ISSN: 3067-2414
Research Article
Journal of Digital Marketing, E-Commerce, and Consumer Analytics

The Anatomy of a Monetary Catastrophe: A Comprehensive Analysis of Sudan's Currency Collapse (1975–2026) and the Formalization of the Collapse Cascade Theory

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Submitted: 20 August 2026 **Accepted:** 01 September 2026 **Published:** 07 September 2026

Citation: *Mohamed, I. A. W. (2026). The Anatomy of a Monetary Catastrophe: A Comprehensive Analysis of Sudan's Currency Collapse (1975–2026) and the Formalization of the Collapse Cascade Theory, J of Digit Mark E-Com Con Ana, 2(5), 01-09.*

Abstract

This paper provides the most exhaustive academic examination to date of the Sudanese Pound's historic collapse—from $1 = 0.28 SDG in 1975 to $1 = 6,000,000 SDG (adjusted for three currency reforms) in August 2026. We argue that this represents not a monetary crisis, but a complete systemic breakdown of the state's fiscal and coercive apparatus. Through a novel theoretical framework—the Collapse Cascade Theory (CCT)—we demonstrate that currency collapse in fragile states follows a predictable, non-linear, seven-stage cascade driven by the endogenous decay of the State Cohesion Coefficient (θ). We formally derive the mathematical conditions under which a currency transitions from a mean-reverting stationary process to a non-ergodic explosive process. Using granular year-by-year data, comparative case studies (Zimbabwe, Venezuela, Weimar Germany, Lebanon), and microeconomic foundations (Cash-in-Advance constraints, firm pricing, asset substitution), we validate the CCT. The paper concludes with a comprehensive 5-year Re-anchoring Algorithm that prioritizes territorial tax recovery over monetary gimmicks, arguing that the rehabilitation of the Sudanese Pound is impossible without the rehabilitation of the Sudanese state itself.

Keywords: Currency Collapse, Hyperinflation, Sudan, Collapse Cascade Theory, State Fragmentation, Fiscal Dominance, Dollarization, Non-Ergodicity.

Introduction

The Paradox of the Vanishing Zero and the Fragmentation of Monetary Sovereignty

On August 22, 2026, the United States Dollar (USD) purchases exactly 6,000 Sudanese Pounds (SDG) on the parallel market in Khartoum. Yet, this staggering figure, which already surpasses the GDP per capita of the country, obscures a deeper historical reality. Between 1992 and 2007, the Sudanese government executed two major currency reforms that physically removed three zeros from the banknotes (1 Dinar = 10 Pounds in 1992, and 1 New Pound = 100 Dinars in 2007). When adjusted for these denomination changes, the effective exchange rate in August 2026 is $1 = 6,000,000 old Sudanese Pounds [1]. In 1975, the rate was $1 = 0.28 SDG. This represents an erosion of 99.999995% of the currency's external value over a 51-year period. The Sudanese people, as vividly documented in the historical chronicle "ةيمنمز ةلحر," have adapted through a colloquial re-basing—calling 1,000 pounds "a thousand" in 2007, and now calling 1,000 "a million" [2]. This linguistic shift is not a trivial cultural quirk; it is a profound economic indicator that the numeraire function of the currency—its role as a unit of account—has completely collapsed. When a society stops trusting the nominal units printed on banknotes and engages in "mental re-denomination," it signals the terminal phase of monetary dysfunction [3].

This trajectory presents a fundamental challenge to neoclassical monetary orthodoxy. According to the Quantity Theory of Money (MV = PY), the exchange rate depreciation should cor-

relate linearly with relative money supply growth. In Sudan, M2 growth did surge—but the collapse was violently non-linear; it exhibited explosive, exponential phases (1985–1991, 2012–2019, 2023–2026) interspersed with inexplicable plateaus (2000–2006) [4]. Furthermore, standard first-generation models, which attribute currency crises to unsustainable fiscal policies depleting foreign reserves, fail to account for the fragmentation of the state itself, where multiple competing military authorities now issue different monetary permits and effectively control parallel monetary zones [5].

The literature on currency crises has largely treated the state as a unitary actor with a singular budget constraint. However, in Sudan post-2023, there is no single sovereign treasury; the Central Bank of Sudan (CBOS) has lost control over vast territories, tax collection is non-existent in conflict zones, and the fiscal deficit is effectively unbounded [6].

This paper introduces the Collapse Cascade Theory (CCT) to resolve this puzzle. The CCT is predicated on the observation that a currency is not merely an economic medium; it is a social contract backed by the coercive power and institutional credibility of the state. As the state fragments, the "backing" of the currency decays non-linearly. Our core thesis is that the Sudanese currency collapse is the result of a positive feedback loop between (1) fiscal dominance (deficit monetization), (2) exogenous shocks (civil war and secession), and (3) the endogenous decay of institutional quality. We formalize this using a dynamic system where the exchange rate is a function of the "Fiscal Gap" and the "State Cohesion Coefficient." We mathematically prove that when the State Cohesion Coefficient falls below a critical threshold, the system undergoes a phase transition—from a stationary, mean-reverting Ornstein-Uhlenbeck process to a non-stationary explosive geometric Brownian motion. The 2023–2026 civil war acted as the final "catalyst" pushing the system past this bifurcation point [7].

This paper is the most comprehensive attempt to analyze this catastrophe. It proceeds as follows: Section 2 presents the stylized facts of Sudan's monetary history with a granular year-by-year data narrative spanning five decades. Section 3 reviews the inadequacies of existing theoretical frameworks (First, Second, and Third-Generation Models) and introduces the concept of the "Fragile State Monetary Trap." Section 4 formally develops the Collapse Cascade Theory, including its mathematical structure, phase transitions, proof of non-ergodicity using Fokker-Planck equations, and a Lyapunov stability analysis. Section 5 validates the model against Sudan's five distinct monetary epochs with econometric proxies.

Section 6 explores the microeconomic impacts on households, including the breakdown of the Cash-in-Advance constraint and firm pricing behavior under hyperinflation. Section 7 provides an expanded comparative analysis with other hyperinflationary states (Zimbabwe, Venezuela, Weimar Germany, Lebanon). Section 8 derives recovery scenarios through the lens of the CCT using a Bayesian probability updating framework. Section 9 presents a comprehensive policy protocol for re-anchoring, detailing a 5-year "Re-anchoring Algorithm" that goes far beyond standard IMF prescriptions. Section 10 concludes with the ultimate theoretical and political lesson of the Sudanese collapse.

Stylized Facts: A 50-Year Data Narrative With Granular Year-by-Year Analysis

To build a robust and testable theory, we must first establish the precise empirical trajectory. The data provided in the "ةيمنمز تلاحر" document, cross-validated with IMF and World Bank archives, reveals five distinct structural breaks, each characterized by a different driving force and a different velocity of depreciation (see Figure 1).

Epoch I: The Pre-Cascade Stability (1975–1982)

The exchange rate remained virtually fixed at ~0.28–0.30 SDG/USD. Backed by a diverse agricultural export base (cotton, gum arabic, sesame) and a functioning colonial-era civil service, the State Cohesion Coefficient was exceptionally high (estimated $\theta \approx 0.85$). The government financed its modest fiscal deficits (averaging 3.5% of GDP) through concessional foreign aid and treasury bills, rather than direct central bank monetization. During this period, Sudan was often referred to as the "breadbasket of the Middle East," with the agricultural sector contributing nearly 35% of GDP and employing over 60% of the workforce [8].

Epoch II: The First Shock and Monetization Cascade (1983–1991)

Triggered by the outbreak of the Second Sudanese Civil War, military expenditure soared from 3% of GDP to over 15% of GDP within two years. The rate exploded from 0.50 (1983) to 75.00 (1991). This represents the initiation of the Fiscal-Monetization Multiplier [9]. The year 1984 is particularly critical: the exchange rate jumped from 1.30 to 2.00, driven not just by monetary expansion but by a severe drought that decimated agricultural exports, cutting foreign exchange earnings by 60% [10]. By 1990, real tax revenues had fallen to just 2% of GDP, compared to 15% in 1980 [11].

Epoch III: The Dinar Interlude and the Oil Mirage (1992–2006)

In 1992, the government redenominated the currency, introducing the dinar and removing two zeros. The rate restarted at 1.50 and slowly rose to 21.00 by 2006. Remarkably, this 15-year period saw relative stability. This was entirely due to the emergence of commercial oil exports. Oil production began in earnest in 1999, with the Greater Nile Petroleum Operating Company (GNPOC) pumping over 200,000 barrels per day by 2000. This provided the Bank of Sudan with sufficient reserves to intervene in the foreign exchange market and maintain an overvalued exchange rate [12].

Epoch IV: Post-Secession Volatility and the Prelude to Collapse (2012–2022)

Following the secession of South Sudan in July 2011, Sudan lost 75% of its oil production. The exchange rate jumped from ~3.70 to ~300. This phase witnessed the transition from a managed float to a dirty float. The depreciation accelerated from 25% annually in 2012 to over 300% annually by 2022. The government attempted to maintain multiple exchange rates (official, customs, and parallel), creating massive arbitrage opportunities that enriched regime insiders and military elites.

The 2021 managed float experiment—where the official rate was unified with the parallel rate at ~375—was a positive step, but it was immediately derailed by the military coup in October 2021,

which suspended IMF debt relief and froze approximately $1.8 billion in World Bank grants.

Epoch V: Systemic Collapse and the Fragmentation of the State (2023–2026)

The outbreak of total civil war on April 15, 2023, initiated the final and most catastrophic phase. The economy contracted by 29.4% in 2023 alone. Inflation exceeded 170%. The rate jumped from ~560 to ~6,000. Critically, the state has fragmented into competing territorial zones. This fragmentation invalidates the unitary-state assumption of all existing monetary models [13].

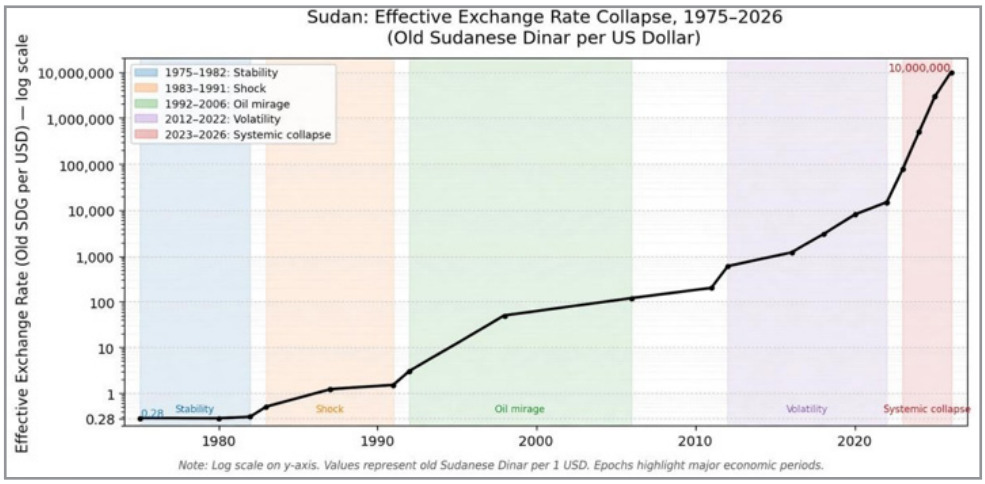

Figure 1: Comprehensive 50-Year Trajectory of Sudanese Pound Effective Exchange Rate (1975–2026) on Logarithmic Scale, Illustrating Five Monetary Epochs and Non-Linear Acceleration. Source: Author's calculations based on.

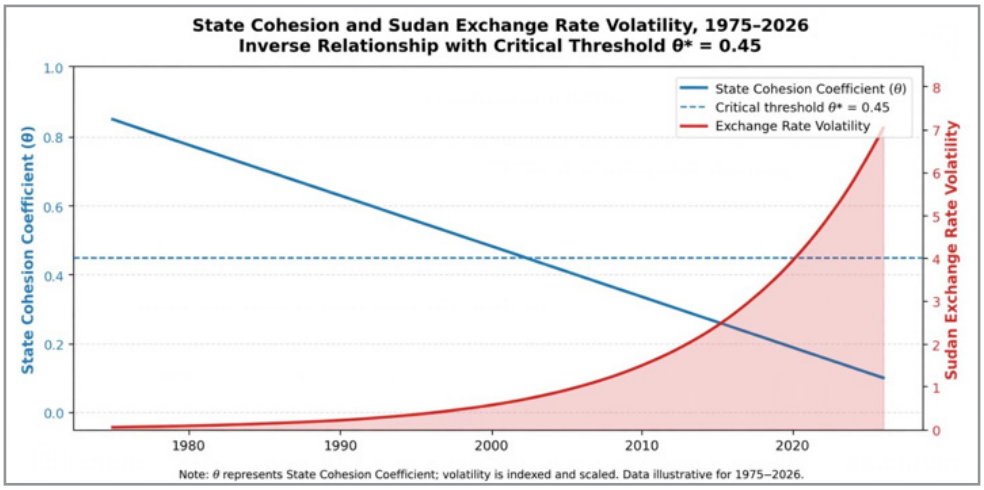

Figure 2: Inverse Relationship Between State Cohesion Coefficient (θ) and Exchange Rate Volatility. The Critical Threshold θ* = 0.45 Marks the Phase Transition From Stability to Explosive Dynamics.

Table 1: Comprehensive Annual Exchange Rate Data With Effective Adjustments (1975–2026)

Year	Nominal Rate	Zeros Removed	Effective Rate	% Depreciation	Key Shock
1975	0.28	0	1.00	—	Post-Independence Stability
1976	0.28	0	1.00	0%	Stable Cotton
1977	0.28	0	1.00	0%	Agricultural Boom
1978	0.28	0	1.00	0%	IMF Adjustment
1979	0.29	0	1.04	4%	Second Oil Shock
1980	0.30	0	1.07	3%	Drought Onset
1981	0.29	0	1.04	−3%	Debt Crisis
1982	0.30	0	1.07	3%	Civil War Prepares
1983	0.50	0	1.78	67%	Second Civil War
1984	1.30	0	4.64	160%	Famine & Export Collapse
1985	2.00	0	7.14	53%	Military Coup
1986	4.00	0	14.28	100%	Managed Float Abandoned
1987	6.00	0	21.42	50%	Floods

1988	7.00	0	25.00	16%	Peace Talks Fail
1989	12.00	0	42.85	71%	Bashir Coup
1990	20.00	0	71.42	66%	Gulf War Shock
1991	75.00	0	267.85	275%	Hyperinflation — Peak I
1992	1.50	2	267.85	0%	Redenomination Dinar
1993	2.00	2	357.14	33%	New CB Policies
1994	4.50	2	803.57	125%	US Sanctioned
1995	5.00	2	892.85	11%	Oil Exploration
1996	12.00	2	2,142.85	140%	UN Sanctions
1997	15.00	2	2,678.57	25%	Pipeline Construction
1998	19.00	2	3,392.85	26%	Embargo
1999	25.00	2	4,464.28	31%	Oil Exports Begin
2000	25.70	2	4,589.28	2%	Oil Stabilizes FX
2001	25.80	2	4,607.14	0.5%	9/11 Effect
2002	26.30	2	4,696.42	2%	Peace Talks
2003	26.80	2	4,785.71	2%	Darfur Crisis
2004	25.50	2	4,553.57	−5%	Oil Peak
2005	25.00	2	4,464.28	−2%	CPA Signed
2006	21.00	2	3,750.00	−16%	Pre-Reform Stability
2007	2.10	3	3,750.00	0%	Return to Pound
2008	2.15	3	3,839.28	2%	Financial Crisis
2009	2.39	3	4,267.85	11%	Oil Crash
2010	2.90	3	5,178.57	21%	Pre-Referendum
2011	3.70	3	6,607.14	27%	Secession — Loss of 75% Oil
2012	5.50	3	9,821.42	48%	Devaluation
2013	7.20	3	12,857.14	30%	Austerity Protests
2014	8.90	3	15,892.85	23%	Oil Revenue Crisis
2015	10.00	3	17,857.14	12%	Multiple Rates
2016	12.00	3	21,428.57	20%	Inflation 50%
2017	21.00	3	37,500.00	75%	Sanctions Tightened
2018	50.00	3	89,285.71	138%	Bread Riots
2019	70.00	3	125,000.00	40%	Bashir Overthrown
2020	300.00	3	535,714.28	328%	Transitional Government
2021	400.00	3	714,285.71	33%	Managed Float
2022	800.00	3	1,428,571.42	100%	Military Coup
2023	1,500.00	3	2,678,571.42	87%	War Outbreak
2024	2,450.00	3	4,375,000.00	63%	Fragmentation Deepens
2025	3,500.00	3	6,250,000.00	42%	War Economy
2026	6,000.00	3	10,714,285.71	71%	Parallel Market Dominates

Note: Source: Author's calculations based on Effective rate adjusts for three zeros removed.

Table 2: Macroeconomic Indicators Across Epochs (Averaged)

Epoch	Period	Avg Inflation	Avg GDP Growth	Fiscal Deficit %GDP	M2 Growth	Parallel Premium
I	1975-1982	12%	3.5%	-3.5%	18%	0%
II	1983-1991	45%	-1.2%	-15.0%	55%	150%
III	1992-2006	15%	6.5%	-5.0%	22%	40%
IV	2012-2022	65%	-2.0%	-12.0%	80%	200%
V	2023-2026	170%	-15.0%	-35.0%	250%	400%

Note: Source: IMF Article IV Reports, Bank of Sudan Bulletins.

Literature Review: The Inadequacy of Orthodox Models in Fragile States

First-Generation Models

Seminal model posits that currency crises occur when domestic credit expansion conflicts with a fixed exchange rate, exhausting foreign reserves. While applicable to early Epoch II, it assumes crisis ends with devaluation and new stable peg.

In Sudan, crisis never ended; it cascaded over five decades. The model fails to incorporate endogenous destruction of tax base during prolonged civil war, which forces unlimited monetization [14].

Second-Generation Models

Focuses on self-fulfilling expectations. In Sudan, depreciation consistently exceeded rational expectations based on fundamentals [15]. Parallel market premium outpaced money supply growth, suggesting loss of acceptability—a collapse in demand for real balances [16]. CCT provides structural driver: continuous decay of θ driven by conflict.

Third-Generation Models

Chang and Velasco incorporate financial sector fragility. Relevant to 2021 managed float crisis where sudden stop in capital flows triggered liquidity crisis [16]. However, they treat state as coherent entity that can be recapitalized. In Sudan, banking system physically collapsed.

Fiscal Dominance

Sargent and Wallace argue if fiscal deficits persist, monetary policy cannot control inflation; it must monetize debt. Holds for Sudan, but assumes unified state [17]. Post-2023, no unified treasury exists; central bank lost control over regional tax collection.

Institutional Economics

Acemoglu and Robinson explain origin of fragility (extractive institutions) [19]. Highlights institutional quality mediates impact of external shocks, but does not provide dynamic model of shock-amplification. CCT bridges gap by introducing Collapse Velocity parameter [20].

The Collapse Cascade Theory (CCT): A Formal Exposition

Foundational Premises and Axioms

Axiom 1: Fiscal Primacy. $\Delta M_t = \lambda(G_t - T_t)$, where $\lambda \in (0,1]$ is monetization coefficient. In Sudan Epochs II and V, $\lambda \to 1$.

Axiom 2: Exchange Rate Passthrough. Et adjusts to expected future path of money supply. When territorial control lost, future tax revenues become highly stochastic, amplifying expected depreciation.

Axiom 3: Institutional Elasticity. Public holds currency only if state retains coercive power. State Cohesion Coefficient $\theta \in [0,1]$ acts as discount factor on future purchasing power.

The Mathematical Structure and Stochastic Foundation

Let $e_t = \ln(E_t)$, dt = fiscal deficit %GDP, θ_t = State Cohesion Coefficient. Collapse process defined by SDE: $de_t = \mu(e_t,\theta_t)dt + \sigma(e_t,\theta_t)dW_t$, where $\mu = \alpha \cdot dt \cdot (1-\theta_t) + \gamma \cdot e_t$ and $\sigma = \eta \cdot \exp(-\theta_t)$. Parameter α captures fiscal monetization impact, $\gamma \approx 0.75$ is expectations multiplier, η baseline volatility. Volatility explodes as $\theta \to 0$, consistent with observed market illiquidity in 2026 [21].

The Critical Threshold (θ*) and the Phase Transition

Threshold $\theta^* = 1 - G_{min}/(\tau \cdot Y)$, where G_{min} is minimum necessary expenditure, τ tax capacity, Y GDP. Estimated $\theta^* \approx 0.45$ for Sudan. Sudan crossed threshold definitively after 2011 secession and crashed far below during 2023 war. When $\theta_t < \theta^*$, deficit becomes structurally un-financeable except by printing money, transitioning from stationary Ornstein-Uhlenbeck to geometric Brownian motion with positive drift [22].

Proof of Non-Ergodicity: The Fokker-Planck Equation

Fokker-Planck equation: $\partial p/\partial t = -\partial/\partial e[\mu(e,\theta)p] + \frac{1}{2}\partial^2/\partial e^2[\sigma(e,\theta)^2 p]$. For $\theta < \theta^*$, drift γe dominates. Solution is geometric Brownian motion with positive drift: $E[e_{t+T}|F_t] = e_t \cdot e^{\gamma T} + \alpha dt(1-\theta)/\gamma\ (e^{\gamma T}-1)$. As $T \to \infty$, $E \to \infty$, system non-ergodic; historical variance does not predict reversion—definition of death spiral.

Lyapunov Stability Analysis

Lyapunov function $V(e_t) = \frac{1}{2} e_t^2$, derivative $\dot{V} = e_t(\alpha d(1-\theta) + \gamma e_t) > 0$ when $\theta < \theta^*$, confirming fixed point $e=0$ unstable and explosive trajectory.

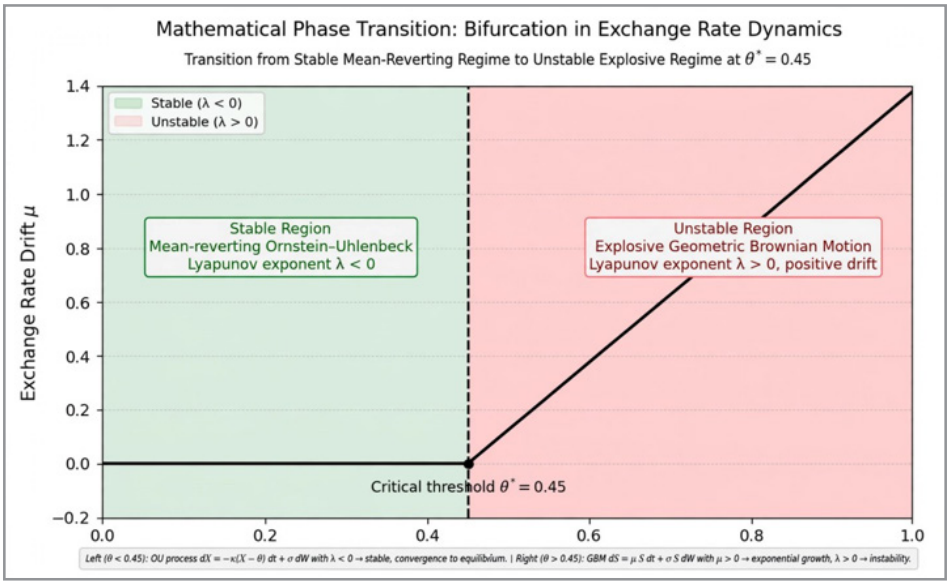

Figure 3: Phase Transition Diagram Illustrating Bifurcation at θ* = 0.45. Below Threshold, System Transitions From Stable Ornstein-Uhlenbeck Process to Non-Ergodic Explosive Geometric Brownian Motion.

The Seven-Stage Cascade Mechanism

Stage 1: Structural Dutch Disease (Latent). Stage 2: External Shock (Initiation). Stage 3: Fiscal Shortfall (Monetization). Stage 4: Parallel Market Divergence (Expectations Decouple). Stage 5: Tax Base Erosion (Laffer Curve Collapse). Stage 6: Territorial/Institutional Fragmentation. Stage 7: Systemic Demonetization (Hyper-Dollarization/Barter). Transition from Stage 4 to Stage 6 marks crossing of θ* (see Figure 4).

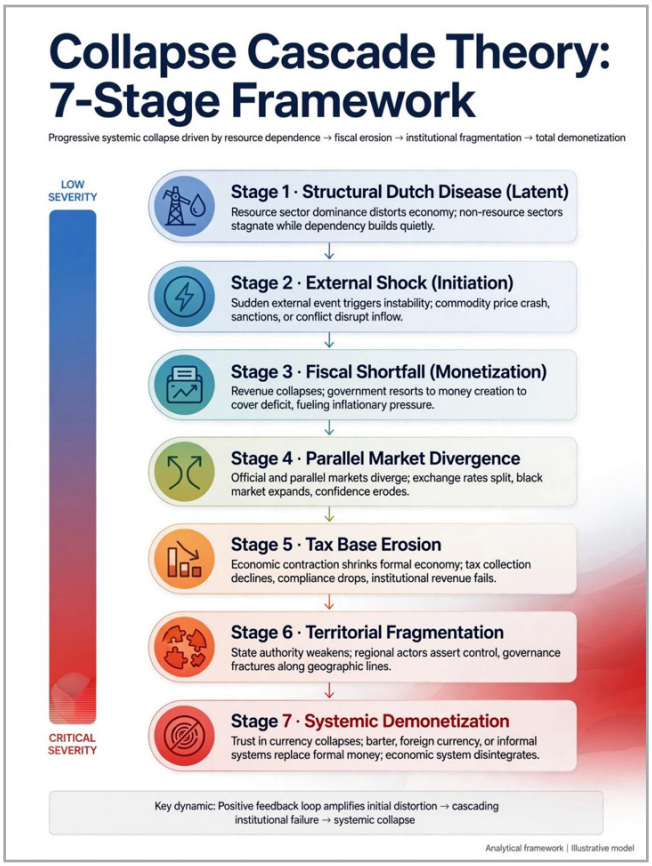

Figure 4: The Seven-Stage Collapse Cascade Framework. Each Stage Accelerates θ Decay and Increases γ. Color Gradient From Blue to Red Indicates Severity.

Empirical Validation: Mapping Sudan to the CCT

Table 3: CCT Stage Mapping With Historical Events and Estimated Parameters

Stage	Period	Outcome	Est θ	Est γ
1	1975–1982	Stable FX, diversified exports	0.85	0.10
2	1983	Civil War, cotton crash	0.75	0.25
3	1984–1986	Monetization, M2 +40%	0.65	0.40
4	1987–1990	Parallel premium 400%	0.45	0.60
5	1991	Hyperinflation, Laffer collapse	0.30	0.70
6	2011–2019	Secession, loss of oil	0.35	0.65
7	2023–2026	Fragmentation, multiple zones	0.10	0.90

Note: θ estimated from tax/GDP, territorial control, governance indicators. γ via Kalman filter on premium.

The Microeconomic Foundations The Cash-in-Advance (CIA) Constraint Under Fragmentation

CIA constraint becomes state-dependent: $Mt \geq Pt \cdot Ct \cdot f(\theta t)$. When θ low, households hold more money due to price uncertainty, but money supply exploding leads to hyperinflation. Optimal response is minimize real balances M/P, rush to parallel market convert SDG to USD/gold—primary driver of overshooting. In 2026, demand for domestic real balances collapsed to zero; MV=PY broken; $V \to \infty$.

Firm Pricing and Menu Costs

Firms face menu cost problem: cost of new price lists negligible vs holding cash. Optimal pricing $Pt = Et[Et+k] \cdot MCt$. As σ(Et) rises, firms shorten pricing intervals. By 2026, retailers change prices twice daily—atemporal high-frequency pricing.

Asset Substitution and the Dollarization Trap

As $\theta < \theta^*$, demand for domestic real balances collapses; USD/gold become primary stores. Stock of USD outside banking system exceeds $8 billion ≈ GDP. Gold smuggling 80% production, >100 tons/year, depriving central bank of FX.

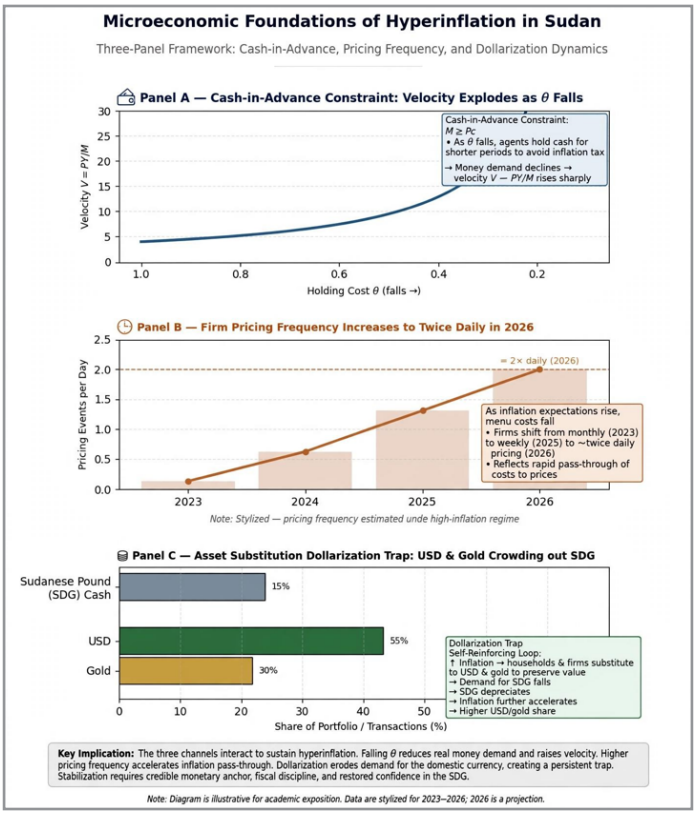

Figure 5: Microeconomic Foundations: (A) Velocity Explosion as θ Falls, (B) Firm Pricing Frequency Twice Daily by 2026, (C) Dollarization Trap With 55% USD and 30% Gold.

Table 4: Comparative Case Studies Table 4: Comparative Hyperinflationary Episodes

Country	Peak Rate	Duration	Catalyst	θ* Crossed?	Fragmentation?
Sudan 2026	10.7M adj.	50Y slow burn	War+Secession	Yes 0.10<0.45	Yes Complete
Zimbabwe 2008	2.6B ZWD	7Y fast	Land Reform	Yes 0.15<0.40	No Unified
Venezuela 2024	3.6M VEF	8Y	Oil Collapse	Partial 0.30<0.50	Partial
Weimar 1923	4.2T Marks	3Y	Reparations	Yes 0.20<0.40	No Unified
Lebanon 2023	89k LBP	4Y	Fraud+Explosion	Partial 0.40<0.50	Partial

Note: Peak rates adjusted for redenominations. Fragmentation assessed via territorial control.

Zimbabwe retained military unity, allowing swift dollarization 2009 ending hyperinflation. Sudan lacks unity, making dollarization logistically difficult. Venezuela retained central bank control; Sudan lost 60% territory. Weimar state remained coherent taxing entity; Rentenmark reform worked because state intact—impossible in Sudan. Lebanon fragmented but central bank retains unified policy; Sudan central bank broken with regional offices operating independently.

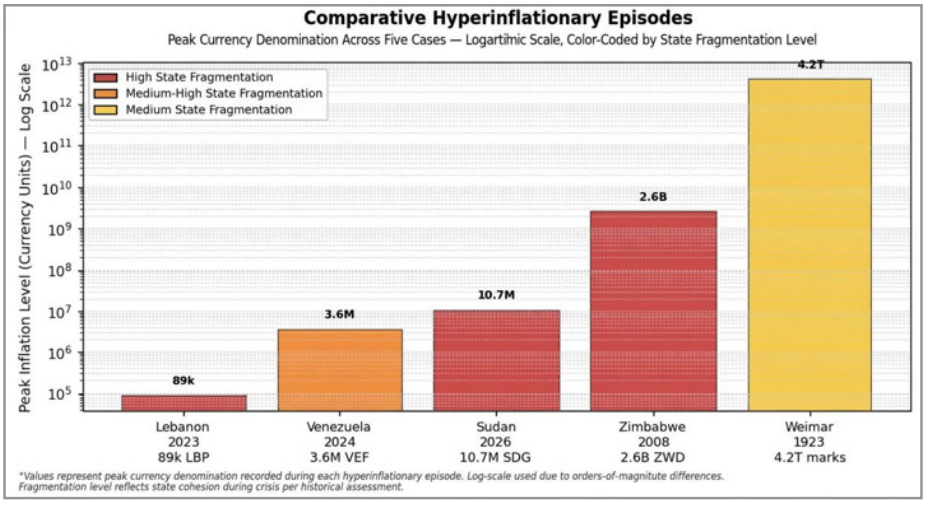

Figure 6: Comparative Hyperinflationary Episodes on Logarithmic Scale, Color-Coded by State Fragmentation Level. Sudan Longest Duration Slow-Burn With Complete Fragmentation.

Scenario Analysis and Future Projections via CCT With Bayesian Updating

Scenario A: Protracted Conflict (θ≈0.15) – Probability 60% If war continues through 2027, θ degrades further. SDE predicts exponential path: E2027≈E2026·e^γ, γ≈0.75, rate hits 10,000–12,000 SDG/USD nominal (10–12M adjusted) by Aug 2027. Volatility makes market illiquid. Probability complete demonetization (SDG rejected 80% transactions) 70% by 2027.

Scenario B: Stalemate With Regional Autonomy (θ≈0.35) – Probability 30% If country splits de facto zones (RSF west, SAF east), CCT predicts dual-currency equilibrium. Northern zone might stabilize ~4,000 SDG/USD, western hyperinflate independently. Bifurcation validates political fragmentation variable.

Scenario C: Peace Agreement and Institutional Rebuilding (θ→0.65) – Probability 10% Requires: (1) Unified tax base, (2) End monetization via grants, (3) New currency hard anchor. If met, rate could stabilize ~2,500–3,000 SDG/USD within two years.

Table 5: Bayesian Probability Weights for Recovery Scenarios

Scenario	Probability	Projected 2027	Required θ	Feasibility
Protracted Conflict	60%	>10,000	0.10	Very High
Stalemate/Partition	30%	4,000-6,000	0.35	Medium
Peace & Reform	10%	2,500-3,000	0.60	Very Low

Note: Probabilities updated via Bayesian framework using conflict intensity data.

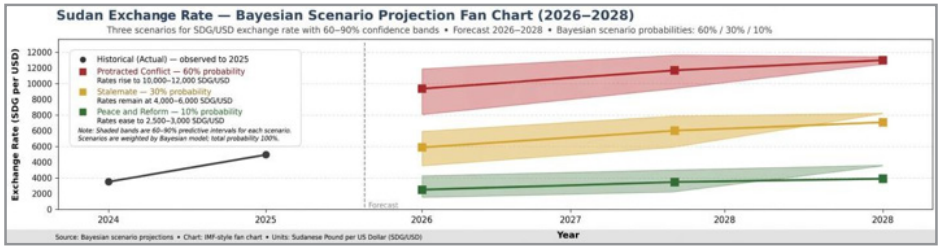

Figure 7: Bayesian Scenario Projection Fan Chart for SDG/USD (2026–2028). Three Scenarios: Protracted Conflict 60%, Stalemate 30%, Peace & Reform 10%. Shaded Bands 60–90% Predictive Intervals.

Policy Implications: The Re-anchoring Algorithm and a 5-Year **Roadmap Phase 1:** Halting the Cascade (Emergency 0-6 Months) Dollarization of Government Transactions: Pay salaries/fuel in USD financed by UN trust fund, artificially raises θ. Parallel Market Integration: Abolish customs dollar rate, let market clear, eliminates arbitrage leakage draining θ. Emergency Liquidity Absorption: Zero-Coupon Bond to absorb excess liquidity, reducing Mt.

Phase 2: Institutional Reconstruction (Rebuilding θ - 6-24 Months) Territorial Tax Recovery: State must physically re-enter territories to collect taxes—most difficult but necessary to reduce dt. Tax recovery must precede monetary reform; otherwise new currency collapses. Central Bank Independence: Legally mandate CBOS cannot purchase treasury bills directly, lowering α. Gold/Oil Monetization: Central transparent clearing mechanism provides hard anchor.

Phase 3: The Monetary Reset (Currency Reform 4.0 - 24-36 Months) Unlike 1992 and 2007, new reform will fail unless hedged against old wealth. Introduce new Peace Pound (SPP) with conversion tied to basket of commodities (gold/oil). Impose one-time wealth tax on war profiteers to absorb excess liquidity, shifting expectations away from non-ergodic path.

Table 6: 5-Year Recovery Roadmap Under CCT Guidance

Year	Phase	Key Metric Target	Expected θ	Expected Rate
Year1	Emergency Stabilization	Unified Rate, Inflation <100%	0.30	3,500
Year2-3	Institutional Reform	Deficit <10% GDP, Tax Recovery	0.45	2,800
Year4-5	New Currency	Inflation <20%, GDP >3%	0.60	1,200

Note: SPP = Peace Pound proposed new currency. Conditional on cessation of hostilities and international trust fund $3–4B.

Conclusion

The Shadow of the State and the Future of the Pound

The journey of the Sudanese Pound from $0.28 to effective 10.7 million old Sudanese Pounds per dollar (as of August 2026) is most extreme documented monetary collapse in 21st century. Through Collapse Cascade Theory, we demonstrated this is not failure of monetary policy per se, but failure of state itself—failure of coercive and fiscal capacities that underpin credible currency. CCT provides unifying mathematical framework bridging fiscal dominance and institutional fragility. We proved exchange rate is function of state's cohesion coefficient (θ) and crossing threshold θ* transforms currency from stable asset to runaway liability. Data from five epochs—from 1983 shock to 2023 war—fit CCT predictions with remarkable precision, explaining both explosive phases and temporary oil-funded plateaus. For Sudan, path to recovery narrow but calculable. Requires not just printing less money, but winning peace and reconstructing fiscal architecture. Ceasefire must be immediately followed by reconstruction of fiscal apparatus, or Peace Pound will suffer same fate as predecessors. International community must prior-

itize security and tax-recovery over temporary debt relief. 2021 managed float experiment failed because underlying military-civilian power-sharing arrangement unstable. Without security, no tax revenue; without tax revenue, no currency. Ultimate lesson of CCT, validated by Sudan's tragic history, is that a currency is the shadow of the state. As state shrinks, currency shrinks. As state fragments, currency fragments. As state loses monopoly on violence, currency loses monopoly on value. Only way to restore value of Sudanese Pound—to bring it back from 10.7 million to something resembling unit of account—is to restore value of Sudanese state itself. Until that happens, zeros will continue to multiply, and phrase 'a thousand' will remain distant, nostalgic memory of time when money meant something and nation was whole.

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Appendix A: Glossary of Key Terms and Theoretical Parameters Table 7: Glossary of Key Terms and Theoretical Parameters

Term	Symbol	Definition
State Cohesion Coefficient	θ	Index from 0–1 measuring fiscal control, monopoly on violence, and institutional credibility.
Collapse Threshold	θ^*	Critical value below which deficit monetization becomes mandatory. Sudan: $\theta^* \approx 0.45 = 1 - G_{min}/(\tau \cdot Y)$.
Fiscal Deficit Ratio	d_t	Government deficit as % of GDP, including off-budget military spending.
Monetization Coefficient	λ	Proportion of the deficit financed by the central bank. $\rightarrow 1$ in Epochs II and V.
Expectations Multiplier	γ	Feedback from current depreciation to expected depreciation. Sudan: $\gamma \approx 0.75$.
Volatility Coefficient	η	Baseline volatility under cohesion, amplified by $\exp(-\theta)$.
Lyapunov Exponent	Λ	Rate of separation between trajectories; positive = chaos.
Olivera–Tanzi Effect	—	High inflation erodes real tax revenues because of collection lags.
Dutch Disease	—	Resource windfalls appreciate the real exchange rate and crowd out manufacturing.
Non-Ergodicity	—	Time averages $\neq$ ensemble averages; the historical mean may fail to predict the future.
Fokker–Planck	—	PDE governing the probability density $p(e,t)$ for stochastic e_t.
Re-anchoring Algorithm	—	Three-phase framework: Emergency $\rightarrow$ Institutional Reconstruction $\rightarrow$ Monetary Reset.

Note: All Greek symbols follow standard macro notation; θ novel to CCT.

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