

# Seven Supermodels of Economics: A Dialogue on Economic Reality

Soumadeep Ghosh

Kolkata, India

## Abstract

This paper presents the oliGARCHy framework, comprising seven economic supermodels that describe actual economic structures rather than idealized markets. We explore three constituent models (7, 8, and 9) that map onto geographic, crystalline, and hierarchical structures respectively. The framework takes asymmetric power concentration and information inequality as baseline conditions, treating perfect competition as a rare special case. We argue that the 9-constituent Standard Nuclear oliGARCHy represents the natural human default, while 8-constituent crystalline symmetry remains an inhuman ideal, and 7-constituent structures persist only under geographic constraints.

The paper ends with “The End”

## 1 Introduction

Economic theory traditionally begins with perfect competition and adds “frictions” to explain observed market structures. The oliGARCHy framework inverts this approach: it starts with oligarchic power concentration, information asymmetry, and hierarchical extraction as baseline reality, then asks when and how competitive or symmetric structures emerge as special cases.

The framework’s name combines *oligarchy* (rule by the few) with *GARCH* (volatility modeling from econometrics), reflecting its focus on economies structured by concentrated power and inherent volatility.

## 2 The Seven Supermodels

### 2.1 Overview

The oliGARCHy framework comprises seven distinct economic supermodels:

1. **Structural Economics** – Models based on production functions, capital accumulation, and causal mechanisms
2. **Reduced-Form Economics** – Statistical relationships and empirical patterns without explicit causal structure
3. **Standard Nuclear oliGARCHy** – The baseline 9-constituent core-periphery model
4. **0 Wealth Small Tri-partite Economy** – Minimal model for understanding fundamentals
5. **Tri-partite Economy with Ramsey Graph Structure** – Intertemporal optimization with network topology
6. **Imperialism** – Explicit modeling of extraction and exploitation relationships
7. **Arbitrage** – Meta-model for speculation and opportunism across the other six

## 2.2 The Standard Nuclear oliGARCHy

The Standard Nuclear oliGARCHy is designated “standard” because it represents what actually exists in most human economic systems. It exhibits:

- 9-constituent structure (1 core + 8 periphery)
- Core-periphery hierarchy with information asymmetry
- Extraction of resources/rents from periphery to core
- Inherent volatility due to systemic dependence on the core
- Extraordinary flexibility across domains
- Support for internal arbitrage opportunities

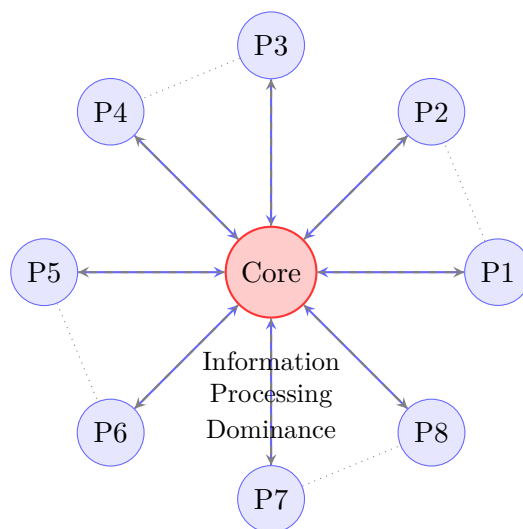


Figure 1: The 9-Constituent Standard Nuclear oliGARCHy. Solid arrows show resource/information flow from periphery to core; dashed arrows show redistribution/control from core to periphery. Dotted lines indicate limited periphery-to-periphery coordination.

Real-world examples include:

- *Nation-states*: Russia (Moscow + federal districts), China (Beijing + regions)
- *Corporations*: Tech platforms (central algorithm + user constituencies)
- *Financial systems*: Central banks + commercial banking sectors
- *Commodity markets*: Major trading houses + producers/consumers (even “perfect” markets like Brent crude)
- *Natural systems*: Solar system (1 Sun + 8 planets, excluding negligible Pluto)

## 2.3 Arbitrage Model

The Arbitrage model operates at a meta-level, exploiting gaps between the other six supermodels. It enables:

- Speculation on model misspecification

- Opportunistic profit from regime transitions
- Exploitation of theoretical commitments by others
- Navigation of differences between Structural vs. Reduced-Form approaches
- Profit from shifts between Nuclear, Tri-partite, and Imperial structures

The Standard Nuclear oliGARCHy itself supports internal arbitrage due to information asymmetries between core and periphery, and across peripheral constituents.

### 3 Three Constituent Models

Economic structures can be characterized by their number of constituents, each representing a fundamentally different organizational principle.

#### 3.1 The 7-Constituent Model: Geographic Multipolarity

**Domain:** Earth's continental geography

**Structure:** Seven roughly equal continents with no dominant core

- Africa, Antarctica, Asia, Australia/Oceania, Europe, North America, South America
- Multiple power centers, distributed authority
- Geographic separation prevents full consolidation
- Relatively stable multipolar equilibrium

**Properties:**

- Messy, historical, path-dependent
- No single constituent can dominate all others
- Physical geography constrains economic integration
- Natural for systems with strong geographic barriers

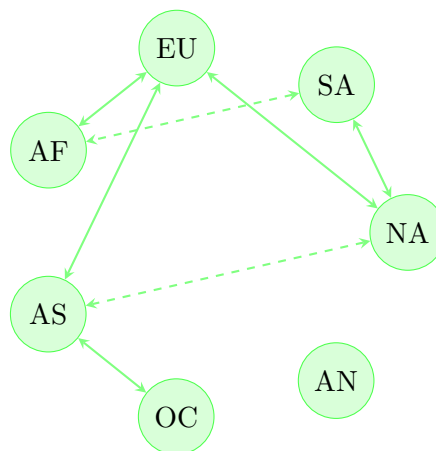


Figure 2: The 7-Constituent Model: Earth's continents as distributed economic zones. Solid lines indicate strong connections; dashed lines indicate weaker integration. No single core dominates.

### 3.2 The 8-Constituent Model: Crystalline Ideal

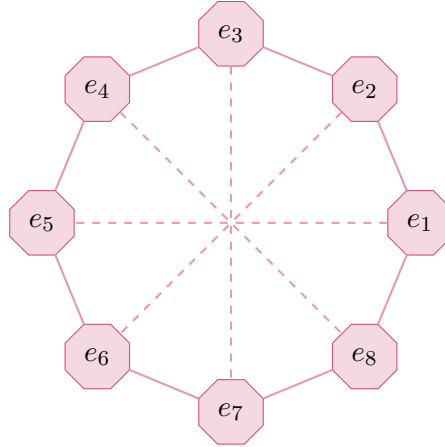
**Domain:** Hypothetical designed economies (e.g., Mars colony)

**Structure:** Octonionic symmetry with eight equal constituents

- Based on octonion algebra (8-dimensional normed division algebra)
- Perfect mathematical symmetry
- Non-commutative ( $A \cdot B \neq B \cdot A$ ): asymmetric trade
- Non-associative ( $(A \cdot B) \cdot C \neq A \cdot (B \cdot C)$ ): path-dependent production

**Properties:**

- Designed from first principles
- Requires rigid adherence to mathematical relationships
- Too inflexible for human systems (“crystalline symmetry is inhuman”)
- Optimized for survival, growth, or welfare depending on objective function
- Likely unstable - would collapse to 9-constituent once any entity gains information advantage



Perfect Octonionic Symmetry

Figure 3: The 8-Constituent Model: Crystalline structure based on octonion algebra. Each constituent ( $e_i$ ) relates to others through non-commutative, non-associative operations.

#### Objective Function Variants:

The octonionic model’s eight constituents can be configured based on three primary objectives:

1. *Survival*: Energy, water, food, shelter, defense, medicine, information, reproduction
2. *Growth*: Physical capital, human capital, technology, finance, infrastructure, R&D, extraction, manufacturing
3. *Welfare*: Material consumption, health, education, leisure, relationships, environment, security, meaning

The objective function provides weightings over the same 8 dimensions. Full exploration requires a dedicated research program beyond this paper’s scope.

### 3.3 The 9-Constituent Model: Nuclear Hierarchy

**Domain:** Most human economic systems, natural hierarchies

**Structure:** 1 dominant core + 8 peripheral constituents

- Core processes vastly more information than periphery
- Core appears “alien” to peripheral agents due to information asymmetry
- Periphery depends on core; core extracts from periphery
- Natural structure in systems with mass/information concentration

**Properties:**

- Most stable for human systems
- Extraordinarily flexible (scales across domains)
- Inherently volatile (systemic dependence creates fragility)
- Accommodates human imperfections and status-seeking
- Natural analog: Solar system (1 Sun + 8 planets)

This is the **Standard** Nuclear oliGARCHy - standard because it describes the prevalent reality.

## 4 Why Asymmetry Prevails

### 4.1 The Myth of Perfect Markets

Traditional economics treats perfect competition as the baseline. However, even the most “standardized” commodity markets exhibit:

- *Supply chain realities:* Transportation, storage, quality variations
- *Geopolitical overlay:* Sanctions, cartels (OPEC+), strategic reserves
- *Information asymmetries:* Trading firms with superior intelligence
- *Concentration:* Major trading houses dominate (Vitol, Glencore, Trafigura)

**Example:** Brent crude oil, often cited as a perfect market, actually exhibits 9-constituent structure with core traders and peripheral producers/consumers, complicated by geopolitics and infrastructure constraints.

### 4.2 Crystalline Symmetry is Inhuman

The 8-constituent model represents theoretical perfection but requires:

- Exact balance across all constituents
- Rigid adherence to mathematical relationships
- Suppression of natural human tendencies toward hierarchy
- Impossible information symmetry

Humans are:

- Imperfect information processors
- Status-seeking (hierarchies form naturally)
- Variable in ability and ambition
- Adaptive and opportunistic (break symmetries for advantage)

### 4.3 Information as Gravitational Mass

In the solar system, physical mass determines gravitational dominance. In economies, *information processing capacity* plays an analogous role:

- Entities with superior information processing become cores
- Peripheral agents cannot coordinate without going through the core
- Core’s decisions directly affect all periphery
- No alternative center can emerge (just as you can’t have two suns in stable orbit)

The core need not be “alien” in origin - it merely needs to be informationally superior. To peripheral agents with limited processing capacity, the core’s decisions appear inscrutable, impossibly complex, almost superhuman.

## 5 Progression and Stability

### 5.1 Natural vs. Designed Structures

Model	Constituents	Status	Stability
Geographic	7	Exists (Earth)	Stable
Crystalline	8	Hypothetical (Mars)	Unstable
Nuclear	9	Exists (Russia, etc.)	Stable

Table 1: Comparison of constituent models by existence and stability

The 9-constituent model is more natural than the 8-constituent model because:

1. It already exists in numerous real-world systems
2. Nation-states and corporations building Mars colonies are themselves 9-constituent structures
3. The solar system itself exhibits 9-constituent structure (1 Sun + 8 planets, excluding negligible Pluto)
4. Human hierarchies naturally form this way

### 5.2 The Mars Colony Paradox

Can 9-constituent entities (hierarchical, volatile, extractive) successfully design and implement an 8-constituent system (symmetric, crystalline, optimal)?

Two possibilities:

1. The Mars colony starts as 8-constituent by design but degrades to 9-constituent once any entity gains information/resource advantage

2. The Mars colony is 9-constituent from inception because it inherits the hierarchical structure of its creators (SpaceX, Blue Origin, Chinese space program, etc.)

The investment structure suggests the latter: nation-states (9-constituent) invest in corporations (9-constituent) that build Mars colonies (?-constituent). The colony likely inherits the hierarchical DNA.

### 5.3 Boundary of the Framework

The oliGARCHy framework is complete within its domain: 7, 8, and 9-constituent models describe all currently observed economic structures.

A **10-constituent model** would require:

- A system irreducible to 7, 8, or 9
- New structural properties beyond current understanding
- Perhaps: 2 competing cores + 8 periphery (bipolar world order)?
- Or: qualitatively new economic phenomena not yet encountered

**Until such a model emerges**, the 7-8-9 framework is sufficient. It is empirically bounded by observed reality, not theoretical limits.

## 6 Implications and Applications

### 6.1 For Economic Analysis

The oliGARCHy framework suggests:

- Start analysis with power concentration, not perfect competition
- Identify the core-periphery structure in any market
- Map information asymmetries explicitly
- Expect volatility as inherent, not anomalous
- Recognize extraction relationships as fundamental

### 6.2 For Arbitrage and Speculation

Sophisticated operators can:

- Exploit internal arbitrage within 9-constituent systems
- Profit from transitions between constituent models
- Bet against theoretical assumptions (shorting “efficient markets”)
- Identify when others use the wrong model
- Navigate geopolitical and supply chain realities ignored by traditional theory

### 6.3 For Policy and Design

When designing new economic systems:

- Recognize that 8-constituent crystalline perfection is likely unattainable
- Plan for 9-constituent emergence even if designing for 8
- Build in mechanisms to manage core-periphery volatility
- Accept information asymmetry as structural, not fixable
- Use geographic separation (7-constituent logic) to prevent excessive consolidation

## 7 Conclusion

The oliGARCHy framework provides a realistic foundation for understanding economic structures as they actually exist, rather than as idealized theory suggests they should be. By taking asymmetric power concentration and information inequality as baseline conditions, the framework explains why:

- Oligarchic hierarchies (9-constituent) dominate human economies
- Perfect markets are myths even for standardized commodities
- Crystalline symmetry (8-constituent) remains an inhuman ideal
- Geographic multipolarity (7-constituent) persists only under physical constraints
- Volatility is inherent to core-periphery structures, not anomalous

The Standard Nuclear oliGARCHy is “standard” because it describes prevalent reality across nation-states, corporations, financial systems, commodity markets, and even natural systems like the solar system.

The framework is pragmatic and operational: it serves as a toolkit for navigation, arbitrage, and clear-eyed analysis. It makes no normative claims about what economic systems *should* be, only rigorous claims about what they *are*.

Until a 10-constituent model emerges - through alien contact, post-AGI reorganization, multi-planetary civilization, or phenomena we cannot yet imagine - the 7-8-9 framework remains complete and sufficient for understanding economic reality.

## References

- [1] Baez, J. C. (2002). The octonions. *Bulletin of the American Mathematical Society*, 39(2), 145–205.
- [2] Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics*, 31(3), 307–327.
- [3] Winters, J. A. (2011). *Oligarchy*. Cambridge University Press.
- [4] Acemoglu, D., & Robinson, J. A. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown Business.
- [5] Lenin, V. I. (1917). *Imperialism, the Highest Stage of Capitalism*. Parus Publishers.



- [6] Ramsey, F. P. (1928). A mathematical theory of saving. *The Economic Journal*, 38(152), 543–559.
- [7] Stiglitz, J. E. (2002). Information and the change in the paradigm in economics. *American Economic Review*, 92(3), 460–501.
- [8] Jackson, M. O. (2008). *Social and Economic Networks*. Princeton University Press.
- [9] Arthur, W. B. (2015). *Complexity and the Economy*. Oxford University Press.

## Glossary

**Arbitrage Model** Meta-level supermodel (#7) enabling speculation and opportunism by exploiting gaps between the other six supermodels and profiting from model misspecification, regime transitions, and theoretical commitments.

**Constituent** A fundamental unit or component in an economic structure. The number of constituents (7, 8, or 9) determines the organizational principle and properties of the system.

**Core-Periphery Structure** Hierarchical organization with one dominant core entity and multiple subordinate peripheral entities. The core processes more information, extracts resources, and creates systemic dependence.

**Crystalline Symmetry** Perfect mathematical balance across constituents following octonionic algebra. Requires rigid adherence to structural relationships and is too inflexible for human systems.

**Information Asymmetry** Structural inequality in information processing capacity between economic agents. In 9-constituent systems, the core’s superior information makes it appear “alien” to peripheral agents.

**Nuclear oliGARCHy** See Standard Nuclear oliGARCHy.

**Octonions** Eight-dimensional normed division algebra with non-commutative and non-associative properties. Mathematical foundation for the 8-constituent crystalline model.

**oliGARCHy** Portmanteau of “oligarchy” (rule by the few) and “GARCH” (volatility modeling). Framework for understanding economies structured by concentrated power and inherent volatility.

**Standard Nuclear oliGARCHy** The baseline 9-constituent model (supermodel #3) representing prevalent economic reality. Called “standard” because it describes what actually exists in most human systems: 1 core + 8 periphery with inherent volatility.

**Supermodel** One of seven fundamental economic models in the oliGARCHy framework: (1) Structural Economics, (2) Reduced-Form Economics, (3) Standard Nuclear oliGARCHy, (4) 0 Wealth Small Tri-partite Economy, (5) Tri-partite Economy with Ramsey Graph Structure, (6) Imperialism, (7) Arbitrage.

**7-Constituent Model** Economic structure with seven roughly equal constituents, natural to Earth’s continental geography. Exhibits multipolarity with no dominant core, constrained by geographic separation.

**8-Constituent Model** Crystalline ideal based on octonionic symmetry. Represents theoretical perfection requiring inhuman discipline to maintain. Natural domain would be designed systems like Mars colonies, but likely unstable.

**9-Constituent Model** Hierarchical structure with 1 core and 8 periphery. The Standard Nuclear oliGARCHy. Most stable for human systems; extraordinarily flexible across domains. Natural to systems with information/mass concentration (e.g., Russia, corporations, solar system).

**Volatility** Inherent instability arising from systemic dependence on a core entity in 9-constituent structures. Not an anomaly but a fundamental feature of nuclear hierarchies.

**The End**