

Transdisciplinary Equilibrium: A Unified Model across Game Theory, Social Psychology, and Economic Structures

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Abstract

We propose a unified transdisciplinary model that bridges game theory, social psychology, and economic power structures. The model expands the traditional Nash equilibrium by introducing a social cost function $J(x)$, capturing emotional and systemic feedbacks that influence behavior in complex societies.

1 Introduction

In various domains of human interaction—from financial markets to online communities—behavior often appears irrational when evaluated through classical economic or game-theoretic lenses. We propose that a deeper equilibrium exists, shaped by emotional, social, and asymmetrical power factors [Nash, 1950, Wittgenstein, 1953].

2 The Core Equation

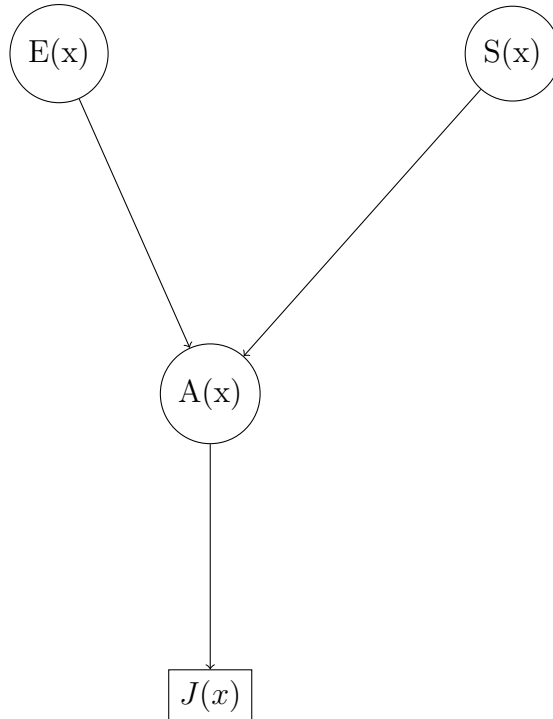
We define the Social Cost Function $J(x)$ as:

$$J(x) = \alpha E(x) + \beta S(x) + \gamma A(x) \tag{1}$$

Where:

- $E(x)$ is the emotional divergence (e.g. perceived rejection, shame, loss of trust),
- $S(x)$ is the structural asymmetry (e.g. market inequality, algorithmic bias),
- $A(x)$ is the anticipatory suppression (e.g. strategic silence, preventive compliance),
- α, β, γ are contextual weights of each factor.

3 Diagram: Interaction of Factors



4 Application and Interpretation

This model applies to:

- Crypto markets where irrationality surfaces due to FOMO, greed, or collective silence.
- Social platforms where power users shape norms through passive-aggressive influence.
- National policies where short-term public sentiment overrides long-term structural balance.

5 Conclusion and Discussion

We argue that $J(x)$ offers a meta-equilibrium—a layer above Nash—where behavior is governed not just by immediate payoffs, but by anticipated social repercussions and systemic inequalities.

References

- John Nash. Equilibrium points in n -person games. *Proceedings of the National Academy of Sciences*, 36(1):48–49, 1950.
- Ludwig Wittgenstein. *Philosophical Investigations*. Blackwell, 1953.