

AI CAPITAL FLOW COMPLEXITY NODE MODEL

A Comprehensive Study

Inspired by Brian Arthur & Geoffrey West

NETWORK STATISTICS	
Total Nodes	25 entities
Total Edges	41 connections
Total Capital Flow	\$728 Billion
Average Flow	\$17.8 Billion
Categories	6 sectors
Period	2025

Date: October 09, 2025

TABLE OF CONTENTS

- 1. Executive Summary**
- 2. Network Visualizations (6 Figures)**
- 3. Complexity Principles**
- 4. Capital Flow Analysis**
- 5. Critical Nodes**
- 6. Systemic Risks**
- 7. Data Tables**
- 8. Theory**
- 9. Implications**

1. EXECUTIVE SUMMARY

This study maps \$728B in capital flows across 25 AI entities, revealing complexity patterns from Brian Arthur (increasing returns) and Geoffrey West (scaling laws).

Key Findings:

- **NVIDIA:** \$176B inflow (24%) - winner-take-most dynamics
- **Hardware:** +\$296B net accumulation
- **Loops:** Investment → AI → Hardware feedback
- **Hubs:** OpenAI (9), NVIDIA (7) connections
- **Risk:** High concentration vulnerability

2. NETWORK VISUALIZATIONS

3. KEY COMPLEXITY PRINCIPLES

Increasing Returns (Brian Arthur): NVIDIA \$176B in, \$40B out = \$136B net. Winner-take-most.

Scaling Laws (Geoffrey West): Hardware shows superlinear scaling. TSMC \$80B from economies.

Network Hubs: OpenAI (9), NVIDIA (7) are critical connection points.

Capital Loops: Investment → AI → Hardware → Manufacturing feedback.

Emergence: Power-law distributions, phase transition potential.

4. CAPITAL FLOW ANALYSIS

By Transaction Type:

- Equity Investment: \$152B (20.9%)
- Public Equity: \$150B (20.6%)
- Hardware Purchase: \$136B (18.7%)
- Manufacturing: \$80B (11.0%)
- Cloud Services: \$75B (10.3%)
- Api Licensing: \$40B (5.5%)

By Category Net Flow:

- Hardware: \$296B
- Services: \$37B
- Research: \$-1B
- AI Software: \$-30B
- Venture Capital: \$-87B
- Investment: \$-215B

5. CRITICAL NODES & HUBS

Top Recipients:

- NVIDIA: \$176B
- AI_Startups: \$81B
- TSMC: \$80B
- Cloud_Infrastructure: \$75B
- OpenAI: \$73B

Top Sources:

- Public_Markets: \$150B
- OpenAI: \$74B
- Microsoft_AI: \$70B
- Google_DeepMind: \$56B
- Anthropic: \$41B

Most Connected:

- OpenAI: 9 connections
- NVIDIA: 7 connections
- Anthropic: 6 connections
- Google_DeepMind: 6 connections
- AI_Startups: 6 connections

6. SYSTEMIC RISKS

Concentration: NVIDIA 24% of inflows. TSMC single point of failure.

Feedback Instability: Positive loops amplify growth and collapse.

Dependency Chains: AI → Hardware → TSMC amplifies disruption.

Capital Efficiency: \$296B hardware accumulation. Overcapacity risk.

Geopolitical: Taiwan (TSMC) threatens entire network.

7. DATA TABLES

Top 15 Nodes by Inflow

Entity	Category	Inflow	Outflow	Net
NVIDIA	Hardware	\$176B	\$40B	\$136B
AI_Startups	AI_Software	\$81B	\$20B	\$61B
TSMC	Hardware	\$80B	\$0B	\$80B
Cloud_Infrastructu	Hardware	\$75B	\$0B	\$75B
OpenAI	AI_Software	\$73B	\$74B	\$-1B
Enterprise_AI	Services	\$45B	\$26B	\$19B
Anthropic	AI_Software	\$37B	\$41B	\$-4B
Google_DeepMind	AI_Software	\$37B	\$56B	\$-19B
Microsoft_AI	AI_Software	\$35B	\$70B	\$-35B
AMD	Hardware	\$25B	\$25B	\$0B
Intel	Hardware	\$20B	\$15B	\$5B
Universities	Research	\$15B	\$15B	\$0B
AI_Infrastructure	Services	\$14B	\$0B	\$14B
Consumer_AI	Services	\$10B	\$6B	\$4B
Research_Labs	Research	\$5B	\$6B	\$-1B

8. THEORETICAL FOUNDATIONS

Brian Arthur - Increasing Returns:

Technology shows positive feedback. Early advantages compound. Path dependence evident.

Geoffrey West - Scaling Laws:

Systems scale predictably. Superlinear in innovation. Sublinear in infrastructure.

9. IMPLICATIONS & PREDICTIONS

Continued Concentration: Increasing returns drive winner-take-most.

New Layers: Complexity suggests intermediate layers emerge.

Phase Transition: System near critical threshold.

Scaling Limits: Physical constraints will limit growth.

Maturation: Current: growth. Next: consolidation.



Report prepared using complexity economics principles