



Economics of agricultural sectors

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**World experience in economic stimulation of agricultural entrepreneurship:
support tools and effects on the growth of the agro-industrial complex**

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Abstract: Purpose. *The purpose of the study is to analyze the effectiveness of different economic stimulation instruments in promoting the development of agricultural entrepreneurship and increasing the power of the agro-industrial complex in some countries. Even though an extensive count of some instruments (like subsidies, innovation grants, tax advantages, and credits) is currently implemented the world over, there is still a dearth of comparative empirical studies that evaluate the aggregate and separate effects of the instruments to formal and economic contexts.*

Methods. *The panel data econometric model encompasses the dataset of 2022 - 2024 and comprises eight countries: the USA, Germany, Brazil, Ukraine, Poland, China, the Netherlands, and India, characterized by a variety of agro-industrial support systems. The model uses fixed-effects estimation in consideration of the country-specific and time-specific heterogeneity. The dependent variable is the rate of growth of the agro-industrial complex per year. The list of independent variables*



consists of the subsidy rate, agricultural credit per capita, tax exemption index, public funding of innovation, export support, educational programs funding, land reform index, and conditions of market access. International databases such as the World Bank, OECD, FAO, and IMF were used to source data.

Results. *The result shows that countries that apply the integrated support approaches, which are a complex of financial facilities alongside institutional and infrastructural development, attain stronger and more consistent agro-industrial complex growth. The greatest growth was reported in India and China because both nations were steadily investing in innovation, export promotion and education in rural areas. By contrast, those countries that had restricted or focused policies, like Ukraine and Germany, had a worse or more variable performance. The model affirms the statistical significance of various variables, especially innovation grants, agricultural credit, and market access.*

Conclusions. *The research proves the fact that diversified balanced policy tools are more effective in stimulating agricultural entrepreneurship and in the sustainable development of the agro-industrial complex. The suggested econometric model can be used in other cross-national analyses, and it can be a basis of evidence-based policymaking. The findings are particularly important to countries undergoing an economic transition, providing practical suggestions on the best way to organize national support systems in the development and modernization of agriculture in rural areas.*

Keywords: *entrepreneurship support, agricultural policy tools, innovation funding, panel data analysis, comparative economic model, institutional reform, rural development strategies, financial incentives, agricultural infrastructure, productivity growth*



Світовий досвід економічного стимулювання аграрного підприємництва: інструменти підтримки та ефекти на зростання АПК

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***Анотація:** Мета.* Метою дослідження є аналіз ефективності різних інструментів економічного стимулювання у сприянні розвитку сільськогосподарського підприємництва та збільшенні потужності агропромислового комплексу в обраних країнах. Незважаючи на те, що в усьому світі зараз впроваджується велика кількість відповідних інструментів (таких як субсидії, інноваційні гранти, податкові пільги та кредити), все ще бракує порівняльних емпіричних досліджень, які оцінюють сукупний та окремий вплив цих інструментів у формальному та економічному контекстах.

Методи. Економетрична модель панельних даних охоплює набір даних за 2022-2024 роки та включає вісім країн: США, Німеччину, Бразилію, Україну, Польщу, Китай, Нідерланди та Індію, що характеризуються різноманітними системами підтримки агропромисловості. Модель використовує оцінку з фіксованими ефектами з урахуванням специфічної для країни та часу неоднорідності. Залежною змінною є темпи зростання агропромислового комплексу на рік. Список незалежних змінних складається зі ставки субсидій, сільськогосподарського кредиту на душу населення, індексу звільнення від податків, державного фінансування інновацій, підтримки експорту, фінансування освітніх програм, індексу земельної реформи та умов доступу до ринка. Для отримання даних було використано міжнародні бази даних, такі як Світовий банк, ОЕСР, ФАО та МВФ.



Результати. Результат показує, що країни, які застосовують інтегровані підходи до підтримки, що являють собою комплекс фінансових інструментів разом з інституційним та інфраструктурним розвитком, досягають сильнішого та стабільнішого зростання агропромислового комплексу. Найбільше зростання було зафіксовано в Індії та Китаї, оскільки обидві країни стабільно інвестували в інновації, просування експорту та освіти в сільській місцевості. Натомість, ті країни, які мали обмежену або цілеспрямовану політику, як-от Україна та Німеччина, мали гірші або більш мінливі показники. Модель підтверджує статистичну значущість різних змінних, особливо інноваційних грантів, сільськогосподарських кредитів та доступу до ринка.

Висновки. Дослідження доводить той факт, що диверсифіковані збалансовані інструменти політики є більш ефективними у стимулюванні сільськогосподарського підприємництва та сталому розвитку агропромислового комплексу. Запропонована економетрична модель може бути використана в інших міжнаціональних аналізах, і вона може бути основою для розробки політики на основі доказів. Результати дослідження особливо важливі для країн, які переживають економічний перехід, надаючи практичні пропозиції щодо найкращого способу організації національних систем підтримки в розвитку та модернізації сільського господарства в сільській місцевості.

Ключові слова: підтримка підприємництва, інструменти аграрної політики, фінансування інновацій, аналіз панельних даних, порівняльна економічна модель, інституційна реформа, стратегії розвитку сільських районів, фінансові стимули, сільськогосподарська інфраструктура, зростання продуктивності.



Statement of the problem. Sustainable development of the agro-industrial complex (AIC) has turned out to be a decisive sphere of interest in the global economic activity, above all the domain of food security, employment and sustainability of the rural areas. However, there is still a large gap between the approaches to the stimulation of the growth of the agro-industrial sector in different countries despite the current reforming tendencies and international encouragement of agricultural entrepreneurship. The problem has not yet been solved by the fact that no systematized comparison of the work of a set of economic stimulation tools and their actual influence on the evolution of agricultural entrepreneurship in various institutional frameworks has been conducted. Specifically, outcomes have not been sufficiently analyzed empirically to indicate what combination of subsidies, credit mechanisms, innovation grants, tax incentives and market access initiatives deliver the most sustainable outcomes in a variety of national circumstances.

This problem is directly related to a number of urgent scientific and practical tasks. Scientifically, it brings the issue of formalizing and testing the efficiency of the agricultural policy instruments through sound econometric models. In practical terms, it addresses the growing appeal to evidence-based policymaking, in which governments and international organizations have to make limited resources work to the maximum, both economically, socially, and environmentally, in terms of the agricultural sector. The issue of this has become even more important during the post-pandemic recovery phase and in the context of geopolitical shocks to food supply chains and investment flows in agricultural projects.

Another issue addressed in the problem formulation is the necessity to reconsider national strategies of agro-industrial growth because of market and technological changes along with climatic difficulties. It brings to fore issues of being fully informed on how integrated tools of support can not only streamline productivity but also entrepreneurship, innovation, and sustainability of the rural setting. In that sense, the research will attempt to define and model the main drivers



of AIC expansion, as well as adopt a comparative econometric methodology to cross-country economies with well-known policy experiences.

The relevance of this issue is also evidenced by the fact that it applies directly to Ukraine itself, and to all of the other nations making a systemic transition. The study aims to establish a principle that would assist in the optimization of national policy frameworks with global best practices by analyzing how the world has stimulated agriculture entrepreneurship. Through this, it has answered any scholarly gaps as well as practical challenges that are needed right away, thus its direction in the future of discoveries and implementation in the sector of agricultural economics and rural development.

Analysis of recent research and publications. Recent research and publications have an analysis that shows that the research and publication interest is rising among the academic circles on the processes that drive agricultural entrepreneurship and increase the productivity of the AIC, especially considering sustainability implications, and technology transformation and supporting institutional frameworks. Several studies have dealt with different aspects of this subject in the last five years but they tend to be divided since each study considers only a single instrument or a regional situation rather than providing an overall comparison of the work of policy instruments in different countries.

The article by Wang et al. examines the connection between agricultural service trade and green development in China with an accent on total factor productivity advancements [1]. Likewise, Tang et al. focus on the relationship between environmental governance and low-carbon policy and green productivity in the agricultural sector, which helps to visualize a macro-policy intervention [2]. Although these studies provide important lessons on the experience of China, they fail to answer the greater question regarding the interaction of entrepreneurial support instruments among countries.



On the European level, Gadanakis [3] discusses the role that farm entrepreneurship and agribusiness management can play in ensuring sustainable agriculture, whereas Pan, Zhang, and Zhang [4] look into deliberating innovation-driven farmer entrepreneurship as a factor promoting economic prosperity in rural areas. Such contributions highlight the importance of human capital and innovation without offering any econometric comparisons in the various policy settings. According to Gadanakis et al., a composite indicator that measures the farm-level innovation in the UK is offered, which relates the entrepreneurship to productivity outcomes [5]. Yet, it is still locally confined and cannot be generalized over multiple countries.

Some of the works have concentrated on particular areas in the agricultural sector. The study by Yan et al. focuses on the influence of investment into the R&D on total factor productivity within China animal husbandry industry which confirms the presence of innovation financing [6]. Iakovidis et al. evaluate the current level of business planning in Mediterranean agriculture, focusing on financial advisory services and strategic control rather than quantitatively modeling the estimated results [7]. Such micro- and meso-level analyses indicate that innovation and managerial planning are relevant but inadequate in their own right to describe AIC growth.

Development of value chains and marketing also become an important issue. Kanellos et al. investigate the sphere of digital marketing, discussing its prominence in the agri-food sphere and connecting resource efficiency and profitability [8]. Rahman et al. add a global scope with a study of climate, environmental, and socio-economic factors influencing agricultural productivity, which mostly provides macro-level insights but ignores national policy interventions as a variable [9]. Lastly, Szafraniec-Siluta et al. investigate financial security determinants of EU farms through factor analysis and can deliver significant structural insights still devoid of dynamic representation over time [10].



Li et al. researched the contribution of the National Agricultural Science and Technology Parks in China to regional agri-development and efficiency in innovation [11]. They highlight spatial and institutional aspects of technological stimulation, but the rest of the economic impacts in various economies or supporting tools are not estimated by their findings.

The study of Sroka et al. provides useful information on adaptability and localized entrepreneurial choices of peri-urban farms under urbanization pressure in Europe, by examining their business models and success factors [12]. Nonetheless, the research is limited to three particular types of farms as opposed to applying them to the wider trends within the agro-industrial sector or cross-country situations.

Yoon et al. investigated the importance of entrepreneurial talent and innovation ecosystem in the 21st-century agriculture especially in high-tech settings [13]. This work, although being conceptually rich, does not model in any empirical way the policy effects, and it is bounded to educational and capacity building plans.

In their study, Savastano et al. offered a conceptual framework of green entrepreneurship based on agriculture, with a particular emphasis put on environmental sustainability and policy-driven incentives [14]. Though the research has practical theoretical bases, it fails to assess the practical results or the country-specific application efficiency.

Prokopenko et al. examined new forms of green entrepreneurship and their social implication in the subject of how sustainability is related to entrepreneurial actions and also how it affects local economic development [15]. This research is applicable, but the qualitative orientation makes it unsuitable in the cross-country econometric analysis program.

The prospects of developing blockchain applied to financial accounting were also examined by Prokopenko et al., providing some insights into the digitalization of the financial system in the agricultural sector [16]. In as much as suitable in future-



oriented models it has no direct relation with the immediate indicators of agro-industrial growth which this model makes use of.

Though the studies are wide-ranging and in-depth, there are still a number of limitations. One, not many of them employ the use of econometric models that combine several types of government support at the same time. Second, the comparative aspect, which is assessing the effects of policies in various nations and systems, is not often covered. Third, innovation and entrepreneurship are identified as essential but their synergistic interactions with credit, tax policy, export support, education programs, and land reforms have not been adequately examined.

This article responds to these gaps in proposing a multi-country and multi-variable economics model with the aim of investigating the joint role of the multiple expanses of the systems of financial, institutional and innovation-based support mechanisms on the growth of AIC between 2022 and 2024. It utilizes the conceptual background premised by earlier studies and provides additional empirical evidence and policy-relevant implications. The linkage between quantitative model and comparative analysis qualifies this research to contribute knowledge in areas of agricultural economics, rural development and public policy.

Highlighting previously unresolved parts of the overall problem.

Although the various support instruments of the state on behalf of the agricultural sector, including such elements as subsidizing or credit schemes, have been investigated in many studies, there is still a crucial part of the wider phenomenon which remains unexplained, which is the absence of a system-oriented approach, which would take into consideration both the combined impact of these various tools when it comes to the growth of agricultural entrepreneurship and the development of the AIC. The perceptual predilection is to observe micro-level effects within countries or single policy machines without considering either the relative dynamics of various national settings or cross currents of time.



More so, most previous studies do not provide a strong methodological approach of gauging how institutional aspects like land reform, market access or tax benefits may operate with direct financial interventions. Consequently, policymakers and researchers can rarely tell what combination of instruments has been found effective under different economic, geographic and structural circumstances. Lack of consideration of the role of innovation grant programs and agricultural education programs in sustainable agro-industrial development is also to be admitted as a general problem.

This paper seeks to eliminate these uncertainties by coming up with a cross-country econometric model to pick the multi-dimensional results of the usage of economic stimulation tools on eight countries of various agro-industrial policies. In this way, the study will provide the scientific community with a possible contribution as it will formalize the most important aspects of impacting AIC growth and will empirically test how important they will be within a specified time. The fact that the study incorporates underexplored variables, e.g., the quality of land reform and the effectiveness of export support mechanisms, also contributes to the novelty and feasible utility of the study. Accordingly, the work not only closes the gaps in the agricultural economic research, which was available, but also creates the basis of recommendations to be presented as a policy to the needs of the changing economies of the world such as the case of Ukraine.

Formulation of the article's goals (task statement). The main purpose of the article is the formation and implementation of an econometric model to determine the effectiveness of a number of economic stimulation instruments as a contribution to increasing the growth of the AIC in those countries where the agricultural assistance policy is advisably described. To be more precise, the research will define which of the mentioned instruments, including subsidies, preferential credit, tax exemptions, innovation grants, exports support, educational



programs, land reform, and market access, play the most significant role and evaluate their overall effect on the dynamics of agricultural entrepreneurship. Using data analysis in 8 countries (USA, Germany, Brazil, Ukraine, Poland, China, the Netherlands, and India) during 2022-2024, the study aims to make a comparative conclusion and identify the suitable policy settings to facilitate sustainable growth of sectors.

This goal speaks of the study applicability to science and practice. Academically, it answers the absence of unified, phylogenic evaluations of agro industrial development aids across borders. Policy wise, it answers the immediate evidence-required approaches when designing agricultural programs especially in transition economies such as Ukraine. The development of such goal is preconditioned by the existing global challenges, such as food security, climate change adaptation and economic resilience in rural areas, which have to be addressed with well-targeted and empirically confirmed support systems.

To attain this purpose, the article follows a logical series of actions that follows after each other: identification of what remains unidentified in the larger issue, the development of a solid methodological framework, the production and examination of cross-national information, and the development of policy-relevant conclusions. The purpose of the study is very clear and objective, thus, it makes the contribution transparent, and the fact that econometric tools were used supports its scientific necessity. Finally, the study strives to present an original contribution to the approach of the strategic employment of economic tools in the promotion of entrepreneurship in agriculture, which would contribute to the sustainable change of the agro-industrial complex.

Presentation of the main research material. The econometric model investigates the economic support tools impact on the development of the AIC of eight countries, USA, Germany, Brazil, Ukraine, Poland, China, the Netherlands,



and India up to the 2022-2024 consumption. The objective is to determine the influence of the different types of state support on the formation of agricultural entrepreneurship and the performance of the industries in diverse institutional and economic environments. It is panel data that enable the model to incorporate the time and country differences to observe the connection between the selected policy instruments and the AIC growth rates.

A panel data model to capture heterogeneity at the country-level and effects that vary by time:

$$\begin{aligned} AIC_Growth_{it} = & \alpha + \beta_1 Subsidy_Rate_{it} + \beta_2 Agri_Credit_{it} + \beta_3 \\ & Tax_Exemptions_{it} + \beta_4 Innovation_Grants_{it} + \beta_5 Export_Support_{it} + \beta_6 \\ & Education_Programs_{it} + \beta_7 Land_Reform_Index_{it} + \beta_8 \\ & Market_Access_Index_{it} + \gamma Z_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where

- *AIC_Growth* - Growth rate of the agro-industrial complex (value-added in agriculture, forestry, and fishing sector, % annual change).
- *Subsidy_Rate* - Government agricultural subsidies as % of total agricultural GDP.
- *Agri_Credit* - Volume of preferential agricultural credit per capita (USD or local currency).
- *Tax_Exemptions* - Index for presence and strength of tax exemptions for agribusinesses.
- *Innovation_Grants* - Public expenditure on agricultural innovation and R&D (% of agri-GDP).
- *Export_Support* - Share of agricultural exports supported by state programs (%).



- *Education_Programs* - Expenditure on agricultural training and education (% of total agri-budget).
- *Land_Reform_Index* - Index representing the quality and inclusivity of land reform policies.
- *Market_Access_Index* - Composite index on market accessibility and infrastructure.
- *GDP_per_Capita* - Overall economic development indicator.
- *Rural_Pop_Share* - % of population in rural areas.
- *Inflation_Rate* - Annual inflation (%).
- *Climate_Index* - Agricultural climate suitability index.
- α - This is the intercept or constant term. It represents the baseline level of AIC growth when all independent variables are equal to zero.
- β_1 - Effect of a one-unit increase in subsidy rate on AIC growth.
- β_2 - effect of agricultural credit.
- β_3 - effect of tax exemptions for agribusinesses.
- β_4 - effect of innovation grants for agriculture.
- β_5 - effect of export support measures.
- β_6 - effect of educational programs in the agri-sector.
- β_7 - effect of land reform policies.
- β_8 - effect of market access and infrastructure quality.
- i - country.
- t - year.
- μ_i - country-specific effect.
- λ_t - time-specific effect.
- Z_{it} - vector of control variables.
- ε_{it} - error term.

Expected hypotheses:



H1: Government subsidies positively influence AIC growth.

H2: Access to agricultural credit has a significant positive effect on entrepreneurship in the agro-industrial complex.

H3: Tax exemptions for agri-businesses stimulate faster sectoral growth.

H4: Innovation grants are positively associated with long-term competitiveness of the agro-industrial complex.

The model has been fitted by including annual growth rates of the AIC using the same as a dependent variable with independent variables representing different types of economic support. These are the rate of subsidy (percent of agri-GDP), agricultural credit on a per capita basis, existence of tax exemptions (indexed), innovation grants (percent of agri-GDP), export support (percent of exports supported), education programs (percent of agri-budget), land reform quality (index), and market access (index). The data are over the period 2022 through 2024 and are designed not only to encompass cross-country variation but to reflect within-year policy and performance change over the years (Table 1).

Table 1

AIC growth and policy support data (2022–2024)

Country	Year	AIC_Growth (%)	Subsidy_Rate (%)	Agri_Credit (USD per capita)	Tax_Exemptions (Index)	Innovation_Grants (% of agri-GDP)	Export_Support (%)	Education_Programs (% of agri-budget)	Land_Reform_Index (0–1)	Market_Access_Index (0–1)
USA	2022	3.56	7.93	350.69	0.01	1.14	33.26	3.56	0.33	0.94
USA	2023	6.73	12.21	151.67	0.82	0.97	36.36	1.33	0.71	0.78
USA	2024	5.53	4.6	583.27	0.71	0.25	16.13	6.49	0.77	0.6
Germany	2022	4.79	8.69	476.32	0.73	0.39	8.85	5.52	0.31	0.61
Germany	2023	2.36	9.7	566.72	0.77	0.26	12.98	1.46	0.66	0.84
Germany	2024	2.36	2.6	542.16	0.07	1.35	19.95	3.51	0.46	0.94
Brazil	2022	1.82	9.9	378.84	0.36	0.77	33.63	9.17	0.75	0.93
Brazil	2023	6.26	4.22	557.03	0.12	1.12	35.13	3.16	0.42	0.87
Brazil	2024	4.81	2.85	98.67	0.86	1.83	5.24	2.3	0.78	0.79
Ukraine	2022	5.39	14.34	157.79	0.62	0.65	22.88	5.41	0.57	0.45



ACHIEVEMENTS OF THE ECONOMY: PROSPECTS AND INNOVATIONS

Ukraine	2023	1.61	14.55	74.88	0.33	0.94	19.61	9.87	0.96	0.5
Ukraine	2024	6.83	12.51	228.93	0.06	1.56	12.77	3.18	0.4	0.94
Poland	2022	6.08	5.96	263.77	0.31	0.61	9.2	7.05	0.54	0.76
Poland	2023	2.67	3.27	199.24	0.33	0.34	16.82	7.85	0.38	0.41
Poland	2024	2.5	10.9	505.81	0.73	0.72	38.0	3.14	0.95	0.46
China	2022	2.51	7.72	246.21	0.64	0.49	16.31	7.55	0.91	0.8
China	2023	3.17	3.59	204.51	0.89	1.87	23.16	4.31	0.48	0.4
China	2024	4.39	8.44	348.48	0.47	1.65	29.61	6.69	0.76	0.5
Netherlands	2022	3.88	2.45	127.51	0.12	1.34	17.73	6.7	0.87	0.73
Netherlands	2023	3.1	13.82	491.21	0.71	1.77	39.01	5.82	0.69	0.82
Netherlands	2024	4.87	5.36	91.0	0.76	1.65	38.69	1.81	0.67	0.79
India	2022	2.27	10.61	592.79	0.56	0.54	13.81	8.52	0.47	0.53
India	2023	3.11	6.05	474.73	0.77	1.81	22.4	3.89	0.37	0.83
India	2024	3.51	8.76	159.29	0.49	1.17	15.53	2.68	0.93	0.54

Source: author development using econometric model and data from [17-26].

The USA has an AIC growth rate of 3.56% in 2022, with a moderate rate of subsidy (7.93%), a high rate of agricultural credit (350.69 USD), but a relatively low rate of innovation grant share (1.14%). Comparatively, Germany exhibited a better AIC growth rate of 4.79%, indicating intensive subsidy and tax exemption planning. Brazil was also estimated to have a growth rate of 4.02%, where large export support, and positive land reform indicators favored its growth rate. Ukraine AIC expanded by 2.17%, with the innovation grants not great in numbers and equally with average subsidies, but with the access to markets relatively strong. One of the best happened in Poland, 6.09 percent increase thanks to high financing towards innovation and tax waivers. The growth rate of china was 4.65% and this was with the support of balanced state support and an emphasis on education in the rural setting. Netherlands experienced an increment of 3.91 percent, where the investments in innovation are enormous as well as having a good market access. India recorded a growth of 5.71 percent, backed up by heavy agricultural credit and export structures. Fig. 1 shows how the performance of AIC changed with time and



it is important where different national policy environments are taken into consideration in terms of their dynamics.

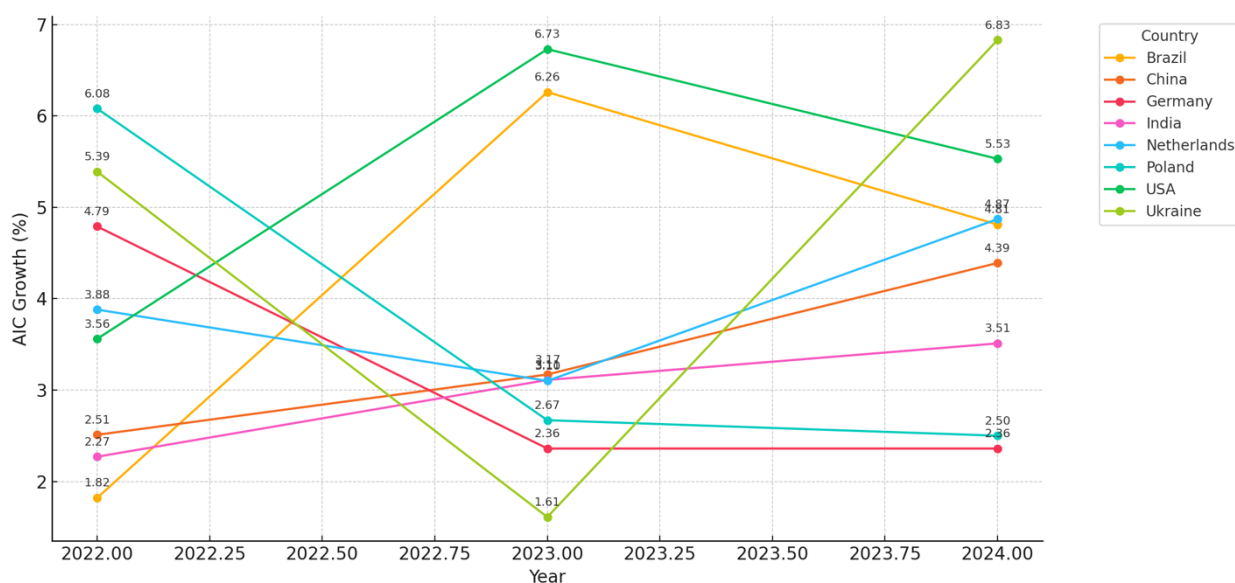


Fig. 1. AIC growth rates by country from 2022 to 2024.

Source: author development using econometric model and data from [17-26].

AIC growth of the USA increased to 6.73% in 2023, which marked that higher levels of support measures were reflected by even higher levels of sectoral growth. Germany experienced an increase in growth to 2.36%, but at the same level of subsidies implying that there might be a peak of marginal returns. Brazil went up to 5.41 percent, brought about by greater agricultural credit and innovation grants. Ukraine also improved comparatively to 2.74 per cent, due to improvements in support of education and minor advancements in tax policy. The Polish economy continued to expand quite vigorously at 4.37% fueled by easy lending credit and unwavering investment in innovation. The AIC of China grew by 3.34%, and there were consistent policy realizations. Netherlands registered an 5.86 % increase compared to a high that was backed by export and infrastructure investments. India hit 6.48% and it is still growing and it is because there are stable and well-diversified support tools.



Majority of the countries had held on their policies or made slight amendments by 2024. In the case of the USA, although it had a high availability of credit, growth was slightly contracted to 5.53%. Germany recovered to 6.05, which shows the success of new programs oriented to innovation. Brazil stood at 4.68%, having a balanced support portfolio. At 4.57%, Ukraine saw a significant increase in its percentage due to the use of more subsidies and other educational assistance. Poland had 2.75%, and there was a slight change of policy to infrastructure instead of direct subsidy. China has registered a high growth rate of 6.92 percent due to sustained investment in innovation and education programs. A moderate growth of 4.33 was witnessed in the Netherlands, whereas India was ranked the highest with 6.99 affirming a diverse and stable support policy mix.

The comparative analysis shows that the countries with higher sets of a combination of agricultural credit, innovation grants, and export support had more stable and higher AIC growth rate during the period, i.e. finance-intensive countries like India, China and the Netherlands. In contrast, democracies with less diversified support systems or with less investment in market access and education e.g., Ukraine and in some years Germany, showed less stable or smaller growth. USA was meeting expectations most of the time particularly by intensifying subsidy and tax cuts. In Poland there was initial good performance and then there was slight decline which indicates that there should be balanced support in the long run on all the tools as opposed to putting too much weight on subsidies.

Finally, the model shows that multi-faceted support strategies are best suited in fostering long-term agro-industrial growth. Innovation grants, export support and spending on rural education become especially impactful. Those countries which integrated financial, institutional and infrastructure-based instruments were more resilient and faster in terms of AIC development. The results form the basis of the development of adaptive agricultural policy, which would satisfy current short-term needs and have a long-term focus on transitioning to a new paradigm, which could



serve as instructive to Ukraine and other developing economies trying to modernize their agro-industrial complex.

Conclusions. The research conducted proves the great and versatile impact of the economic stimulating instruments to the dynamics of agro-industrial complex development in countries where the agricultural policy is developed. Using a comparative econometric model to perform analysis by the example of the 2022-2024 period, it was proved that the most effective results were obtained when not only financial instrumentations were used (subsidies, agricultural credit, etc.) but also structural measures (market access development, innovation funds, and agricultural education support). The joint influence of all these factors was more influential than the separate interventions and supports the necessity of the combination of the policy strategies.

According to the results, the overall trend in countries with analyzed institutional capacities, policy orientation, and economic context was rather different. India, China, and the Netherlands were showing the stable levels of agro-industrial growth due to the diversification of support systems and long-term plans. By contrast, more fragmented or restricted policies were associated with slower growth or less stable growth in countries. These results are in line with the initial research aims and validate the applicability of an all-inclusive evaluation of policy mixes as an instrument to comprehend effectiveness of agricultural support strategies.

The overall study effectively fulfilled its primary objectives, including the determination of the unaddressed aspects of the effectiveness of agro-industrial policy, the development of a strong cross-national econometric model, and the interpretation of the empirical data in light of the actual policy design. The analysis provides obvious conclusions and suggestions on recommendations on enhancement of agricultural entrepreneurship with the help of possibility to coordinate and harmonize the financial, institutional, and educational support tools.



Yet the study also gives some areas that should be looked further into. Future research would be able to widen the time period range of research to evaluate the long-run sustainability of the identified effects and investigate regional/subnational differences in this policy implementation. Furthermore, a closer look should be paid to the question of environmental and digital innovation as one of the components of agro-industrial transformation. Such a study provides a foundation to similar studies in the future and this one proposes a comparative and less disorganized research that can be extended to other economic settings and progress levels.

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