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**FACTORS INFLUENCING THE DURABILITY
OF OPERATIONS FINANCED UNDER THE CAP
IN THE OPINION OF AGRICULTURAL ADVISORS²**

Key words: durability of operations, CAP, farm investment, agricultural finance,
agricultural policy

ABSTRACT. The durability of operations is an important category from the point of view of public policies, including the Common Agricultural policy (CAP). The main objective of the article is to identify and assess factors affecting the durability of CAP financial operations on the example of measure 4.1. “Modernization of farms” based on the opinions of experts – advisors of agricultural advisory centers (ODR). We used primary data from expert surveys amongst agricultural counsellors: CAWI technique was employed. Diversification of production at farm-level, employment outside the farm and running non-agricultural activities should be assessed as key internal factors having a beneficial impact on the durability of the investment. The significant internal factors that were considered to have a strongly unfavorable impact on the durability of investments projects are those related to the insufficient level of capital and land held. Specialization in milk production, then pig production had a beneficial effect on durability of operations. Strengthening the quality of human capital in rural areas, including farm management should be recommended. This includes strengthening their flexibility and resilience, for example through diversification.

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² Research on the durability of operations financed under the CAP was carried out as part of the task of a targeted subsidy from the Ministry of Agriculture and Rural Development for IAFE-NRI for 2022, results were presented (in a modified form than in the article) in the report "Sustainability of operations financed under Rural Development Program 2014-2020" (December 2022), by C. Klimkowski, J. Kulawik, M. Soliwoda, <https://www.gov.pl/web/rolnictwo/ewaluacja> (only Polish version is available). The empirical part (with the division criterion used) is original.

INTRODUCTION

The durability of operations is an important category from the point of view of public policies, including the Common Agricultural Policy (CAP). The assessment of durability as a category that, like effectiveness and efficiency, has a praxeological basis, relates to answering the question to what extent the changes caused by the implementation of the investment are long-term and whether the beneficiaries will continue to function after the end of support. From the point of view of the modernization of the Polish agricultural sector, measures from the second pillar of the CAP play an important role, and above all 4.1. Support for investments in farms (Modernization of farms), 6.4. Support for investments in the creation and development of non-agricultural activities (Development of entrepreneurship – development of services related to agriculture and forestry). Theoretical bases for assessing the sustainability of operations refer to the achievements of agricultural economics and finance. Nevertheless, environmental assessment of some selected operations may be also essential. In particular, this concerns previous empirical work related to the determinants of the investment activity of farms, as well as the determinants of disinvestment in agriculture. To measure and assess durability of operations, it is necessary to adapt methodologies from subdisciplines related to agricultural finance (including SME finance, corporate finance, behavioral finance).

Durability of operations is a narrow but important economic category of farm achievement measurement. For example, the financial sustainability is definitely broader, with a greater decision-making value. It refers also to the broader concept of their viability that is underlined in CAP tools [see: O'Donoghue et al. 2016, Zorn et al. 2018].

The main objective of the article is to identify and assess factors affecting the durability of CAP financial operations on the example of Modernization of Agricultural Farms based on the opinions of experts – advisors of agricultural advisory centers (ODR). We used primary data from expert surveys amongst agricultural counsellors: CAWI technique was employed. To our best knowledge, our article is the first paper related to durability of operations under the CAP.

CONTEXT ANALYSIS AND LITERATURE REVIEW

This category of durability referring to operations financed from the EU funds, including CAP, has not been precisely defined. The assessment of durability, leads to answering the following questions: (1) How are the changes caused by the implementation of the investment for a long-term period? (2) Will the beneficiaries continue their economic activity after the end of support? The measurement and assessment of durability is important from the point of view of the activities of the Rural Development Program (RDP),

which in fact may lead to an increase in the investment activity. No consensus regarding the definition of the durability category, its measurement and assessment is a clear premise for a well-thought-out and prudent adaptation of some methodological approaches and methodological tools from sub-disciplines related to agricultural finance, i.e. SME finance, corporate finance, behavioural finance. Particularly well-developed analysis of investment/disinvestment processes of farms in Poland and in the EU deserves attention. With regard to projects financed or co-financed from public funds (including from the EU budget), the category of durability is related to assessing them. However, it applies to such projects in which there was an investment in infrastructure or of a production nature. This type of investments should achieve the assumed effect during the durability period, ergo: this is to imply positive changes in the economy, but also, indirectly, in the social environment [Krawczuk 2018]. The legislative base for the durability assessment relates to Regulation (EU) No. 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the Euro – European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No. 1083/2006. According to art. 71 par. 1 of the regulation, durability refers to investment projects (i.e. investments in fixed assets or intangible assets, necessary to conduct production or service activities).

From the point of view of practice of projects co-financed from the EU funds, assessment of durability is related to the fulfilment of a number of qualitative and quantitative criteria, which are in fact requirements checked by the intermediate body (IB) or the managing body (MA). The qualitative criteria include:

- 1) no significant modifications radically changing the essence of the project or leading to the generation of “unjustified benefits” [Kister et al. 2014, p. 391];
- 2) reliable archiving of design documentation [cf. Grzymkowska 2022];
- 3) promotional activities undertaken.

Quantitative criteria refer to maintaining values/desired product and result indicators above the threshold, they are quite significant under the Project Cycle Management approach [Kot and Weremiuk 2012, p. 16]. From the point of view of project management practice, limitation of project flexibility is a fairly significant impediment resulting from the application of the durability principle. This leads to a reduction in the possibility of making changes in the investment process, and, if necessary, to undertaking restructuring activities [Kot and Weremiuk 2012, p. 16].

An audit undertaken by the European Court of Auditors (ECA) was a good example of the measurement and assessment of the durability of projects co-financed from the

EU funds, results of it were presented in the special report entitled: “Durability in rural development. Most projects remain operational for the period required, but there are opportunities to achieve longer lasting results” (Special report 12-2022). Durability assessment by the ECA consisted in verifying “whether investments in diversifying the rural economy and improving rural infrastructure have resulted in lasting benefits” [ETO 2022, p. 4]; this involved a thorough analysis of three areas, i.e.: (1) determining whether the “legal requirements as to the minimum durability period of the implemented projects were met”; (2) identify factors affecting project durability; (3) determination “to what extent the EU funds have contributed to creating opportunities for long-term diversification in rural areas” [ETO 2022, p. 4].

The theoretical fundamentals for durability of operations relates to the theory of investment (both at macro- and microlevel). Kalecki’s approach to the investment theory from 1933 is a significant contribution to economic theory. Investments can, on the one hand, be a long-term source of income [Woś 1967], which, on the other hand, influence the investment activity of agricultural farms [Wysokiński and Klepacki 2013, Ziętara and Adamski 2014]. The level of public support in terms of income [Czyżewski and Henisz-Matuszczak 2004] is important from the point of view of investment activity in agriculture. Higher investment activity means an increase in the scale of production. It may lead to farms falling into a technological treadmill [Czyżewski 2017]. Significant differentiation in the direction of investment depending on the production type of the farm [Poczta and Czubak 2007]. Increasing the economic size of farms means an increase in relative debt and the importance of this source of investment financing [Grzelak 2022].

The following determinants of farmers’ investment behaviour were identified in the economic literature:

- factors related to the macroeconomic and political environment, including agricultural policy options [Hay and Morris 1991, Gomez y Paloma et al. 2007];
- a phase of the business cycle, including boom/bust in agriculture [Czubak 2012, Kusz et al. 2015];
- features related to investment projects, including start time, duration, source of financing [LaDue et al. 1988];
- characteristics of commodity markets as well as factor markets, e.g. credit market – the problem of credit constraints [Fertő et al. 2017];
- features of a family farm, incl. economic size, debt [LaDue et al. 1988, Olsen and Lund 2011];
- attitudes of the agricultural producer (including his tendency to take various risks).

From the point of view of assessing the durability of investment projects, the achievements regarding disinvestment (disinvestment or, less often, divestment) in agriculture are also of great importance, including: suspension or exit from agricultural

activity (farm exit), radical change in the direction of activity, exhaustion of specific assets [Wojewodziec 2010, Maart et al. 2011]. The real options approach (modeled on real options – as a product of financial engineering), already presented in the description of the research results of the team of Elisabeth Vollmer et al. [2017], may also prove useful for analyzing disinvestment decisions of farms.

MATERIAL AND METHODS

The basic source of data were responses contained in surveys completed by 166 experts working in Agricultural Advisory Centers located throughout Poland. The surveys concerned a number of issues related to maintaining the durability of investments implemented thanks to support under the Modernization of Agricultural Farms (MAF) operation. This article analyzes questions relating to the impact of internal and external factors influencing sustainability, as well as questions relating to the impact of the type of agricultural production and the class of investments carried out by farmers on sustainability.

The results relating to the responses of the entire population of experts as well as by regional division are presented. When determining the boundaries of the regions, the methodology used by Farm Accountancy Data Network (FADN) was used. The following four regions are distinguished:

- Pomorze i Mazury (voivodeships: warmińsko-mazurskie, pomorskie, zachodnio-pomorskie, lubuskie);
- Wielkopolska i Śląsk (voivodeships: kujawsko-pomorskie, wielkopolskie, dolnośląskie, opolskie);
- Mazowsze i Podlasie (voivodeships: podlaskie, mazowieckie, łódzkie, lubelskie);
- Małopolska i Pogórze (voivodeships: podkarpackie, świętokrzyskie, małopolskie, śląskie).

The number of surveys completed by experts varies between regions. Most responses were received for the Region Wielkopolska i Śląsk, where experts fulfilled 53 surveys. In the remaining three regions, the number of responses is at a similar level. There are 39 surveys from Małopolska i Pogórze, 38 surveys from Pomorze i Mazury and 37 surveys from Mazowsze i Podlasie.

As many as 80.8% of respondents indicate over three years of experience in helping farmers complete MAF applications, and only 7.2% had no experience in this area at all.

In the case of the set of questions analyzed in this article, respondents had six answer options to choose from. When assessing the impact of a selected factor, experts could choose between the following answers:

- strongly favourable,
- moderately favourable,

- no influence,
- moderately unfavourable,
- strongly unfavourable,
- no opinion.

Research results were presented using the simplest statistics. The Mann-Whitney U test was used to assess the statistical significance of differences in the answers of experts from different regions.

RESULTS

At first, the results referring to the question about external factors that, according to experts, influence the durability of investments implemented as part of MAF will be presented.

Respondents could assess the twelve external factors indicated in the survey. In most cases the names of the factors have been formulated in such a way that they are associated at first glance with a negative impact. They are as follows:

- unfavourable climatic and weather conditions,
- occurrence of epidemic animal diseases,
- increase in prices of means of production (feed, fertilizers, etc.),
- increase in the costs of hired labour,
- increase in agricultural land rental prices,
- decrease in prices of manufactured agricultural raw materials,
- changes in the EU Common Agricultural Policy,
- other changes in legal regulations regarding agricultural activities,
- consequences of pandemic diseases (e.g. COVID-19),
- difficulties in international trade of agricultural raw materials,
- consequences of armed conflicts and the policy of economic sanctions (e.g. embargoes, war in Ukraine),
- difficulties in access to external sources of financing.

Of all the factors marked above, the highest share of responses indicating a strongly unfavorable impact on the durability of the investment concerned increase in prices of means of production (62.2% of all answers), occurrence of epidemic animal diseases (61.4%) and decrease in prices of manufactured agricultural raw materials (58.4%). The cumulative share of responses indicating a strongly or moderately unfavorable impact of the above-mentioned factors exceeded 84.0% in each case. The lowest level of responses indicating unfavorable impact refers to changes in the EU common agricultural policy (68.0%) and other changes in legal regulations regarding agricultural activities (68.3%).

On the other hand, most indications of a beneficial effect refer to factors such as changes in the EU common agricultural policy (15.3% of all answers), unfavourable climatic and weather conditions (15.2%) and difficulties in international trade of agricultural raw materials (13.8%). The overall distribution of answers relating to these and other external factors is presented graphically in Figure 1.

As a rule, respondents' answers did not differ significantly between the distinguished regions. However, some differences were noted for selected factors. This applies primarily to answers relating to factors such as: occurrence of epidemic animal diseases, increase in the costs of hired labor or difficulties in access to external sources of financing. Differences that were considered significant based on the analysis of supporting charts, however, did not always turn out to be statistically significant when the Mann-Whitney U test was performed.

Below are the pairs of regions for which the answers of the surveyed experts turned out to be different and these differences were statistically significant. Firstly, there are clear differences in the assessment of difficulties in access to external sources of financing. Experts from the Region Pomorze i Mazury indicate it as a particularly important problem (a large percentage of responses indicating a strong negative impact).

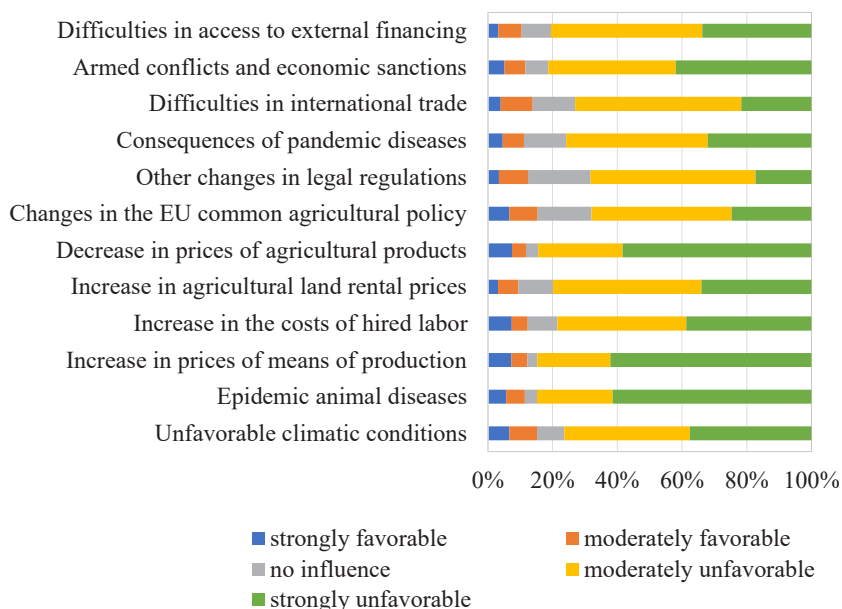


Figure 1. Experts' opinions the impact of selected external factors on the investment durability
Source: own study

There are statistically significant differences between these answers and the recommendations of experts from the regions Wielkopolska i Śląsk and Mazowsze i Podlasie. When comparing the answers with the recommendations of experts from the Wielkopolska i Śląsk Region, differences were found at the level of $p = 0.005$. In the case of the second mentioned region, the differences were also significant at the level of $p = 0.091$.

Statistically significant differences between the surveyed regions also concerned the answers to the question about the impact of difficulties in international trade on the durability of investments (at the level of $p = 0.012$). This applies to the Pomorze i Mazury and Wielkopolska i Śląsk regions. Experts from the latter region were much less likely to point out that difficulties in exporting and importing agricultural raw materials negatively affect the durability of investments. The awareness of the impact of international trade on the economic condition of farms and, consequently, on the durability of investments made thanks to MAF support is significantly higher in the region of Pomorze i Mazury.

The last observed difference in answers, which turned out to be statistically significant ($p = 0.061$), concerns indications regarding the impact of changes in agricultural raw materials. Experts from the Małopolska i Pogórze Region were much more likely to consider agricultural prices as a factor that is a strong threat to the durability of the investment than experts from the Wielkopolska i Śląsk Region.

Experts also assessed the impact of selected internal factors. An internal factor is understood as one whose source is located inside the farm. The opinions were to refer to eleven selected factors, such as:

- conducting diversified agricultural production,
- insufficient level of capital,
- insufficient level of agricultural land,
- insufficient labor force on farms,
- failure to comply with the recommendations of good agricultural practice,
- lack of a successor on the farm,
- resignation from various forms of cooperation with other farmers.
- lack of long-term contracts for the supply of manufactured agricultural raw materials,
- simultaneous employment outside the farm and running non-agricultural activities,
- failure to use external sources of financing,
- lack of or insufficient insurance protection for agricultural production.

Of all the internal factors mentioned above, experts concluded that only the diversification of production should be assessed as having a beneficial impact on the durability of the investment. The share of cumulative responses with a strong and moderate favorable impact was 80.1%. The next factor with a high share of this type of responses is simultaneous employment outside the farm and running non-agricultural activities. In this

case, only 26.3% of respondents indicated a beneficial effect. Other factors were assessed as having a smaller positive impact on the durability of the investment. The smallest share of responses indicating a positive impact refers to factors connected with limited resources and limited opportunities to increase labor and land resources on the farm. For insufficient labor force on farms there were only 13.6% answers indicating positive influence. For inability to increase the area of agricultural land – 15.2% such answers.

The factors that were most often considered to have a strongly unfavourable impact on the durability of investments are those related to the insufficient level of capital (44.6% of all answers) and land held (46.2%). According to experts, limited production resources are the greatest threat to the long-term use of investments made by farmers. If we take into account the cumulative share of responses stating a strong and moderate unfavourable impact, then in addition to the two factors mentioned there will be a third one, related to insufficient labour resources on the farm (third production factor in the agricultural sector). In turn, the factors to which the answer “no influence” was most often given are: resignation from various forms of cooperation with other farmers (38.1% answers), lack of or insufficient insurance protection for agricultural production (35.6%) and simultaneous employment outside the farm and running non-agricultural activities (31.4%). The share of individual responses in relation to the identified internal factors is graphically presented in Figure 2.

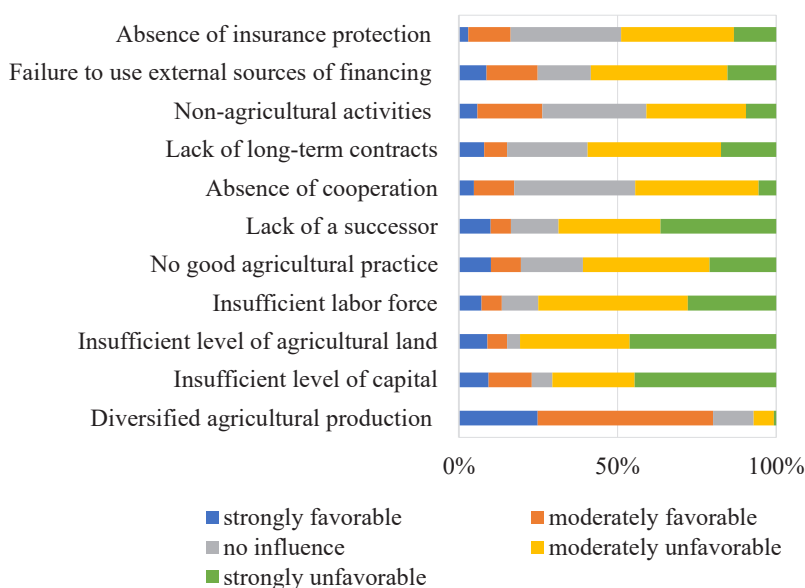


Figure 2. Experts' views on the impact of selected internal factors on the investment durability
Source: own study

As in the case of external factors, the occurrence of statistically significant differences in the answers of experts from different regions was analysed for internal factors. In this case, after selecting potential candidates and conducting appropriate statistical tests, it was determined that regional differences are visible in the case of answers relating to only two internal factors affecting the durability of investments carried out thanks to support under MAF. The first one is Insufficient level of capital. In this case, there is a statistically significant difference ($p = 0.077$) between the structure of answers given by experts from the Wielkopolska i Śląsk Region and the Małopolska i Pogórze Region. For the former, an insufficient level of capital is a much smaller threat to the durability of the investment than for experts from Małopolska i Pogórze, among whom the share of responses with an unfavourable impact was nearly 80%. The explanation for these differences may be the fact that farms in Wielkopolska i Śląsk Region are generally much richer and the lack of sufficient capital is a much less significant barrier to development. As shown by FADN data, on average in the years 2018-2021 the level of capital on a farm from this region was higher compared to a farm from the Małopolska i Pogórze Region by 140%. In the case of the level of capital per one full-time employee, the differences are even greater.

The second factor where statistically significant differences ($p = 0.026$) were recorded is the lack of a successor on the farm. This factor was particularly often considered to have a significant negative impact in the Pomorze i Mazury Region. It was mentioned as such much less frequently by experts from Wielkopolska i Śląsk.

Finally, it is also worth mentioning the experts' survey responses regarding the types of production that, in their opinion, have a positive impact on maintaining the durability of the investment. Most experts (91.2%) assessed that specialization in milk production has a beneficial effect on sustainability. On the other hand, the least of them (72.2%) gave such an answer in the case of live pig production. The difference between answers for those two types of production is statistically important ($p = 0.000$). As for experts' opinions regarding the impact of individual types of investments on their durability, the largest share of responses stating a strong and moderately positive impact was received by investments in machines and equipment for sowing and planting (95.6%), fertilization machines (94.4%), and agricultural tractors (92.6%). In turn, the smallest share of this type of answers related to investments in computer equipment (63.9%). The differences between those groups of investments that can be carried out using funds from MAF are statistically important ($p = 0.000$).

DISCUSSION AND CONCLUSIONS

Our results are consistent with empirical findings related to determinants of farm investment (in particular, Jakob V. Olsen and Mogens Lund [2011], Wojciech Ziętara and Marcin Adamski [2014]). Investment subsidies sometimes may have a positive impact on generating added value. The problem, however, appeared on small-sized farms, as their managers generally had lower skills, especially digital ones, and were poorly integrated into the industry food chains. Improved governance of agricultural and rural policy with respect to regional governance may be treated as a proper remedy for it [OECD 2022, Khafagy and Vigani 2022]. Jacek Kulawik et al. [2024] proved that total profitability ratio, subsidy rate stimulated durability of operations at farm level, whereas the mobile age of farm operators and total asset-to-equity ratio negatively affected the aforesaid dependent variable.

Our results indicate that the employment outside the farm and running non-agricultural activities should be assessed as key internal factors having a beneficial impact on the durability of the investment. The significant internal factors that were considered to have a strongly unfavourable impact on the durability of investments projects are those related to the insufficient level of capital and land held. Specialization in milk production, then pig production had a beneficial effect on durability of operations.

Our research limitations refer to the characteristics sample of surveyed agricultural counsellors (i.e. purposive sampling). Future research should also combine primary data from expert survey and farmers' responses. It is important to conduct periodic empirical research on durability, which has an important impact on the construction of eligibility criteria for investment projects.

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CZYNNIKI WPŁYWAJĄCE NA TRWAŁOŚĆ OPERACJI
FINANSOWANYCH W RAMACH WSPÓLNEJ POLITYKI ROLNEJ
W OPINII DORADCÓW ROLNYCH

Słowa kluczowe: trwałość działań, WPR, inwestycje gospodarstw rolnych,
finanse rolnictwa, polityka rolna

ABSTRAKT. Trwałość operacji jest kategorią ważną z punktu widzenia polityk publicznych, w tym Wspólnej Polityki Rolnej (WPR). Głównym celem artykułu jest identyfikacja i ocena czynników wpływających na trwałość operacji finansowanych w ramach WPR na przykładzie działania 4.1. „Modernizacja gospodarstw rolnych”, z wykorzystaniem opinii ekspertów – doradców ośrodków doradztwa rolniczego (ODR). Wykorzystano dane pierwotne z sondażu diagnostycznego, z zastosowaniem techniki CAWI. Dywersyfikację produkcji na poziomie gospodarstwa, zatrudnienie poza gospodarstwem i prowadzenie działalności pozarolniczej zostały ocenione jako kluczowe czynniki wewnętrzne, korzystnie wpływające na trwałość inwestycji. Do istotnych czynników wewnętrznych, które uznano za mające zdecydowanie niekorzystny wpływ na trwałość projektów inwestycyjnych, zaliczono te związane z niewystarczającym poziomem posiadanego kapitału i ziemi rolnej. Specjalizacja w produkcji mleka, a następnie produkcja trzody chlewnej korzystnie wpłynęły na trwałość prowadzonej działalności. Zalecane jest wzmocnienie jakości kapitału ludzkiego na obszarach wiejskich, w tym zarządzania gospodarstwem rolnym. Obejmuje to wzmocnienie ich elastyczności i odporności gospodarstw, na przykład przez dywersyfikację.

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