The 23 Laws of Quantified Commitments: A Commitment-Centric Ontology for Economic Systems

Otto B. Isong
Genie Capital, Buea, Cameroon
Email: ottobeseka@geniecapital.co

Date: January 17, 2026

Abstract

This paper introduces the 23 Laws of Quantified Commitments, a novel economic ontology that posits commitments—defined as pledges from a Liable Authority (the party obligated to fulfill the pledge) to a Holding Entity (the party entitled to the fulfillment)—as the atomic unit of all economic value, supplanting traditional foundations like money, goods, or individual preferences. Value is quantified through the universal Commitment Value (CV) formula: $CV = CV_0 \times V \times A \times (1 + T)$, where CV_0 is the base value, V is Visibility, A is Assurance, and T is Transferability. This framework delivers a mathematically rigorous, interdependent architecture to explain economic phenomena ranging from bilateral trades to systemic crises. Its core value includes: (1) quantifiable metrics for diagnosing economic health (e.g., Derivation Ratio $DR \leq 0.123$ for fragility bounds, Economic Pulse $\tau_e = \ln(2)/\lambda$ for currency stability); (2) predictive power for crises via phantom value detection; (3) holistic integration of relational, informational, and dependency dynamics; and (4) prescriptive guidance for resilient institutions and policies. Validated against historical cases like the Byzantine Empire's sustained prosperity (Generativity $Gen \approx 2.7$ over 1,129 years), it outperforms traditional models by addressing frame-dependence, multi-stakeholder balances, and long-term trajectories. Applications span investment analysis, crisis forecasting, and sustainable development.

Keywords: Economic ontology, commitments, value anchors, generativity, derivation bounds, economic pulse

JEL Classification: A12, B41, E42, G01, O43

1. Introduction

Conventional economic paradigms, anchored in scarcity, utility maximization, or monetary metrics, frequently overlook the relational, informational, and contextual dimensions that truly underpin value creation in human systems. This oversight manifests in recurrent failures: models that predict growth yet miss impending collapses, policies that boost Gross Domestic Product (GDP) while eroding foundational resilience, and theories that treat agents as isolated utility calculators rather than interdependent framing entities. Why did the 2008 financial crisis, rooted in obscured dependencies and phantom values, catch mainstream economics off guard? How did the Byzantine Empire sustain prosperity for over a millennium amid external threats, while modern economies cycle through booms and busts despite technological abundance?

The 23 Laws of Quantified Commitments resolve these paradoxes by reconstructing economics from a foundational axiom: commitments, as pledges between parties, constitute the elemental building blocks of economic value. Value is neither intrinsic nor static but emerges relationally and dynamically, captured by the Commitment Value equation $CV = CV_0 \times V \times A \times (1 + T)$, where CV_0 represents the pledged base value (e.g., principal or coverage amount), V (Visibility) quantifies knowability ($\in [0,1]$), A (Assurance) denotes fulfillment probability ($\in [0,1]$), and T (Transferability) measures ownership liquidity ($\in [0,1]$) (Law 1). This ontology shifts the paradigm from money-centric to commitment-centric, revealing economics as a system of quantified pledges composed, transformed, and fulfilled across scales.

The framework's value is profound and multifaceted:

- **Quantifiable Diagnostics and Prediction:** Metrics like the Derivation Ratio (DR, bounding financial layering at ≤ 0.123 to prevent circularity), Economic Pulse ($\tau_e = \ln(2)/\lambda$, where λ is the currency degradation rate, signaling investment horizons), and Generativity ($Gen = G \times \mu \times D \times [1/(1+\lambda)]$, integrating generation, memory, defense, and stability) enable precise assessment of systemic health, early crisis warnings (e.g., Value Violation Index VVI > 1.3), and quality-adjusted growth (Growth Quality Index GQI).
- **Holistic Explanatory Power:** It integrates interpretive framing (Law 2), dependency hierarchies (Law 3), and multi-dimensional compensation (Law 7), explaining phenomena like poverty as anchor ceilings rather than exploitation, and crises as anchor cascades.
- **Prescriptive Resilience:** By emphasizing foundation-first sequencing (ecology to finance) and constraint respect, it guides policies for compound prosperity, as evidenced by historical successes (e.g., Byzantine gold solidus stability yielding $\tau_e \approx$ 80 years).
- **Superiority to Alternatives:** Unlike behavioral add-ons to neoclassical models or fragmented complexity approaches, this is a complete, generative grammar—interconnected laws deriving all economic activity from commitments—offering falsifiable predictions and practical tools.

Structured in six phases—Foundation (core value mechanics), Transformation (scaling), Infrastructure (support systems), Instruments (commitment types), Markets (resource direction), and System Properties (trajectories)—the laws form a logical progression. This paper details each law with equations, constraints, corollaries, examples, and applications, inviting empirical validation.

2. Foundation: Core Mechanics of Value

2.1 Law 1: Commitment Value

Law 1 establishes commitments as the origin of economic value. From the Holding Entity's asset perspective:

Commitment Value $CV = CV_0 \times V \times A \times (1 + T)$,

Where

- CV_0 is the intrinsic base value (positive for meaningful pledges),
- Visibility V = Commitment Transparency (CT) × Authority Transparency (AT) × Interpretability (I) × Relevance (R) × Dependency Visibility (D_V) (each $\in [0,1]$),
- Assurance A = Capability (C) × Reliability (R) × Dependency Assurance (D_A) (each $\in [0,1]$), and
- Transferability $T = [N(F)/(N(F) + 1)] \times (1 - F)$, with $N(F) = N_0 \times (1-F)^k$ (N_0: maximum buyers; F: friction; k: sensitivity).

From the Liable Authority's obligation view: Value = CV_0 (fixed legal maximum).

Anchors interdepend, fostering virtuous cycles (high V improves A assessment, reducing F, boosting T) or vicious ones. Key threshold: $V \times A \geq 0.40$ for self-reinforcement; below, degradation ensues. Dependencies cap CV at the weakest link, with failures cascading.

Mathematical bounds: CV min = 0 (V or A = 0); max = $2 \times CV_0$ (all anchors =1). Examples: U.S. Treasury bonds ($CV \approx 104\%\ CV_0$; $V\approx0.74$, $A\approx0.71$, $T\approx0.98$); 2008 subprime Mortgage-Backed Securities (MBS) collapse (from ≈31% to <1.2% CV_0 via D_V/D_A failures). Applications: Investment valuation (true vs. face value), risk monitoring (anchor degradation as warnings), negotiation (anchor enhancement creates mutual value).

2.2 Law 2: Interpretive Framing

Law 2 declares value as frame-constructed, not objective: $CV(F) = CV_0 \times V(F) \times A(F) \times (1 + T(F)) \times W(F)$, where W(F) is the agent's weight for frame F in their concern hierarchy.

Frames include Domain (e.g., economic: Return on Investment ROI; ecological: sustainability), Epistemic (e.g., empirical: data-driven; revelatory: faith-based), and Temporal (e.g., strategic: 1-5 years, 5-20% discount rate; generational: 1-3% discount).

Constraints: Incommensurability (e.g., economic bids fail for sacred sites); asymmetry (dominant frames marginalize others, as in colonialism).

Crises arise from frame gaps (e.g., 2008: optimistic homeowner frames vs. actual capacity).

Corollaries: Rationality is frame-specific; innovation breaks frames (e.g., Tesla reframing cars as software). Applications: Multi-frame decision architectures for organizations; frame mapping in negotiations.

2.3 Law 3: Dependency Constraint

Law 3 constrains systems to their foundations: For dependent commitment D on underlying U, $CV_0\_D \leq k \times CV_0\_U$, $V\_D \leq V\_U$, $A\_D \leq A\_U$, where translation efficiency $k \approx 0.5\text{-}0.9$ (rarely >1, except human capital); weakest dependency dominates.

Five-layer hierarchy: Layer 0 Ecology (e.g., biodiversity) → Layer 1 Human Capital (education, health; unique k>1 amplification) → Layer 2 Infrastructure (roads, institutions) → Layer 3 Economy (production) → Layer 4 Finance (derivatives). Typical cumulative $k \approx 0.32$ × ecological base.

Phantom value emerges when $CV_0\_apparent > k \times CV_0\_underlying$, corrected via crashes or inflation (e.g., 2008: $20T securities on $14T housing = $6T phantom).

Examples: Aral Sea collapse (140% water extraction); South Korea's education-led growth (k=2.8).

Applications: Value Violation Index $VVI = CV_0\_dependent / (k \times CV_0\_underlying)$ for crisis prediction (VVI>1.5 imminent); portfolio construction (10-30% reserves, max 20% Layer 4).

2.4 Law 4: Commodity

Law 4 posits commodities as foundational substrates: Base Commodity Value $CV_0\_commodity$ = Relations(Material M, Energy E, Information I) × Frame(Agent, Context), with substrate weights $\alpha\_M + \alpha\_E + \alpha\_I = 1$ (e.g., gold: $\alpha\_M \approx 0.8$; software: $\alpha\_I \approx 0.95$).

Temporal stability: $CV_0(t) = CV_0(0) \times e^{(\gamma-\delta)t}$, where γ is appreciation, δ degradation. Hierarchy: Layer 0 Existential (air, water) → Energy → Material → Information → Relational. Constraints: No intrinsic value (pre-human Earth had relations but no CV); conservation (substrates sum to 1); supply inelasticity for reserves.

Insights: Frame arbitrage (e.g., colonial gold vs. Incan decoration); collateral grading (material-dominant superior).

Applications: Substrate-balanced portfolios (30-40% material for stability); sustainability assessments (stabilize lower layers first).

2.5 Law 5: Non-Transferable Commitment

Law 5 addresses commitments with T=0 (non-transferable): $CV = CV_0 \times V \times A$, relying on trust; health thresholds $V \times A \geq 0.64$ (sustainable), <0.25 (worthless).

Dynamics: dV/dt = Investment $I(t)$ - decay γ; dA/dt = Performance $P(t)$ - erosion δ (trajectories: growth if I>γ and P>δ). Derivation allows independent T engineering (e.g., mortgages T≈0.1 to MBS T≈0.95).

Institutions solve scaling: Bilateral n parties yield $n(n-1)/2$ costs; hub-and-spoke reduces to n. Trade-offs: 1.3-1.7× value multiplier vs. 10-30% overhead. Premiums: 1200-2000 bps for pure T=0 (e.g., human capital).

Applications: Maintenance (50-100 hours/year); semi-transferable innovation (T=0.3-0.5 via reputation systems).

2.6 Law 6: Fair Exchange

Law 6 mandates balanced Exchange Value (EV): $EV_\alpha = EV_\beta$, where EV = Realized Commitment Value CV_n + Compensation Comp, $CV_n = CV_0 \times V \times A \times (1 + T)$, Comp = Utility U (satisfaction) + Income I (resources) + Recognition R (status) + Influence Inf (power) + Optionality Opt (flexibility).

Fair ≠ equal; EV_{max} bounded by anchors (poverty from low anchors, not unfairness). Derivative premium: Higher Comp for degraded CV_0/V/A.

Corollaries: Conflict $\propto |EV_\alpha - EV_\beta| \times$ duration; inclusive institutions raise anchors.

Pathologies: Deception (2008 misrepresentation); intergenerational extraction.

Applications: Development sequencing (human capital first); conflict resolution (target degraded dimensions).

2.7 Law 7: Compensation

Law 7 defines Compensation as EV balancer: Comp = $|EV_\alpha - EV_\beta|$ = U + I + R + Inf + Opt, each with properties (e.g., U: non-storable, diminishing; I: fungible, erodes as $I_{real}(t) = I_{nominal} \times e^{-\lambda t}$; R: accumulative but fragile; Inf: zero-sum; Opt: volatility-loving).

Constraints: Foundation dependency (bounded by layers); currency degradation (double nominal every τ_e to maintain real); framing (perceived value 0.6-1.6× objective).

Design steps: Assess capacity/preferences, λ-adjusted allocation, timed delivery, monitoring, conflict prevention. Insights: Comp shifts with λ (high λ favors U/Inf over I).

Applications: Equilibrium maintenance in volatile environments.

3. Transformation: Value Scaling

3.1 Law 8: Generation

Law 8 delineates value creation through the Production-Consumption-Investment-Expenditure (PCIX) cycle: Net Generation = $\Sigma(CV_{output} + Comp_{received}) - \Sigma(CV_{input} + Comp_{given})$, positive via anchor enhancement (human capital multiplier >1).

Pillars:

- Production (transforms inputs to outputs via anchors);
- Consumption (deploys inputs, efficiency = output/input);
- Investment (builds reserves, human/intellectual multipliers high);

- Expenditure (deploys reserves, all depreciate without maintenance).

Dynamics: dEconomic Output EO/dt = (Production P - Consumption C - Waste W) + (Investment I - Expenditure E - Leakage L).

Health: $P/C > 1.1$, $I/E > 1.2$; multi-stakeholder Net Generation ≥ 0. Corollaries: Virtuous cycles (surplus → investment → capacity); human capital primacy.

Applications: Stakeholder flow mapping; early warnings (declining ratios).

3.2 Law 9: Derivation

Law 9 conserves value in creating derivatives: $\Sigma(CV\_n\_underlying + Comp\_underlying) = \Sigma(CV\_n\_derivatives + Comp\_derivatives)$.

Bounds: $CV_0\_derivative \leq k \times CV_0\_underlying$ (k=0.6-0.98 by complexity); $V\_derivative \leq V\_underlying$; $A\_derivative \leq A\_underlying$; T_derivative independent (engineered via structure).

Compensation bidirectional (e.g., premiums upward, payouts downward).

Constraints: No circularity ($\partial CV_0\_underlying/\partial CV_0\_derivative \leq 0.1$); minimum accountability; independent underlying value. Examples: Banking (deposits to loans); credit (circularity in bubbles).

Applications: Sound innovation (T enhancement without anchor violation).

3.3 Law 10: Institution

Law 10 portrays institutions as meta-structures coordinating non-transferable commitments at scale, emerging when bilateral coordination costs $n(n-1)/2$ exceed institutional n (break-even $n \approx 5\text{-}10$ for services).

Value creation: Pooling (synthetic T); reputation aggregation (institutional $V \times A$ > individual); survivorship (outlives members).

Trade-offs: Customization loss, agency problems, governance overhead (10-30%).

Applications: Design for partial portability; cost-benefit analysis.

4. Infrastructure: Systems for Complexity

4.1 Law 11: Memory

Law 11 quantifies Institutional Memory $\mu \in [0,1]$ as pattern preservation across categorization, tracking, storage, reporting, and interpretation. Threshold: $\mu < 0.70$ causes cognition collapse (no learning from cycles).

Dynamics: $\mu(t)$ degrades without investment; modern averages $\mu \approx 0.35\text{-}0.50$.

Applications: Infrastructure for transparency (e.g., real-time dependency tracking).

4.2 Law 12: Defense

Law 12 measures Defense D = repair capacity / violations (e.g., preventive norms, detective monitoring, corrective enforcement). Threshold: $D < 0.3$ signals imminent breach.

Forms: Active integrity maintenance against external/internal threats.

Applications: System design for resilience (e.g., buffer reserves).

4.3 Law 13: Reserve Asset

Law 13 identifies Reserve Assets as material-dominant commodities (high V/A, low T; e.g., gold) anchoring stability, serving as benchmarks for operational currency.

Properties: Inelastic supply, verifiable.

Applications: Portfolio anchors.

4.4 Law 14: Operational Currency

Law 14 defines Operational Currency as high-T mediums ($T \approx 0.95$) for transactions, anchored to reserves for value preservation.

Functions: Facilitate exchange without substrate dominance.

Applications: Daily coordination.

4.5 Law 15: Economic Pulse

Law 15 introduces Economic Pulse $\tau_e = \ln(2)/\lambda$, the timescale for operational currency to halve value against reserves (λ: degradation rate). Stable range: 35-80 years ($\lambda<0.02$); crisis: <15 years ($\lambda>0.046$).

Impacts: Short τ_e collapses horizons, rationalizing speculation.

Applications: Policy targeting (e.g., reserve backing for low λ).

5. Instruments: Dynamic Commitment Types

5.1 Law 16: Temporal Instrument

Law 16 classifies Temporal Instruments as commitments resolving via time passage (e.g., bonds, loans: value accrues predictably). Equation: $Value(t) = CV_0 \times (1 + r)^t \times V(t) \times A(t) \times (1 + T)$, where r is yield rate.

Constraints: Anchor degradation over time; suitable for stable environments.

Examples: Fixed-income securities.

Applications: Portfolio duration matching; risk from λ mismatches.

5.2 Law 17: Contingent Instrument

Law 17 covers Contingent Instruments resolving on state changes (e.g., insurance, derivatives: payout if event occurs). Equation: Expected Value $EV = p \times CV_0 \times V \times A \times (1 + T) - \text{premium}$, where p is event probability.

Constraints: Dependency sensitivity (D_V/D_A critical); moral hazard if unexposed.

Examples: Options (Black-Scholes context); insurance (A tied to underwriting).

Applications: Hedging; crisis amplification if circular (e.g., Credit Default Swaps CDS in 2008).

5.3 Law 18: Residual Instrument

Law 18 defines Residual Instruments as pure compensation claims with initial $CV_0=0$ (e.g., equity: claim on future Comp).

Equation: Value = Σ(Expected Comp_t) / (1 + discount)^t × V × A × (1 + T).

Properties: Unlimited upside, zero floor; high Opt.

Constraints: Frame-dependent (e.g., growth vs. dividend frames).

Examples: Stocks; venture capital.

Applications: Incentive alignment; valuation via multi-stakeholder Gen.

6. Markets: Resource Direction

6.1 Law 19: Price Discovery

Law 19 conceptualizes price discovery as establishing "honest uncertainty bounds" rather than a single true price. Process: Market aggregates frames to bound CV (e.g., bid-ask spread $\propto 1/V$; error $E_{info} \propto 1/V_{market}$).

Health metrics: Spread width, depth; perishability γ widens bounds.

Applications: Opaque markets require higher accuracy; transformation of illiquid to liquid (e.g., exchanges).

6.2 Law 20: Capital Allocation

Law 20 models allocation as a dual-layer metabolism:

- Primary (consumers, 70-85% flow): Revenue if Anchor Contribution α + Compensation Surplus Ω > Friction β + Degradation λ.
- Secondary (investors, 15-30%): Threshold Compliance Ratio TCR = [CV_instrument + ΣComp] / CV_reserve ≥1; Expected Return E[R] = λ + Anchor Degradation Premium $\Psi(\Delta V,\Delta A,\Delta T)$ + Productive Yield Γ_π.

Equilibrium: Generative G=70%, Reserve R=15%, Derivative D=10%; excess D creates fragility.

Constraints: Consumer signals precede (3-12 months); multi-stakeholder satisfaction.

Health:

- Consumer Allocation Health CAH = avg($\alpha + \Omega - \beta - \lambda$);
- Capital Allocation Health Index CAHI = (G/0.70) × (R/0.15) × (1 - max(0, D-0.10)/0.50).

Applications: Signal monitoring; pulse-stabilized horizons.

7. System Properties: Trajectory Measures

7.1 Law 21: Economic Growth

Law 21 decomposes growth rate g = ΔEconomic Output EO / EO, where EO = Generation Output GO (new commitments) + Derivation Output DO (transformed commitments): $g = (GO/EO) \cdot g\_gen + (DO/EO) \cdot g\_der - \Delta\lambda$, with g_gen = ΔGO/GO, g_der = ΔDO/DO.

Quality: Growth Quality Index GQI = (g_gen/g) · (0.123/DR) · (1 - λ), where Derivation Ratio DR = DO / GO.

Sustainable g_sustainable = g_gen · [1.123] / [1 + DR] · (1 - λ); real g_real = g_nominal - λ - λ^2 · complexity.

Constraints: DR ≤ 1/(3e) ≈0.123 (entropy/extraction bound; violations accumulate phantom value); g_gen primacy; τ_e >20 years; μ >0.70; GQI ≥0.50.

Corollaries: Composition over magnitude (3% high-GQI >5% low); currency drag exponential.

Applications: Quality-adjusted reporting; policy prioritizing g_gen.

7.2 Law 22: Harvest

Law 22 bounds sustainable extraction:

Harvest H_sustainable = ($\alpha - \beta - \lambda$) · Generative Output (G),

where

- α = (V_anchor × A_anchor) / (V_reserve × A_reserve) (contribution ratio),
- $\beta = \beta$_compliance + β_distortion + β_corruption + β_complexity (friction),
- λ = currency degradation.

Dynamics: dG/dt = f(H_actual - H_sustainable) (growth if under-harvest, erosion if over).

Constraints: $\alpha > \beta + \lambda$ (net positive); H_actual / H_sustainable ≈0.80-0.95 optimal; foundation bound.

Corollaries: Friction multiplier (compounds costs); quality dividend $\Delta H = (\Delta\alpha - \Delta\beta) \cdot G$.

Examples: Relationships (negative H destroys networks); e-commerce (investment yields 6.4× return); governments (reform raises H 12.5%).

Applications: Equilibrium optimization; sequencing (quality before extraction).

7.3 Law 23: Generativity

Law 23 quantifies system trajectory:

Generativity Gen(t) = Generation G(t) × Memory μ(t) × Defense D(t) × $[1/(1+\lambda)]$,

where

- G = value created / consumed (>1 creation) - Law 8,
- μ = memory integrity - Law 11,
- D = defense strength - Law 12,
- λ = currency decay rate - Law 15, filters all.

Dynamics:

- Velocity v_Gen = dGen/dt;
- Acceleration a_Gen = dv_Gen/dt (renaissance a_Gen >0.10; collapse < -0.10).

Constraints: Multiplicative (weakest link); $\tau_e \geq 20$ for Gen>1; $\mu>0.70$ cognition; dependency ceiling.

Paradox: High productivity Π can mask low Gen (e.g., Π=3.92 but Gen=0.90 via μ=0.35).

Corollaries: Pulse dominance (stabilizing λ multiplies 3.5×); doom loops (low pillars reinforce decline).

Applications: Health checks; allocation to high-Gen assets.

8. Discussion and Applications

The framework diagnoses modern ailments: DR≈0.30 (2.4× bound, $80-100T phantom); τ_e≈10-15 (below threshold); μ<0.70 (amnesia); Gen<1 (capital consumption). Interventions:

Pulse restoration (reserve anchoring); memory infrastructure; bound enforcement; foundation investment.

Applications: Crisis prediction (VVI, GQI); portfolio (substrate balance); policy (human capital amplification); corporate (stakeholder Gen≥0).

Figures: [Commitment Value formula diagram (image1.png); Dependency hierarchy (image2.png); Generativity cycle (image3.png).]

9. Conclusion

The 23 Laws furnish a commitment-centric ontology that illuminates economic realities and charts resilient futures. By respecting constraints, civilizations can achieve Byzantine-like compounding; violations invite collapse. We invite collaboration from scholars, practitioners, and policymakers to empirically test, extend, and implement these laws. For comprehensive derivations, code, datasets, and discussions, visit the GitHub repository: https://github.com/ibeseka-cmd/Theory-of-Quantified-Commitments/blob/main/The%2023%20Laws%20of%20Quantified%20Commitments.pdf