	-426
Brazil	-157	465	-300	-1110	-287	213	324	-852
Venezuela	1687	161	-2492	-2774	-3568	-3190	-2156	-12332
Saudi Arabia	-2183	-3855	-1002	-1112	-1959	-4760	-280	-15151
Qatar	-5133	-4145	-3279	-2673	-1285	-1242	1580	-16177

Source: own development based on data from the ILOSTAT database [2]

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According to the results, the following can be noted:

– if we leave out Qatar and Saudi Arabia, the output per employee in our sample is the highest in the United States, then in the EU countries: Belgium, Sweden, Italy, and France. This indicator can be considered as an indicator of the overall state of the economy and its stability, since, for example, China, which is comparable in total GDP with the United States, is significantly inferior to a number of countries in output per employee. It is obvious that more output per employee is achieved mainly by automating technological processes: whether it is the process of assembling a car, or processing large amounts of information. Because digital technologies allow one person who knows how to handle them to replace several workers who perform routine non-creative tasks;

– based on the analysis of the dynamics of this indicator, it is possible to clearly identify countries that are developing in terms of technology – countries where output per employee has significantly increased over the period 2011-2018. These include Turkmenistan, Turkey, China, Latvia, Australia, and Sweden in our sample;

– the impact of the 2015 crisis can be clearly seen in the CIS, where output per employee in almost all countries decreased or had minimal growth;

– countries with a high share of commodity exports in the output structure - Qatar and Saudi Arabia, despite the largest indicators of total gross output per employee, showed a stable decline in this indicator for the period 2011-2018. The impact of commodity prices (primarily oil) can also be traced to the economies of other countries: Russia, Venezuela, and Kazakhstan.

**Conclusion.** Based on the conducted analysis we can draw the following conclusions for 2011-2018:

– the category of "elementary occupations and skilled workers of agriculture, forestry and fisheries" in the structure is reduced: to 30 countries – a decline for the rest of the minimum increase to a maximum of 0.8%, and the increase in this area is observed, including in highly developed countries France, Italy, USA;

– the highest growth in the employment structure (in almost all countries) is observed in the category of "professionals" - these are highly qualified workers in a particular area. This indicates a certain trend in employment, which can be formulated as follows: increasingly complex technological processes require the presence of highly qualified specialists in their field in the country;

– for the category of "managers" - as highly qualified managers, there is no clear trend to determine (in 20 countries it increased, for the rest 18 – decreased), but it is worth noting that these changes are less than 1 % in one direction or another;

– the categories of "office workers", "operators", and "artisans" have not pronounced but still general downward trend in the employment structure, while "sales and service workers" often get more space in the overall ratio of employed in the economy. This can also be explained by another general trend, that the market has a maximum focus on the consumer, respectively, requires more "salesmen".

## REFERENCES

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