

Appendices to Policy Brief

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Economic and Social Consequences of the Participation of Children and Adolescents from Ukraine in the Polish Education System

Policy Brief

Appendix 1. Assumptions for Scenarios of Educational Integration of Persons from Ukraine

Scenario 1 Assumptions:

- **Full integration** of refugees into the Polish school system.
- The size of the Ukrainian diaspora of school-age children at 120% of the number indicated by the “800+ program” statistics (meaning 69.1% of the number from the PESEL register), which assumes that starting in the 2024/25 school year, there will be, on average, 20% more refugee students from Ukraine in Polish schools than before (based on ZUS data).
- A prolonged conflict in Ukraine, resulting in the long-term stay of refugees in Poland.

Scenario 2 Assumptions:

- **Partial school integration.**
- A more cautious approach to migration statistics.
- A shorter duration of the conflict.

Scenario 3 Assumptions:

- **No integration**—limited participation of refugee students from Ukraine in Polish education (despite the formal introduction of compulsory education) and a swift end to the war in Ukraine.

Common Assumptions for All Scenarios:

- The cost of educating a refugee student from Ukraine in Poland will be, on average, comparable to the cost of educating a Polish student. In 2024, the financial standard of the education subsidy amounts to PLN 8,991. The average “weight” of a student (the ratio between the so-called recalculated student and the actual one) is 1.296 for primary school students and 1.233 for secondary school students (MoE Regulation 2023). This translates into per capita annual education costs of PLN 11,652 and PLN 11,086, respectively. It is assumed that these per capita costs will remain unchanged in real terms over the coming years.
- The education subsidy covers only part of the cost of funding schools. The so-called education gap, i.e., the portion of educational expenditures that local governments must cover from other sources, has increased dynamically in recent years. One of the latest studies on primary schools indicates that 39.5% of their funding comes from non-subsidy sources (Siwek, 2021). For the purposes of cost simulations related to the compulsory schooling of refugee children from Ukraine, it is assumed that the education gap will remain at this level over the next five years.
- Regardless of future migration flows, the number of children from Ukraine subject to compulsory schooling will also change due to varying cohort sizes completing and beginning education. Changes in school cohort sizes among refugee children from Ukraine over the next five years were estimated based on the current size of individual preschool-age cohorts in the PESEL register (see Table 3).

Table 3. Projected changes in the number of school-age refugee children from Ukraine, 2025/2026 – 2028/2029 (compared to the previous year):

	2024/25	2025/26	2026/27	2027/28	2028/29
Children of 7-14 Years	-1.14%	-1.50%	-2.19%	-3.08%	-3.57%
Adolescents 15-18 Years	-5%	-2.84%	3.72%	1.94%	1.45%

Variables that differentiate solution scenarios

Given uncertainties regarding the duration of the war in Ukraine, future migration decisions of families from Ukraine, and even their current numbers in Poland, it is necessary to simulate educational costs under alternative scenarios. Differences between scenarios will concern four distinct variables, whose values will be determined separately, based on statistical data, available analyses, and future projections:

Variable 1. The actual size of Ukrainian wartime emigration in Poland relative to the numbers recorded in the PESEL registry.

- In Scenario 1, we assume it is 69.1%, significantly lower than indicated by PESEL but 20% higher than suggested by ZUS data (800+ benefit).
- In Scenario 2, we assume a value of 65.0% of current PESEL database number.
- In Scenario 3, we adopt a value of 57.6%, which corresponds directly to the ZUS data.

Variable 2. The duration of the conflict.

- In Scenario 1, we assume the war will not end within the next five years.
- In Scenario 2, we assume it will end in three years from now.
- In Scenario 3, we assume the war will end within a year.

Variable 3. The schooling rate of children and adolescents from Ukraine after the introduction of compulsory education.

- In Scenario 1, we assume universal enrollment in primary schools, with 93.9% of eligible adolescents attending secondary schools (which are not subject to compulsory education). This figure corresponds to the current enrollment level of Polish adolescents in secondary education.
- In Scenario 2, we assume a schooling rate of 90.0% for primary schools and 70.0% for secondary schools.
- In Scenario 3, we assume rates of 84.6% for primary schools and 47.9% for secondary schools, which reflect current enrollment rates for adolescents from Ukraine under the assumption that the 800+ program provides a reliable estimate of the number of refugee children and adolescents from Ukraine in Poland.

Variable 4. The likelihood of Ukrainian families remaining in Poland after the war ends.

- In Scenarios 1 and 2, this likelihood is estimated at 50.0%, based on a survey conducted among refugee families from Ukraine living in Poland (Herbst, 2023). However, given that our analysis spans a five-year horizon and Scenario 1 assumes the war will last at least five more years, the effect of refugee family returns will not be evident in this scenario.
- In Scenario 3, we assume that 30.0% of the current population of Ukrainian wartime migrants will remain in Poland after the war.

Combinations of assumptions for each scenario are summarized in Table 4.

Table 4. Scenarios underlying educational cost simulations for refugee students from Ukraine in Poland:

	Scenario 1 - full Integration	Scenario 2 partial integration	Scenario 3 lack of integration
The number of children and youth refugees from Ukraine in relation to the PESEL register	69.1%	65.0%	57.6%
Duration of the conflict in Ukraine (years)	At least 5 years	3 years	1 year
Enrollment rate after the introduction of compulsory education – primary school	100.0%	90.0%	84.6%
Enrollment rate after the introduction of compulsory education – secondary school	93.9%	70.0%	44.9%
Probability of staying in Poland after the end of the war in Ukraine	50.0%	50.0%	30.0%

Appendix 2. Assumptions for Scenarios of the Integration of Persons from Ukraine into the Labor Market

Within each scenario of educational integration described in Appendix 1, three variants will be considered:

- **Variant A (full integration into the labor market):** assumes employment levels of refugees from Ukraine similar to those of Polish citizens but with lower average wages. High employment rates among Ukrainian wartime migrants are observed in all studies, both in Poland and other EU countries (OECD 2023). Reliable data on refugees' wages is lacking; however, partial studies indicate that these are significantly lower than the average salary in Poland (NBP 2023).
- **Variant B (partial integration):** assumes slightly lower employment rates and wages for refugees from Ukraine compared to Variant A.
- **Variant C (no integration):** assumes lower employment rates than Polish citizens (the same as in Variant B) and average wages only 10% above the minimum wage.

Thus, there are nine different combinations reflecting various values of variables describing refugees in schools and the labor market.

All variants assume that the parent generation of today's students will transfer a portion of their income earned in Poland to Ukraine. However, such transfers are not considered during the period when today's student generation enters the labor market. This is because it is assumed that the generation raised and remaining in Poland will no longer feel obligated to do so, as they will have a lower degree of identification with Ukraine than their parents. Naturally, this assumption may prove incorrect. In such a case, reduced consumption among young Ukrainian citizens living in Poland can be expected, leading to lower VAT revenues for the state budget.

Variants A-C

Variants A-C of the analysis differ in the assumed level of integration of refugees from Ukraine into the Polish labor market. The values of individual indicators are partly based on existing research, though information about refugee behavior in the Polish labor market is incomplete and should be interpreted cautiously.

According to OECD data (2023), the employment rate of migrants in Poland is not significantly different from that of Polish citizens (72%). Survey data from EUROREG UW (EUROREG 2023) indicates that the employment rate of parents of refugee children from Ukraine living in Poland is 75.17%. This figure is adopted for Variant A, while lower rates are assumed for Variants B and C, which may result from the significant scale of the informal labor market for Ukrainian citizens.

Research also shows that Ukrainian citizens transfer a portion of their income earned in Poland to Ukraine to support families living there. NBP (2023) estimates that 32% of refugees make such transfers. This value is adopted for the forecasts. Unfortunately, the average size of these transfers is unknown. It is assumed that they account for 10% of earned income, meaning that individuals making transfers can spend only 90% of their earnings in Poland.

Data on PIT (personal income tax) payments and social security contributions by refugees from Ukraine are not available. Investigating these issues would require requesting detailed data from the Ministry of Finance and the Social Insurance Institution (ZUS), which falls outside the scope of this analysis. However, based on data from GUS (Statistics Poland) for the first quarter of 2024, the average monthly PIT paid by an employee with a contract is 542 PLN, and ZUS contributions amount to 1,152 PLN (calculated via money.pl). For Variant A (good integration), these values are assumed to be 20% lower. For Variants B and C, lower wages (and thus lower taxes and contributions) are assumed for Ukrainian citizens—70% and 60% of the average

wage in the country, respectively, with the latter being approximately 10% higher than the minimum wage.

The estimated VAT “generated” per Polish resident is 8,416 PLN, according to the government’s budget forecast. For refugees from Ukraine working in Poland, this amount is expected to be reduced due to lower earnings and the transfer of funds to Ukraine, based on the parameters assumed in each variant.

The analysis of contributions to public finances generated by refugees from Ukraine should separately address the generation of today’s adults—parents of students subject to compulsory education—and today’s students, once they enter the labor market. Based on the PESEL register (listing Ukrainian

citizens with UKR status), the ratio of adults aged 20-65 to children and adolescents aged 6-18 is 1.03. This allows for estimating the number of adults for whom the compulsory education of their children will be a “binding” factor in the Polish labor market.

Regarding the generation of today’s students, the analysis of their impact on public finances in Poland will focus on the first five cohorts subject to compulsory education—those born between 2010 and 2014. It is assumed that these individuals will enter the labor market at the age of 19, regardless of whether they attend higher education. Therefore, the estimated state budget revenues cover the years 2030-2034.

Table 5. Variant Parameters

Variant	A - full integration into the labor market	B - partial integration into the labor market	C – lack of integration into the labor market
Legal employment rate of Ukrainian citizens in Poland	75.2%	60.0%	50.0%
Average salary of a Ukrainian worker in relation to the national average	80.0%	70.0%	55.5%
Percentage of employed Ukrainian citizens transferring income to Ukraine	32.0%	32.0%	32.0%
Average percentage of income transferred to Ukraine	10.0%	15.0%	20.0%

Appendix 3. Estimated costs of education for refugee students from Ukraine in the years 2025–2029.

	Implementation of compulsory education in primary schools			Implementation of compulsory education in secondary schools		
	Expenditures financed from the educational subsidy			Expenditures financed from the educational subsidy		
	scenario 1	scenario 2	scenario 3	scenario 1	scenario 2	scenario 3
2025	1 737 725 849	1 471 157 195	1 225 451 310	691 685 368	485 038 649	294 118 908
2026	1 711 737 969	1 449 155 878	362 137 366	672 046 768	471 267 243	85 730 451
2027	1 674 263 537	1 417 430 056	354 209 229	697 032 798	488 788 490	88 917 824
2028	1 622 618 777	686 853 824	343 283 201	710 578 655	249 143 705	90 645 817
2029	1 564 729 769	662 349 432	331 036 132	720 853 825	252 746 394	91 956 582
	Expenditures financed from other revenues of local government units.			Expenditures financed from other revenues of local government units.		
2025	686 401 710	581 107 092	484 053 267	273 215 720	191 590 266	116 176 969
2026	676 136 498	572 416 572	143 044 259	265 458 473	186 150 561	33 863 528
2027	661 334 097	559 884 872	139 912 645	275 327 955	193 071 454	35 122 540
2028	640 934 417	271 307 260	135 596 864	280 678 569	98 411 764	35 805 098
2029	618 068 259	261 628 026	130 759 272	284 737 261	99 834 826	36 322 850
	Total public spendings					
2025	2 424 127 559	2 052 264 286	1 709 504 577	964 901 088	676 628 915	410 295 877
2026	2 387 874 467	2 021 572 450	505 181 625	937 505 241	657 417 804	119 593 979
2027	2 335 597 634	1 977 314 929	494 121 875	972 360 753	681 859 943	124 040 364
2028	2 263 553 194	958 161 084	478 880 065	991 257 224	347 555 469	126 450 915
2029	2 182 798 028	923 977 458	461 795 404	1 005 591 086	352 581 220	128 279 432

Appendix 4. Estimated tax (PIT) revenues related to the presence of Ukrainian refugees—parents of school-age children—in the labor market (in PLN at 2024 prices).

Scenario-variant	2025	2026	2027	2028	2029
1-A	851 371 123	835 264 743	831 390 059	818 467 410	802 200 439
1-B	594 611 999	583 363 030	580 656 886	571 631 489	560 270 361
1-C	392 868 642	385 436 288	383 648 300	377 685 091	370 178 631
2-A	684 271 552	671 672 184	667 073 430	327 709 173	320 552 274
2-B	477 906 831	469 107 219	465 895 372	228 877 632	223 879 132
2-C	315 759 870	309 945 841	307 823 728	151 222 721	147 920 141
3-A	530 087 962	156 217 719	154 636 118	151 489 149	147 734 381
3-B	370 222 403	109 105 099	108 000 481	105 802 585	103 180 191
3-C	244 611 230	72 087 297	71 357 461	69 905 279	68 172 626

Appendix 5. Estimated social security (ZUS) contributions to be paid by Ukrainian refugees—parents of school-age children (in PLN at 2024 prices).

Scenario - variant	2025	2026	2027	2028	2029
1-A	1 814 238 815	1 779 916 744	1 771 659 944	1 744 122 279	1 709 457 996
1-B	1 267 095 088	1 243 123 973	1 237 357 284	1 218 124 513	1 193 914 391
1-C	837 187 826	821 349 768	817 539 634	804 832 268	788 836 294
2-A	1 458 156 116	1 431 307 352	1 421 507 587	698 335 527	683 084 452
2-B	1 018 400 906	999 649 275	992 804 953	487 729 349	477 077 740
2-C	672 872 027	660 482 557	655 960 415	322 249 748	315 212 079
3-A	1 129 596 871	332 893 896	329 523 565	322 817 496	314 816 231
3-B	788 929 569	232 498 730	230 144 834	225 461 202	219 872 983
3-C	521 257 037	153 615 232	152 059 979	148 965 437	145 273 221

Appendix 6. Estimated VAT revenues related to the presence of Ukrainian refugees—parents of school-age children—in Poland (in PLN at 2024 prices).

Scenario - variant	2025	2026	2027	2028	2029
1-A	1 068 370 787	1 048 159 171	1 043 296 899	1 027 080 491	1 006 667 353
1-B	733 834 877	719 952 067	716 612 304	705 473 694	691 452 464
1-C	476 706 360	467 687 950	465 518 407	458 282 656	449 174 327
2-A	921 067 656	903 947 574	898 447 012	594 462 833	582 080 488
2-B	630 955 878	619 232 247	615 446 692	403 326 201	394 913 813
2-C	408 732 735	401 140 926	398 676 842	258 649 491	253 247 004
3-A	785 150 338	449 559 472	446 718 618	439 119 757	429 736 489
3-B	536 028 923	301 879 908	299 951 938	294 831 968	288 514 186
3-C	346 013 140	191 461 702	190 224 951	186 965 802	182 947 251

Appendix 7. Estimated tax (PIT) revenues related to the entry of the first cohorts of refugee students from Ukraine subject to compulsory education into the labor market (in PLN at 2024 prices).

Scenario - variant	2030	2031	2032	2033	2034
1-A	59 340 995	121 259 446	187 761 587	252 374 016	317 472 806
1-B	41 444 755	84 689 649	131 135 869	176 262 283	221 728 380
1-C	27 383 142	55 955 661	86 643 342	116 459 009	146 499 108
2-A	20 806 191	42 516 092	65 833 131	88 487 597	111 312 591
2-B	14 531 396	29 693 958	45 978 972	61 801 235	77 742 597
2-C	9 601 101	19 619 222	30 378 964	40 832 959	51 365 644
3-A	7 569 905	15 468 606	23 952 032	32 194 394	40 498 799
3-B	5 286 950	10 803 537	16 728 504	22 485 109	28 285 046
3-C	3 493 163	7 138 051	11 052 762	14 856 233	18 688 334

Appendix 8. Estimated social security (ZUS) contributions to be paid by the first cohorts of refugee students from Ukraine subject to compulsory education entering the labor market (in PLN at 2024 prices).

Scenario - variant	2030	2031	2032	2033	2034
1-A	126 453 358	258 399 172	400 112 653	537 799 232	676 522 225
1-B	88 317 165	180 470 354	279 445 447	375 608 084	472 494 570
1-C	58 352 412	119 239 341	184 633 599	248 169 627	312 183 912
2-A	44 337 186	90 600 142	140 287 846	188 563 634	237 202 810
2-B	30 965 841	63 276 672	97 979 406	131 696 033	165 666 457
2-C	20 459 574	41 807 801	64 736 393	87 013 450	109 458 195
3-A	16 131 174	32 963 000	51 040 850	68 605 003	86 301 368
3-B	11 266 285	23 021 917	35 647 793	47 914 895	60 274 336
3-C	7 443 795	15 210 909	23 553 006	31 658 056	39 824 115

Appendix 9. Estimated VAT revenues related to the entry of the first cohorts of refugee students from Ukraine subject to compulsory education into the labor market (in PLN at 2024 prices).

Scenario-variant	2030	2031	2032	2033	2034
1-A	76 927 666	157 196 659	243 407 793	327 169 169	411 561 045
1-B	53 727 584	109 788 807	170 000 121	228 500 484	287 441 198
1-C	35 498 582	72 539 033	112 321 509	150 973 534	189 916 506
2-A	26 972 445	55 116 429	85 343 852	114 712 338	144 301 891
2-B	18 838 012	38 494 247	59 605 590	80 117 038	100 782 883
2-C	12 446 544	25 433 699	39 382 265	52 934 472	66 588 690
3-A	9 813 370	20 052 980	31 050 607	41 735 727	52 501 278
3-B	6 853 824	14 005 341	21 686 269	29 148 938	36 667 781
3-C	4 528 419	9 253 529	14 328 428	19 259 120	24 226 927