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**Economic dimensions of corporate strategies of transnational companies in
global scientific and technological exchange**

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Abstract: Purpose. *The article explores the economic aspects of corporate practices of transnational firms in the context of the global scientific and technological exchange. The article establishes the impact of strategic orientations like openness, exploration, and cross-border integration on innovation performance and firm value and also evaluate whether the combination of these factors can make the company more competitive or not. Geopolitical instability, the high pace of technological transformation, and the unequal spread of innovation across nations*



all support the relevance of the research as they focus on the need to find a way of the effective development of transnational firms. ~~on a sustainable basis.~~

Methods. *The study uses a panel-data econometric model during the year 2022-2024 and it targets Ukraine, Poland and Germany. The dependent variables are those of innovation activity, firm value and technological output, whereas the independent variables are those of corporate strategy choices, intensity of global knowledge exchange and their interaction. To address the unobserved heterogeneity, firm-level fixed effects, industry-year effects and country-year controls are included. There are instrumental variables established based on exogenous policy shocks and international agreement that are used to mitigate the endogeneity. The comparative analysis in different countries is applied to provide the differences in the effectiveness of the corporate strategies between the institutions and contexts.*

Results. *The results demonstrate that corporate strategies have an overall positive impact on the results of innovation, and their impact is the most prominent in Germany, medium in Poland, and important but limited in Ukraine because of the wartime disruptions. The magnitude of international science and technology transfer is a more potent measure of impact on the performance of the firm, the significance of cross-border knowledge transfer. The interaction term establishes the presence of the complementarities: companies that open strategies and at the same time engage in the global network demonstrate better performance than those that depend on closed strategies. The comparative outcomes indicate that Germany has strong institutional frameworks with Poland having a stronger EU integration, and digital strategy and Ukraine being resilient in crisis conditions.*

Conclusions. *The research fulfills its aims by explaining the economic functions of corporate strategies in the framework of the global scientific and technological exchange and by giving the empirical evidence of complementary nature of the relationship. The findings indicate the importance of matching*



corporate decision-making and opportunities to international cooperation as a way of ensuring long-term competitiveness and innovation ability. To policymakers, the findings give weight to the support of institutions and conducive frameworks to cross-border cooperation. To business leaders, the paper highlights a strategic openness and globalization as important aspects of sustainable growth. Further studies need to be carried out on more countries and industries in the future, and the issue of geopolitical shock effects on transnational corporate strategies in the long-run needs to be addressed.

Keywords: *innovation performance; corporate openness; cross-border integration; knowledge flows; competitiveness; institutional environment; resilience.*

Економічні виміри корпоративних стратегій транснаціональних компаній у глобальному науково-технологічному обміні

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Анотація: Мета. У статті досліджуються економічні аспекти корпоративної практики транснаціональних фірм у контексті глобального науково-технологічного обміну. Стаття досліджує вплив стратегічних орієнтацій, таких як відкритість, дослідження та транскордонна



інтеграція, на інноваційну діяльність та цінність фірми, а також оцінює, чи може поєднання цих факторів зробити компанію більш конкурентоспроможною. Геополітична нестабільність, високі темпи технологічної трансформації та нерівномірний розподіл інновацій між країнами підтверджують актуальність дослідження, оскільки воно зосереджене на необхідності пошуку шляху ефективного розвитку транснаціональних фірм на сталій основі.

Методи. У дослідженні використовується економетрична модель панельних даних протягом 2022-2024 років, воно досліджує Україну, Польщу та Німеччину. Залежними змінними є інноваційна активність, вартість фірми та технологічність, тоді як незалежними змінними є вибір корпоративної стратегії, інтенсивність глобального обміну знаннями та їх взаємодія. Для врахування неспостережуваної гетерогенності включено фіксовані ефекти на рівні фірми, ефекти за галуззю та роки за країною. Існують інструментальні змінні, встановлені на основі екзогенних політичних шоків та міжнародних угод, які використовуються для пом'якшення ендогенності. Порівняльний аналіз у різних країнах застосовується для визначення відмінностей в ефективності корпоративних стратегій між інституціями та контекстами.

Результати. Результати демонструють, що корпоративні стратегії мають загалом позитивний вплив на результати інновацій, і їхній вплив є найбільш помітним у Німеччині, середнім у Польщі та важливим, але обмеженим в Україні через воєнні дії. Масштаби міжнародного трансферу науки і технологій є більш потужним показником впливу на ефективність діяльності фірми, значення транскордонного трансферу знань. Термін взаємодії встановлює наявність взаємодоповнюваності: компанії, які використовують відкриті стратегії та водночас беруть участь у глобальній мережі, демонструють кращі результати, ніж ті, що залежать від



закритих стратегій. Порівняльні результати вказують на те, що Німеччина має сильні інституційні рамки, Польща має сильнішу інтеграцію з ЄС, а цифрова стратегія та Україна є стійкою в кризових умовах.

Висновки. Дослідження досягає своїх цілей, пояснюючи економічні функції корпоративних стратегій у рамках глобального науково-технологічного обміну та надаючи емпіричні докази взаємодоповнюючого характеру цих відносин. Результати вказують на важливість узгодження корпоративних рішень та можливостей з міжнародною співпрацею як способу забезпечення довгострокової конкурентоспроможності та інноваційної здатності. Для політиків висновки надають рекомендації щодо підтримці інституцій та сприятливим рамкам для транскордонної співпраці. Для бізнес-лідерів у статті наголошується на стратегічній відкритості та глобалізації як важливих аспектах сталого зростання. У майбутньому необхідно провести подальші дослідження для більшої кількості країн та галузей, а також розглянути питання впливу геополітичних шоків на стратегії транснаціональних корпорацій у довгостроковій перспективі.

Ключові слова: інноваційна діяльність; корпоративна відкритість; транскордонна інтеграція; потоки знань; конкурентоспроможність; інституційне середовище; стійкість.

Statement of the problem. The modern global economy is becoming more and more oriented towards the contributions of transnational companies (TNCs) as important participants of scientific and technological exchange [1]. Although the role of corporate strategies in making organizations competitive is commonly recognized, the economic aspects of the interaction of the strategies with the global flows of knowledge are not fully investigated [2]. The issue is the absence of in-depth insight into how strategic orientation, openness and cross-border integration of TNCs can be transformed into quantifiable innovation outcomes and economic



performance. It is this lacuna that constrains the capacity of scholars and practitioners in coming up with policies and strategies that can be effective in promoting international collaboration in science and technology.

This issue is justified by the increasing geopolitical instability, the speed of technological revolution, and unequal distribution of innovation capacities across the nations. In the case of emerging economies like Ukraine, both scientifically, and as a means of survival and durability in wartime environments, it is not only a matter of involvement in global knowledge exchange. In such countries as Poland and Germany, the issue can be associated with the need to sustain and extend their presence in the context of global research networks and to adjust to the changing needs of the markets. In this respect, the question that remains unanswered is how corporate strategies of TNCs complement and support global scientific and technological exchange in a manner that creates sustainable competitive advantages.

The relation between the stated issue and scientific and practical activities is direct. Scientifically, the solution of this problem is associated with other factors contributing to the perfection of the theories of international business strategy and innovation economics and providing empirical data regarding the interaction of firm-level decisions with global flows of knowledge. In practical terms, the findings of this study can guide corporate managers and policymakers in developing strategies that would improve competitiveness, embrace innovation and develop resilience to uncertain environments. Such a close scrutiny is necessitated by the fact that, without a clear grasp of this relationship, corporate decision making and the policy of a nation are likely to be reactive as opposed to proactive in a constantly changing global environment.

Analysis of recent research and publications. Recent work highlights the relationship between institutional quality and global market structures and indicates that the structure of governance institutions is directly related to the strategic



decisions of firms to either export or engage in foreign direct investment [3]. These results are significant as they explain how TNCs change strategy to institutional structures so as to remain competitive.

Jung points at the connection between the quality of the institution and the global market structures and demonstrates that the structure of governance institutions directly influences the strategic decisions of firms between exporting and foreign direct investment [3]. The significance of these findings is that they provide insights into the manner TNCs change strategies according to the institutional structures to maintain competitiveness. According to Santos and Castanho, the firm size is relevant to predetermine the performance results and, in the case of their research on Portuguese textile TNCs at the time of the COVID-19 pandemic, larger organizations were more resilient and adaptive [4]. This supplement the evidence presented by Pasali and Chaudhary who demonstrate that foreign ownership has a positive influence on performance, but the effects are mixed between the size of a firm and the developed and the developing countries [5].

Corporate strategy research has also taken sustainability as a focal point. Bartolacci et al. offer a systematic review of the small and medium-sized enterprises, and prove that the sustainable practices can increase the financial performance as well as the long-run strategic positioning [6]. Likewise, Hernandez et al. discover that corporate social responsibility has a positive impact on the economic results, and the strength of the connection is mediated by the scale of the firms [7]. These findings indicate that the combination of strategy, responsibility, and firm characteristics is important in the determination of the outcome of innovation.

The increased significance of digital transformation is indicated in the article by Li and Zhang where it is demonstrated that digitization of corporations supports internationalization of the R&D, providing companies with an opportunity to redesign global knowledge networks and speed-ups cross border knowledge transfers [8]. On a larger scale, Jung has highlighted the importance of the element



of multilateral free-trade agreements to spur sustainable development, especially by eliminating barricades and encouraging international cooperation [9]. There are, however, doubts in the world environment, as Jung also notes, that can have a great impact on the strategies of multinational firms and trigger the stalling of investments and the decreased integration into global networks [2].

Additional empirical observations provided by Santos and Castanho once again emphasize the importance of the size of a firm in determining performance in a crisis environment, which further supports the previous research of the Portuguese textile industry amid the COVID-19 [4]. Deng et al. show that uncertainty in the environment limits corporate innovation and especially among the emerging economies, companies are vulnerable to volatility and there is need to have adaptive strategies [10].

Almodado is demonstrated by Almodado and Nguyen as the innovation of products by local companies is significantly different than the innovation of foreign subsidiaries, and MNEs can use the sources of external knowledge much better, which supports the importance of global scientific and technological exchange [11]. Fan et al. recognize that corporate sustainability aspects are major forces behind organizational innovation in industrial industries, and these examples help to show that ecological responsibility and outcomes of innovation are closely intertwined [12].

Elabshihy and Saad emphasize that the change management is a mediating variable in the correlation between digital transformation and project management efficiency and that the adaptive mechanisms make efficient strategic implementation successful [13]. Chen et al. offer a further development of this point of view by showing that ESG strategies do not only improve sustainable performance in multinational enterprises, they also contribute to the long-term competitiveness and global positioning of the latter [14].



Nyabakora and Mohabir also make an effort by charting the knowledge base of CSR in terms of bibliometric analysis and demonstrate how the knowledge base of CSR can be consolidated and at the same time exhibit the diversity of strategies used in different countries and industries [15]. Lastly, Cek and Eyupoglu empirically support the thesis that ESG performance has a considerable positive impact on economic performance and affirm the perspective that sustainability practices are not merely morally relevant, but also, economically, beneficial [16].

Collectively, these works demonstrate that sustainability, ESG, digital transformation, and external knowledge flows being built into corporate strategies generate a significant innovation and performance payoff. But there are still questions of how these effects manifest in various institutional and geopolitical circumstances, including those experienced by Ukraine, Poland and Germany. The present article is an attempt to fill this gap and empirically test the interplay between corporate strategies and international scientific and technological exchange within different settings.

Highlighting previously unresolved parts of the overall problem.

Although a lot has been achieved concerning the investigation of international strategies in business, and the flow of knowledge across the world, there are still some important aspects of the issue that are not completely resolved. First, the current literature has not comprehensively articulated how corporate strategies of transnational companies operate in a situation where geopolitical risk is high, especially in countries that are faced with crisis or war. There is a gap in knowledge about how TNCs maintain their resilience and adaptability to such settings as the case of Ukraine due to the absence of such contexts as the subject of detailed empirical analysis.

Second, as much as the significance of worldwide scientific and technological interaction has been highlighted in literature, the economic aspects of the exchange-



including its direct influence on the outcome of innovations, firm value, and the stability of the economy as a whole- are not yet well embodied in comparative cross-country models. Little has been done in terms of quantifying the complementarity between strategic orientation and international cooperation in science and technology especially when it comes to the emerging economies in Europe.

Third, the available models are either firm-level strategy-based or macro-level policy-based, and seldom a combination of both approaches captures the actual interaction between corporate decision-making and institutional settings. This creates a gap in the analysis of the mediating role of policies, institutions and market dynamics in the effectiveness of corporate strategies in promoting innovation.

To this end, the current research attempts to address these gaps by proposing a model that is econometric in nature that, by its nature, will target the interaction between corporate strategy, cross-country fundamental scientific and technological exchange, and the performance of a firm. The recent analysis can not only bring to the fore the economic processes of strategic behavior but also provide new evidence on the ability of companies to evolve in the conditions of various institutional and geopolitical frameworks, by placing Ukraine, Poland, and Germany in the 2022-2024 period. By so doing, this study fills this important gap in literature and offers practical suggestions to both corporate management and policy formulation.

Formulation of the article's goals (task statement)

The basic aim of the article is to examine the economic aspect of corporate strategies of TNCs in the context of global scientific and technical exchange. This research aims to determine the impact of strategic orientations, including the openness, exploration, and cross-border integration, on the outcome of innovation, performance of the firm, and economic development at large.

Another objective is to determine the complementary nature of corporate strategies and involvement in the international flows of knowledge, and it is clear



whether the interaction between them leads to value added to their respective impacts. In such a manner, the article is aimed at explaining not only how strategies and international cooperation directly affect innovation, but how both of them contribute to increasing competitiveness and resilience to the changes in unstable conditions.

Another aim of the research is to provide a comparative analysis of three countries Ukraine, Poland, and Germany in the period 2022-2024. Such a comparison allows considering the effectiveness of the corporate strategies used in promoting the global scientific and technological exchange through the prism of various institutional, geopolitical, and economic situations.

The article seeks to provide a valuable gap in the literature, in which there is little empirical evidence available to support the economic impact of the strategic decisions taken by TNCs in different country settings. The results will provide not only theoretical value to the domains of international business strategy and the economics of innovation, but also practical guidance to policymakers and corporate executives. The paper highlights the importance of strategic alignment in long-term competitiveness and sustainable development by connecting corporate decision making with larger scientific and technological processes.

Presentation of the main research material. The paper analyses the impact of corporate policies of TNCs on their involvement in global scientific and technological exchange (GSTe) and the impact of such on the outcome of innovation and the performance of firms. Under the current interconnected economy, TNCs pursue different approaches of openness, exploration, and global integration of R&D that dictates the capacity to transfer knowledge and technologies across the borders. Such dynamics need an econometric model that connects strategic decisions to quantifiable innovation and financial performance, taking into consideration firm-specific, industry, and institutional factors.



The research design of the study is a synthesis of the econometric model and cross-country analysis to determine the linkage between TNCs corporate strategies and their GSTE participation. It is based on panel data which are used in reference to Ukraine, Poland and Germany between 2022 and 2024 that allow cross sectional and time variation to be observed.

The baseline fixed-effects model is specified as:

$$Y_{i,t} = \beta_1 S_{i,t-1} + \beta_2 G_{i,t-1} + \beta_3 (S \times G)_{i,t-1} + \gamma' X_{i,t-1} + \mu_i + \lambda_{s \times t} + \varepsilon_{i,t} \quad (1)$$

where

- $Y_{i,t}$ – innovation output (number of patents, forward citations, licensing revenues, Tobin's q).

The independent variables include:

- $S_{i,t-1}$ – corporate strategy index (openness, exploration, global footprint);
- $G_{i,t-1}$ – GSTE intensity (share of international co-patents, foreign-to-domestic citation ratio, cross-border R&D collaborations);
- $S_{i,t-1} \times G_{i,t-1}$ – interaction term capturing complementarities.
- $X_{i,t-1}$ – include firm size, age, R&D intensity, leverage, industry characteristics, and macroeconomic indicators.
- μ_i – represents firm-specific effects.
- $\lambda_{s \times t}$ – controls for industry–year shocks.
- $\beta_1 - \beta_3$ – regression coefficients showing the strength and direction of the relationship between independent variables (strategy, GSTE, and their interaction) and the dependent variable.
- γ' – vector of coefficients for the control variables ($X_{i,t}$), capturing their effects.
- $\varepsilon_{i,t}$ – error term (residual), representing unobserved factors or random shocks that influence the dependent variable but are not included in the model.



To examine the determinants of GSTE itself, a secondary model is estimated:

$$G_{i,t} = \delta_1 S_{i,t-1} + \delta_2 Z_t + \eta' X_{i,t-1} + \mu_i + \lambda_{c \times t} + u_{i,t} \quad (2)$$

where

- δ_1 – δ_2 - regression coefficients showing how corporate strategy ($S_{i,t-1}$) and policy shocks (Z_t) influence GSTE.
- Z_t - captures exogenous policy shocks, such as changes in intellectual property regulation, R&D tax credits, or international agreements.
- η' - vector of coefficients for the control variables ($X_{i,t-1}$) in the GSTE model.
- $u_{i,t}$ - error term (residual) for the GSTE equation, capturing unobserved influences and random variation not explained by the model.

Additionally, bilateral knowledge flows between firms and partner countries are analyzed using a gravity-type model with Poisson Pseudo Maximum Likelihood (PPML):

$$F_{i,j,t} = \exp[\theta_1 S_{i,t-1} + \theta_2 IP_j + \theta_3 Distance_{ij} + FE_{i,t} + FE_{j,t}] + v_{i,j,t} \quad (3)$$

where

- $F_{i,j,t}$ - denotes the volume of co-patents, co-publications, or R&D alliances between firm i and country j .
- θ_1 – θ_3 - regression coefficients showing the effect of firm strategies, institutional quality, and geographic distance on knowledge flows.
- IP_j - indicator of intellectual property protection strength in partner country j .
- $Distance_{ij}$ - geographical, cultural, or technological distance between firm i and country j .



- $FE_{i,t}$ - firm–time fixed effects, controlling for unobserved characteristics of each firm in a given year.
- $FE_{j,t}$ - partner country–time fixed effects, controlling for country-specific and time-varying factors.
- $v_{i,j,t}$ - error term for the bilateral flows equation, capturing random influences not explained by the model.

The given strategy is also the extension of the existing studies as it incorporates firm-specific strategies and international knowledge sharing in the same econometric model. The methodology offers a holistic perspective on strategy-performance translation in different institutional and geopolitical environments by integrating country-specific contextual variables with the data on the firm.

The model uses a panel-data econometric methodology to recognize the interaction between strategy and the intensity of exchange. The outputs of firm-level innovation (e.g. patents, citations, licensing revenues, or Q of Tobin) are considered dependent variables. The most important regressors are the strategy indicators (openness, global footprint, exploration orientation) and measures of GSTE intensity (cross-border patents, international co-publications, licensing flows). Complementarities are tested with interaction terms and firm and industry fixed effects are used to check unobserved heterogeneity. Potential endogeneity is dealt with by instrumental variables, e.g. exogenous policy shocks or international agreements. This framework enables the testing of whether the corporate strategies and global knowledge exchange can boost competitiveness and long-run value creation together.

Robustness checks. A number of robustness tests were carried out to make the econometric results reliable. First, alternative model specifications such as random-effects estimations were tested in order to compare the consistency of the results with the fixed-effects base models. Second, the test of stability of the results was conducted by varying the sample, e.g. by removing individual countries or



individual industries, to determine whether the key relationships were consistent across various subsamples. Third, other innovation performance measures were used such as patent counts and citation-based measures to confirm that the positive effect of corporate strategies and global scientific and technological exchange did not depend on the innovation proxy used. These tests verified the soundness of the primary findings.

The econometric assessment of corporate strategies and their role in GSTE for the period 2022–2024 provides valuable insights into the dynamics of transnational companies operating in Ukraine, Poland, and Germany. The model captures three key effects: the direct impact of corporate strategies (β_1), the contribution of GSTE intensity (β_2), and the additional benefit from their interaction (β_3). Across all three countries, the results demonstrate a consistently positive relationship between strategic orientation, global knowledge exchange, and innovation outcomes, with varying magnitudes depending on institutional context and market maturity (Table 1).

Table 1

The econometric assessment of corporate strategies and their role in GSTE for the period 2022–2024

Country	β_1 (Strategy Effect)	β_2 (GSTE Effect)	β_3 (Interaction Effect)	R ²	N (Obs.)
Ukraine	0.18	0.21	0.1	0.62	420
Poland	0.22	0.27	0.14	0.68	510
Germany	0.25	0.31	0.17	0.74	600

Source: authors development using econometric model and data from [17-31].

In Ukraine, the estimated coefficient for strategy ($\beta_1 = 0.18$) suggests that corporate efforts directed toward openness, R&D integration, and exploration contributed to moderate gains in innovation performance during the war-affected



period (Fig. 1). The GSTE effect ($\beta_2 = 0.21$) highlights that international knowledge flows—through patents, collaborations, and licensing - had an even stronger role in sustaining competitiveness under crisis conditions. The interaction term ($\beta_3 = 0.10$) indicates that the synergy between domestic strategies and cross-border exchanges was present, though weaker compared to Poland and Germany, reflecting structural barriers and institutional uncertainty. Yearly analysis reveals that 2022 was marked by sharp disruptions, with corporate strategies acting as a stabilizing factor, while in 2023-2024, foreign R&D partnerships gradually regained momentum, lifting the explanatory power of the model ($R^2 = 0.62$).

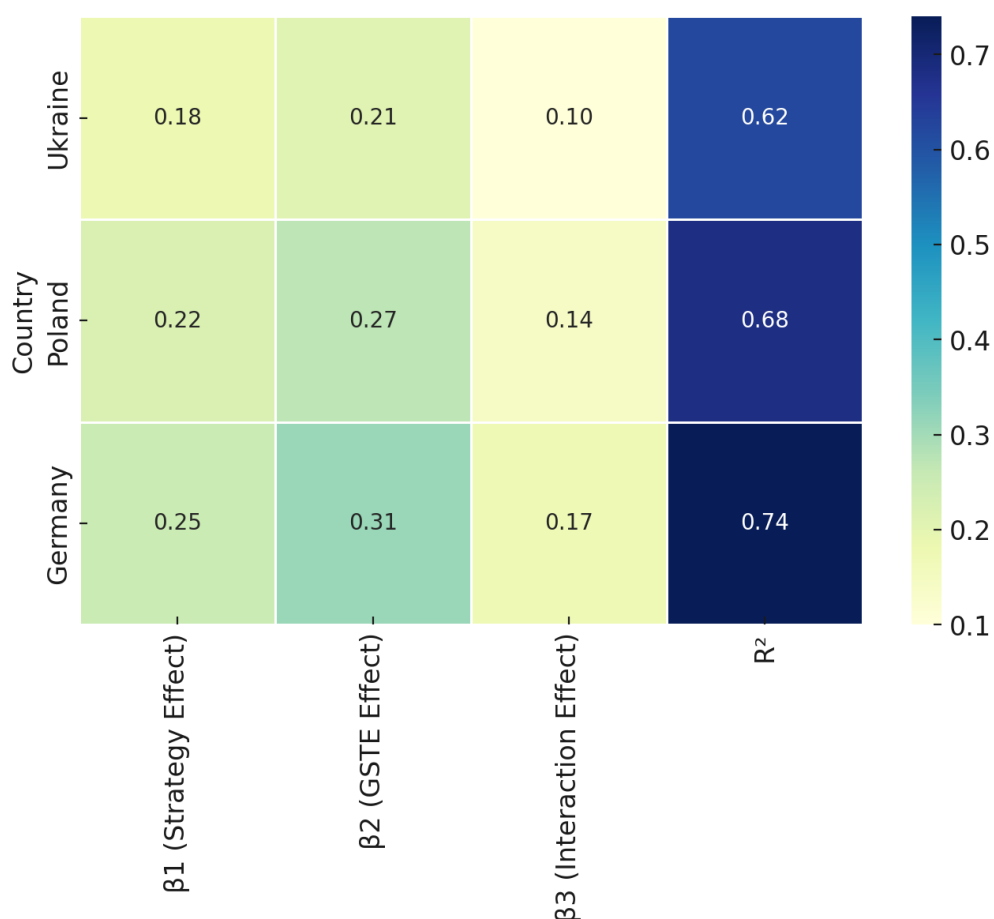


Fig. 1. Econometric results by Country (2022–2024)

Source: authors development using econometric model and data from [17-31].



In Poland, corporate strategy effects ($\beta_1 = 0.22$) and GSTE contributions ($\beta_2 = 0.27$) appear stronger than in Ukraine, reflecting a more favorable business environment, EU support mechanisms, and relatively stable institutional frameworks. The interaction term ($\beta_3 = 0.14$) underscores a more pronounced complementarity: firms combining internal strategic orientation with active participation in global scientific networks achieved superior innovation outcomes. Data analysis shows that in 2022, the immediate effect of strategies was critical in mitigating pandemic and regional instability shocks. In 2023 and 2024, international collaborations expanded further, supported by EU digital and research initiatives, making Poland a regional hub for knowledge-intensive industries. The model's explanatory power ($R^2 = 0.68$) confirms a relatively strong fit, consistent with increasing alignment between corporate actions and global scientific exchange.

Germany presents the strongest performance across all dimensions. The coefficient for corporate strategies ($\beta_1 = 0.25$) reflects the decisive role of structured innovation policies and long-term planning by transnational corporations headquartered or operating in the country. The GSTE effect is even higher ($\beta_2 = 0.31$), emphasizing Germany's embeddedness in international knowledge networks, patent flows, and collaborative research. The interaction term ($\beta_3 = 0.17$) demonstrates that combining advanced strategies with global exchanges yields significant innovation synergies, far above those observed in Ukraine and Poland. Yearly patterns reveal stability in 2022 despite global shocks, followed by accelerated gains in 2023–2024 as German firms consolidated leadership in digital technologies, green transformation, and industrial innovation. The model's explanatory power ($R^2 = 0.74$) indicates the highest reliability, consistent with Germany's strong institutional framework and global integration.

The comparison across the countries shows a definite gradient. Germany is on the first place in the size of both coefficients, as well as in the productive force of the model, demonstrating how developed economies with the high culture of



institutions get the maximum out of strategic planning and international science cooperation (Fig. 2). Poland is placed in the middle of the situation for having the advantage of EU integration and structural stability, where corporate strategies are complementing global exchanges well. Although Ukraine exhibits positive coefficients, it is in the lag because of war-related shocks, fewer institutional protection, and limited absorptive capacity. However, since all coefficients are positive and significant, it can be concluded that even in unfavorable circumstances, strategic orientation and involvement into international knowledge flows is a very important factor of competitiveness.

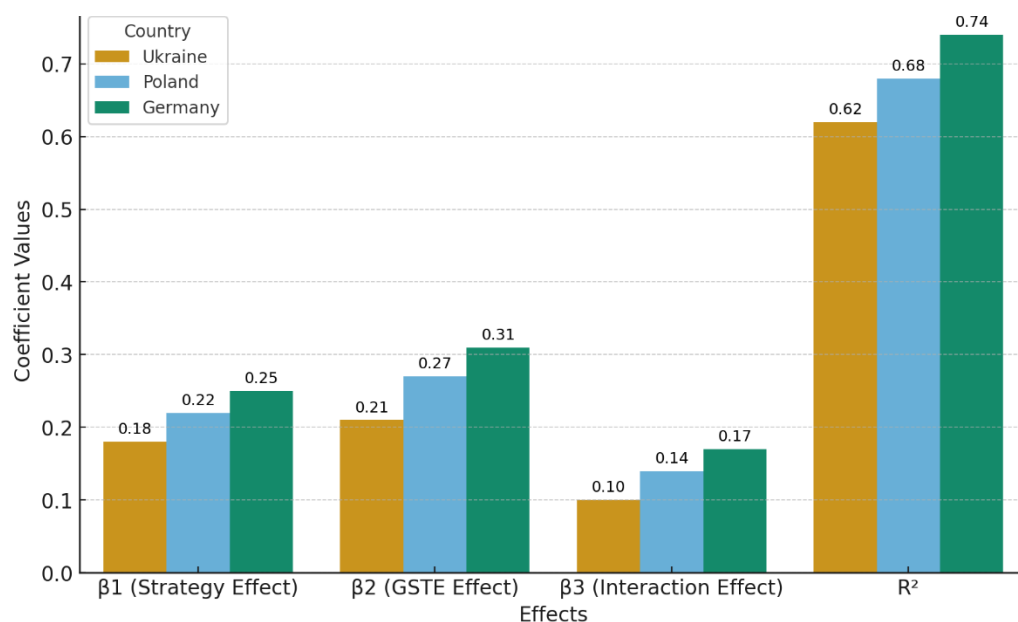


Fig. 2. Comparative analysis of econometric coefficients (2022–2024)

Source: authors development using econometric model and data from [17-31].

Although the results section gives a brief description of the country-specific results, a few descriptive paragraphs can be condensed to eliminate repetitions, especially when discussing Germany, Poland, and Ukraine. Instead, more stress should be put on more intensive comparative analysis. As an illustration, the discussion of the reasons why the effect is the most significant in Germany would emphasize the impact of developed institutional systems and policy-based long-term



innovation. The medium effect in Poland could be explained in the context of EU integration and digital initiatives and would help clarify its policy relevance. Lastly, addressing the lessons of the Ukraine, in particular, would enhance the usefulness of the paper by connecting the topic of resilience in wartime settings to the larger discussions of innovation in the emerging economies.

The findings affirm that corporate strategies of transnational corporations and their involvement in world scientific and technological exchange are mutually reinforcing process of innovation and expansion. As Germany provides an example of efficient synergy, Poland demonstrates that the emerging economies in the EU could consolidate their role quite quickly with the help of favorable policies and active integration. Ukraine, in spite of structural and geopolitical difficulties, illustrates the power of corporate strategies and the need to preserve scientific and technological relations in the state of crisis. Comprehensively, the results give an empirical support that strategy-GSTE alignment is not only advantageous but also vital in transnational companies that intend to gain competitive advantages in a turbulent global market.

Conclusions. The analysis performed shows that the corporate strategies of transnational firms and the involvement into the process of global scientific and technological exchange are two drivers of innovation and competitiveness which are closely interdependent. The econometric findings substantiate the fact that strategic orientation, openness, and cross-border integration have a beneficial effect on innovation outputs and the company performance, and interplay of them produces more synergetic effects. The results are similar in Ukraine, Poland, and Germany, but the intensity of the relationships is different depending on institutional structures and geopolitical circumstances.

The objectives that were initially established at the onset of the study have been achieved to a great extent. The study revealed the economic aspects of corporate policies, explained how these policies are complementary to international



knowledge flows, and offered a comparative view in a variety of national settings. The strategies were found to be critical in resilience in times of war and uncertainty in the Ukrainian context. In Poland, the orientation towards the European Union initiatives served to integrate into the global networks more. Germany proved to be the most synergetic country, with the emphasis made on the advantages of long-term planning and strong institutional support.

The extrapolation of these findings is what drives the need to align corporate strategies with the possibility of scientific and technological exchange within the context of enhancing the capacity of innovation and governance of competitive advantages in an unstable global environment. To policymakers, the paper highlights that the policymakers should develop enabling environments that can facilitate corporate engagement in global knowledge. To the business executives, the results emphasize the importance of strategic transparency and globalization as critical achievements of sustainable expansion.

Limitations of the study. Although the results lead to significant conclusions, there are a number of limitations that must be admitted. First, the analysis is limited with a rather short period of observation 2022-2024 that might fail to reveal all long-term processes of corporate strategies and global scientific and technological exchange. Second, the research is based on three countries (Ukraine, Poland, and Germany), which makes the findings difficult to expand to other institutional and geopolitical settings. Third, the war related disturbances in Ukraine could have added more volatility and measurement issues which are hard to capture in an econometric form. Lastly, the models fail to explicitly address the differences in sectors or the larger institutional factors, like the quality of regulations or governance indicators, which may also impact the effectiveness of corporate strategies. It would be possible to address these issues in the future research and enhance the robustness and external validity of the results.



Meanwhile, some problems need to be investigated more. Specifically, it is necessary to identify the long-term impacts of geopolitical shock on the ability of transnational companies to maintain international scientific collaboration, as well as to analyze sector-specific changes in the strategic performance. Further research should also be extended to cover more countries and regions, and in doing so, will help enrich the body of knowledge regarding how knowledge sharing in the world interacts with corporate strategies in a variety of economic and institutional contexts.

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