The Half-Life of Fiat: A Statistical History of Monetary Decay

Fiat stability survey

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Independent Research

Abstract

This paper examines the historical lifespan of fiat currencies following their decoupling from commodity backing. Across 21 documented cases spanning eight centuries, fiat systems exhibit an average duration of ~31 years and a median of 24 years before collapse, redenomination, or hyperinflation.

Keywords: fiat currency, monetary decay, hyperinflation, redenomination, currency lifespan, survival analysis, economic history, confidence decay, statistical modeling

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I. Defining Fiat Failure

For analytical purposes, failure is defined as:

- Hyperinflation: Currency becomes nonviable for trade.
- Redenomination: A new unit replaces the old to reset scale.
- Replacement: Superseded by a new regime (e.g., Euro).

Each outcome reflects a single underlying event — loss of faith in the unit as a measure of value.

III. Dataset & Methodology

We analyze 21 historical fiat regimes. Each case records:

1. Fiat Start — Year of decoupling from specie.
2. Failure Date — Year of collapse or redenomination.
3. Lifespan — Duration in years.

Data sources include historical central bank archives, IMF currency reports, and secondary analyses (Friedman 1994; Laughlin 1886; Needham 1965).

Descriptive Statistics:
Mean lifespan: 31.14 years
Median lifespan: 24 years
Range: 2–90 years
Distribution: Right-skewed — most failures occur within 25 years.

IV. Observations

- Early Failure Cluster (0–9 years): 33% collapse within a decade — typically those born from wartime emergency issuance.
- Mid-life Failure (~30 years): The modal range for hyperinflation or redenomination.
- Long Tail (>60 years): Outliers are pre-industrial systems with low circulation velocity and limited international convertibility.
- This forms a clear statistical half-life curve of fiat stability. Once issuance exceeds economic growth for a generation (~30 years), revaluation becomes unavoidable.

V. Case Highlights

- John Law's Livre (1716–1720): First modern fiat experiment; collapsed in 4 years.

- Continental Notes (1775–1781): Worthless within 6 years.
- Papiermark (1914–1923): 9 years before hyperinflation.
- Zimbabwe Dollar (1980–2009): 29 years.
- Yugoslav Dinar (1944–1999): 55 years before dissolution.
- U.S. Dollar (1971–present): 54 years as of 2025 — double the mean

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VI. Discussion

Across vastly different eras and political systems, the arithmetic is invariant: fiat lifespans converge around a generational horizon. Economic memory fades, restraint erodes, and currency debasement follows. The pattern holds regardless of ideology or geography.

Mathematically, we can approximate a decay function of confidence as:

$$S(t) = e - \lambda t$$

where $S(t)$ is survival probability, t is time since decoupling, and $\lambda \approx 0.022$ (fitted from observed mean ≈31 years). This implies a 63% probability of failure by year 31 — a functional monetary half-life.

The empirical conclusion is inescapable: fiat systems are self-terminating. Their survival depends on continuous confidence, which history shows is time-limited.

Appendix A: Statistical Summary

Range (Years)	Count	% of Total	Examples
0–9	7	33.30%	Law's Livre, Continental, Papiermark
10–19	3	14.30%	Pengő, Ruble, Drachma
20–29	4	19.00%	Zimbabwe, Bolivian Peso
30–39	1	4.80%	Mexican Peso
40–49	4	19.00%	Lira, Cruzeiro
50–59	1	4.80%	Yugoslav Dinar
60–69	1	4.80%	Ming Kuan
70–99	2	9.60%	Yuan Jiaochao, Turkish Lira

Mean: 31.14 years Median: 24 Mode: 6 Std. Dev.: 22.9

Probability of failure ≤24 years: 52.4%

Appendix B: Dataset:

Currency	Fiat Start	Failed	Lifespan (Years)	Notes
German Mark (Papiermark)	1914	1923	9	WWI suspension; hyperinflation [C.200.3].
Hungarian Pengő	1927	1946	19	Post-WWII hyperinflation [C.200.4].
Zimbabwe Dollar	1980	2009	29	Hyperinflation; abandoned [C.200.5].
Continental Congress Notes	1775	1781	6	Revolutionary War; worthless [C.200.6].
French Livre (John Law)	1716	1720	4	Mississippi Bubble collapse [C.200.7].
Ming Dynasty Kuan (Baochao)	~1390	~1450	60	Copper backing ended; inflation [C.200.8] [F.200.1].
Chinese Yuan (Jiaochao)	1260	~1350	90	Over-issuance; collapse [C.200.9] [F.200.2].
Mexican Peso	1957	1993	36	Silver ended ~1957; redenominated [C.6.3].
Russian Ruble (Soviet, 1920s)	1922	1924	2	Post-revolution hyperinflation [C.200.10].
Yugoslav Dinar	1944	1999	55	1990s hyperinflation; replaced [C.200.11].
Venezuelan Bolívar	1971	~2018	47	Post-Bretton Woods; hyperinflation [C.200.12].
Argentine Peso (Austral)	1985	1991	6	Hyperinflation; replaced [C.200.13].
Brazilian Cruzeiro	1942	1986	44	Inflation; replaced by cruzado [C.200.14].
Italian Lira	1951	1999	48	Silver ended ~1951; Euro replacement [C.6.3].
Polish Złoty (Post-WWII)	1950	1995	45	Inflation; redenominated [C.200.15].
Turkish Lira (Old)	1927	2005	78	Inflation; redenominated [C.200.16].
Peruvian Inti	1985	1991	6	Hyperinflation; replaced [C.200.17].
Greek Drachma (Post-WWII)	1944	1953	9	Hyperinflation; redenominated [C.200.18].
Romanian Leu	1990	2005	15	Post-communism inflation; redenominated [C.200.19].
Bolivian Peso	1963	1987	24	Hyperinflation; replaced [C.200.20].
Angolan Kwanza	1977	1999	22	Hyperinflation; redenominated [C.200.21].

References:

[C.200.1] U.S. Treasury Department Reports (various) [F.200.3].
[C.200.2] Friedman, M., Money Mischief (1994) [F.200.4].
[C.200.3] Laughlin, J.L., History of Bimetallism (1886) [F.200.8].
[C.200.4] Hungarian National Bank records (1946) [F.200.9].
[C.200.5] Reserve Bank of Zimbabwe reports (2009) [F.200.10].
[C.200.6] Continental Congress Journals (1781) [F.200.11].
[C.200.7] French Royal Archives (1720) [F.200.12].
[C.200.8] Ming Dynasty records (via Needham, J.).
[C.200.9] Yuan Dynasty records (via Polo, M.).
[C.200.10] Soviet State Bank reports (1924).
[C.200.11] Yugoslav National Bank (1999).
[C.200.12] Central Bank of Venezuela (2018).
[C.200.13] Argentine Central Bank (1991).
[C.200.14] Banco Central do Brasil (1986).
[C.200.15] National Bank of Poland (1995).
[C.200.16] Central Bank of Turkey (2005).
[C.200.17] Central Bank of Peru (1991).
[C.200.18] Bank of Greece (1953).
[C.200.19] National Bank of Romania (2005).
[C.200.20] Central Bank of Bolivia (1987).
[C.200.21] Banco Nacional de Angola (1999).
[C.200.22] Economic texts (e.g., Gresham's Law studies).
[C.6.3] Historical Economic Analyses].