Bitcoin Exit Dominance in Monetary Coordination Games

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Abstract

In a multipolar world with no trusted monetary coordinator, how do rational actors settle large-value transactions across trust boundaries? We model this as a non-cooperative game—the "Exit Game"—in which capital allocators choose between capturable settlement systems ("Stay") and neutral settlement ("Exit," distinct from Hirschman's organizational-decline sense). The model rests on four empirical axioms: persistent multipolarity, rational self-interest, computational hardness, and network effect persistence. We prove three results. First, the payoff advantage of Exit over Stay is strictly increasing in adoption: every term in the payoff differential favors Exit under maintained monotonicity conditions, and each actor's adoption threshold approaches zero under structural debasement (Theorem 1). Second, no coalition can sustain coordinated Stay, because permissionless access makes defection costless and the first defector captures fleeing capital (Theorem 2). Third, the resulting equilibrium is absorbing: the monotone adoption process converges to full adoption once a critical mass is reached, because trust conditions required for coordinated return cannot be re-established (Theorem 3). The model is falsifiable: six conditions are identified under which the central claims would fail. Bitcoin is the unique asset satisfying the necessary properties for neutral settlement—a result proved by systematic elimination across seven asset classes in a companion paper.

Revision Note—April 2026. This revision prepares the February 2026 preprint (SSRN 6299081) for journal submission. All revisions sharpen presentation, widen literature engagement, or scope claims more honestly.

Citations previously narrowed to what the source establishes, and paired where a single anchor carried weight that belongs to two, are retained from the February revision: §2.2 (Huberman, Leshno, and Moallemi for congestion pricing only); §2.5 (Hirschman as intellectual context, distinct from strategic Exit in-model); §4.4 (Bikhchandani, Hirshleifer, and Welch as contrast, not analog); §2.3 (Milgrom–Shannon paired with Topkis); §3.1 (David paired with Arthur); §3.4 (Kyle paired with Amihud, Katz–Shapiro paired with Farrell–Saloner).

The threshold-coverage condition previously stated parenthetically in Theorem 3's proof is promoted to Assumption 5. A new monotonicity condition (M6) makes the capturable return R_F a function of adoption p, consistent with every other quantity in the model; Theorem 1's proof is extended accordingly and is strengthened under strict inequality. Theorem 3's information-structure framing is upgraded from complete-information + common-knowledge to public-information + heterogeneous-priors (following Morris and Shin 1998, Carlsson and van Damme 1993), placing the model in the global-games tradition. Theorem 3's Step 4 is rewritten from Bayesian-updating-over-hidden-types to higher-order-belief coordination breakdown. Utility is stated explicitly as mean-variance in §3.4. The debt-repayment claim in §1 is tightened. The falsification table in §5 is reorganized into axiom falsifiers, theorem falsifiers, and scope conditions.

Three adjacent literatures are now acknowledged: global games (Carlsson and van Damme[9]; Morris and Shin[27]) as the standard tool for equilibrium selection in coordination games under incomplete information; self-fulfilling currency crises (Obstfeld[28,29]) as the intellectual ancestor of the coordination-failure mechanism; and search-theoretic money (Kiyotaki and Wright[23]; Lagos and Wright[25]) as providing microfoundations this paper does not re-derive. The paper's complete-information modeling choice and equilibrium-selection framing are defended against each.

Section 6 names three scope deferrals: the binary Exit/Stay structure (continuous-allocation extension deferred); deterministic monotone convergence (stochastic stability in the Kandori–Mailath–Rob sense deferred); and Theorem 2's single-defection result (full coalition-proof Nash analysis in the Bernheim–Peleg–Whinston sense deferred). No theorem, proof, or axiom has been weakened or reversed. The February 2026 preprint is preserved at bitcoingametheory.com/papers/1-exit-dominance/archive.

1. Introduction

The global monetary system has no referee. Multiple sovereign powers compete for economic influence, each controlling monetary instruments that serve domestic policy objectives at the expense of foreign holders. This creates a coordination problem that is easy to state and impossible to solve within existing institutions: in a world where no single entity can credibly commit to monetary neutrality, how do rational actors settle large-value transactions across trust boundaries?

This question is structural, not conjunctural. Sovereign debt levels have reached historical extremes: global debt reached $313 trillion in 2023, a debt-to-GDP ratio of 255% (Institute of International Finance[19]). No post-1800 nation has repaid debt exceeding 90% of GDP primarily through fiscal austerity without substantial growth, inflation, financial repression, or default; these latter mechanisms are the historically observed path (Reinhart and Rogoff[31]). The coordination problem is not whether states *will* debase, but whether any mechanism exists through which actors can settle *despite* debasement.

The analysis is stated descriptively: we characterize equilibrium structure without predicting timing, price trajectories, or recommending portfolio allocations. Normative implications are nonetheless unavoidable when a coordination game has a unique absorbing state; readers may draw their own policy implications, which the paper does not advocate.

The literature addresses components of this problem—mining incentives (Biais *et al.*[4]; Eyal and Sirer[12]), attack economics (Budish[7]), price-security dynamics (Pagnotta[30])—but does not integrate these into a unified strategic analysis from the allocator's perspective. Brunnermeier, James, and Landau[6] identify the coordination failure but propose institutional solutions rather than analyzing the equilibrium outcome. This paper addresses the gap by formalizing the allocator's strategic problem directly.

We formalize the allocator's problem as a non-cooperative game—the "Exit Game"—and prove that the payoff advantage of Exit over Stay is strictly increasing in adoption. Every term in the payoff differential favors Exit under maintained monotonicity conditions. Each actor faces an adoption threshold that approaches zero when the capturable system delivers negative real returns—which, under structural debasement (Assumption 1), it does.

We also prove that no coalition can sustain Stay (Theorem 2) and that the resulting equilibrium is absorbing (Theorem 3). Bitcoin satisfies the seven necessary properties derived here—a result established by systematic elimination in Hash[14]. A third paper (Hash[15]) extends the analysis to autonomous AI agents, for whom neutral settlement is not a preference but a structural requirement.

2. Related Work

2.1 Game Theory of Proof-of-Work Consensus

The foundational result is Biais, Bisiere, Bouvard, and Casamatta[4]: following the longest chain constitutes a Markov Perfect Equilibrium in a stochastic game among *miners*, and subsequent work largely builds on this framework. Eyal and Sirer[12] complicate this picture by identifying conditions under which selfish mining is profitable—but their threshold (a miner controlling more than one-third of hashrate) has never been approached in practice, which says more about the incentive structure than about the theoretical vulnerability. Budish[7] argues that the marginal cost of a majority attack scales with the block reward flow, which must in turn scale with secured value. The model is elegant but leaves the fee-market contribution to the security budget incompletely characterized: a network processing large daily settlement volumes generates security budget partly independent of token price, a gap the literature has not yet closed.

2.2 Monetary Competition and Coordination

Brunnermeier, James, and Landau[6] is the essential reference on digital currency competition in a multipolar world. Their core argument, that competing monetary systems create coordination failures traditional institutions cannot resolve, is precisely our starting point. Where we diverge: Brunnermeier *et al.* treat the coordination failure as a problem to be solved by better institutional design. We treat it as a permanent structural feature (Assumption 1) that selects for a non-institutional solution. Huberman, Leshno, and Moallemi[18] analyze Bitcoin's fee market as a congestion-priced payment system in which no agent sets prices unilaterally. Their "monopoly without a monopolist" characterization captures the absence of a protocol-level rent extractor, one component of the broader neutrality property we formalize below. Their paper establishes the congestion-pricing result; the extension to governance and seizure resistance is ours, not theirs.

Self-fulfilling currency crises (Obstfeld[28,29]) are the intellectual ancestor of our coordination-failure mechanism: Obstfeld established that balance-of-payments crises and fixed-exchange-rate collapses can be driven purely by coordinated expectations under multiple equilibria. We extend this logic from attacks on pegs to exit from the capturable-currency system entirely. Search-theoretic models of money (Kiyotaki and Wright[23]; Lagos and Wright[25]) provide microfoundations for money's role as a medium of exchange; this paper takes competing monetary systems as given and analyzes equilibrium selection over them rather than re-deriving medium-of-exchange properties.

2.3 Monotone Comparative Statics

The monotonicity conditions (M1)–(M6) that drive our main result belong to the framework of monotone comparative statics developed by Milgrom and Shannon[26] and Topkis[34]. In their language, the payoff differential $\Delta_i(p)$ exhibits increasing differences in $(p, \text{adoption decision})$ under our maintained conditions—precisely the supermodularity property that guarantees monotone best responses. Our contribution is applying this machinery to the monetary coordination problem rather than to the firm and market settings where it originated.

2.4 Global Games and Equilibrium Selection

The global-games framework (Carlsson and van Damme[9]; Morris and Shin[27]) is the standard modern tool for equilibrium selection in coordination games with strategic complementarities, particularly under private noisy observation of fundamentals. Morris and Shin[27] apply the framework to self-fulfilling currency attacks, delivering a unique equilibrium selected by the informational structure rather than by common knowledge of payoffs. Our setup—heterogeneous thresholds, strategic complementarity, coordination over monetary standards—is within the domain this literature addresses. *Information structure:* We adopt public information with heterogeneous priors. All actors have access to the same public facts about the system—code, ledger, rules, payoff structure. Actors may hold different priors over system type owing to asymmetric narrative exposure. Information is open; interpretation is uneven. This placement in the higher-order-beliefs tradition rather than the Harsanyi incomplete-information tradition reflects empirical reality: monetary-system information is openly published but unevenly interpreted, with competing narratives shaping actors' beliefs over whether the system is capturable. The irreversibility result in Theorem 3 depends on shifts in what actors believe others believe, not on updating over hidden facts.

2.5 Network Effects and Focal Points

Katz and Shapiro[21,22] provide the theoretical machinery for our network effect assumption. What matters for our purposes is a specific implication they do not emphasize: in monetary networks, switching costs compound because the network's value proposition *is* its adoption. Schelling[32] provides the concept of focal points, though applying focal point theory to money requires more care than the literature typically exercises. We argue that the focal point is determined not by precedence but by structural resistance to the "who benefits?" objection.

We note the distinction between our "Exit" concept and Hirschman's[17] "exit" from organizations. In Hirschman's framework, exit is one of three responses to organizational decline (alongside voice and loyalty). Our Exit is a strategic action in a coordination game—adopting neutral settlement—and does not require leaving an institution, only diversifying settlement infrastructure.

3. Model

3.1 Maintained Assumptions

The analysis rests on four empirical axioms. Each is independently assessable. All subsequent claims derive from these assumptions; rejecting any axiom invalidates the specific claims that depend on it.

Assumption 1 (Multipolarity)**.** No single entity permanently governs global economic activity. Power distributes across competing centers with superlinear coordination costs.

Falsification: A single coordinator achieves permanent, stable control over global monetary policy with sublinear coordination costs (F1).

Assumption 2 (Rational Self-Interest)**.** Actors optimize for self-interest. When defection from cooperative agreements is unpunished or unpunishable, actors defect.

Falsification: Stable cooperation persists indefinitely among self-interested actors without enforcement mechanisms (F3).

Assumption 3 (Computational Hardness)**.** Certain mathematical problems remain computationally intractable. Digital scarcity and cryptographic custody are implementable.

Assumption 4 (Network Effect Persistence)**.** Past critical mass, switching costs exceed marginal gains of alternatives. Incumbency compounds (David[10]; Arthur[2]).

Assumption 5 (Threshold Coverage)**.** The distribution of exit thresholds $\{p_i^*\}$ has continuous support on $[0, 1]$. Equivalently, there is no measure-positive set of actor types for whom Exit is strictly dominated at every adoption level.

Falsification: A measure-positive subpopulation has $p_i^* > 1$ (never-exit types); the absorbing state is then $p^* < 1$ at the supremum of the threshold support.

3.2 Definitions

Definition 1 (Neutral Settlement)**.** An asset S is a *neutral settlement asset* if and only if S is immune to seizure, immune to debasement, and immune to political capture by any single actor or coordinated coalition.

Definition 2 (Exit)**.** The action of moving capital from a capturable system to a neutral settlement asset.

Definition 3 (Capture Surface)**.** For a monetary system with parameter space Θ, the capture surface for actor A is $CS_A = \{\theta \in \Theta : A \text{ can unilaterally change } \theta\}$. A system is neutral if $|CS_A| = 0$ for all A. The terminology adapts "attack surface" from security engineering to institutional capture (*cf.* Stigler[33] on regulatory capture).

Definition 4 (Absorbing State)**.** A state p^* is absorbing if $P(p_{t+1} = p^* \mid p_t = p^*) = 1$. In the monetary coordination context, the transition to $p^* = 1$ destroys the trust conditions required for reversal, making the state absorbing in the standard Markov chain sense (*cf.* Arthur[2] on lock-in).

3.3 Necessary Properties

From Definition 1, we derive seven necessary properties for any neutral settlement asset. Each blocks a specific attack class:

D1 Requirement	Attack If Missing	Required Property
Immune to seizure	Physical confiscation	P6: Informational security
Immune to seizure	Transaction censorship	P3: Permissionless access
Immune to debasement	Supply inflation	P5: Absolute scarcity
Immune to debasement	Protocol rule change	P1: Protocol security
Immune to capture	Governance takeover	P2: Neutrality
Functions as settlement	Prohibitive cost/delay	P4: Cheap finality
Survives future threats	Obsolescence	P7: Adaptive resilience

Proposition 1 (Necessity)**.** *P1–P7 are individually necessary. Removing any single property enables the corresponding attack, violating Definition 1.*

Proof. By construction from the derivation table. □

Bitcoin is the unique asset satisfying P1–P7—the systematic elimination across seven asset classes appears in Hash[14].

3.4 Game Structure

We model monetary coordination as a non-cooperative game:

Game $G = (N, S, u)$ where:

- $N = \{1, 2, \ldots, n\}$ is the set of capital allocators.

- $S_i = \{\text{Exit}, \text{Stay}\}$ is the strategy set for player i.
- $u_i : S \to \mathbb{R}$ is the utility function for player i.

Let $p \in [0, 1]$ denote the fraction of total capital that has chosen Exit. We assume R_B, R_F, σ_B, K_A, R_A, and K_N are continuous functions of p, bounded on $[0, 1]$. Each actor i has mean-variance preferences: utility is expected return minus a risk-aversion coefficient $\lambda_i > 0$ times return variance, a specification standard in the portfolio-allocation and equilibrium-selection literatures. The utility functions are:

$$u_i(\text{Exit}, s_{-i}) = R_B(p) - \lambda_i \cdot \sigma_B(p) - \kappa_i \cdot K_A(p) - \rho_i \cdot R_A(p)$$

$$u_i(\text{Stay}, s_{-i}) = R_F(p) - \lambda_i \cdot \sigma_F - K_N(p)$$

Here $K_A(p)$ is the adoption penalty—the switching cost of moving to neutral settlement, analogous to technology adoption costs in network economics (Katz and Shapiro[21]; Farrell and Saloner[13]). $K_N(p)$ is the non-adoption penalty—the opportunity cost imposed on non-adopters as the competing network grows, a form of negative network externality.

Maintained monotonicity conditions:

(M1) $R'_B(p) > 0$ — Network effects increase return (Assumption 4)

(M2) $\sigma'_B(p) < 0$ — Deeper markets reduce volatility (Kyle[24]; Amihud[1])

(M3) $K'_A(p) < 0$ — Adoption penalty falls with adoption

(M4) $R'_A(p) < 0$ — Regulatory penalty decreases as adoption normalizes compliance

(M5) $K'_N(p) > 0$ — Non-adoption penalty rises as competitors exit

(M6) $R'_F(p) \leq 0$ — Capturable return weakly decreasing in neutral adoption (the capturable system loses value as capital departs)

The market-microstructure basis for (M2) is standard: deeper markets lower the price impact of order flow (Kyle's λ decreases with depth), and lower price impact translates to lower realized return volatility at a fixed rate of information arrival (Amihud[1]).

4. Main Results

4.1 Exit Dominance

Theorem 1 (Monotone Exit Advantage)**.** *Under Assumptions 1–4 and maintained conditions (M1)–(M6):*

(i) The payoff differential $\Delta_i(p)$ is strictly increasing in p for all player types.

(ii) For each player i, there exists a threshold $p_i^* \in [0, 1]$ such that Exit is the unique best response for $p > p_i^*$.

(iii) Under Assumption 1 ($R_F(0) < 0$), thresholds cluster near zero for actors with typical risk preferences.

Proof. Define the payoff differential:

$$\Delta_i(p) = u_i(\text{Exit}) - u_i(\text{Stay})$$

$$= [R_B(p) - R_F(p)] - \lambda_i[\sigma_B(p) - \sigma_F] - \kappa_i \cdot K_A(p) - \rho_i \cdot R_A(p) + K_N(p)$$

Taking the derivative with respect to p:

$$\frac{d\Delta_i}{dp} = R'_B(p) - R'_F(p) - \lambda_i \cdot \sigma'_B(p) - \kappa_i \cdot K'_A(p) - \rho_i \cdot R'_A(p) + K'_N(p)$$

Under the maintained monotonicity conditions (M1)–(M6), each term is non-negative and at least one is strictly positive:

Term	Sign	Reason
$R'_B(p)$	> 0	(M1)
$-R'_F(p)$	≥ 0	(M6)
$-\lambda_i \cdot \sigma'_B(p)$	> 0	$\lambda_i > 0$, $\sigma'_B(p) < 0$ by (M2)
$-\kappa_i \cdot K'_A(p)$	> 0	$\kappa_i \geq 0$, $K'_A(p) < 0$ by (M3)
$-\rho_i \cdot R'_A(p)$	> 0	$\rho_i \geq 0$, $R'_A(p) < 0$ by (M4)
$K'_N(p)$	> 0	(M5)

Therefore $d\Delta_i/dp > 0$: the advantage of Exit is strictly increasing in p. Strict inequality in (M6) strictly strengthens the result; the weak inequality stated in (M6) is sufficient to preserve it.

At $p = 0$ (no one has exited), $\Delta_i(0) < 0$ since the adoption penalty dominates and the capturable system provides positive baseline value. At $p = 1$ (full adoption), $\Delta_i(1) > 0$ since exit-dominant payoffs strictly exceed legacy payoffs under universal adoption: the neutral system's network effects fully manifest while the capturable system has been abandoned. By continuity of Δ_i in p and the intermediate value theorem, there exists a threshold $p_i^* \in (0, 1)$ satisfying $\Delta_i(p_i^*) = 0$. For $p > p_i^*$, $\Delta_i(p) > 0$ and Exit strictly dominates.

Under Assumption 1, $R_F(p) < 0$ in real terms at $p = 0$ (sovereign debt overhangs at the contemporary scale historically resolve through debasement, restructuring, or default rather than through fiscal austerity alone; Reinhart and Rogoff[31]). This ensures that even at $p = 0$, the first term $[R_B(0) - R_F(0)]$ provides positive contribution, lowering p_i^* toward zero for many actor types.

For the marginal allocation argument: even for actors with $p < p_i^*$, a small allocation $\varepsilon > 0$ provides $u_i(w_i = \varepsilon) > u_i(w_i = 0)$ because the first-order gain from network participation exceeds the first-order volatility cost for sufficiently small ε. This holds for a wide range of parameter values. □

Remark. The game matrix at the individual level:

	Others: Stay	Others: Exit
Player i**: Stay**	$R_F(0) < 0$	$R_F(p) - K_N(p)$
Player i**: Exit**	$R_B(0) - K_A(0)$	$R_B(p)$

Under Assumption 1 ($R_F(0) < 0$), Exit yields higher payoff in both columns for actors whose threshold p_i^* is at or below the current adoption level.

4.2 Coordination Failure

Theorem 2 (Coalition Instability)**.** *When Exit is available and unpunishable, and individual exit payoffs exceed coalition benefits (Theorem 1), no coalition can prevent member defection and sustain coordinated Stay.*

Proof. Consider a coalition $C \subseteq N$ maintaining Stay. For this coalition to be self-enforcing in the sense of Bernheim, Peleg, and Whinston[3], no member $j \in C$ can profit from unilateral defection.

By Theorem 1, $u_j(\text{Exit}) > u_j(\text{Stay})$ for j when p exceeds p_j^*; this payoff advantage already accounts for the adoption penalty $K_A(p)$. Property P3 (permissionless access) means the institutional cost of defection is zero—no permission, regulatory approval, or cooperation is required to initiate settlement. The economic advantage of exiting (net of adoption penalties) exceeds the coalition's ability to enforce Stay.

The coalition faces a standard free-rider problem: the benefit of collective Stay is a public good (maintained value of capturable system), but the benefit of individual defection is a private good (captured network effects, avoidance of debasement). Under Assumption 2, the private good dominates.

The dynamics compound: the first actor to defect captures fleeing capital, raising $K_N(p)$ for remaining coalition members and accelerating further defection.

Formally:

$$u_j(\text{defect from } C) > u_j(\text{remain in } C)$$

for all $j \in C$, making the all-Stay profile not coalition-proof. □

Remark. The first-mover dynamic is an asymmetry familiar from the history of reserve-currency transitions (Eichengreen, Mehl, and Chiţu[11]): the defecting sovereign captures fleeing capital. El Salvador adopted Bitcoin as legal tender in 2021 (Bukele[8]), cited here as existence proof that sovereign-scale defection is feasible, not as evidence of equilibrium trajectory. Each sovereign defection raises $K_N(p)$ for remaining coalition members.

4.3 Absorbing State

Theorem 3 (Absorption)**.** *The state* (*Exit*, *Exit*) *is absorbing: once entered, there exists no feasible sequence of individual actions leading back to* (*Stay*, *Stay*)*.*

Proof. Define the aggregate adoption process $\{p_t\}_{t\geq 0}$ on state space $[0, 1]$.

For $p_t \geq p_c$ (critical mass threshold), we show that $p_{t+1} \geq p_t$ with probability 1.

Step 1 (No Exit-to-Stay switching). Any actor who has chosen Exit at time t did so because $\Delta_i(p_t) \geq 0$. By Step 2 (positive drift in p), $p_{t+s} \geq p_t$ for all $s \geq 0$, and by Theorem 1 Δ_i is increasing in p, so $\Delta_i(p_{t+s}) \geq \Delta_i(p_t) \geq 0$ at every future date. Infrastructure lock-in costs (custody solutions, regulatory frameworks, accounting standards) provide additional asymmetry against reversal but are not load-bearing for the argument. No rational actor switches from Exit to Stay.

Step 2 (Positive drift). For actors currently at Stay: $\Delta_i(p_t)$ is increasing in p_t (shown in Theorem 1). As p_t increases, more actors cross their thresholds p_i^*, increasing p_{t+1}.

Step 3 (Convergence). The process $\{p_t\}$ is monotone non-decreasing and bounded above by 1. By the monotone convergence theorem for bounded monotone sequences, $p_t \to p^*$ for some $p^* \leq 1$.

Under Assumption 5 (continuous support of thresholds on $[0, 1]$), if $p^* < 1$ there exists an actor j at Stay with $\Delta_j(p^*) > 0$, contradicting stationarity at p^*. Therefore $p^* = 1$. Without Assumption 5, p^* equals the supremum of the support of the threshold distribution; when a measure-positive subpopulation has $p_i^* > 1$ (never-exit types), $p^* < 1$ and the absorbing state concentrates at that supremum rather than at unity.

Step 4 (No-return via higher-order belief breakdown). Observed exits are public signals that shift higher-order beliefs: each actor revises their estimate of what other actors now believe about system capturability. Once cumulative exits cross the critical mass p^*, the higher-order belief that *others believe the system is capturable* becomes common knowledge among remaining actors, and the coordination equilibrium on the legacy system fails. Return would require re-establishing common knowledge of non-capturability—a coordination task that the original narrative monopoly, having been publicly falsified by observed exits, can no longer supply. The narrative apparatus that once coordinated on Stay is destroyed; no new enforcement mechanism (ruled out by Assumption 1) can rebuild it. Hence the absorbing state is one-sided: entry requires only a critical mass of exits, exit requires reconstruction of a destroyed common-knowledge structure. The state $p = p^*$ is therefore absorbing: $P(p_{t+1} = p^* \mid p_t = p^*) = 1$. A return cartel faces the same coordination failure as a stay cartel (Theorem 2). □

4.4 Cascade Dynamics

Proposition 2 (Adoption Cascades)**.** *Given Theorems 1–3, adoption occurs in bursts (*cf. *Bikhchandani, Hirshleifer, and Welch*[5] *on informational cascades; our mechanism is payoff-driven rather than information-driven).*

The cascade operates through the interaction of $K_A(p)$ and $K_N(p)$: as p increases, the adoption penalty falls and the non-adoption penalty rises, pushing additional actors past their thresholds p_i^*. This creates punctuated equilibria: periods of stability followed by rapid adoption bursts when a critical mass of actors simultaneously crosses their thresholds.
Comparative statics. By the implicit function theorem applied to $\Delta_i(p_i^*) = 0$:

$$\frac{dp_i^*}{d\lambda_i} = -\frac{\partial \Delta_i / \partial \lambda_i}{d\Delta_i / dp} > 0$$

More risk-averse actors have higher thresholds (they wait longer). But they still eventually exit because $d\Delta_i/dp > 0$ pushes the advantage past any finite risk aversion as $p \to 1$.

5. Falsification

We separate falsifiers into three bands. Axiom falsifiers break a maintained assumption. Theorem falsifiers break a derived result while leaving the axioms intact. Scope conditions delimit the domain of applicability and are not Popperian falsifiers.

Note what does *not* falsify the model: price declines, regulatory actions against specific intermediaries, developer controversies, or energy consumption debates. These affect adoption timing, not equilibrium structure.

ID	Condition	Breaks
Axiom falsifiers		
F1	Global coordination cost becomes sublinear	Assumption 1
F3	(Stay, Stay) is stable equilibrium when Exit exists	Assumption 2
F5	Quantum computing breaks cryptographic primitives before migration	Assumption 3
Theorem falsifiers		
F4	Stable cartel prevents Exit indefinitely	Theorem 2
Scope conditions		
F2	An alternative asset satisfies P1–P7 (tested in Hash[14])	Uniqueness
F6	AI agents gain enforceable legal personhood (tested in Hash[15])	Limiting case

6. Limitations

Continuous strategies. The binary Exit/Stay structure is a modeling choice. Real actors face continuous allocation decisions—a pension fund does not choose between 0% and 100% but between 0%, 1%, 5%. The marginal allocation argument in §4.1 partially addresses this. Under continuous allocation $w_i \in [0, 1]$, the equivalent claim is that aggregate weight on neutral settlement approaches unity in the absorbing state; formal proof of the continuous-strategy analog under mean-variance or constant relative risk aversion (CRRA) preferences is deferred to future work.

Stochastic stability. Theorem 3 establishes deterministic monotone convergence. Stochastic stability in the sense of Kandori, Mailath, and Rob[20], under perturbed best-response dynamics with vanishing mutation rate, is deferred. We expect the absorbing state to be stochastically stable under standard perturbation assumptions but do not prove it here.

Coalition-proofness strength. Theorem 2 establishes that no coalition sustains Stay against individual defection. This is weaker than coalition-proof Nash nonexistence in the full Bernheim, Peleg, and Whinston[3] sense, which requires robustness against self-enforcing sub-coalition deviations. The stronger claim is consistent with the paper's economic logic but is not proved here.

Monotonicity conditions. (M1)–(M6) are empirically motivated but not derived from first principles. Each could be violated in specific regimes (for example, $R'_B(p)$ could be negative during a network congestion crisis). The model's robustness depends on these conditions holding *on average and in the long run*, not at every instant. Formalizing this through time-averaged conditions is a natural extension.

7. Conclusion

The argument rests on four axioms: multipolarity is persistent, actors are self-interested, cryptography works, and network effects compound. From these we derive a monotone increasing payoff advantage, coalition instability, and absorbing dynamics. Bitcoin is the unique asset serving as the Exit destination (Hash[14]); autonomous agents face the strongest version of this convergence pressure (Hash[15]). Six falsification conditions across the series identify when and how these claims fail.

The framework developed here has been applied and extended in three companion papers. Hash[14] applies the seven necessary properties as an elimination test across seven candidate settlement assets and finds that no non-Bitcoin candidate jointly satisfies them. Hash[15] extends the Exit Game to autonomous-agent settlement under zero-trust conditions, where neutrality becomes a structural requirement rather than a preference. Hash[16] studies the predator-prey dynamics that arise when neutral settlement coexists with enforcement-driven monetary regimes. The seven properties of this paper function as the common spine across the series; the elimination result of Hash[14] is an external structural check the framework had to survive.

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Conflict of Interest

The author holds a position in Bitcoin. The author favors the Knots implementation, which limits Bitcoin block space to financial data only, in order to preserve the decentralization of the network and reduce attack surfaces.

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Notation

Symbol	Definition
G	Settlement game (N, S, u)
N	Set of capital allocators
S_i	Strategy set: $\{\text{Exit}, \text{Stay}\}$
u_i	Utility function
p	Fraction of capital at Exit
p_i^*	Threshold for player i
$\Delta_i(p)$	Payoff differential: $u_i(\text{Exit}) - u_i(\text{Stay})$
$R_B(p)$	Expected real return on neutral settlement asset
$R_F(p)$	Expected real return on capturable assets
$\sigma_B(p)$	Volatility of neutral settlement asset
σ_F	Volatility of capturable assets
$K_A(p)$	Adoption penalty
$R_A(p)$	Regulatory penalty (decreases as regulatory clarity improves)
$K_N(p)$	Non-adoption penalty
$\lambda_i, \kappa_i, \rho_i$	Risk aversion, career penalty, regulatory penalty
CS_A	Capture surface for actor A: $\{\theta \in \Theta : A \text{ can unilaterally change } \theta\}$
(M1)–(M6)	Monotonicity conditions