

Integrating Game Theory and Critical Accounting for Strategic and Social Analysis of Nearshoring

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Abstract

This study explored the integration of Game Theory and Critical Accounting Theory to understand the strategic, accounting, and social dynamics associated with nearshoring. Using a mixed-method design and agent-based modeling, the study analyzed decisions regarding cooperation and competition among actors, the impacts on transparency and accounting control, and social concerns related to equity and governance. The results revealed that strategic cooperation and the inclusion of social variables are key to the stability and sustainability of supply chains. It also showed that critical accounting plays a fundamental role in highlighting the social and ethical consequences of the process. The study offers a multidimensional perspective that contributes to a better understanding of nearshoring, highlighting the importance of integrated approaches to managing both the economic and social aspects in this context.

Keywords: Game Theory, Critical Accounting Theory, Nearshoring, Strategic Cooperation, Accounting Transparency

Introduction

The objective of this study is to analyze how Game Theory and Critical Accounting Theory can provide an explanatory and critical framework for understanding the phenomena associated with nearshoring, specifically in terms of strategic business dynamics and the accounting and social impacts this process generates. The genealogy of Game Theory dates back to the foundational work of John von Neumann and Oskar Morgenstern in the 1940s, which aimed at modeling strategic interaction between rational agents. Critical Accounting Theory, for its part, emerges from the critical perspective of the Frankfurt School and authors such as Ronald Gray and David Cooper, who question the role of accounting in the reproduction of power relations and inequality in capitalist contexts. Epistemologically, Game Theory is framed within logical positivism and rationalism, seeking to establish predictive models based on formal logic and utility maximization, while Critical Accounting Theory adopts an interpretive and emancipatory stance, seeking to reveal the hidden social structures and ideological implications of accounting practice. The current context of nearshoring, understood as the relocation of production chains to nearby countries to reduce costs

and logistical risks, has intensified in the face of geopolitical changes, health crises, and the search for greater resilience in global supply chains. The research background includes studies of Game Theory applied to governance and strategic decisions in supply chains (Azevedo and Silva, 2022), as well as critical research on the role of accounting in the management and control of resources in economic restructuring processes (Cooper and Sherer, 1984). The problematization revolves around how nearshoring, being a strategy with multiple actors and variables at play, is configured through interdependent strategic decisions that can be analyzed from the perspective of Game Theory, but at the same time generates accounting and social consequences that require a critical approach to understand its implications for inequality, transparency, and corporate governance. The state of the art shows a growing application of Game Theory to model strategic interactions in productive relocation (Bimpikis, Candogan, & Saban, 2019), while Critical Accounting Theory has deepened the analysis of how accounting practices can legitimize or challenge disruptive economic processes (Gray & Laughlin, 2012). The approach consists of integrating both theoretical approaches to address the nearshoring phenomenon in a complex and multidimensional manner, recognizing the strategic rationality of the actors while questioning the social and ethical impacts of the related accounting decisions. The research question is how Game Theory and Critical Accounting Theory can contribute to a more comprehensive understanding of nearshoring, its strategic decisions, and their social and accounting consequences. The hypothesis is that combining a strategic analysis based on Game Theory with a critical accounting perspective will reveal both the power and negotiation dynamics between business actors and the social and ethical implications of productive relocation in the context of nearshoring. The proposed intervention involves an interdisciplinary analysis that uses formal models of strategic interaction to map business decisions and, simultaneously, a critical analysis of accounting reports and corporate policies that reveal the tensions and inequalities generated, with the aim of proposing recommendations for more transparent and equitable governance in nearshoring processes.

Method

The method used in this study was based on a methodological triangulation approach to ensure the validity and reliability of the results, combining qualitative and quantitative techniques. A mixed, exploratory, and descriptive design was adopted, allowing the nearshoring phenomenon to be addressed from multiple strategic, accounting, and social dimensions. The sample was selected through purposive sampling and comprised of experts in game theory, critical accounting, and professionals involved in nearshoring processes in transnational companies, with a total of 45 participants. For the collection and systematization of documentary information, recognized instruments and protocols in scientific research, such as Prisma, Cochrane, and Campbell, were used, facilitating a comprehensive review of literature and relevant empirical evidence on nearshoring, game theory, and critical accounting. In ethical terms, informed consent was guaranteed for all participants, as well as confidentiality and anonymity. International standards for research involving human subjects were met, ensuring a responsible and respectful approach to the subjects involved. The study's critical path included the phases of document review, instrument design and validation, data collection, quantitative and qualitative analysis, modeling, and results validation, all carried out between January and December 2024. For the modeling, the Agent-Based Modeling technique was applied, which allowed simulating the strategic interactions between actors

involved in nearshoring, considering heterogeneous behaviors and adaptive rules. The variables included in the model included strategic decisions (cooperation, competition), logistical costs, accounting impacts (transparency, control), and social variables such as equity and governance. The base equation that represented the strategic dynamics was structured as a non-zero-sum game with utility function $U_i = \alpha X_i + \beta Y_i + \gamma Z_i$, where X_i represents the individual strategy of agent i , Y_i the associated accounting impact, and Z_i the social variables evaluated. The coefficients α , β , and γ indicated the relative weighting of each component in the utility function, estimated from empirical data and calibrated through iterative simulations. This approach allowed us to capture the complexity of the phenomenon and evaluate diverse interaction scenarios to obtain robust and well-founded conclusions.

Results

The results obtained show a significant relationship between the strategies of the actors involved in nearshoring processes and the accounting and social variables analyzed. Table 1 presents the frequencies and percentages of the strategic decisions adopted by the agents, highlighting that 60% opted for cooperative strategies, while 40% preferred direct competition. This finding suggests a trend toward collaboration to minimize logistical risks and maximize shared benefits. One informant noted, "Cooperation between companies and local partners has been fundamental to stabilizing the production chain in this context."

Table 1. Strategic decisions taken by agents

Strategy	Frequency	Percentage
Cooperation	27	60%
Competence	18	40%

Table 2 details the perceived accounting impacts, showing that 70% of participants believe nearshoring has increased financial transparency and internal control. This perception is supported by a finance manager who stated, "We have implemented new accounting systems that more clearly reflect the costs and benefits associated with relocation, which has improved decision-making."

Table 2. Perceived accounting impacts

Impact	Frequency	Percentage
Greater transparency	31	70%
Improved internal control	31	70%
No significant changes	14	30%

Table 3 shows the social variables assessed, where 55% of respondents indicated an increase in concerns about equity and governance, particularly in relation to working conditions and the impact on local communities. In this regard, a critical accounting expert commented, "Strategic decisions

cannot be separated from social consequences; accounting must be a tool to make these realities visible."

Table 3. Social variables evaluated

Variable	Frequency	Percentage
Concern for equity	25	55%
Corporate governance	25	55%
Community impact	20	44%

Agent-based modeling allowed for the simulation of scenarios where the weighting of strategic, accounting, and social variables generated different outcomes for the stability and efficiency of nearshore supply chains. Table 4 presents the estimated coefficients (α , β , γ) that influence the utility function, highlighting that the social variable (γ) had a significant weight in scenarios where cooperation outweighed competition. A high-level informant stated, "The models show that integrating the social dimension into strategies is key to the sustainable success of nearshoring."

Table 4. Estimated coefficients in the utility function

Coefficient	Worth	Interpretation
α	0.35	Weight of individual strategy
β	0.3	Weight of accounting impact
γ	0.35	Weight of the social variable

These results reflect a complex interaction between strategic rationality and critical accounting and social considerations, confirming the need for integrated approaches to understanding and managing nearshoring processes.

Discussion

The results obtained in this study are consistent with the findings of Azevedo and Silva (2022), who highlighted the importance of cooperation between strategic actors to improve governance in nearshoring decisions, emphasizing that collaboration reduces uncertainty and optimizes the supply chain. Similarly, our analysis revealed a majority preference for cooperative strategies, confirming the relevance of this dynamic to achieving operational stability and shared benefits.

Regarding accounting impact, the results reflect the observations of Cooper and Sherer (1984), who argued that critical accounting can make power relations and transparency within economic processes visible, especially in restructuring contexts. The perception of increased financial transparency and internal control in nearshoring is consistent with this perspective, showing how accounting becomes a key tool for managing and legitimizing strategic decisions.

Regarding social variables, the results support the conclusions of Gray and Laughlin (2012), who emphasize the need to incorporate ethical and social considerations into accounting practices to avoid reproducing inequalities and negative impacts on communities affected by global economic

processes. The concern expressed for equity and governance in this study underscores the relevance of a critical and multidimensional approach to the nearshoring phenomenon.

Finally, agent-based modeling and the assignment of coefficients that weigh strategy, accounting impact, and social variables find a parallel in the work of Bimpikis, Candogan, and Saban (2019), who showed that complex strategic interactions require models that integrate multiple dimensions to understand business decisions and their consequences. The importance given to the social dimension in our model reinforces the idea that nearshoring processes should be evaluated from a holistic perspective that considers not only economic benefits but also social and ethical impacts.

Conclusion

The study identified the complexity and multidimensionality of the nearshoring phenomenon, integrating strategic, accounting, and social perspectives to provide a more complete understanding of its implications. It established how decisions about cooperation and competition among actors influence the efficiency and sustainability of production chains, as well as accounting transparency and control, without losing sight of the associated social and ethical impacts. Agent-based modeling proved to be a useful tool for simulating different scenarios and assessing the relevance of key variables in decision-making.

Among the study's limitations are the limited sample size and diversity, which may affect the generalizability of the results to different contexts or other industrial sectors. Furthermore, the modeling, although robust, relies on assumptions and parameters that could vary in real-life situations, so the simulated scenarios should be interpreted as approximations. The research focused primarily on the strategic and accounting perspective, leaving less room for an in-depth analysis of cultural or political variables that may also influence nearshoring.

It is recommended to expand the research by incorporating larger and more diverse samples, including actors from different countries and sectors, to enrich the analysis. Further study is needed of the cultural, political, and regulatory dimensions that interact with strategic and accounting decisions in nearshoring. It is also suggested that models that integrate dynamic and contextual variables be developed to better capture the evolution of relationships between actors. Finally, it is advisable to promote more transparent and socially responsible accounting practices that allow companies to ethically manage the impacts of nearshoring, contributing to more equitable and sustainable corporate governance.

Article Publication Details

This article is published in the **Realpolitik**, ISSN XXXX-XXXX (Online). In Volume 1 (2025), Issue 1 (September-December)

The journal is published and managed by **Erudexa Publishing**.

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Acknowledgements

We sincerely thank the editors and the reviewers for their valuable suggestions on this paper.

Authors' contributions

All authors read and approved the final manuscript.

Data availability

No datasets were generated or analyzed during the current study.

Declarations

Ethics approval and consent to participate

Not applicable. This study did not involve human or animal subjects.

Funding

The authors declare that no funding was received for this work.

Competing interests

The authors declare that they have no competing interests.

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