OPENING UP OPPORTUNITIES: education reforms in Poland

Poland is one of the few European countries that achieved strong improvement of student performance over the last decade. According to the OECD PISA results Poland moved from below to above the OECD average and now is close to top-performing countries. The score improvements are a consequence of Polish education system reform introduced in 1999. The most important change of the 1999 reform was an extension of comprehensive education by one year. The evidence suggests the change immediately benefited student, while the remaining elements of the reform are probably responsible for the gradual improvement. The differences between secondary schools were largely limited. Introduction of nation-wide comparable exams, conducted at the end of every stage of education, played a crucial role in assuring quality in education system. Poland also increased support for the preschool education and further expanded the general curriculum in vocational schools. The result of all reforms was the expansion of obligatory comprehensive education from 8 years to at least 10 years now.

Maciej **Jakubowski**

IBS Policy Paper 01/2015

January **2015**

INSTYTUT BADAŃ STRUKTURALNYCH

Opening up opportunities: education reforms in Poland[1]

Maciej Jakubowski
Evidence Institute, University of Warsaw

January 2015

ABSTRACT

Poland is one of the few European countries that achieved strong improvement of student performance over the last decade. According to the OECD PISA results Poland moved from below to above the OECD average and now is close to top-performing countries. The score improvements are a consequence of Polish education system reform introduced in 1999. The most important change of the 1999 reform was an extension of comprehensive education by one year. The evidence suggests the change immediately benefited student, while the remaining elements of the reform are probably responsible for the gradual improvement. The differences between secondary schools were largely limited. Introduction of nation-wide comparable exams, conducted at the end of every stage of education, played a crucial role in assuring quality in education system. Poland also increased support for the preschool education and further expanded the general curriculum in vocational schools. The result of all reforms was the expansion of obligatory comprehensive education from 8 years to at least 10 years now.

Keywords: Education, Education Policy, Human Capital, Skills, Comprehensive education, Compulsory education

JEL Codes:

I21: Analysis of Education
I28: Education: Government Policy
J24: Human Capital; Skills; Occupational Choice; Labor Productivity

This paper was financially supported by the Jobs and Development Network under the auspices of the World Bank

Network for
JOBS AND DEVELOPMENT

[1] I would like to thank Marton Csillag, Jarosław Górniak, Piotr Lewandowski, Maciej Lis and Jerzy Wiśniewski for their helpful comments.

Introduction

Poland is one of the few countries in Europe where the level of achievement of students has improved over recent years. It is also one of the few countries that had a large number of students at the lowest levels of achievement prior to 2000, whereas now it has a growing number of students that are among the best achievers in Europe. According to the OECD PISA study, Poland moved from below to above the OECD average and is now close to the top-performing countries. Although the evidence suggests that there is still room for improvement, this progress is exceptional. It is even more striking when compared to Poland's neighbours where the achievement levels have remained the same, at below-average levels.

Over the last 15 years we have observed a sequence of school system reforms in Poland with one main goal: to create new opportunities for students to learn and achieve more. Gradually, Poland extended comprehensive education for all students and also improved the curriculum by emphasizing core skills and problem solving. Furthermore, Poland increased its investment in pre-school education and foreign language teaching. Although the reforms were much broader than that, the key to understanding the consistency of the Polish reforms over time is to see that the main aim, of extending comprehensive education, has remained the same over the years. This goal is very different from what has been happening in the neighbouring countries, where few students are given the opportunity to continue their general education and enrol in higher education.

In this context we outline the Polish efforts to improve education and the evidence suggesting they have been successful. We contrast these efforts with the policies implemented by neighbouring countries. Finally, we discuss the evidence from higher education and labour market outcomes. We ask whether the reforms have only led to improvements in the PISA scores or whether they have also improved the overall situation of young people in Poland. At the end, we discuss the policy implications and conclude the study by suggesting possible policy improvements for Poland and other European countries.

1. The Polish reforms

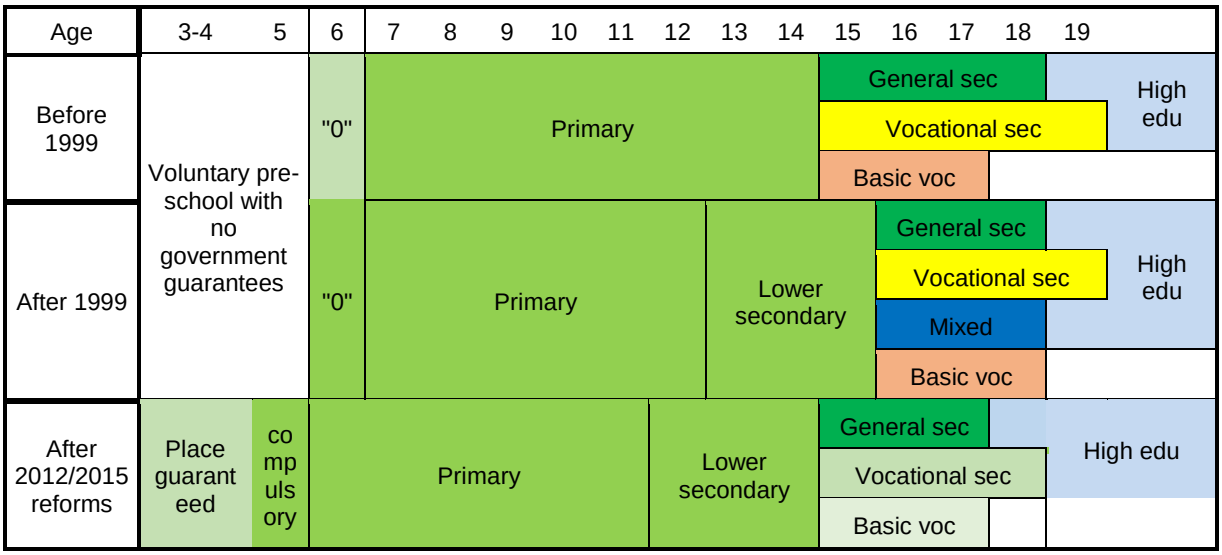
In 1999, Poland implemented a set of structural reforms including a reform of the school system. The goal was to improve the quality of education and to increase educational opportunities for all students. From a political perspective, the reform was supported by those who wanted a break from the educational system inherited from the communist period. Until the 1990s, the majority of secondary school students attended various types of vocational education institutions, while access to higher education was limited to a relatively small group. With the democratic changes in society and the restructuring of the economy, Poland sought a way to enhance the supply of skills in high demand by the fast-changing labour market. The demand for low-skilled labour was clearly diminishing, while companies were desperately looking for well-educated workers.

The education reform consisted of several components, although the most revolutionary change concerned the restructuring of the school system. The eight-year basic primary education was shortened to six years, followed by three years of comprehensive lower secondary education that previously did not exist. The selection of the educational programme was postponed by one year, to the age of 16. In the new system, all students followed the same curriculum for 9 years instead of 8. Upper secondary education was shortened by one year. This is the same as before the reforms, although secondary vocational schools do not provide direct access to higher education. All other

types of upper secondary schools now end with a standardised post-secondary school exam that also serves as à higher education entrance exam. Education remains compulsory until the age of 18.

Figure 1 compares Poland's education system prior to 1999, after 1999 and after the most recent changes, introduced gradually until 2015 (the remaining modifications are to be implemented in September 2015). The education system introduced after 1999 extended the length of comprehensive education by one year. The figure also shows the latest changes that concern early and upper secondary education. The common curriculum was expanded so that students of vocational schools are now able to acquire, during the last year of lower secondary education, the knowledge and skills equivalent to the first grade of older (before 1999) secondary schools. The changes emphasize the need to acquire core skills, which include foreign languages. Compulsory education now starts at the age of five with mandatory pre-school classes, while primary education will be compulsory for all 6-year-olds from 2015.

Figure 1. Changes to the Polish school system over time.



Overall, when looking at Figure 1 it is evident that Poland has consistently followed a path of extending general education. While before 1999, students only had 8 compulsory years of the same general programme, students who now start education will have a right to pre-school education from the age of 3 and will be obliged to follow the same general programme from the age of 5 until the age of 15 (or even later if the vocational school decides to include the general programme in later grades). In the current system, 11 years of general education are mandatory for all students and compulsory education still ends relatively late - at the age of 18. By using all the opportunities available from the age of 3, students can now benefit from 13 years of general education instead of only 8 available in the 1990s.

The 1999 reform also introduced external national exams. The first exams were launched in 2002 and now monitor student performance at the end of every stage of education (after the 6th, 9th and 12th/13th grades). The exams are standardized and individual results are available to all students and teachers. The results at school level are also made available to the public. Based on the exam results the so-called value-added measures of student progress at lower and upper secondary schools have been developed and are now publicly available. Furthermore, the external examination system creates incentives to improve the quality of teaching. It is quite difficult to punish or reward teachers for exam results as they are not linked to teachers but only to schools. On the other hand,

the results are publicly available which creates social and political pressure to achieve better results at school level. The results are crucial for lower and upper secondary graduates as they decide whether they will be allowed into better secondary or tertiary schools respectively.

Overall, the external assessments of learning performance and the large autonomy of Polish schools in terms of teaching seem to provide a good mix of freedom and external monitoring. This autonomy was also extended in 1999 allowing teachers to decide themselves which textbooks and teaching methods to use. The recent introduction of a single government textbook for first graders can be seen as a step back towards the limitations of the old system. On the other hand, teachers still enjoy freedom when it comes to methods, the details of the programme or the training materials they want to use in the classroom. Moreover, the 2008 curriculum reform which we describe below, further increased their responsibilities regarding the teaching content.

In 1999 additional changes regarding teachers and governance were introduced. A new system of teacher development was established with four professional levels. The system created incentives to improve teaching, although it was also criticized as being too bureaucratic. In fact, the system was used to increase teacher salaries with each level providing better remuneration. Between 2006 and 2012 salaries at all levels were increased by 50% on average. The largest increase was for the youngest teachers, to limit negative selection into the profession. In 1999 the governance and finance system was also further decentralized. Currently local governments are partly responsible for financing education, although most of the funds are transferred from the central budget. In addition, the main expenditure is teacher salaries and those are centrally regulated to a large degree, according to the professional levels scheme. In any case, local governments are adding more than 20% of the funds from their own resources and are responsible for the increased investment in school facilities.

Overall, the revolutionary changes of 1999 provided the basis for building a modern system that now follows the example of the best school systems around the world. The recent reforms of the curriculum and the school evaluation system would not have been possible without the structural changes introduced in 1999. The core curriculum was revised substantially in the 2008 reform. Currently the curriculum outlines the learning outcomes that should be achieved at the end of each stage of education. The curriculum does not specify the teaching content and allows for variations in the distribution of materials over time. The new curriculum limits the need for knowledge acquisition and focuses more on problem solving, analytical skills and even soft skills like team work. It blurs the boundaries between subjects and emphasizes fundamental skills, also in vocational education. Overall, the new curriculum assumes that learning is a life-long process and that students should acquire skills that allow them to continue education after school and formal education (for more details on the reform see Marciniak, 2014).

The new school evaluation system has been gradually introduced since 2009 and replaced the old overly bureaucratic system of inspections. The new system provides reports that are made publicly available, although the main goal is not accountability but improving teaching and learning. The system is based on visits by assessors but is supported by self-evaluation tools. It is also data-driven as the assessors, teachers and school principals can benefit from numerous research tools that provide quantitative and qualitative information about students, teachers and parents. Although the system is still changing, it is already providing the necessary feedback to improve the quality of teaching. Together with a relatively generous system of professional development in Poland, it provides strong support for teachers.

2. Evidence of the effects of Polish reforms

The reformers focused on implementing their policies and did not think about carefully evaluating them. Fortunately, Poland joined the first edition of the OECD PISA study in 2000. Currently, PISA is the largest international study of student performance with more than 70 participating countries, testing a representative sample of 15 year-olds in each country. An additional benefit, besides the rigorous measurement of achievements, is that it focuses on real-life problems rather than typical school tasks. Consequently, it measures the fundamental skills that are necessary to fully participate in modern societies.

Polish students tested in 2000 were still in the first grade of one of the old-type secondary schools: general secondary, vocational secondary or basic vocational and had not yet been affected by the reform. The second PISA wave in 2003 covered 15 year-olds who were the first cohort that completed three years of education in the newly established comprehensive lower secondary schools. Consequently, PISA has served as a tool to evaluate the reforms of 1999, especially the effects of extending comprehensive education to cover 15 year-olds.

Polish reformers were similarly lucky to benefit from the PISA 2009 and PISA 2012 studies that allowed them to evaluate the effects of the reforms introduced in 2008. The newly revised core curriculum was implemented for the cohort that followed the students tested in PISA 2009. The school evaluation system was launched in 2009. PISA 2009 therefore served as a benchmark, while the PISA 2012 results showed the outcomes for students who were the first to take the new curriculum throughout the whole of their lower secondary education.

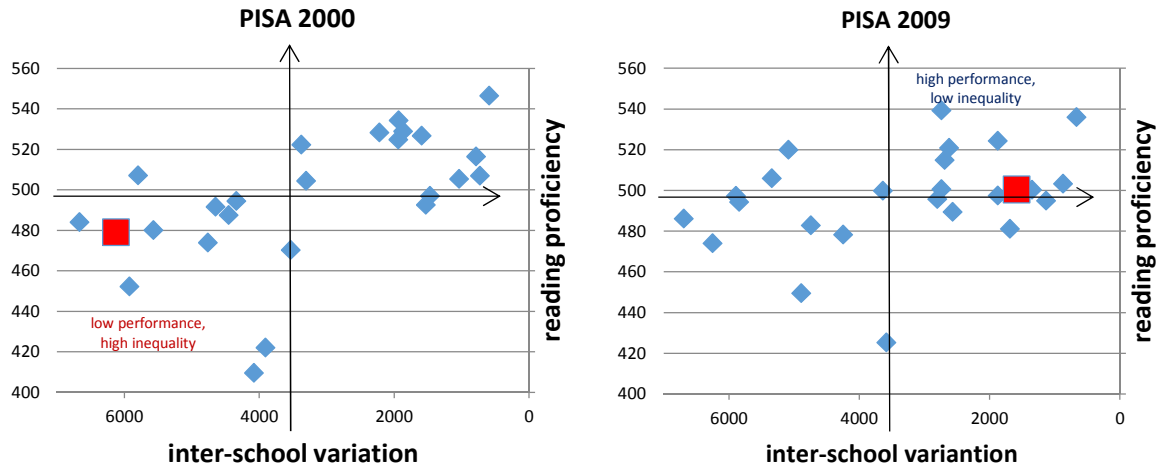
The primary evidence of the outcomes of the 1999 reform comes from a comparison between the 2000 and 2009 editions of the PISA study. These two editions focused on measuring reading proficiency and providing a detailed account of the changes in student performance. The basic evidence is presented in Figure 2. It demonstrates the two main effects of the 1999 reforms:

(1) The largest improvement in average scores among the countries that are performing close to or above the OECD average

(2) The largest decline in performance differences between schools among the OECD countries

Figure 2 shows that Poland witnessed a huge improvement in terms of limiting inter-school differences in student performance. These differences reflect how the system segregates students according to their achievements or related characteristics. They are usually taken as a measure of the inequality of a school system that is more directly related to educational policy. Although geographical differences affect this measure and are often independent of what governments can do, the inter-school variations can be shaped by policies that limit the segregation of students. Most notably, these differences are directly related to the early tracking or selection of students into different programmes, with those selected for vocational or non-general tracks showing much lower performance. Other measures like the effect of the socio-economic background or overall variations often reflect country characteristics that are only partly related to education policy, at least in the short term.

Figure 2. Poland and other OECD countries in PISA 2000 and PISA 2009: inter-school differences vs. average student reading proficiency.



Note: Author's own calculations based on PISA 2000 and PISA 2009 data. Poland is denoted by the red square.

In 2000 the differences between schools in Poland were similar to those found in Germany, where in some parts of the country students as young as 10 are selected for vocational and general types of schools. Both countries were among those with the largest inter-school disparities. In 2009, Poland had one of the smallest differences across all OECD countries, similar to the level found in Scandinavian countries. This was an enormous achievement for a country with social disparities above the OECD or EU average. On the other hand, while the differences between schools declined, the overall effect of the socio-economic background (SES) has remained similar, comparable to the OECD average. Most of the variations and differentiation related to SES is currently observed within schools, and the relative impact of schools and external factors in this regard is still a point of discussion.

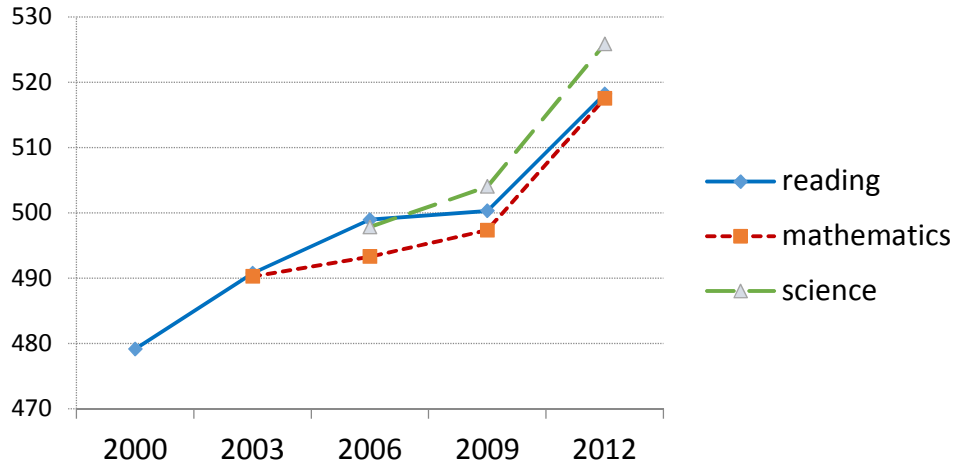
Figure 2 also shows that at the same time Poland significantly improved its average scores. This demonstrates that it is possible to reform the system to improve the average performance while at the same time limiting inequality. In fact, Poland is the only country that improved from below the OECD average to above. Poland is also the only OECD country with a decline in inter-school variations. The only other country which followed the same pattern was Latvia where, however, the average performance has remained below the OECD average. These results are even more remarkable when one takes into account the fact that Poland is a country with average expenditure on education, one of the smallest number of teaching hours and a relatively poor family background (for the data see OECD, 2014b, and for the analysis see Dolata, Jakubowski, Pokropek, 2013). In fact, when the socio-economic family background of students is taken into account there are only few OECD countries that outperform Poland in both aspects.

The 1999 reforms opened the way to further modernisations in the system. An important change happened between 2007 and 2008 when the new curriculum was developed and gradually implemented for all types and levels of school education. The students tested in PISA 2009 were still not affected by the changes, but those tested in PISA 2012 were the first cohort that followed the new curriculum throughout whole of their lower secondary education.

Figure 3 summarizes the re-scaled performance trend estimates in all three subjects. The reading proficiency has been tracked since 2000, mathematics since 2003 and science since 2006. The 2000-2009 data was re-scaled using the improved 3PL IRT model and data only from Poland, to provide more reliable trend estimates. The data was also re-weighted to exclude the effects of changes in background variables that were unrelated to school reforms (for details see Dolata, Jakubowski, Pokropek, 2013). The data for PISA 2012 is presented unchanged. The results can be compared to the OECD average which is close to 500 with a standard deviation of 100 points.

The data suggests that the two reforms played a crucial role in the improvement of the performance of Polish students. Reading proficiency improved gradually between 2000 and 2006, which was followed by relatively unchanged proficiency in all three subjects between 2006 and 2009 (the original data even suggested a decline, although it was statistically insignificant and disappeared after re-scaling). After 2009 we can observe another large improvement, similar across all subjects, that led to Poland achieving the highest ranking among European countries. Across this relatively short period of time, Poland reduced the share of low-performing 15 year-olds from one of the largest in Europe to one of the smallest and is also one of the few European countries that has already met most of the EU 2020 education targets. Between 2009 and 2012, Poland also increased the number of top-performing students. Taking into account the lower socio-economic background of students' families in Poland, the performance levels are one of the highest in the OECD, although still lower than those of the best-performing Asian countries.

Figure 3. Student achievement trends in Poland from 2000 to 2012.



Note: Author's own calculations based on PISA data. The results for 2003, 2006 and 2009 were re-scaled using the 3PL IRT model. The results are also based solely on the data from Poland, re-weighted to account for changes in the background characteristics and to exclude the effects related to the inclusion of other countries in the estimation of the IRT and re-weighting models. The propensity score re-weighting method was used. This way the results better reflect the achievement trends among Polish students that can be related to policy changes and not to the other factors (for details see Dolata, Jakubowski, Pokropek, 2013). The original data provides similar evidence on the effects of the two reforms, while the trends are less smooth showing variations that can be assigned to the inclusion of other countries in the estimation models.

Who benefited from the reforms?

From a policy perspective it is just as important to know the overall effects of the reform, as it is to understand which particular groups of students it benefited. When it comes to reforms that postponed the selection of students, the usual expectation is to see an improvement among low-

achievers who would normally end up in vocational education, while on the other hand this is considered to be a potential threat to the best students who are now mixed with peers of different ability levels. The international evidence as well as national studies (for reviews see Woessmann, 2009; Meier, Schütz, 2007) suggest that de-tracking or comprehensive school reforms are usually neutral for the best students, while they help the weakest ones. The Polish reform provides a unique opportunity to see who benefited from postponing selection and providing an additional year of comprehensive education.

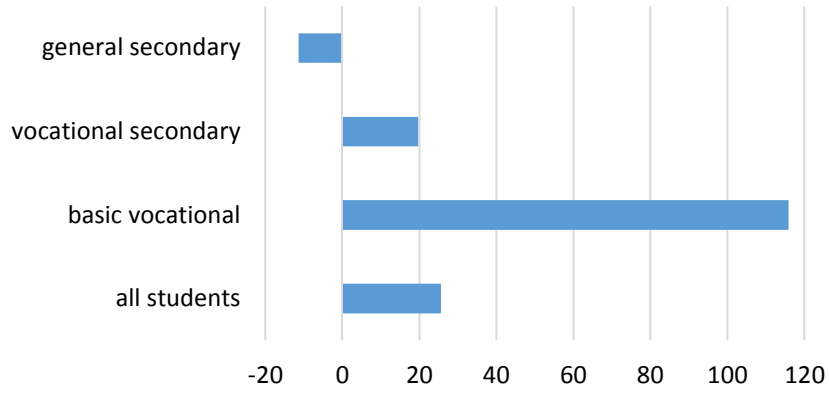
The results presented below focus on two key questions:

- What were the benefits of the reform for the students who would previously have attended different types of secondary schools?
- What were the benefits of both the 1999 and 2008 reforms for all the different groups defined by achievement level and gender?

Part of these results are based on the paper by Jakubowski, Patrinos, Porta and Wiśniewski (2010) where a more detailed analysis is available. The paper applies a difference-in-differences model that compares the change in test scores of the likely vocational school students that were able to study in general, academic education due to the change in school policy.[2]

Benefits from the 1999 reform for potential students of former basic vocational schools are simulated to be above 100 score points. This is more than one standard deviation of PISA scores in OECD countries, which is a dramatic improvement. Figure 4 summarizes these estimates of the hypothetical benefits for students who would probably have ended up in different types of programmes without the 1999 reform. These results suggest that 15 year-old students who, without the reform, would have been placed in vocational education benefited greatly from the reform. Students in vocational secondary schools benefited by around 20 points, which is one fifth of the standard deviation. Point estimates for students in general education suggest that their scores would have been better without the reform, however, the difference is not statistically significant, so we can assume the reform has had negligible impact on their performance (see Jakubowski, Patrinos, Porta, Wisniewski, 2010, for details).

Figure 4. Benefits of the 1999 reform for a hypothetical groups of students



Source: Jakubowski, Patrinos, Porta and Wiśniewski (2010)

[2] The group of "likely vocational students" is constructed using propensity score matching method by comparing 2003 comprehensive school students who have similar characteristics (e.g. gender, socio-economic background) to students who were in vocational schools in 2000.

Although the reform postponed the selection by one year, students still had to choose different types of schools by the age of 16. Consequently, the real policy question is whether the effects of delayed tracking are visible at later stages of education. Fortunately, Poland used PISA 2006 to additionally test 16 and 17 year-old students with the same tools. This gives us a unique opportunity to compare the achievement between 15-year-olds before the reform and 16- and 17-year olds after the reform. All these students were in different types of upper secondary schools but those tested in 2006 had one extra year of comprehensive education thanks to the reform.

Estimates of mean achievement by PISA cycle, grade and type of school programme are presented in Table 1. The average difference between grades is around 7 to 8 points and reflects the effect of age combined with the overall effect of one year of education for all students. Unsurprisingly, the achievement increase is mostly visible among students of general schools, while 11th grade students in vocational schools had even lower scores than those in the 10th grade. This could be due to students changing school after the 10th grade, with underachieving students moving to basic vocational schools. It is also the effect of the emphasis on practical training in vocational schools. In any case, this simple evidence demonstrates how little students gain in terms of general skills at vocational schools, supporting the recent reforms that have introduced the additional teaching of core subjects to their curriculum.

The results suggest that delayed tracking has a long-term impact on the general skills of vocational school students. Compared to the performance in 2000, it is clear that students in all types of schools improved. However, those continuing general education benefited from the most ambitious programme focused on academic training. Those in vocational schools, especially those in basic vocational schools, focussed on technical or practical training. Also note the lower share of students who enter basic vocational education. These students are fewer than in 2000 and there is clearly a negative selection based on their previous achievements. Overall, the results in the table probably present the lower bounds of the long-term benefits for vocational school students.

Table 1. Mean achievement by PISA wave, grade and type of school programme

	PISA 2000	PISA 2003	PISA 2006		
	9th grade	9th grade	9th grade	10th grade	11th grade
All students	479.1	501.9	513.5	520.1	528.3
Lower secondary school	-	501.9	513.5	-	-
General secondary (% of all students)	543.4 42%	-	-	580.8 45%	592.6 47%
General (profiled) secondary (% of all students)	-	-	-	494.9 11%	494.6 13%
Vocational secondary (% of all students)	478.4 36%	-	-	505.9 29%	508.8 25%
Vocational basic (% of all students)	357.6 22%	-	-	388.8 16%	384.1 15%

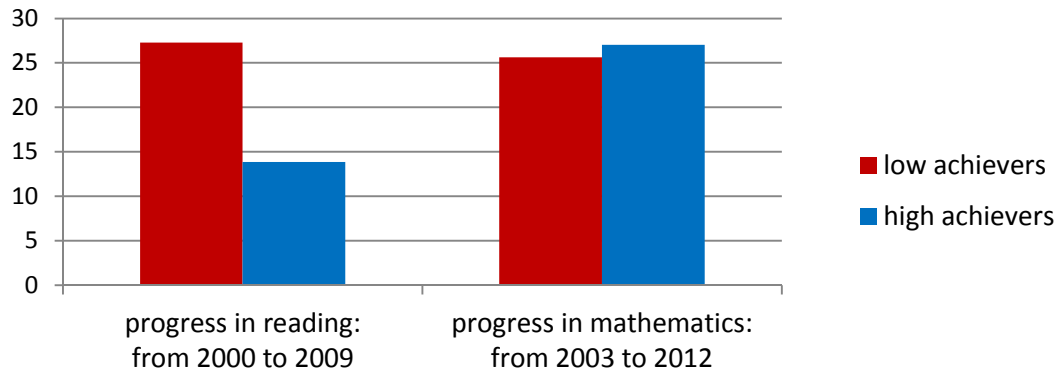
Source: Jakubowski, Patrinos, Porta and Wiśniewski (2010)

From a policy perspective it is also interesting to compare the distribution of outcomes before and after the 1999 and 2008 reforms. The 1999 reform focused on reducing inequalities in access to high quality general education, while the 2008 reform altered the way students are taught in all schools, independently of their programme or ability level. As a result, the 1999 reform should have narrowed the gaps while the 2008 reform should have boosted performance at all achievement levels.

Figure 5 compares the distribution of reading proficiency growth between PISA 2000 and 2009, which mainly summarizes the effect of the 1999 structural reform, with the distribution of mathematics proficiency growth between PISA 2003 and PISA 2012. The latter probably reflects the effects of the 2008 curriculum reform. The comparisons chosen are driven by the PISA methodology which repeats a detailed measurement of one domain every nine years, so the trends can be compared over time.

Figure 5 demonstrates that the average improvements related to the 1999 reforms were mostly driven by better performance of low achieving students. This was expected as most of these students ended up in vocational education before the reform, while after 2000 they benefited from comprehensive education. High-achieving students also improved, but by a half the level of low performers' improvement. The 2008 reform seems to have equally improved the performance of all students across the achievement spectrum. It also helped boys and girls at a similar level and had a comparable effect across the tested domains. The curriculum reform and the introduction of an improved school evaluation system therefore boosted the overall teaching quality for all teachers and students.

Figure 5. Distribution of the benefits of the 1999 and 2008 reform among low and high-achievers.



Note: Own calculations based on PISA 2000, 2003, 2009 and 2012 data.

3. Different policies and different opportunities – Poland and its neighbouring countries

Nowadays, the three countries neighbouring Poland have different school systems, although all four had a similar start in the 1990s. Czechoslovakia, Hungary and Poland had different education systems when communism collapsed, although they shared similarly strong support for vocational education and limited access to universities. All four countries, with the Czech and Slovak Republics now as separate states, saw a transition away from an economy where the demand for manual labour was much larger and the individual pay-off for tertiary education was artificially limited. In the newly-developed market economies, the demand for high-level skills was increasing and individual incentives to invest in education were boosted.

All four countries faced a new reality, with old industry jobs disappearing and people seeking to continue education. The schools were not able to adapt quickly enough to the rising demand for new skills. The gap between the demand and supply of skills has increased and remained large - in all four countries the labour market wage premium for tertiary education degree is above the OECD average (see OECD, 2014b, Indicator A6).

As a consequence, all four countries had to adapt their school systems and find a way to better educate their youth. The chosen policies vary importantly, however, not in terms of the strategic choices but rather in the details of the implementation (see Herbst, Wojciuk, 2014, for a detailed discussion). All four countries increased the autonomy of their schools, modernized the curriculum by allowing more flexibility and decentralized their systems. In the Czech Republic, schools have the most autonomy when it comes to teaching. Slovakia and Poland, on the other hand, left the more important decisions regarding teaching to central government. In all four countries the teaching profession is still centrally regulated. Governance and supervision were also modified by all four countries by vesting the local governments with additional decision-making powers and replacing systems of inspections with more supportive systems. Across the region, the importance of vocational education diminished with more students entering general and tertiary education.

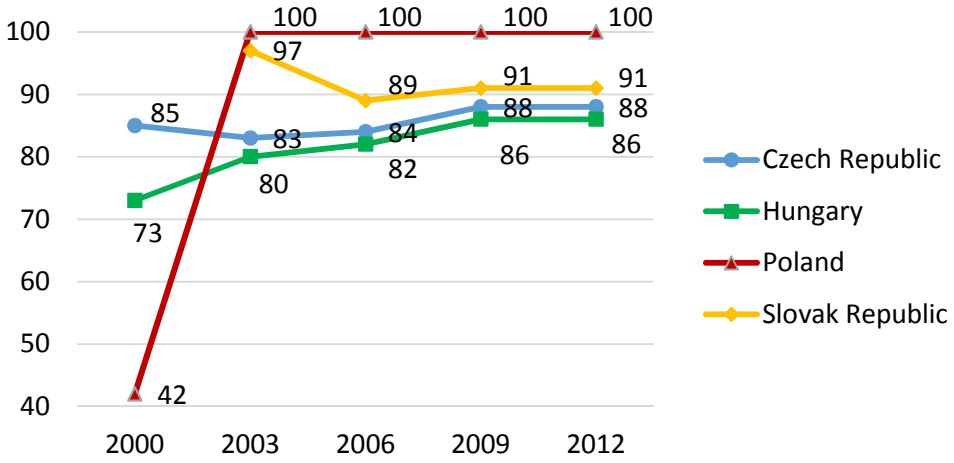
It is hard to summarize all the differences in a few paragraphs, so we will focus on two dimensions that make the Polish system distinct from the others:

- The duration of compulsory and comprehensive education.
- The methods of monitoring and publishing student results.

These two dimensions seem to be crucial for the success of Polish students and can therefore be seen as benchmarks for reforms in other countries. They also seem to be the most controversial in policy discussions as they shape school systems more than other policy choices. Consequently, one can see them as crucial choices that all countries need to take into account when evaluating the outcomes of their policies.

Before 2000 the share of Polish students in general upper secondary education was the lowest of the four countries. Figure 6 presents the percentage of 15 year-olds in programmes designed for general studies. In 2000, only 42% of students were in such programmes. After the reforms, all students follow the same comprehensive education until the 9th grade (i.e. the age of 15 or 16). The other three countries have had a much larger share of students in programmes designed for general studies, but this share has remained at relatively similar levels in the Czech Republic and Slovakia up to now (around 85-90%), while in Hungary it has increased to similar levels from 73% in 2000. As a result, the situation currently varies and while in Poland all students aged 15 are in comprehensive education, a substantial share of students in other countries are already tracked into vocational education at that age. Poland tracks students just a year later, at the age of 16, but the results above suggest that this additional year is highly beneficial for vocational students.

Figure 6. The percentage of 15 year-olds in programmes designed for general studies.



Source: Author's own calculations based on PISA 2000, 2003, 2006, 2009 and 2012 data.

Moreover, this selection is very different in nature from that in other three countries. Polish students need to choose different programmes after the 9th grade and less than one fifth of students end up in basic vocational education that does not offer direct access to higher education. However, even these students need to follow the general curriculum for one year, are obliged to continue studying foreign languages, and can later decide to continue education at more advanced levels. In the Czech Republic and Slovakia students can enrol, in the 6th grade already (previously the 5th in Slovakia), in academic schools which provide an elitist programme for the most talented students (see Federicova, 2014, for a description of both systems and an analysis of the recent reforms limiting selection in Slovakia). Therefore, the selection occurs very early and is of a different nature: the best students leave the rest to follow a more advanced programme. In Hungary the earliest selection at the age of 10 also allows the best students to separate from the others and follows a more ambitious academic course, while later all students are segregated into different programmes and at the age of 14 they already follow a different education path. Research shows that the results of students following different paths diverge even if they share similar socio-economic backgrounds and achievements in the earlier stages. Those who are left behind after the selection of the best students perform worse compared to similar students in schools where there is no selection (see Horn, 2013).

Not only is the selection of students postponed until much later in Poland - students are also obliged to continue education until the age of 18. In practice, this means that nearly all students graduate from upper secondary education. In the Czech Republic it is only compulsory to complete 9 grades, which is normally achieved at the age of 15. In Slovakia, education is compulsory until the age of 16. In Hungary, compulsory education was extended to the age of 18 and recently lowered back to the age of 16. Consequently, students who are in grade 11 or below can finish at the age of 16, while those in grade 12 have to study until the age of 18 (Eurydice, 2014).

Poland also stands out by the way it monitors and publishes student learning results. Students need to sit for national exams after the 6th and 9th grades. These exams are standardized and monitor results in core subjects and foreign languages, summarizing proficiency at the comprehensive stages of education. At the end of upper secondary education, students pass the *Matura* exam which covers almost all subjects taught in general schools and serves as an entrance exam for tertiary education. Students who follow vocational programmes can take vocational exams that validate their

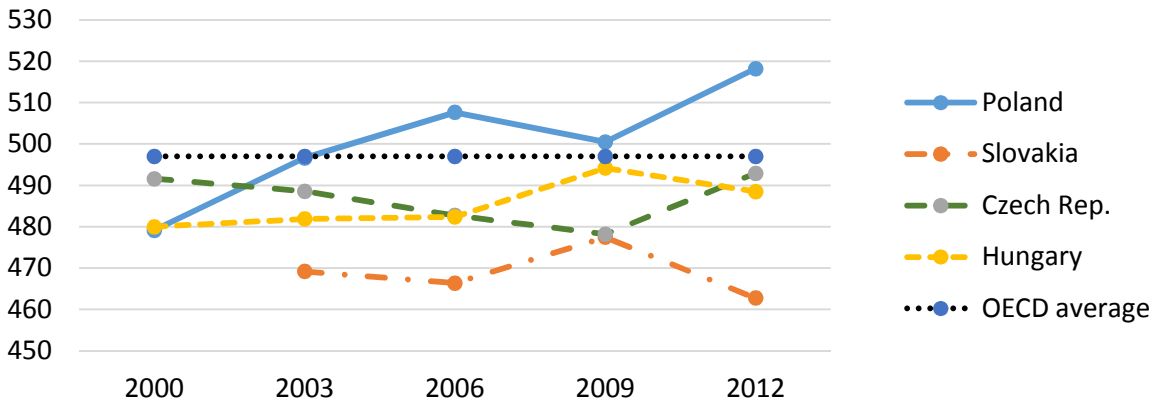
professional competencies. All these exams are standardized, conducted by external bodies and comparable nationwide.

Poland publishes exam results at school level, while the individual results are available to students (parents) and teachers. The Czech Republic has no national exams or other standardized assessments that would allow for comparisons between primary and lower secondary students or schools. At the same time, the Czech Republic has the most decentralized system with the strongest school autonomy of the four countries. Slovakia has national exams, but the results are not available to the public. Hungary has an extensive system of national assessments at different grades, and the results may be used to enforce quality improvement programmes in schools. Consequently, of the four countries only Hungary and Poland use assessments to monitor school performance and inform the public about their results (Eurydice, 2009).

Student performance in the four countries

The evidence of outcomes is presented in Figures 7 and 8. In 2000, the Czech Republic was outperforming Poland and Hungary, which had similar average scores. In 2003 Poland was already performing better than its neighbours and the gap increased even more in 2012. Currently, the Czech Republic and Hungary have slightly lower reading proficiency levels than the OECD average, while Poland joined the best performers in Europe. Slovakia joined PISA in 2003 and has shown relatively low proficiency levels ever since.

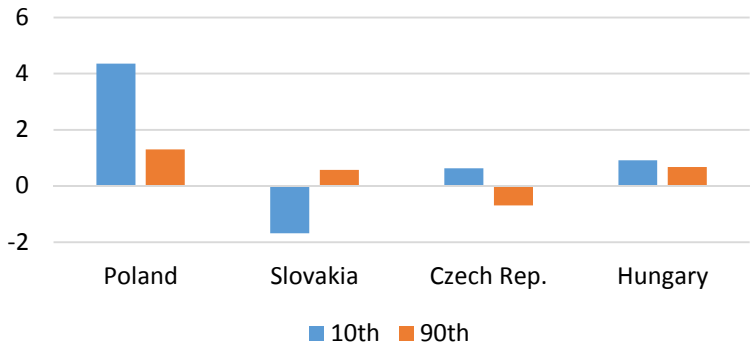
Figure 7. Average reading proficiency from PISA 2000 to PISA 2012.



Source: PISA 2012, Volume I, Table I.4.3b. Slovakia did not participate in PISA 2000. Note that these are the original PISA results, so the average for Poland differs from the re-scaled results presented in Figure 3.

Figure 8 presents similar trends, albeit separately for the lowest-performing (those at the 10th percentile of the achievement distribution) and the highest-performing students (those at the 90th percentile). The figure clearly demonstrates that between 2000 and 2012 Polish low-achievers improved by more than 4 points per year, and the top-achievers improved by only slightly more than one point. However, both groups improved more than similar students in neighbouring countries. Hungarian students improved by less than one point at both ends of the achievement spectrum. In Slovakia, the performance of the lowest achievers has declined since 2003 with a very small improvement among the best students. In the Czech Republic only marginal changes were reported with a larger decline among the top achievers compared to their low-achieving peers.

Figure 8. Estimates of linear growth per year for the lowest (10th percentile) and the highest (90th percentile) performing students: PISA 2000 to PISA 2012 (Slovakia from PISA 2003).



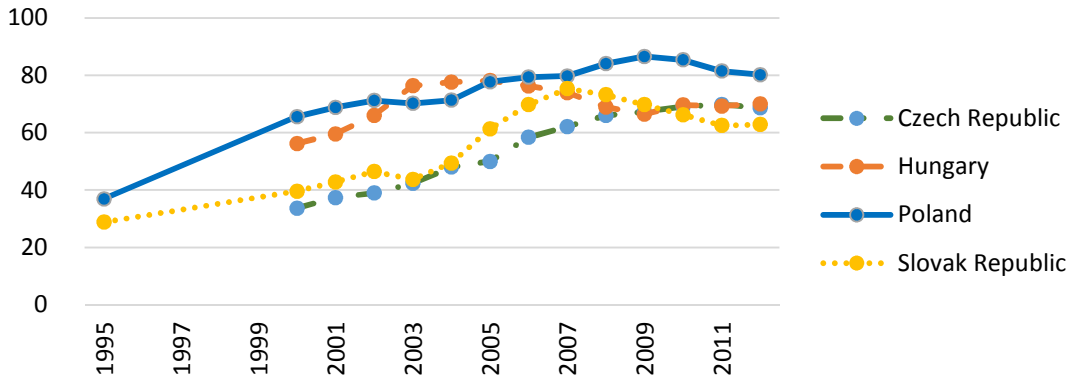
Source: PISA 2012, Volume I, Table I.4.3d. Note that PISA 2000 data for Slovakia is not available. All estimates are statistically significant except the estimates for the 10th percentile for Slovakia.

As already noted, most of the improvement in Poland can be accounted for by the success of the lowest achieving students. They have benefited most from the reforms, although Figure 8 shows that the improvements among top performing students were also much larger than in the neighbouring countries. As a result, the Polish reforms can be taken as an example of successful policies aimed at students with different ability levels.

Life after school

Another outcome is often cited when discussing the Polish education reforms: the large increase in the percentage of young people continuing into higher, tertiary education. Figure 9 compares the increase in the share of students in tertiary education in the four countries since 1995 (Poland and Slovakia) or 2000 (the Czech Republic and Hungary). All the countries inherited relatively limited access to tertiary education and strong support for vocational education from the communist period. Gradually, starting in the 1990s, the number of students entering tertiary education increased in all countries, with only a recent drop in Hungary and Slovakia.

Figure 9. Trends in entry rates into tertiary education between 1995 and 2012 (ISCED 5A and 5B).

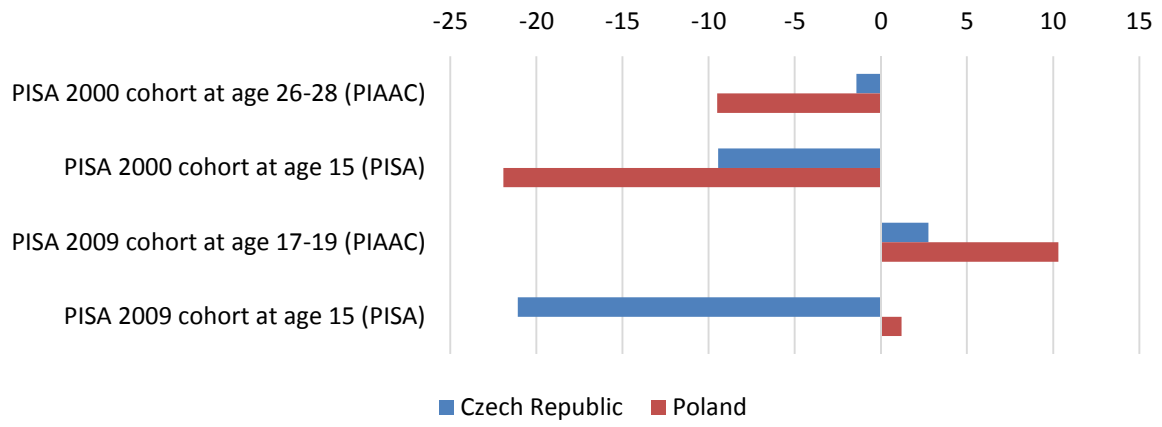


Source: OECD Education at a Glance 2014, Table T_C3.2a. The data for ISCED 5B in Slovakia from 2005-2007 were imputed as a linear trend across three years.

A common doubt is whether the skills developed at school and the increased enrolment in tertiary programmes both translate to better skills among adults and better labour market outcomes. The OECD PIAAC study measures foundational skills among16 to 65 year-olds based on real-life problems. The study demonstrates that these skills are in fact related to individual success, because those who demonstrate better skills not only attain higher formal education degrees but are also better paid, even compared to colleagues with the same level of education and a similar background. Adults who demonstrate lower skills are also not only more often unemployed, but in addition report poorer health more often, a lower level of civic engagement and less trust (see OECD, 2014a). As a result, it is interesting to see if skills measured among the 15 year-olds translate into better fundamental skills several years later. In a sense, this is the measure of the importance of school reforms, as their ultimate goal is not to improve scores but to improve skills that translate into better lives.

Polish students and adults educated under the old system are performing at much lower levels than the similar cohort of Czech students. The opposite can be said of the cohort of students who participated in the PISA 2009 study: Polish 15 year-olds outperformed students from the Czech Republic and they continue to show better skills at the age of 17-19. This can be seen in Figure 10 that compares the results from the PISA and PIAAC studies for the same cohort of students and then young adults. The figure presents the difference between the average country performance and the OECD average reported for countries participating in both studies (see OECD, 2014a, Table A5.6L; note that differences for PIAAC study were doubled to put them on a scale comparable to PISA). Note that for the PIAAC study, three consecutive cohorts were reported due to the limitation of the sample size.

Figure 10. PISA 2000 and PISA 2009 cohorts in PISA and PIAAC: differences from the OECD average.

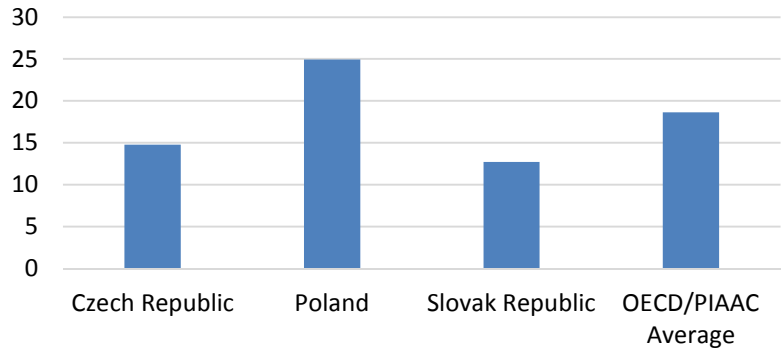


Note: Differences for PIAAC were doubled to make them comparable with the PISA scale. Slovakia did not participate in PISA 2000 and Hungary did not participate in PIAAC, so the results for these countries are not reported.

The youngest Polish adults demonstrate much better skills than the older cohorts. This difference is observed in all countries, but for Poland it is exceptionally large. In the Czech Republic and Slovakia it is below the average difference for the OECD countries participating in the study. This suggests that the development of skills among young Poles improved compared to the older cohorts. On the other hand, young Czechs are still outperforming Poles showing that additional improvements are necessary. The Polish data that oversamples the youngest adults, suggest in fact that after leaving the school their skills remain at similar levels, like in Slovakia. In other countries, including the Czech Republic, skills improve until the age of 30-35. That might suggest that the higher education system

in Poland is ineffective. However, this data also show that 16 year-old students who have already benefited from the latest reforms are showing even better skills, above the OECD average. As a result, the PIAAC data partly confirms that the school reforms in Poland have improved skills and that these effects are sustainable. They also show that other countries in the region need to address school system deficiencies to sustain or improve skills of the youngest cohorts.

Figure 11. Numeracy skills gap between the youngest (16-24) and the oldest (55-65) adults.



Source: OECD 2013 Skills Outlook, Table A3.2N.

There are also issues that need to be addressed in Poland, despite its generally successful reforms. The PISA and PIAAC studies do not measure some skills for which schools are at least partly responsible. For example, Polish employers rarely complain about the lack of core or subject-specific skills among graduates, but they often report a lack of communication or interpersonal skills, problems with self-organisation, or a lack of specific vocational skills (see Górniak, 2013). Some attempts have been made to include training in so-called soft skills into the new curriculum, but Polish schools struggle with their implementation. It is a system that is still evolving and searching for new opportunities to improve quality and address different demands. The evidence presented above demonstrates, however, that to a large extent the system has managed to reach the goal set up before the reforms started: expanding the general skills of Polish students and providing them with opportunities to continue education.

4. Conclusions

- Polish reforms provide an example of successful policies aiming at expanding learning opportunities for students. Today, Poland has one of the best educational systems in Europe and is catching up with the best performers in the world.
- The most important change introduced by the 1999 reform was the extension of comprehensive education by one year. Evidence suggests that this extension immediately benefited students who would otherwise have gone into vocational education, while the remaining elements of the reform are probably responsible for the gradual improvement of overall student performance.
- Poland also limited the differences between schools attended by 15 year-olds, which used to be among the largest across the OECD countries and are now among the smallest.
- Besides structural changes, the Polish system has been gradually modernized over the last 15 years. The most important changes include decentralization, increased school autonomy, professional development and the introduction of the national exams.
- National exams are a crucial component of quality assurance and improvement. The standardized assessments are conducted at the end of each stage of education. The results are published and carefully analysed by schools.
- In 2008, a new curriculum focusing on learning results was introduced and in 2009 the new data-driven system of school evaluation replaced the old system of school inspections. These two changes seem to be crucial for further improvements in the results of Polish students.
- Poland has also increased its support for pre-school education and further expanded the general curriculum in vocational schools. The result of all reforms mentioned was the extension of compulsory comprehensive education from 8 years before the 1999 reform to a minimum of 10 years nowadays. For many students comprehensive education now starts at the age of 3 and continues until the age of 16.
- The evidence from PISA shows that Polish students now outperform their peers in the Czech Republic, Hungary and Slovakia. This can be related to the distinct path of Polish reforms, as, for example, all of the three neighbouring countries still have a very early selection of students.
- Although the skills of Polish adults on average remain lower than, for example, those in the Czech Republic, results from PIAAC show that Poland has experienced one of the largest improvements among the younger cohorts. The share of students entering tertiary education is also larger in Poland. Together this data suggests that the effect of the school reforms translates into continuing education and better skills after leaving school.

References

Dolata Roman, Jakubowski Maciej, Pokropek Artur, 2013. „Polska oświata w międzynarodowych badaniach umiejętności uczniów PISA OECD. Wyniki, trendy, kontekst i porównywalność", Wydawnictwo Uniwersytetu Warszawskiego.

Eurydice, 2009. National Testing of Pupils in Europe: Objectives, Organisation and Use of Results. European Commission, Eurydice.

Eurydice, 2014. Compulsory education in Europe 2014/2015. European Commission, Eurydice.

Federicova Miroslava, 2014. "The Impact of High-Stakes School-Admission Exams on Study Effort and Achievements: Quasi-experimental Evidence from Slovakia," CERGE-EI Working Papers wp517, The Center for Economic Research and Graduate Education - Economic Institute, Prague.

Górniak Jarosław (ed.), 2013. "Youth or experience? Human capital in Poland.". PARP.

Herbst Mikolaj, Wojciuk Anna, 2014. Common origin, different paths. Transformation of education systems in the Czech Republic, Slovakia, Hungary and Poland. GRINCOH working paper.

Horn Dániel, Diverging performances: the detrimental effects of early educational selection on equality of opportunity in Hungary, Research in Social Stratification and Mobility, Volume 32, June 2013, Pages 25-43

Jakubowski Maciej, Patrinos Harry, Porta Emilio, Wisniewski Jerzy, 2010. "The impact of the 1999 education reform in Poland," Policy Research Working Paper Series 5263, The World Bank.

Marciniak Zbigniew, 2014. "Reviewing Polish education reform in the late 1990s – possible lessons to be learned", World Bank Report, to be published

Meier Volker, Schütz Gabriela, 2007. "The Economics of Tracking and Non-Tracking," Ifo Working Papers No. 50, Ifo Institute for Economic Research at the University of Munich.

OECD, 2014a. Skills Outlook 2013. OECD Publications, Paris.

OECD, 2014b. Education at a Glance 2014. OECD Publications, Paris.

Woessmann Ludger, 2009. "International Evidence on School Tracking: A Review," CESifo DICE Report, Ifo Institute for Economic Research at the University of Munich, vol. 7(1), pages 26-34, 04.

WWW.IBS.ORG.PL