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A Theory of Cash in the 21st Century

The last form of money that belongs to citizens, not to institutions.

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THE PARADOX OF BANKNOTES

Cash is losing as a flow.
Cash is winning as a stock.

POS Share of Transactions

79% → 52%

Euro area, 2016 → 2024. Cash is used less often at the point of sale as digital alternatives proliferate.

Source: ECB SPACE 2024

Euro Banknotes in Circulation

€220bn → €1.6tn

2002 → 2025 — a sevenfold increase. Citizens hold more physical cash than ever before, even as they use it less for day-to-day transactions.

Source: ECB Annual Accounts 2025

> *This is not confusion. This is information. Citizens are choosing to hold cash as a store of value and an instrument of resilience, even whilst preferring digital methods for routine payments.*

THE CENTRAL ARGUMENT

Cash is not just a payment method. Cash is a sovereign monetary institution of general constitutional interest

Monetary

The apex retail tier in Mehrling's hierarchy — the only Tier-1 instrument that ordinary citizens can hold directly, without any institutional intermediary.

Behavioural

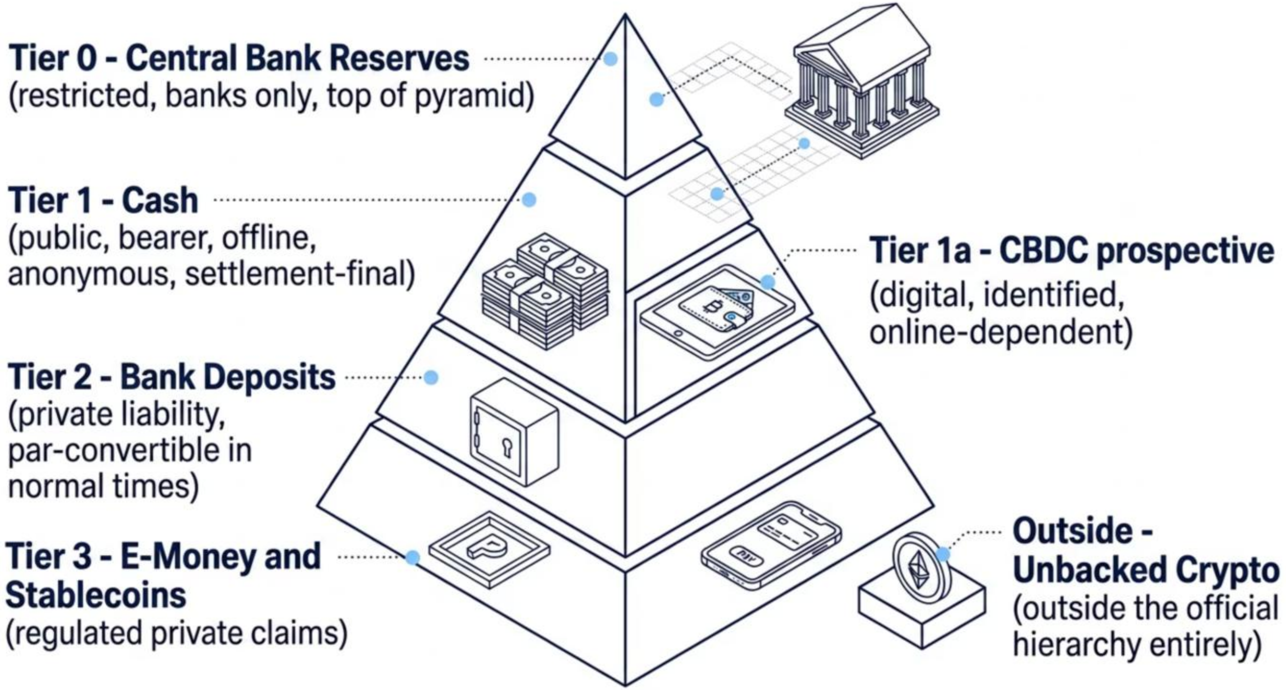
It disciplines spending through the pain-of-paying, anchors mental accounting, and shapes the psychology of ownership and financial responsibility.

Constitutional

It is the last form of money citizens can own as private property — without intermediation, without institutional permission, without surveillance.

THE HIERARCHY OF MONEY

Where cash sits — and why no digital instrument can take its place



Cash is the apex retail instrument: the highest-tier money that ordinary citizens can hold directly. No digital alternative — not even a CBDC — currently occupies this position. A CBDC sits at Tier 1a: it shares the sovereign issuer, but not the physical, bearer, offline properties that define Tier 1.

FIVE CONSTITUTIVE PROPERTIES

All jointly necessary. None sufficient alone.

1

Bearer Transfer

Title passes by physical delivery. No identification, no record-keeping, no third party is required or involved.

2

Offline Independence

No telecoms, no power grid, no network connection required. Two parties and the currency itself suffice for a complete transaction.

3

Transactional Anonymity

No mandatory record of who paid whom, for what, or when. Privacy is not a side-effect — it is a structural, constitutive feature of the instrument.

4

Settlement Finality

Irrevocable, non-repudiable, and complete at the moment of delivery. Property transfers without any intermediation whatsoever.

5

Public Issuance

A direct liability of the monetary sovereign. The citizen's last unmediated claim on the state — requiring no institution to hold, use, or transfer.

OFFLINE INDEPENDENCE

What we learned from a real test

−41pp

Card Spending

vs April 2024 baseline — the immediate collapse of digital transactions

−54%

National e-Commerce

drop during the blackout period, as online infrastructure failed

−34%

Consumer Spending

overall drop — economic activity contracted sharply without working payments

+50%

ATM Withdrawals

in unaffected Canary and Balearic Islands — pure insurance demand, immediately observable

Source: ECB Economic Bulletin 6/2025 — Iberian blackout analysis

The Lesson

ATM withdrawals in the affected regions fell 80% below normal — because the machines themselves had no power. Meanwhile, in unaffected islands, citizens rushed to withdraw cash as insurance against potential future outages.

⚠ Offline payment capability is critical infrastructure. It must be maintained **before** the emergency, not rebuilt during it.

PRIVACY AS A PUBLIC GOOD

Every citizen who retains the option to pay in cash constrains the data-extraction capacity of commercial and governmental actors — benefiting even those who never use cash.

Garratt & van Oordt (2021), Journal of Political Economy

Cash — No Mandatory Record of:

- Who paid, to whom, or for what
- When, where, or how often
- Any device, IP, or behavioural profile
- Nothing monetisable by any party

Digital Payment — Permanent Record of:

- Identity, location, and timestamp
- Merchant, category, and amount
- Device, IP address, and behavioural profile
- All data monetisable indefinitely by multiple parties

For domestic abuse survivors, political dissidents, and undocumented migrants — anonymity is not a preference. It is a survival condition.

THE PROPERTY–PRIVACY NEXUS

Money you can own, not money you have an account in

Dimension	Cash	Digital / CBDC / Deposits
Form	Bearer instrument	Account entry
Holder relationship	Sovereign liability, directly held	Contractual claim against institution
Custody	You hold it; no one inspects it	Institutional custody at all times
Inspection threshold	Judicial order, with full due process	Administrative request; often no judge required
Effect of institutional failure	Unaffected — you hold the asset directly	Conditional; sometimes bailed-in (Cyprus 2013)

> *Warren & Brandeis (1890): "the right to privacy is grounded in the right of property." Cash is the last monetary instrument to which this nexus fully and unconditionally applies.*

EURO BANKNOTES IN CIRCULATION

A sevenfold rise — through every shock, in every direction

1

2008

Global Financial Crisis — citizens fled to the only instrument that required no bank to function

2

2013

Cypriot Bail-In — depositors across the eurozone realised their accounts could be frozen or confiscated

3

2020

COVID-19 — +17% in circulation within 12 months, despite widespread restrictions on cash handling

4

2022

Russia Invades Ukraine — +6–10σ withdrawal spikes in Baltic states; existential threat triggers existential hoarding

5

2025

Iberian Blackout — +50% ATM withdrawals in unaffected zones: pure, rational, forward-looking insurance demand

Sources: ECB Annual Accounts; Ashworth & Goodhart (2020); Beckmann & Zamora-Pérez (2023); ECB Economic Bulletin 6/2025

THE PAIN OF PAYING

The form of payment is not neutral

2.0×

Willingness to Pay

Credit-card vs cash bidders for the same item in real auction settings. The mere presence of a card doubles bids.

Prelec & Simester (2001)

+22–54%

Debit vs Cash Bids

Increase in spending across multiple categories in incentivised experimental settings with real money at stake.

Runnemark, Hedman & Xiao (2015)

Insula

Neural Correlate of Pain

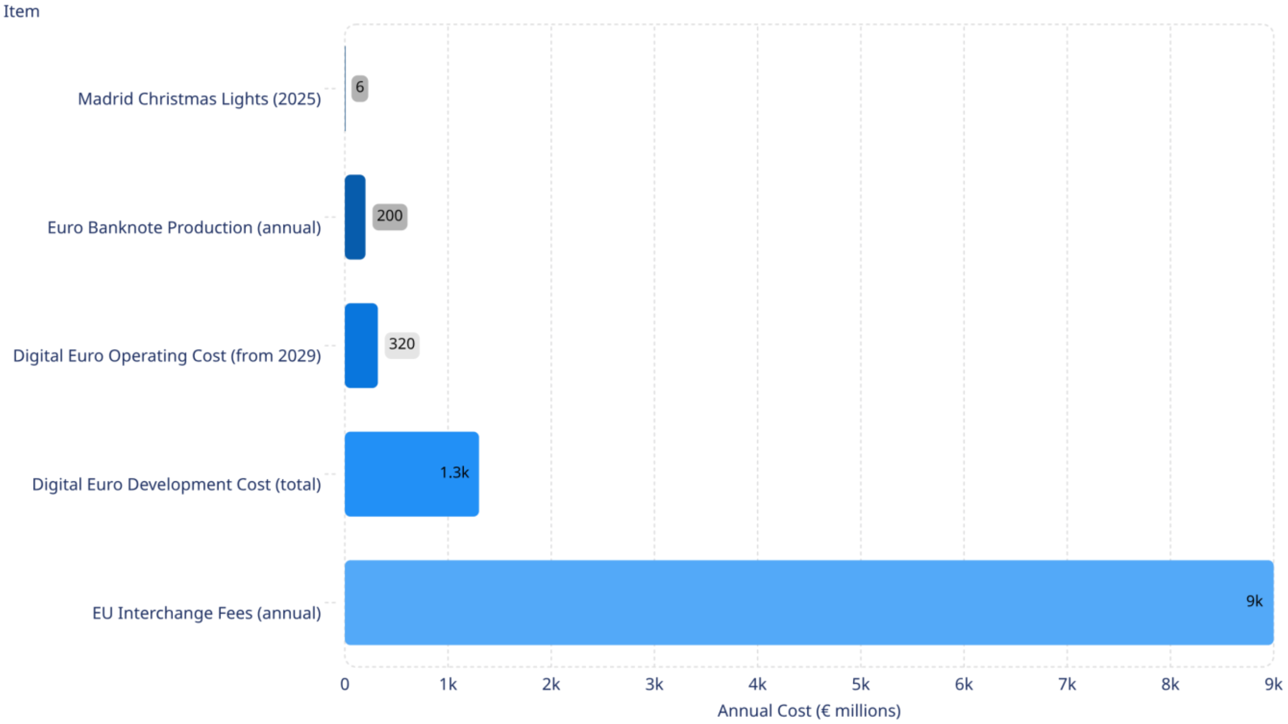
Cash payments activate the brain's pain region — the insula — more strongly than card payments. Confirmed via fMRI.

Mazar, Amir & Ariely (2017)

> *Frictionless digital payment is not a consumer benefit. It is the systematic, evidence-based degradation of financial self-control — designed into the payment infrastructure itself.*

THE ECONOMICS OF WHAT WE FUND

A question of proportion



Card networks extract more from the EU economy every year than the digital euro will cost to build — and roughly 1,500 times more than what Madrid spends to look festive for six weeks.
Sources: ECB; European Commission; Copenhagen Economics 2020; Madrid City Council 2025.

RESILIENCE IS PRICED IN — EXCEPT FOR CASH

Total-defence spending vs. the cost of keeping cash alive

EU 2025 Defence Spending

€381bn

A year — and rising 11% annually. Defence is now treated as critical infrastructure. We rebuild the army before the war, not during it.

Annual Cost of Euro Cash Provision

<€5bn

For the entire Eurosystem — printing, distribution, ATM network, central-bank handling combined. Less than 1.3% of defence spending.

The only payment instrument that survives every form of attack — kinetic, cyber, or infrastructural — costs a negligible fraction of what we spend on conventional defence.

Sources: EDA Defence Data 2024–2025; cost of euro cash provision estimated from Eurosystem reports and ECB-coordinated retail-payment cost studies (cash unit cost €0.42).

THE SILENT TAX

What happens to seigniorage when cash disappears

With Cash

- Citizen pays merchant directly — no intermediary
- Settlement is final and instant at point of delivery
- Seigniorage flows to central bank, then to public treasury
- **Public revenue. No private toll.**

Eurosystem seigniorage from banknotes: several €bn per year flowing directly to national governments.

Without Cash

- Citizen pays via issuing bank
- Routed through card network (Visa / Mastercard)
- Processing fee extracted by acquiring bank
- Remainder finally reaches the merchant
- **A toll at every single layer.**

EU merchants paid ≈ €9bn/year in interchange and scheme fees in 2024 — a private tax levied on every transaction in the economy.

> *Rochet & Tirole (2002, 2003, 2006): when cash is no longer the outside option, card networks extract monopoly rents from the entire economy. The consumer pays through merchant surcharges; the merchant pays directly. Everyone loses except the network.*

THE NORDIC PIVOT

From cashless champions to cash mandates

Sweden

Riksbank Act imposes a statutory duty to ensure payment infrastructure in peacetime crisis and heightened alert. Cash acceptance mandated at grocers and pharmacies from 1 July 2026. Recommended household reserve: 1,000 SEK per adult.

Norway

Right-to-pay-in-cash law enters into force with fines for businesses that refuse — in a country where cash's POS share had fallen to approximately 2%, the lowest in the world.

Finland & Austria

Cash integrated into national emergency preparedness frameworks. Austria's Nationalbank establishes a network of preparedness cash envelopes at post offices — approximately €100 per family member in small denominations.

This convergence across different political contexts, economic systems, and ideological traditions is not ideology. It is rational, evidence-based institutional response to observable and documented risk.

THE LONG ARC OF MONETARY POLITICS

Cash is the last remnant of a constitutional monetary order

16th Century — School of Salamanca

Vitoria, Azpilcueta, Soto: sovereign monetary power is bounded by justice. Debasement is expropriation. The first constitutional theory of money.

1870–1914 — Classical Gold Standard

Hard constitutional limit on monetary discretion. Cash is gold, or a direct and redeemable claim upon it.

1944 — Bretton Woods

Dollar-gold convertibility at the international tier; domestic monetary discretion begins to expand.

1971 — Nixon Shock

Gold convertibility suspended. The beginning of progressive, systematic monetary privatisation.

1980s–90s — Financial Deregulation

Money-market funds, securitisation, derivatives. Private near-money explodes in volume and complexity.

2020s — The Cashless Campaign

The final step: elimination of the last public monetary instrument, framed as technological inevitability rather than political choice.

> *The 'death of cash' is not technologically neutral. It is the culmination of a decades-long project of monetary depoliticisation.*

CAN A CBDC REPLACE CASH?

Mapping the five constitutive properties onto each instrument

Property	Cash	Digital Euro	Key Distinction
Bearer Transfer	✅	❌	Title passes by delivery; no account required. CBDC requires wallet and identity.
Offline Independence	✅	⚠️ Partial	ECB design allows limited offline for small values only. Full offline not achievable.
Transactional Anonymity	✅	❌	All CBDC transactions recorded; data minimised, not eliminated. Structural difference.
Settlement Finality	✅	✅	Both settle on central-bank money. This property is genuinely shared.
Public Issuance	✅	✅	Both are direct ECB liabilities. Issuance is genuinely shared.

> *A library card is not a substitute for a book. The digital euro is a valuable and welcome innovation — but it is not, and cannot be, a substitute for cash. Three of the five constitutive properties cannot be replicated in digital form.*

THE TIPPING POINT

Why delay is not neutral

The Cash Doom Loop

Once the feedback loop takes hold, each stage reinforces the next. The system collapses not through a single decision, but through accumulated neglect.

The Cost Spiral

5×

estimated cost per withdrawal in 15 years if current decline trends continue unchecked

> *"Once cash infrastructure has gone, rebuilding it is very hard."*

— UK Access to Cash Review, 2019

Infrastructure decisions made today determine options available during the next crisis. There is no neutral choice — inaction is itself a decision with irreversible consequences.

CONCLUSION

The question is not whether we can afford to maintain cash.

It is whether we can afford to lose the last form of money that belongs, without qualification,

to the citizens — not to the institutions.

Thank you.

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