

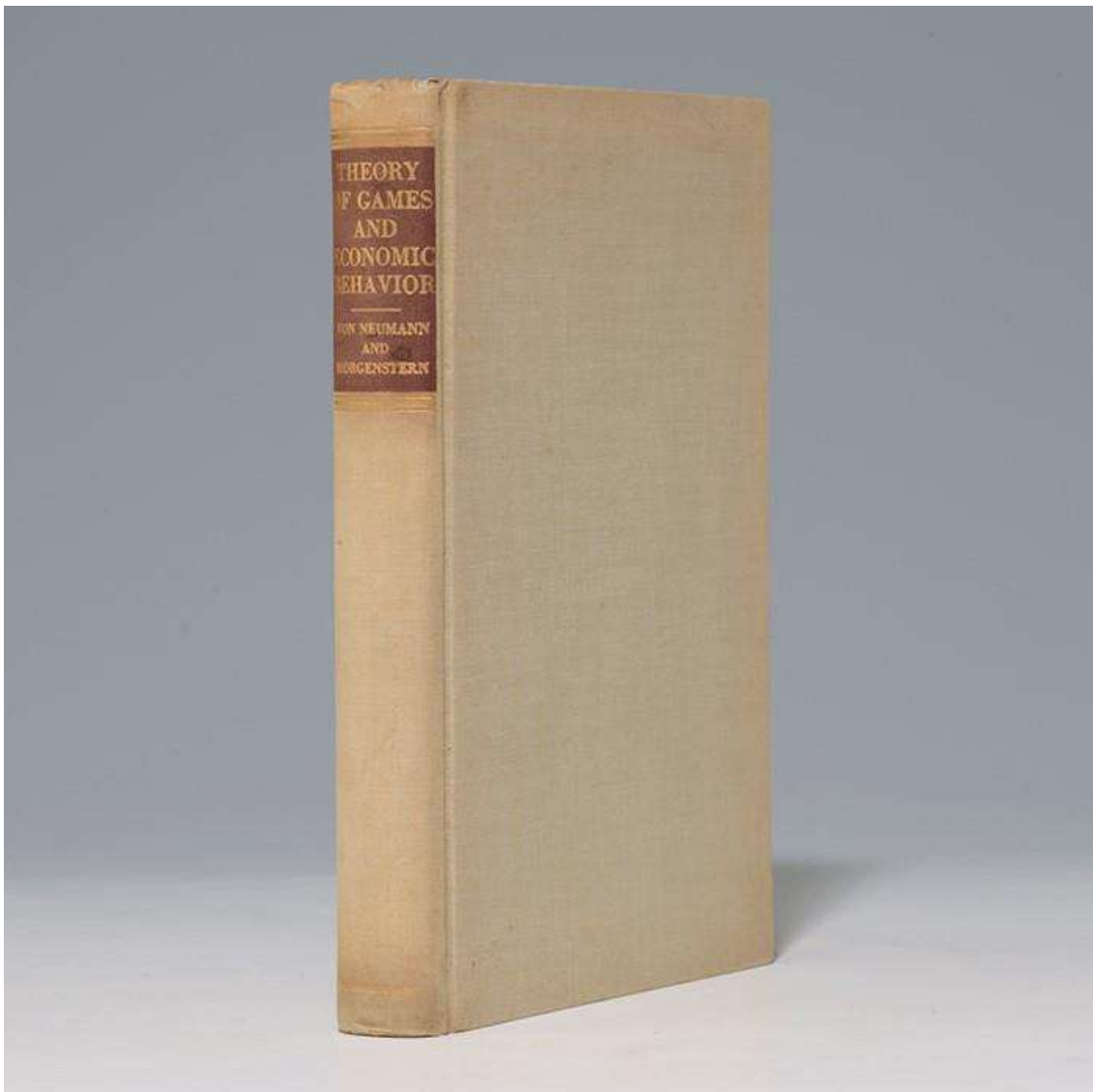
"Theory of Games and Economic Behavior" (1944), by John von Neumann and Oskar Morgenstern: A Canonical Book

Curated by Stephen A Batman

Thursday, March 13, 2025

Summary of this Particular Rare First Edition

John von Neumann and Oskar Morgenstern, Theory of Games and Economic Behavior, 1944



CORRIGENDA

Lines are text lines, counting each formula as one. Footnote lines are not counted unless the reference is specifically to a footnote. Minus lines are counted from the bottom.

Page	Line	instead of:	read:
24	17	this relation	these concepts
33	-4	number (say n)	number of (say n)
56	-12	σ_n	σ_n
65		invert Figure 7	
71	11	movements	moves
87	18	affected	effected
92	15	Max_x	$\text{Max}_x \text{Max}_y$
98	-11	desire	desires
127	1	σ_x	σ_{x+1}
127	9	$M_{x'}^{x'}$	$M_{x'}^{x'}$
132	Figure 17	$\vec{x}_1, \dots, \vec{x}_n$	$\vec{x}_1^1, \dots, \vec{x}_n^1$
141	11	$\{w', \dots\}$	$\{w_1', \dots\}$
141	Footnote 1	x_n	x_n
143	14	$i, j = 1, \dots, n$	$j = 1, \dots, n$
150	-8	$v'_1 = v'_2$	$v'_1 = v'_2$
152	-6	$\text{Max}_{x'}$	$\text{Max}_{x'}$
163	Footnote 3		
	line -2	$\vec{\eta}$	$\vec{\eta}$
167	6	(in τ_1)	(in τ_2)
171	9	player	players
171	Footnote 3	$\mathcal{K}(\tau_1, \tau_1)$	$\mathcal{K}(\tau_1, \tau_2)$
174	-8	a column	a row or a column
175	-1	have the	the value
179	-8	3	2
180	2	β	δ
182	-1	31	30
183	Footnote 4		
	line -1	r_n	r_{n_2}
185	-6	σ'_x, σ'_y	σ'_x, σ'_y
193	Formula (19:1)	$i_x = 1$	$i_x = 1$
193	Footnote 1	attention	intention
194	Footnote 1	iS	iS
	(indices and	S	S
	subindices)	jS	jS
196	10	σ'_x	γ'_x
198	-4	ρ	ρ^2
199	Footnote 2	greatest z	greatest z^0
208	20	$\neq 0$	$\neq 0, 1$
210	Footnote 1:		
	lines 1 and 3	m	n [four times]
	line 3	$\frac{1}{ca}$	$\frac{1}{ca_1}$
213	2	iS	i_s
	Formula (19:25)		Missing under \sum_i :
			$i_s = i$
	Formula (19:26)		Missing under \sum_j :
			$j_s = j$
215	7	δ'_x	ρ'_x
216	-8	line $p = 1$	line $p = 1$

"ONE OF THE MAJOR SCIENTIFIC CONTRIBUTIONS OF THE FIRST HALF OF THE 20TH CENTURY": FIRST EDITION OF VON NEUMANN'S *THEORY OF GAMES*

First edition of von Neumann's groundbreaking treatise on game theory, highly influential in business, economics, and the social sciences.

"One of the major scientific contributions of the first half of the 20th century" (Goldstine & Wigner).

"Had it merely called to our attention the existence and exact nature of certain fundamental gaps in economic theory, the *Theory of Games and Economic Behavior*... would have been a book of outstanding importance. But it does more than that. It is essentially constructive: where existing theory is considered to be inadequate, the authors put in its place a highly novel analytical apparatus designed to cope with the problem.

It would be doing the authors an injustice to say that theirs is a contribution to economics only. The scope of the book is much broader. The techniques applied by the authors in tackling economic problems are of sufficient generality to be valid in political science, sociology, or even military strategy. The applicability to games proper (chess and poker) is obvious from the title.

Moreover, the book is of considerable interest from a purely mathematical point of view... The appearance of a book of the caliber of the *Theory of Games* is indeed a rare event" (*World of Mathematics* II:1267-84). *With scarce corrigenda slip laid in.* Without scarce dust jacket.

NEUMANN, John von and MORGENSTERN, Oskar. *Theory of Games and Economic Behavior*. Princeton: Princeton University Press, 1944. Octavo, original brown cloth. Housed in a custom clamshell box.

Text fine, edge-wear lightly affecting text at lower edge of rear corrigenda, faint soiling to cloth. A handsome near-fine copy.

Introduction

"*Theory of Games and Economic Behavior*," published in 1944 by Princeton University Press, stands as a groundbreaking text that created the interdisciplinary research field of game theory¹. The collaboration between mathematician John von Neumann and economist Oskar Morgenstern resulted in a work that would revolutionize not only economics but also establish an entirely new field of scientific inquiry. The book emerged during a pivotal period in world history—amid World War II—when the integration of mathematical concepts into social sciences was gaining momentum⁴. Von Neumann had already established the mathematical foundations of game theory in a 1928 paper titled "Zur Theorie der Gesellschaftsspiele" ("On the Theory of Board Games")¹, but it was the partnership with Morgenstern that transformed these abstract mathematical concepts into a framework applicable to real-world economic behaviors.

The cultural and economic climate surrounding the book's publication was characterized by significant upheaval. The world was still in the throes of World War II, and economic thinking

was heavily influenced by the aftermath of the Great Depression. Traditional economic theories were struggling to explain entrepreneurial anticipation and imperfect competition³. In this context, von Neumann and Morgenstern's work offered a fresh perspective by turning attention away from steady-state equilibrium toward the market process and strategic interactions between economic agents. What began as a modest proposal for a short paper blossomed into a comprehensive mathematical theory of economic and social organization that would fundamentally alter how economists and social scientists understood human behavior in strategic situations².

The Authors

John von Neumann (1903-1957) was a Hungarian-American mathematician widely regarded as one of the most brilliant minds of the 20th century. Born in Budapest, he demonstrated extraordinary mathematical abilities from an early age. Beyond his contributions to game theory, von Neumann made significant advances in quantum physics, computer science, and was instrumental in the development of the first electronic computer. His versatility and intellectual prowess allowed him to bridge pure mathematics with practical applications, making him ideally suited to formalize the mathematical underpinnings of game theory¹.

Oskar Morgenstern (1902-1977) was born in Görlitz, Germany, and later emigrated to the United States in the 1930s amid the political turmoil in Europe. As an economist, he held academic positions at prestigious institutions including the University of Vienna and Princeton University. Morgenstern brought economic insight to the partnership, helping to apply von Neumann's abstract mathematical concepts to economic behavior. His interests spanned a broad range of topics within economic theory and policy, making him a pivotal figure in 20th-century economics⁴. The collaboration between these two intellectual giants—one a mathematician and the other an economist—created a synergy that bridged the gap between pure mathematics and applied economics, forever changing the landscape of both fields.

Why this is a Canonical Book

"Theory of Games and Economic Behavior" must be included in the canon of major ideas for several compelling reasons. First, it fundamentally transformed economics by addressing crucial problems in prior mathematical economic models. Neoclassical economics had struggled to explain entrepreneurial anticipation and imperfect competition, but game theory provided a framework for understanding these complex phenomena³. By shifting focus from steady-state equilibrium to the market process and strategic interactions, von Neumann and Morgenstern's work enabled economists to analyze situations where traditional models fell short.

Second, the book's influence extends far beyond economics, permeating fields such as political science, sociology, evolutionary biology, and computer science⁴. This interdisciplinary impact reflects core American values of innovation and intellectual cross-pollination. Game theory has become an essential tool for understanding human behavior in various contexts, from business competition to international relations, embodying the American pragmatic approach to knowledge that values practical applications.

Third, the mathematical rigor introduced by von Neumann and Morgenstern established a new standard for economic analysis. Their work exemplifies the American commitment to scientific advancement and rational inquiry. By formalizing the study of strategic interactions, they created a framework that allows for precise analysis of complex social phenomena, aligning with America's emphasis on evidence-based approaches to understanding society¹.

Fourth, game theory has profound implications for understanding democratic processes and market dynamics—both central to American governance and culture. It provides insights into how individual choices aggregate into collective outcomes, illuminating both the potential and limitations of markets and democratic institutions. This aligns with America's ongoing dialogue about the balance between individual liberty and collective welfare⁸.

Finally, the book's emphasis on strategic thinking and rational decision-making resonates with America's entrepreneurial spirit and focus on individual agency. By analyzing how individuals make choices in competitive environments, game theory offers a framework that both celebrates individual strategic thinking and recognizes the complex interdependencies that characterize social life—a duality that mirrors America's own balance between individualism and community⁷.

Five Timeless Quotes

1. "What began more than sixty years ago as a modest proposal that a mathematician and an economist write a short paper together blossomed, in 1944, when Princeton University Press published *Theory of Games and Economic Behavior*."²

This quote captures the remarkable genesis of a work that began as a modest collaboration but evolved into a groundbreaking text that would revolutionize multiple fields. In our current era of increasing specialization, this quote reminds us of the immense value of interdisciplinary collaboration. The partnership between von Neumann (mathematics) and Morgenstern (economics) demonstrates how bringing together diverse perspectives can lead to revolutionary insights that neither discipline could achieve in isolation. This lesson remains profoundly relevant today as we face complex global challenges—from climate change to artificial intelligence governance—that require integrating knowledge across traditional academic boundaries.

2. "Game theory brought about a revolution in economics by addressing crucial problems in prior mathematical economic models. For instance, neoclassical economics struggled to explain entrepreneurial anticipation and could not handle the imperfect competition."³

This quote highlights how game theory filled critical gaps in economic understanding. Today, as we navigate increasingly complex global markets characterized by technological disruption and strategic corporate behavior, game theory continues to provide essential tools for analyzing competitive dynamics. From platform economics to international trade negotiations, the framework established by von Neumann and Morgenstern helps us understand situations where traditional economic models fail. This quote reminds us that theoretical innovations are most valuable when they address real limitations in our understanding of practical problems.

3. "In game theory, the case is more complex, since the outcome depends not only on my own strategies and the 'market conditions,' but also directly on the strategies [of others]." [5](#)

This insight captures the fundamental shift in perspective that game theory introduced—acknowledging the interdependence of decision-makers. In our interconnected world, this perspective is more relevant than ever. From climate agreements to cybersecurity, outcomes depend critically on the strategic choices of multiple actors. This quote reminds us that addressing today's most pressing challenges requires understanding not just our own interests but how they interact with the interests and strategies of others. It offers a framework for moving beyond simplistic zero-sum thinking toward more sophisticated analyses of strategic interaction.

4. "Neoclassical economics is based on the assumption that human beings are absolutely rational in their economic choices... Game theory was intended to confront just this problem: to provide a theory of economic and strategic behavior when people interact directly, rather than 'through the market.'" [5](#)

This quote highlights how game theory expanded economic analysis beyond the constraints of perfect rationality and market-mediated interactions. Today, as behavioral economics continues to reveal the limits of rational choice models, this insight remains profoundly relevant. From public health interventions to retirement savings policies, effective approaches must account for how people actually behave in strategic situations, not just how perfectly rational agents would behave. This quote reminds us that theoretical models must evolve to capture the complexity of human behavior in real-world contexts.

5. "In neoclassical economic theory, to choose rationally is to maximize one's rewards. From one point of view, this is a problem in mathematics: choose the activity that maximizes rewards in given circumstances. In game theory, the case is more complex, since the outcome depends not only on my own strategies and the 'market conditions,' but also directly on the strategies [of others]." [5](#)

This quote encapsulates the fundamental shift in perspective that game theory introduced to economic thinking. In today's complex global economy, this insight is more relevant than ever. From corporate strategy to international relations, success depends not just on optimizing against fixed conditions but on anticipating and responding to the strategic choices of others. This quote reminds us that in interconnected systems, narrow optimization can lead to suboptimal outcomes, while understanding strategic interdependence can reveal paths to mutual benefit that might otherwise remain hidden.

Five Major Ideas

1. Strategic Interdependence of Decision-Makers

At the core of "Theory of Games and Economic Behavior" is the recognition that in many situations, the outcome for any participant depends critically on the actions of all involved [3](#). This represents a fundamental departure from traditional economic models that focused on individual

optimization against fixed market conditions. Von Neumann and Morgenstern formalized this interdependence using mathematical models that capture how each player's optimal strategy depends on the anticipated strategies of others. This framework allows for analyzing competitive situations ranging from business rivalry to international relations, providing insights into how strategic thinking shapes outcomes in complex social interactions. The concept of strategic interdependence has profound implications for understanding everything from market competition to environmental cooperation, making it one of the book's most enduring contributions⁷.

2. Zero-Sum vs. Non-Zero-Sum Games

The book introduced the crucial distinction between zero-sum games, where one player's gain is exactly balanced by another's loss, and non-zero-sum games, where mutual gains or losses are possible⁴. Zero-sum games like poker exemplify purely competitive situations, while non-zero-sum games reflect scenarios where cooperation can lead to collective benefits. This distinction has profound implications for understanding different types of social interactions. In business, it helps distinguish between market-share competition (more zero-sum) and innovation-driven growth (potentially positive-sum). In international relations, it illuminates the difference between territorial disputes and climate cooperation. By formalizing these different interaction structures, von Neumann and Morgenstern provided a framework for understanding when competition is inevitable and when cooperation might emerge⁵.

3. Nash Equilibrium and Strategic Stability

Though fully developed later by John Nash, the concept of equilibrium in non-cooperative games has its roots in von Neumann and Morgenstern's work⁴. A Nash equilibrium occurs when no player can improve their outcome by unilaterally changing their strategy, given the strategies of others. This concept provides a powerful tool for analyzing strategic stability across various domains. In markets, it helps predict competitive outcomes; in public policy, it illuminates why certain social dilemmas persist despite their collective disadvantages. The equilibrium concept revolutionized how economists think about strategic interactions, offering insights into why certain patterns of behavior emerge and persist in competitive environments. This framework continues to inform analyses of everything from pricing strategies to international agreements³.

4. Expected Utility Theory

In an appendix to the second edition (1947), von Neumann and Morgenstern presented a formal derivation of expected utility theory, which provides a mathematical framework for decision-making under uncertainty¹. This theory formalized how rational agents should evaluate risky prospects by weighing potential outcomes by their probabilities. Beyond its technical significance, this contribution established a rigorous foundation for analyzing risk preferences, with far-reaching implications for fields from finance to insurance. The expected utility framework continues to serve as the basis for modern theories of decision-making under uncertainty, influencing how we understand everything from investment decisions to public health policies. This mathematical formalization of risk assessment represents one of the book's most technically significant contributions¹.

5. Cooperative Game Theory and Coalition Formation

Beyond non-cooperative games, von Neumann and Morgenstern developed a theory of cooperative games, analyzing how players might form coalitions to achieve better outcomes⁷. This framework examines which coalitions are likely to form and how the benefits might be distributed among coalition members. Cooperative game theory has profound implications for understanding collective action problems, from business alliances to international agreements. It provides insights into when cooperation is stable and when it might break down, illuminating the challenges of sustaining collective action in diverse contexts. This aspect of the book has influenced thinking about organizational design, political coalitions, and international cooperation, offering a mathematical framework for analyzing the stability and effectiveness of collaborative arrangements⁷.

Three Major Controversies

1. Rationality Assumptions and Behavioral Realities

One of the most significant controversies surrounding "Theory of Games and Economic Behavior" concerns its assumptions about rationality. The book's formal framework assumes that players are perfectly rational, capable of complex strategic reasoning and maximizing their expected utility⁸. Critics argue that this assumption fails to capture how people actually behave in strategic situations, pointing to experimental evidence showing systematic deviations from game-theoretic predictions. This controversy has spawned the field of behavioral game theory, which integrates psychological insights about cognitive biases and bounded rationality⁷. The tension between formal elegance and psychological realism continues to animate debates about the appropriate foundations for economic theory. Some argue that relaxing rationality assumptions undermines the predictive power of game theory, while others contend that more psychologically realistic models are necessary for practical applications. This controversy reflects broader tensions in American intellectual life between formal, mathematical approaches to social science and more contextual, psychologically-informed perspectives⁷.

2. Ethical Implications and Social Welfare

A second major controversy concerns the ethical implications of strategic thinking as formalized in game theory. Critics argue that the framework's focus on individual strategic advantage can normalize self-interested behavior at the expense of ethical considerations and social welfare⁸. The famous Prisoner's Dilemma illustrates how individually rational choices can lead to collectively suboptimal outcomes, raising questions about the relationship between strategic rationality and social good. This controversy connects to longstanding debates in American political thought about the proper relationship between self-interest and common welfare. Some critics contend that game theory's formalization of strategic thinking has contributed to a narrowly self-interested conception of rationality in public discourse and policy. Others argue that by illuminating the structure of social dilemmas, game theory actually helps identify institutional arrangements that can align individual incentives with collective welfare. This controversy reflects America's ongoing negotiation between individualistic and communitarian values⁸.

3. Mathematical Complexity and Practical Applicability

A third controversy concerns the relationship between game theory's mathematical sophistication and its practical applicability. Critics argue that the theory's formal elegance comes at the cost of practical relevance, with many real-world situations being too complex or indeterminate for game-theoretic analysis⁵. The challenge of applying abstract models to concrete situations has led to debates about the appropriate level of simplification and the role of contextual factors in strategic analysis. Some practitioners advocate for simplified, more intuitive applications of game-theoretic concepts, while others insist on maintaining mathematical rigor. This controversy reflects broader tensions in American intellectual culture between theoretical sophistication and practical utility. It also connects to debates about the role of expertise in public decision-making, with some arguing that game theory's complexity makes it accessible only to specialists, potentially limiting its democratic application. Others contend that core game-theoretic insights can be communicated effectively to non-specialists, enhancing strategic literacy among citizens and policymakers⁵.

In Closing

Civic-minded Americans should read "Theory of Games and Economic Behavior" because it provides essential tools for understanding the strategic dimensions of social, economic, and political life. In a democratic society where citizens are called upon to make informed judgments about complex policy issues, the framework developed by von Neumann and Morgenstern offers valuable insights into how individual choices aggregate into collective outcomes⁸. By illuminating the structure of strategic interactions, game theory helps citizens recognize situations where uncoordinated individual choices might lead to suboptimal results, and where institutional design can help align individual incentives with collective welfare.

The book's analysis of cooperation and competition speaks directly to America's ongoing negotiation between market dynamics and democratic governance. By formalizing the conditions under which cooperation can emerge and persist, game theory offers insights into how societies can address collective action problems while respecting individual autonomy⁷. This balance between individual liberty and collective coordination lies at the heart of the American political tradition.

Furthermore, in an era of increasing polarization, game theory provides a framework for understanding political conflict not as a simple matter of opposing values but as a complex strategic interaction where outcomes depend on the choices of multiple actors⁵. This perspective can help citizens move beyond simplistic zero-sum thinking toward more sophisticated analyses of political dynamics, potentially identifying opportunities for mutual gain that might otherwise remain hidden.

The book's integration of mathematical rigor with practical insights exemplifies the American pragmatic tradition, which values both theoretical understanding and practical application. By reading von Neumann and Morgenstern's work, citizens can appreciate how abstract mathematical concepts can illuminate concrete social problems, fostering a deeper appreciation for the role of formal analysis in addressing real-world challenges⁴.

Finally, as Americans navigate an increasingly complex global environment characterized by strategic interdependence, the framework developed in "Theory of Games and Economic Behavior" offers valuable tools for understanding international dynamics. From trade negotiations to climate agreements, game-theoretic concepts help illuminate the strategic dimensions of global challenges, empowering citizens to engage more effectively with international issues³.

In sum, von Neumann and Morgenstern's canonical work provides civic-minded Americans with intellectual tools that enhance their capacity for strategic thinking, institutional design, and collective problem-solving—capabilities essential for effective citizenship in a complex democratic society.

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