

PRELIMINARY COMPILATION OF INITIAL DATA FOR STRUCTURAL CONVERGENCE DETECTION OF POSTTRANSFORMATION AND GERMAN ECONOMIES

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The correspondence of branches classifications in Germany and Ukraine is established. The comparable input-output table for intermediate consumption is completed.

Key words: structural convergence, input-output table.

ПОПЕРЕДНЯ ОБРОБКА ВИХІДНИХ ДАНИХ ДЛЯ ВИЯВЛЕННЯ СТРУКТУРНОЇ КОНВЕРГЕНЦІЇ ПОСТТРАНС-ФОРМАЦІЙНОЇ ТА НІМЕЦЬКОЇ ЕКОНОМІК

Ключові слова: структурна конвергенція, таблиці витрати-випуск.

ПРЕДВАРИТЕЛЬНАЯ ОБРАБОТКА ИСХОДНЫХ ДАННЫХ ДЛЯ ВЫЯВЛЕНИЯ СТРУКТУРНОЙ КОНВЕРГЕНЦИИ ПОСТТРАНСФОРМАЦИОННОЙ И НЕМЕЦКОЙ ЭКОНОМИК

Ключевые слова: структурная конвергенция, таблицы затраты-выпуск.

The structural convergence, which undoubtedly takes place in the core EU countries (see, for example, Percoco, Dall'era and Hewings, [3]), is not so obvious even for cohesion countries; let alone the CEE countries - new member states of the EU. There are numerous works examining convergence processes in the CEE countries and core EU countries, but the conclusions made in them are ambiguous. At the same time such researches have not dealt with the rest of European countries with transition economy – namely Eastern Partnership countries, including Ukraine.

Ukraine refers to the Cluster of Countries dependent on the export of manufactured goods, supported in most cases by large inflows of foreign direct investment and financed by foreign banks, such as the Czech Republic, Hungary, Poland, Slovenia, Slovakia, Belarus and Ukraine [1], but in our opinion, Belarus and Ukraine are important exclusions considering the role of foreign capital in national economy.

The examination of convergence processes with EU countries is very important for the future of Ukraine which tries to start the process of European integration. It can follow the example of already conducted researches of convergence processes of the CEE countries, in which Germany often appears as the reference country due to different reasons.

Crespo, Fontoura [2] came to the conclusion that among the old EU members, Germany is the country that is, on average, most similar to the CEE countries. The similarity is higher with the more advanced CEE countries: the Czech Republic and Hungary (then followed by Slovakia, Poland and Slovenia). The same thing is true about Ukraine, though among the new EU members it certainly has more similarities with the CEE countries.

All this proves the appropriateness of choosing Germany as the reference country in case of Ukraine as well. The research available for comparing Germany with the CEE countries also confirms the appropriateness of choosing Germany as the reference country.

Besides, some peculiarities of the historical background of Ukraine are also advantageous for choosing Germany as the reference country. In the twentieth century the economic structure of Ukraine greatly changed, which to some degree made it closer to the economic structure of Germany. Even before World War I there was a fast development of coal, steel and on a limited scale engineering industries in Ukraine within the Russian Empire.

This tendency, even with a greater accent on the development of engineering and chemical industry, was continued in the period of the so-called industrialization in the former USSR. One can say that to some degree Ukraine played the same role in the industry of the former USSR as Germany in the industry of Europe.

While there was transition to the new manufacture branches in Germany in the last quarter of the twentieth century there were no similar changes in Ukraine, which remained a part of the former USSR. The acquisition of independence didn't change this tendency to divergence. On the contrary, it only intensified this tendency.

However, the comparison cannot be limited only to quantitative methods; it also should include deep qualitative analysis. In any case for such an analysis it is necessary to have the comparable data, containing all the information needed for the comparison of the two countries. Obtaining the comparable data for Ukraine and Germany is the main goal of this paper (for results, see Table 1).

Such data is presented in input-output tables which have been chosen for comparison of the economic structure of Ukraine and Germany. The three types of input-output tables are presented in the statistical data for Germany: the use tables, the supply tables and the symmetric input-output tables, and only the symmetric input-output ones, are published in Ukraine. Obviously, only the last type of the input-output tables can be used for comparison of the economic structure of the above two countries.

Table 1

The correspondence of branches classifications in Germany and Ukraine

No	Homogeneous branches, Germany, 59	Code	Comparable branches, Germany and Ukraine, 35	Види економічної діяльності (Україна), 38
1	01 Products of agriculture, hunting and related services	01	Products of agriculture, hunting and related services	Сільське господарство, мисливство та пов'язані з ними послуги
2	02 Products of forestry, logging and related services	02	Products of forestry, logging and related services	Лісове господарство та пов'язані з ним послуги
3	05 Fish and other fishing products; services incidental of fishing	05	Fish and other fishing products; services incidental of fishing	Рибальство, рибництво
4	10 Coal and lignite; peat	10, 12	Coal and lignite; peat, Uranium and thorium ores	Добування вугілля, лігніту і торфу; добування уранової і торієвої руди
5	11 Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	11	Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	Добування вуглеводнів та пов'язані з ним послуги
6	13 Metal ores	13, 14	Metal ores. Other mining and quarrying products	Добування корисних копалин, крім паливно-енергетичних
7	15 Food products and beverages	15, 16	Food products and beverages. Tobacco products	Виробництво харчових продуктів, напоїв та тютюнових виробів
8	17 Textiles	17-19	Textiles and textile products. Leather and leather products	Легка промисловість
9	20 Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	20-22	Wood and wood products. Pulp, paper and paper products; publishing and printing	Оброблення деревини та виробництво виробів з деревини; целюлозно-паперове виробництво; видавнича діяльність
10	23 Coke, refined petroleum products and nuclear fuels	23	Coke, refined petroleum products and nuclear fuels	Виробництво коксу; виробництво ядерних матеріалів
11	24 Chemicals, chemical products and man-made fibres	24, 25	Chemicals, chemical products and man-made fibres. Rubber and plastic products	Виробництво продуктів нафтоперероблення
12	26 Other non-metallic mineral products	26	Other non-metallic mineral products	Хімічна та нафтохімічна промисловість
13	27 Basic metals	27, 28	Basic metals. Fabricated metal products, except machinery and equipment	Виробництво іншої неметалевої мінеральної продукції
14	29 Machinery and equipment n.e.c.	29-35	Machinery and equipment n.e.c. Electrical and optical equipment. Transport equipment	Машинобудування
15	36 Furniture; other manufactured goods n.e.c.	36, 37	Manufacturing n.e.c.	Інші галузі промисловості
16	40 Electrical energy, gas, steam and hot water	40	Electrical energy, gas, steam and hot water	Виробництво та розподілення електроенергії Виробництво та розподілення газу Постачання пари та гарячої води

Table 1 (continuation)

The correspondence of branches classifications in Germany and Ukraine

17	41	Collected and purified water, distribution services of water	Збирання, очищення та розподілення води
18	45	Construction work	Будівництво
50		Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	
19	50-52	Wholesale trade and commission trade services, except of motor vehicles and motorcycles	Оптова та роздрібна торгівля.
51		Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	Ремонт автомобілів, побутових виробів та предметів особистого вжитку
52			
20	55	Hotel and restaurant services	Діяльність готелів та ресторанів
60		Land transport; transport via pipeline services	
61	60-63	Water transport services	Діяльність транспорту
21		Air transport services	
62		Supporting and auxiliary transport services; travel agency services	
63			
22	64	Post and telecommunication services	Діяльність пошти та зв'язку
65		Financial intermediation services, except insurance and pension funding services	
23	65-67	Insurance and pension funding services, except compulsory social security services	Фінансова діяльність
66			
67		Services auxiliary to financial intermediation	
24	70	Real estate services	Операції з нерухомим майном
71		Renting services of machinery and equipment without operator and of personal and household goods	Оренда машин та устаткування; прокат побутових виробів і предметів особистого вжитку
26	72	Computer and related services	Діяльність у сфері інформатизації
27	73	Research and development services	Дослідження та розробки
74		Other business services	Діяльність у сферах права, бухгалтерського обліку, інжинірингу; надання послуг підприємцям
28			
75		Public administration and defence services; compulsory social security services	Державне управління
29			
30	80	Education services	Освіта
31	85	Health and social work services	Охорона здоров'я та надання соціальної допомоги
32	90	Sewage and refuse disposal services, sanitation and similar services	Санітарні послуги, прибирання сміття та знищення відходів
33	91	Membership organisation services n.e.c.	Діяльність громадських організацій
34	92	Recreational, cultural and sporting services	Діяльність у сфері культури та спорту, відпочинку та розваг
93		Other services	
95	93,95	Private households with employed persons	Надання індивідуальних послуг

As a matter of fact, the symmetric input-output tables can be calculated both in consumer prices and in basic prices. In Ukraine, both methods are used, while in Germany the symmetric input-output tables are presented only in basic prices. Hence, a logical decision to use exactly basic prices for comparison the symmetric input-output tables in both countries is as follows.

A maximal equal period for both countries restricted by the available data has to be chosen to smooth much of the random volatility that could result from selecting the shorter period. But firstly it is necessary to determine the period for which the same comparative methodology could be conducted. The methodologies of the compilation of the symmetric input-output tables for every country for the appointed decade have not crucially changed over 12 years in Ukraine and over 8 years in Germany. The comparison for each country can be conducted for these time periods, but the comparison between the countries can be conducted for the shorter period. The eight-year period fulfills this condition.

The object of comparison between the countries also calls for additional requirements. As the end point of the period it is natural to choose the latest available year, and the first year for which the same comparative methodology could be conducted - as the start point of the investigation period.

But the preparation and publication of the symmetric input-output tables in the two countries does not occur simultaneously. For the last moment the table for 2009 is available in Ukraine, while in Germany – only for 2007. As Ukraine is the country of "overtaking development", it would be unreasonable to decline the data for the last 2 years.

In connection with this fact, we decided to compare the two-year lag symmetric input-output tables both at the start point and at the end point of the period. Thereby comparable tables for the latest available year for each country (2009 for Ukraine and 2007 for Germany) and the similar tables for the earliest comparable year with the same lag can be obtained (2002 for Ukraine and 2000 for Germany).

The comparison of the matrixes of intermediate consumption presupposes their equal dimension for the two countries. In Germany the dimension of the symmetric input-output tables is 59x59, while in Ukraine, the dimension of the matrix is 38x38. That's why the corresponding table for Germany must be aggregated to such a form.

But the specification of the 3 branches appearing in the symmetric input-output tables in Ukraine is absent in Germany, thus for the reliable comparison we need to aggregate these 3 branches for Ukraine as well. As a result of all the transformations the dimension of the final symmetric input-output tables for the comparison of the intermediate consumption has to be equal to 35x35.

That is why we aggregated the initial tables both of Germany and Ukraine to a 35x35 dimension. It resulted in the fact that the similar symmetric input-output tables for Ukraine and Germany can be completed both for the start point and end point of the chosen period (for example, see Table 2).

So, this way the symmetrical input-output table for Germany comparable with the Ukrainian one was compiled for future comparative studies of economic structure of both countries..

Table 2

The input-output table for intermediate consumption completed in dimension 35x35 for Germany, 2007 in basic prices

No	Code	1	2	3	4	5	6	7	8	9	10	11	12
		01	02	05	10, 12	11	13,14	15,16	17-19	20-22	23	24,25	26
1	01	1213	190	0	8	0	0	32579	197	0	0	502	0
2	02	83	885	0	5	16	16	0	0	2611	0	7	1
3	05	0	0	52	0	0	0	248	0	0	0	0	0
4	10,12	35	0	0	149	0	20	49	15	86	585	110	122
5	11	53	0	0	0	420	35	483	81	538	39175	1900	618
6	13,14	343	4	1	5	0	427	201	0	63	1	672	2421
7	15,16	4443	0	0	0	0	0	26713	56	1	0	1708	3
8	17-19	51	11	50	7	1	7	38	8218	27	2	638	13
9	20-22	177	22	2	45	11	143	3120	648	29789	41	3439	465
10	23	1171	53	9	22	0	104	710	91	462	4651	8130	423
11	24,25	3475	51	2	159	8	79	3627	3185	5725	291	62173	1590
12	26	421	23	0	48	0	15	722	192	604	3	1215	4961
13	27,28	471	47	5	553	175	132	1164	216	591	279	4053	275
14	29-35	1285	98	2	826	171	195	1439	335	966	249	4084	939
15	36,37	1	0	0	0	0	2	2	52	564	1	503	196
16	40	681	5	5	307	48	277	2549	709	2711	270	4004	1601
17	41	327	1	1	24	0	25	461	52	245	25	507	149
18	45	237	32	5	109	7	30	433	99	405	81	672	262
19	50-52	2992	137	28	200	36	132	10654	1989	4696	129	7171	2509
20	55	2	2	1	14	5	1	35	12	124	3	226	11
21	60-63	194	24	51	11	201	447	5480	262	2320	1573	4431	2043
22	64	55	13	0	17	38	19	364	84	1219	117	1023	166
23	65-67	915	56	2	28	41	88	1537	177	1362	450	2301	446
24	70	355	12	1	187	45	100	2713	395	2449	202	2726	618
25	71	2454	67	0	33	44	170	1311	52	1946	65	1937	606
26	72	7	1	0	1	12	5	118	21	378	44	809	106
27	73	0	0	0	0	0	0	1	0	0	0	4864	73
28	74	4100	210	3	223	398	534	13826	991	8072	1550	19545	3011
29	75	122	33	1	41	24	56	505	70	358	72	938	222
30	80	36	5	0	2	12	5	190	31	119	47	333	35
31	85	375	0	0	0	0	0	20	0	0	0	102	0
32	90	298	11	2	114	0	64	743	39	903	17	2878	166
33	91	69	4	1	25	3	9	238	46	154	60	237	59
34	92	0	0	0	0	0	0	338	0	2718	0	149	0
35	93,95	74	2	0	15	9	23	177	18	273	15	269	56
	Total	26515	1999	224	3178	1725	3160	112788	18333	72479	49998	144256	24166

Table 2 (continuation)

The input-output table for intermediate consumption completed in dimension 35x35 for Germany,
2007 in basic prices

No	Code	13	14	15	16	17	18	19	20	21	22	23	24
		27,28	29-35	36,37	40	41	45	50-52	55	60-63	64	65-67	70
1	01	0	0	0	3	0	0	15	745	87	5	6	648
2	02	0	0	45	1	0	0	0	3	0	0	0	0
3	05	0	0	2	0	0	0	0	48	2	0	0	0
4	10, 12	245	5	0	4330	0	2	2	1	0	0	0	0
5	11	1397	637	34	3862	0	20	491	45	31	10	66	4
6	13,14	5867	28	37	0	0	1508	0	8	9	0	0	0
7	15,16	12	0	0	0	0	7	9	9672	213	0	0	0
8	17-19	130	1190	1002	3	1	348	251	104	21	28	20	2
9	20-22	1471	6209	3715	166	30	5796	6770	451	724	1137	987	651
10	23	2806	1260	392	1552	34	1907	2375	113	12884	285	115	60
11	24,25	5169	31738	1954	83	126	11294	2799	199	564	50	31	17
12	26	1586	4178	185	96	1	15681	143	57	39	6	0	0
13	27,28	89210	85299	2354	1021	105	12685	1909	112	1193	61	38	143
14	29-35	5809	258281	1013	4706	287	13285	5325	250	6518	2861	373	743
15	36,37	1984	2589	5343	2	0	38	46	24	11	7	13	2
16	40	5251	4978	423	22654	604	220	3980	865	1329	514	641	467
17	41	490	637	52	36	89	139	225	281	114	59	81	33
18	45	790	1382	105	1006	269	9877	1534	437	1225	615	630	18194
19	50-52	9700	25112	2936	1465	110	11296	15933	3601	6207	1161	366	145
20	55	166	664	13	16	1	216	889	34	1151	83	320	9
21	60-63	4624	14658	997	2548	9	902	38196	186	67758	2152	816	40
22	64	761	3412	98	344	32	502	8588	495	1699	17519	2363	488
23	65-67	1791	6508	381	1415	123	4074	7149	1224	5026	1109	70052	14450
24	70	2585	11722	755	653	29	13373	30683	4671	2903	4247	7935	14499
25	71	1411	4166	364	1518	79	5766	5689	410	6679	647	1694	118
26	72	1026	3391	109	284	22	115	1763	20	2289	2084	2684	328
27	73	66	1348	0	0	0	0	0	0	0	66	0	0
28	74	7869	49353	2348	4299	232	9170	23521	2351	6284	3999	32331	11386
29	75	469	1378	172	4404	74	1060	704	184	499	92	190	1557
30	80	274	922	40	87	5	260	549	78	487	100	343	473
31	85	1	118	0	0	0	0	110	62	0	0	0	0
32	90	1052	818	73	262	2	512	3780	475	469	70	142	1373
33	91	151	524	46	203	7	520	1493	51	523	26	585	38
34	92	1	535	0	25	0	0	60	596	0	239	254	0
35	93,95	244	1591	67	71	8	115	661	478	962	413	502	229
Total		154408	524631	25055	57115	2279	120688	165642	28331	127900	39645	123578	66097

Table 2 (continuation)

The input-output table for intermediate consumption completed in dimension 35x35 for Germany,
2007 in basic prices

No	Code	25	26	27	28	29	30	31	32	33	34	35	Total
		71	72	73	74	75	80	85	90	91	92	93,95	
1	01	1	3	3	22	1067	61	718	9	19	104	15	38220
2	02	0	0	0	3	1	0	1	0	1	0	1	3680
3	05	0	0	0	0	1	0	30	0	0	2	0	385
4	10, 12	0	0	0	0	28	0	0	0	0	0	0	5784
5	11	1	14	11	129	251	116	184	5	14	43	33	50701
6	13,14	0	0	0	0	253	1	4	70	0	0	0	11923
7	15,16	0	0	0	20	1071	348	4874	0	77	123	34	49384
8	17-19	2	7	7	18	139	15	373	5	18	163	6	12916
9	20-22	42	200	353	6201	1496	1154	913	269	152	491	602	77882
10	23	52	106	80	738	1036	571	505	150	46	307	154	43354
11	24,25	0	18	397	1122	645	173	6973	415	34	76	127	144369
12	26	0	0	22	48	129	32	92	3	1	0	69	30572
13	27,28	7	38	49	161	776	119	232	1130	31	46	5	204685
14	29-35	24	1060	619	540	6282	472	3985	540	119	521	53	324255
15	36,37	2	9	9	21	24	86	29	1230	42	36	2	12870
16	40	49	132	256	727	1228	1265	1671	47	116	336	354	61274
17	41	3	30	24	284	258	324	418	26	31	236	316	6003
18	45	67	212	100	1641	2935	930	2328	607	194	540	180	48170
19	50-52	329	175	365	1190	2669	884	5364	1534	187	1278	304	122984
20	55	4	50	38	457	942	94	151	16	185	379	46	6360
21	60-63	22	251	250	1491	1987	2509	164	61	175	604	73	157510
22	64	44	259	166	2242	2165	166	916	256	247	1246	113	47236
23	65-67	1015	674	166	4636	3360	1322	2982	696	1252	760	803	138371
24	70	208	499	503	12131	3808	727	4983	706	392	1121	421	129357
25	71	7407	795	142	591	656	378	1143	1234	253	636	547	51008
26	72	56	10115	1064	2060	1286	396	1168	703	67	250	36	32818
27	73	0	0	1340	0	1540	485	233	250	0	0	0	10266
28	74	1616	1559	2039	70189	6331	1145	8184	5477	471	2345	634	305596
29	75	34	58	251	951	2878	154	568	268	266	149	32	18834
30	80	16	633	3073	1271	1055	10862	184	37	143	95	16	21818
31	85	0	0	0	17	227	148	4722	0	0	211	0	6113
32	90	12	64	49	454	2264	186	1903	1371	26	213	22	20827
33	91	11	68	231	999	850	161	572	165	1293	115	125	9662
34	92	0	0	2	8654	1003	418	304	0	136	14298	18	29748
35	93,95	22	278	106	3872	104	38	1048	440	28	827	4817	17852
Total		11046	17307	11715	122880	50745	25740	57919	17720	6016	27551	9958	2252787

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