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## **EDUCATION AND ENTREPRENEURISM: HOW POLAND CAN CATCH UP WITH THE GERMAN ECONOMY BY INVESTING IN NON-MATERIAL CAPITAL**

### **Introduction**

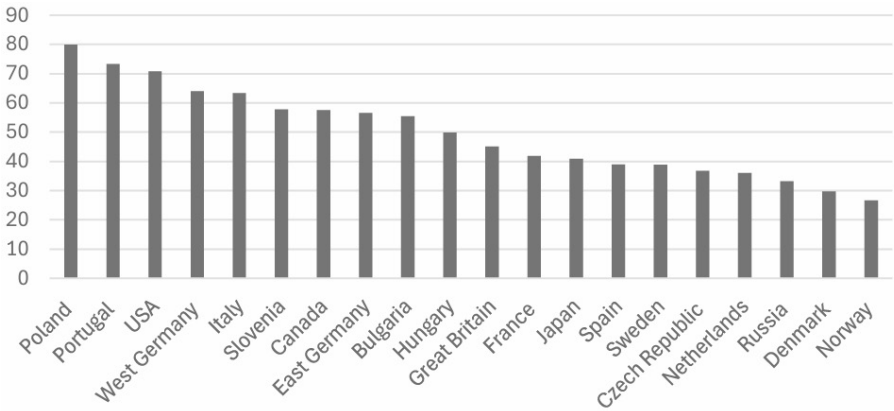
On one hand entrepreneurship is a motor for dynamizing an economy, but on the other hand entrepreneurship itself is dynamized by education and the stability of institutions. Improvement of the Polish economy starts in schools and institutions, not only in companies. Professor Jan Winiecki<sup>1</sup>, who wrote about the necessity of introducing an effective transformation in Poland, argued that large economies, which report high GDP per capita, tend to also have a high number of entrepreneurs. The more entrepreneurs an economy has, the more competitiveness arises, which eventually leads to higher innovation, resulting in increasing profits which are also beneficial for the society. For the Polish economy, which neighbours the largest, most developed and stable economy in Europe, the very process of catching up with it served as a measure of the effectiveness of the economic transformation under way. Germany was chosen as a comparison to Poland for various reasons. Both economies are often compared in political and economic debates, because of their geographical position, neighbouring in the centre of Europe and sharing a relevant history.

Poland is already rich in its resources: it is geographically placed in a beneficial place, it is known for its inexpensive cost of containing a company and has people willing to be entrepreneurs as can be seen in figure 1, with Poland having the most citizens, almost 80%, willing to be self-employed in the year 2001. However, because of the instability and high risk of a business not being profitable, Poles tend to be more holding back when it comes to running an entrepreneurship, which is unfortunate, because Poland is called an “Economic Miracle”, meanwhile it is not even using all its potential. This can be observed in figure 2, which presents the development of the entrepreneurial spirit in

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1 J. Winiecki, *Przekształcenia strukturalne w procesie rozwoju gospodarczego: Modyfikacje i rozszerzenia*, „Ruch Prawniczy Ekonomiczny i Socjologiczny”, 2014, vol. 76, nr 2, p. 271-292.

2022. It shows that in comparison to other countries Poland has a low number of people willing to be entrepreneurs. Those two figures could be interpreted as followed:after two decades Poles lost the courage and interest in leading their own business, decreasing the number of entrepreneurs and movement in the economy.



**Figure 1. Percentage of Europeans preferring self-employment in 2001**

Source: Own compilation based on data from research of D. Blanchflower, A. Oswald, *Latent entrepreneurship across nations*, „European Economic Review”, 2001, vol. 45, issues 4-6, p. 680-691.



**Figure 2. European Preferences for Employment Status in 2022**

Source: Own compilation based on data from research of the European Commission, Flash Eurobarometer 513: *Social entrepreneurship and youth*, generated by Ipsos European Public Affairs, Social Affairs and Inclusion, Brussel 2023.

This paper attempts to identify the key factors that could help the Polish economy catch up with the German economy. It compiles and presents key data on education and innovation, whilst also devoting considerable attention to the works of Professor Winiecki, which served as the inspiration for this topic. My own personal experience of living in Germany for over 12 years, going to school and finishing A-levels there has also been drawn upon in the preparation of this text.

## 1. GDP comparison - so far but also so close

To catch up with the German economy, which is well known for its size, stability and on-going growth, and assure safety and stability for new entrepreneurs, Poland must commit to some changes in:

- its educational system;
- position towards R+D (especially when it comes to investments in that field);
- stability of institutions responsible for entrepreneurship to function.

Table 1 presents the GDP growth in Germany and Poland, as averaged over a longer period between 1995-2000, 2001-2008 and 20212-2020 as well as current values from reports of the World Data Bank 2021-2024. Additionally, the table evaluates the ratio of GDP per capita in Germany in comparison to the Polish GDP per capita, to show the process of Poland catching up with the German GDP.

When comparing the annual growth of GDP<sup>2</sup> in % the table shows Poland is in a leading position because in 2024 it has achieved an annual growth of 3.03% while Germany has a negative GDP growth of -0.5%. Although Germany has a strong economy, its growth is rather stable as the average being 1.5% of GDP growth annually and now gradually slowing down reaching minus figures as in previous years around -0,5%, which can be explained for instance by the energy crisis in 2022. Meanwhile, Poland has a strong annual GDP growth of average 5%. It has experienced a slowdown from 2022 with 5.26% to 0.25% in 2023. However, the economy was able to recover, obtaining a positive annual GDP per capita growth in 2024 of 3.03%.

Additionally, the most valuable observation is that between 1995-2000 and 2024 the GDP per capita ratio went from 6.7 to 2.2, which indicates again that Poland is already moving towards economic parity with Germany. Achieving

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2 World Data Bank: *GDP annual growth in % Poland, Germany, GDP ratio between Poland and Germany*, <https://databank.worldbank.org/source/world-development-indicators> (access: 20.04.2026).

economic parity with Germany is realistic if Poland commits to the changes quoted above.

**Table 1. Dynamics of GDP measures of Germany and Poland in the years 1995-2024**

| Indicator/year                                      | 1995-2000 | 2001-2008 | 2012-2020 | 2021 | 2022 | 2023  | 2024  |
|-----------------------------------------------------|-----------|-----------|-----------|------|------|-------|-------|
| Germany/Poland GDP per capita ratio (Current USD *) | 6.7       | 4.5       | 3.3       | 2.8  | 2.7  | 2.5   | 2.2   |
| Germany GDP growth (annual %)                       | 1.9       | 1.3       | 0.9       | 3.91 | 1.81 | -0.87 | -0.50 |
| Poland GDP growth (annual %)                        | 5.7       | 4         | 3.1       | 6.93 | 5.26 | 0.25  | 3.03  |

Source: Own calculations based on the WDI data.

## **2. Schools are the first objective – investment into non-material capital**

The investment in non-material capital in Germany can be observed in various fields, for example the approach to analysis and independent thinking - which is an important skill in entrepreneurship. During the preparation period for advanced German A-level examinations in Germany students are required to read two readings, whereas students preparing for Polish A-level examinations are expected to be familiar with approximately twenty readings. The difference is that more does not always mean better. The German approach focuses more on the understanding of the reading's syntax, historical background and overall analysis, which has the effect of students learning how to read between the lines and detect things that are not said directly. Therefore, German students know less readings but understand them fully, get to evolve their critical and independent thinking and can apply it in various fields - for example entrepreneurship. In Polish schools the overload with readings that must be rather memorized and not understood, leads to students being overwhelmed

with too much information that they often do not understand and rarely even read. A research<sup>3</sup> on deep and surface learning by Christine Chin and David E. Brown found that, when students were told to apply each approach, the group learning with deep approach later used “elaborate explanations (...) asked questions which focused on explanations and causes, predictions, or resolving discrepancies in knowledge” and engaged in “on-line theorising”. Furthermore, students which focused on surface approach basically used reformulations of the questions as their explanation, as well as “descriptions which referred only to what was visible (...) (and asked) questions (referring) to more basic factual or procedural information”. A similar effect can be observed in the approach towards readings.

Another way in which Germany supports people that are willing to educate themselves further on, is the program *Bafög*. In 2024 it reached over 612,800 thousand participants, from which 8 out of 10 were students<sup>4</sup> Naturally Poland offers such programs as well, however *Bafög* is paid monthly throughout the whole period of studies, from which exemplary around 20.000 Euro only 50% must be paid back without an interest rate. This program is strongly future-oriented, it should encourage students to continue their education and achieve a greater career, meanwhile Germany increases its intellectual capital. Professor Winiecki argued “*Knowledge Intensive Services - KIS*”, which cover IT services, telecommunication, transport, as well as R+D. He also mentioned that highly developed countries usually focus on investments in these fields. In the long run Germany secures Knowledge Intensive Services that allow entrepreneurs to develop and dynamize the economy.

Additionally, *Bafög* is not only an economic aid, but it also covers a social aspect: it lowers inequality<sup>5</sup> for higher education between wealthy and less wealthy families. Since 1971, the year in which *Bafög* was introduced, the program allowed many students, especially from less wealthy families of workers, to continue their education, which would otherwise not be possible.

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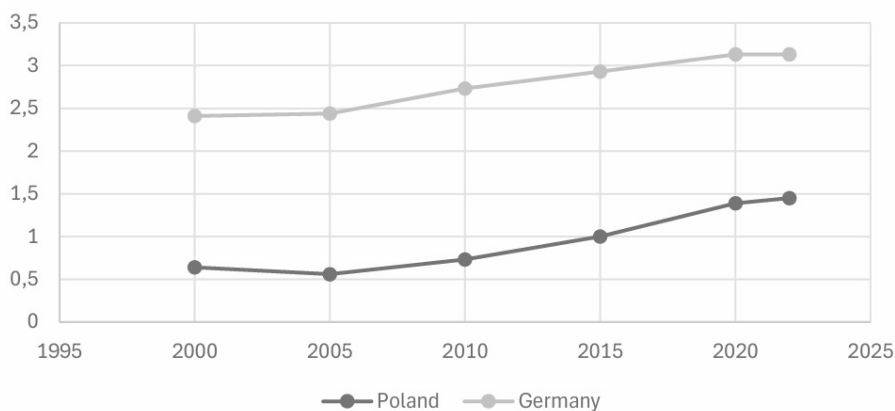
3 C. Chin, *Learning in Science: A Comparison of Deep and Surface Approaches*, „Journal of Research in Science Teaching”, 2000, vol. 37, issue 2, p. 109-138.

4 DESTATIS, [www.destatis.de/DE/Presse/Pressemitteilungen/2025/08/PD25\\_283\\_214.html](http://www.destatis.de/DE/Presse/Pressemitteilungen/2025/08/PD25_283_214.html) (access: 03.06.2026).

5 L. Wössmann, *How Equal Are Educational Opportunities? Family Background and Student Achievement in Europe and the United States*, „CESifo Working Paper”, No.1162, Munich 2004.

### 3. Providing certainty for entrepreneurs with R+D

As presented in figure 3 exactly 3,13% of GDP was invested by Germany in 2022 into R+D, meanwhile in Poland it was only half that much, around 1,45% of Polish GDP<sup>6</sup>. These numbers provide additional evidence for the fact that Germany puts a lot of worth into R+D. However, Poland has undergone improvements since 2015 to 2020 by 0.4% of higher investments, meanwhile in Germany it was less than 0.2% of raise during that period (figure 3). For current as well as future entrepreneurs academic research is a necessary fundament for certainty in leading a business. Moreover, based on research<sup>7</sup> modern entrepreneurship, that note the biggest success are usually focusing on the quality of their intellectual capital. *The Global Entrepreneur Monitor* <sup>8</sup>(GEM) from 2024 supports this conclusion as well.



**Figure 3. Research and development expenditure in Poland and Germany from 2000 to 2022 (% of GDP)**

Source: Own compilation of data based on research from the World Data Bank.

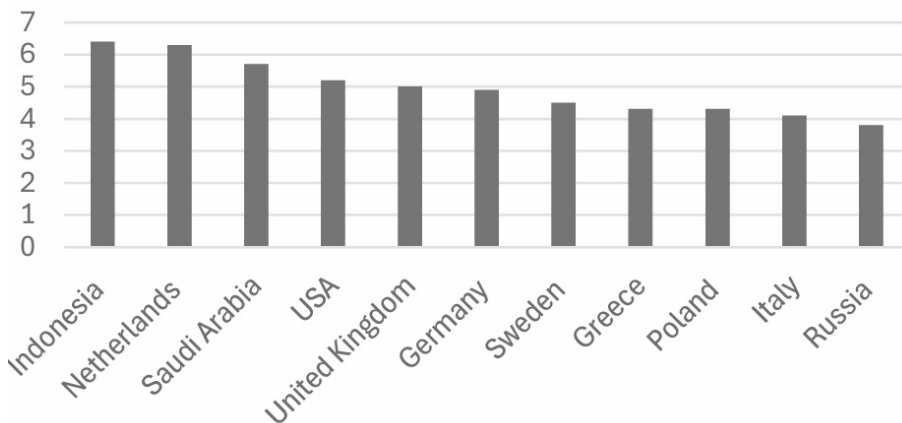
The *National Entrepreneur Context Index* (NECI) from 2020 shown in figure 4. improved in Poland from 3.8 to 4.2 of 10 points in the last period, while in

<sup>6</sup> World Data Bank: *Research and development expenditure (% of GDP) - Germany, Poland*, <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=DE-PL> (access: 20.04.2026).

<sup>7</sup> D. Bubel, *Behavioural Aspects of Intangible Assets Management in Enterprises*, „Przegląd Organizacji”, 2017, nr 7, p. 59-66.

<sup>8</sup> Raport z badania *Global Entrepreneurship Monitor Polska 2024*, <https://www.parp.gov.pl/component/publications/publication/gem-polska-2024-raport-z-badania-przed-siebiorczosci> (access: 29.02.2026).

Germany the score is about 4,8 points. However, from all countries included in the research Poland is placed on the 19th place of all the given 22 places. It is also said, that although improvement is already taking place, it could be strengthened in the field of entrepreneurship education<sup>9</sup>. The report underlines that in Poland changes connected to entrepreneurship have to be made on every level: primary, secondary, in universities, later in the career and additionally in the institutions responsible for financing sectors connected to R+D. So, the conclusion is that entrepreneurship starts with education. The more education and research are provided, the more information and safety is assured for entrepreneurs. With the given certainty, entrepreneurs tend to take more thought through risks that lead to innovation and competitiveness among entrepreneurs, later leading to a stable economic growth, with which Poland could catch up with the German one.



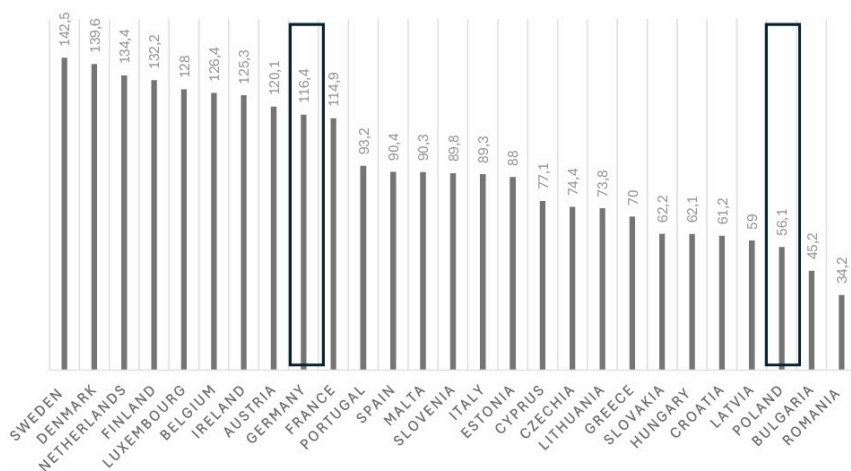
**Figure 4. Results of National Entrepreneur Index (NECI) in 2020**

Source: Own compilation of the results of NECI 2020.

Nevertheless, according to the *European Innovation Scoreboard*<sup>10</sup>, which divides European countries into four groups of innovation: leaders, strong, moderate and emerging, Poland is placed in the last group of emerging innovators while Germany is a strong innovator. The image shows a pattern, that east

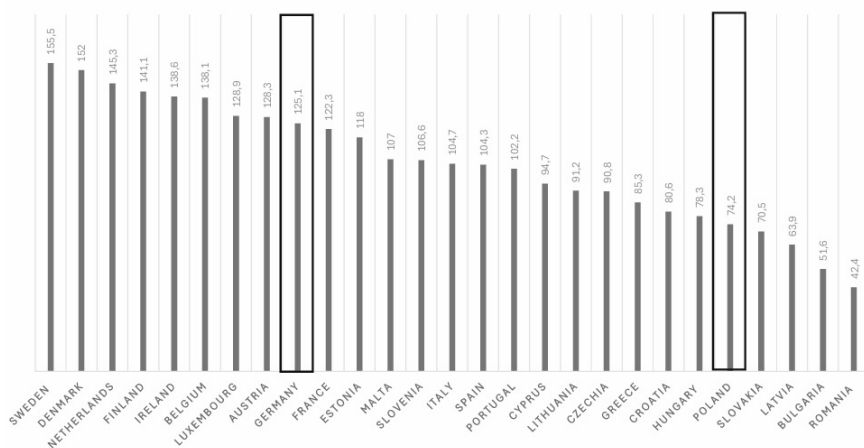
<sup>9</sup> *Ibidem*.

<sup>10</sup> European Commission: *European Innovation Scoreboard 2025 and 2018*: [https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard\\_en](https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en) (access: 20.04.2026).



**Figure 5. Innovation Scoreboard in Europe in 2018**

Source: Own compilation of the European Innovation Scoreboard in 2018.



**Figure 6. Innovation Scoreboard in Europe in 2025**

Source: Own compilation of the European Innovation Scoreboard in 2025.

European countries with a soviet past are less prone to be innovative. Professor Winiecki<sup>11</sup> explains this phenomenon with the historic fact, that soviet institutions were strongly unstable and that entrepreneurship was barely

11 J. Winiecki, *Determinants of catching up or falling behind: interaction of formal and informal institutions*, „Post-Communist Economies”, no. 16, issue 2, p. 137–152.

encouraged. Figures 5 and 6 represent the development of innovation scores throughout Europe between 2018 and 2025. It can be observed that Poland, although it increased its score of innovation, remains in the last group of emerging innovators. However, the improvement was greater than the one in Germany, because Poland's score increased by around 18 units, while in Germany it was around 9. All in all, Poland has committed to improving its innovation, which could be even stronger if entrepreneurs were given higher access to knowledge and stable institutions.

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## Summary

The aim of this paper is that Poland needs to pivot to investing in non-material capital, focusing on entrepreneur education at schools, followed by educating current entrepreneurs more and giving them more access to knowledge by higher investments in R+D.

Additionally, the institutions responsible for maintaining entrepreneurships should be investigated further and changed to serve benefits for entrepreneurs. The question is, is all this possible? Of course, it won't be simple, but if applied now, the financial sacrifices will bring future, and most important stable profits. After all, the changes include various fields, like institutions of education, investment decisions, budget and political approval. So, the enforcement will be difficult but not impossible. Poland is already in a good place, but where could it be if all resources were used to their full potential? Additionally, I would like to address that this paper does not examine all potential factor and only focuses on the most relevant one, due the possible length of the paper.

Key words: non-material capital, R+D investments, entrepreneurship education

## **EDUKACJA I PRZEDSIĘBIORSTWO: JAK POLSKA MOŻE DOGONIĆ NIEMIECKĄ GOSPODARKĘ INWESTUJĄC W KAPITAŁ NIEMATERIALNY**

### **Streszczenie**

Celem niniejszego artykułu jest wykazanie, że Polska powinna skoncentrować się na inwestowaniu w kapitał niematerialny, kładąc nacisk na kształcenie przedsiębiorczości w szkołach, a następnie zapewniając obecnym przedsiębiorcom lepszy dostęp do wiedzy poprzez zwiększenie nakładów na badania i rozwój. Ponadto należy poddać dalszej analizie instytucje odpowiedzialne za wspieranie przedsiębiorczości i wprowadzić w nich zmiany, tak aby służyły one interesom przedsiębiorców. Pytanie brzmi: czy to wszystko jest możliwe? Oczywiście nie będzie to łatwe, ale jeśli podejmiemy te działania już teraz, związane z nimi poświęcenia finansowe przyniosą w przyszłości – a co najważniejsze – stabilne zyski. W końcu zmiany te dotyczą różnych dziedzin, takich jak instytucje edukacyjne, decyzje inwestycyjne, budżet oraz poparcie polityczne. Wdrożenie tych zmian będzie więc trudne, ale nie niemożliwe. Polska ma już dobrą pozycję, ale gdzie mogłaby się znaleźć, gdyby w pełni wykorzystać potencjał wszystkich zasobów? Ponadto pragnę zaznaczyć, że niniejszy artykuł nie uwzględnia wszystkich potencjalnych czynników, a ze względu na ograniczoną objętość skupia się wyłącznie na tym najbardziej istotnym.

**Słowa kluczowe:** kapitał niematerialny, inwestycje B+R, edukacja przedsiębiorcza