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The Decentralization Error

Why crypto solved the wrong layer, and why the family balance sheet is the real unit of financial decentralization.

Yoshi Mua

Founder & CEO, Pari

Co-authored & edited with Claude

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Abstract

For seventeen years, the dominant project in financial technology has been the attempt to decentralize the financial system by decentralizing *money*. The premise was that if the unit of account could be made trustless, the institutions built on top of it would lose their power. Measured against that stated intent, the experiment has not succeeded. Mining and staking have concentrated into a handful of operators. Custody, exchange, and issuance have concentrated into a handful of firms with freeze and blacklist authority exceeding that of most commercial banks. The one crypto product that achieved real scale, the fiat-backed stablecoin, is a centralized liability of a private issuer. And over the same period in which crypto captured trillions of dollars of attention and capital, the number of chartered depository institutions in the United States fell from over 14,000 at its modern peak to roughly 4,300, with new bank formation collapsing to fewer than six charters per year. Whatever crypto decentralized, it was not the financial system.

This paper argues that the failure was not one of execution but of *category*. Crypto attacked the currency layer while the power it sought to disperse lives in the institutional layer, in the small number of balance sheets legally permitted to pool capital, underwrite risk, extend credit, hold deposits, and report repayment behavior. A distributed ledger does not create a new lender. It creates a new record of the same lenders.

We propose an alternative and, we argue, correct definition: **the financial system decentralizes when the number of independent balance sheets capable of originating, documenting, servicing, and reporting credit increases.** By that measure, the highest-leverage intervention available today is not a new chain. It is an operating system for the oldest and largest lending institution in the world, the family.

Families already function as the primary credit institution for most of humanity. In low- and middle-income economies, more adults borrow informally from family and friends than borrow formally from banks. In the United States, 40% of homeowners received help with a down payment, rising to 78% among Gen Z. Roughly \$124 trillion in household wealth is projected to change hands by 2048. This is not a fringe market. It is the largest bank without walls on earth, and it operates with no charter, no underwriting standard, no servicing infrastructure, no compliance layer, and no credit reporting. It is an institution without an operating system.

Pari is building that operating system: a micro-bank in each family's name, distributed through Registered Investment Advisors, beginning with intra-family lending and extending toward accounts and card issuance. This paper sets out the evidence for the diagnosis, the argument for the alternative, an honest accounting of the objections, and a proposed set of metrics by which the thesis should be judged.

Part I. Scorecard: Crypto Against Its Own Stated Intent

1.1 The intent

The founding document of the modern crypto movement is explicit about its purpose. Nakamoto's 2008 paper proposed an electronic payment system allowing two parties to transact directly ^[1], the stated goal being to eliminate the need for a trusted financial institution as intermediary. The claim was not that a better asset would exist. The claim was that intermediaries would become unnecessary.

That is a falsifiable claim. It should be tested on its own terms rather than on price appreciation, which is a separate question entirely. Below are five tests.

1.2 Test One: Were intermediaries removed?

They were replaced, not removed. The Bank for International Settlements described this directly in its December 2021 Quarterly Review, coining the term "decentralisation illusion" to describe the observation that the need for governance makes some degree of centralization inevitable, and that structural features of blockchain consensus tend to concentrate power ^[2]. The BIS extended the analysis in a subsequent bulletin, noting that despite the vision of doing away with financial intermediaries, crypto markets rely heavily on centralized entities in order to function at meaningful scale, including concentrated protocol governance, centralized exchanges, and stablecoins ^[3].

The BIS grounds this in a well-established economic argument. Firms exist in part because contracts cannot specify every contingency; centralization is how organizations absorb what contracts leave out. In DeFi, the analogue is *algorithm incompleteness*, the impossibility of writing code that anticipates every state of the world ^[2]. Because no protocol can be complete, every protocol requires discretionary governance. And governance is, definitionally, a locus of centralized authority.

The empirical picture matches the theory. Academic work on the centralization–decentralization paradox notes that major exchanges present themselves as champions of decentralized finance while maintaining control over user funds, transaction processing, and platform governance ^[4].

1.3 Test Two: Did the base layer stay distributed?

It did not.

Bitcoin. As of a June 2026 snapshot, four mining pools (Foundry Digital, AntPool, ViaBTC, and F2Pool) controlled more than 70% of total network hashrate, at approximately 31%, 18%, 13%, and 10% respectively ^[5]. Six pools mine over 80% of all blocks, and Bitcoin's Nakamoto coefficient, the minimum number of entities required to compromise the network, has been assessed at 3 ^[6]. Pool selection determines who constructs block templates and therefore which transactions are confirmed; this is not an abstract concern about network topology but a concrete question of transaction censorship capability concentrated among a handful of institutionally-oriented operators.

Ethereum. Staking is similarly concentrated. Lido holds roughly 8.7–8.9 million ETH, representing approximately a quarter of all staked ETH and about 62% of the liquid staking market ^{[7][8]}. Ten entities control more than 60% of total network stake ^[8]. Within Lido itself, the Curated Module, historically around 90% of Lido's stake, is operated by a set of roughly 34–36 approved node operators, which critics characterize as a permissioned membership arrangement rather than an open market ^[9].

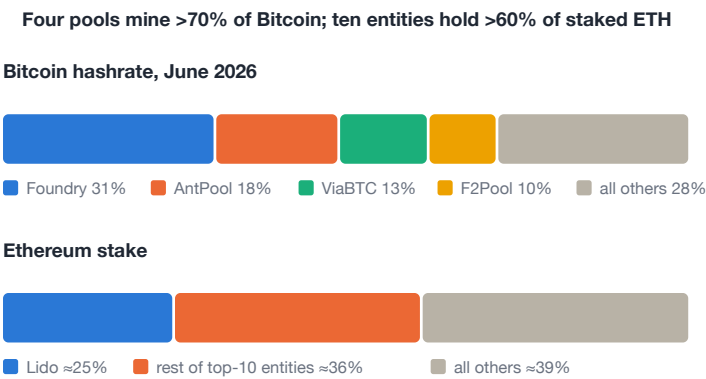


Figure 1. The base layer did not stay distributed. Four pools control >70% of Bitcoin hashrate (June 2026); Lido alone holds ~25% of staked ETH and ten entities hold >60%. Sources: miningpoolstats via Bitcoin.com News; Datawallet.

To be fair to both ecosystems: these concentrations are actively debated inside their own communities, and mitigation work is ongoing, Lido's Community Staking Module and Simple DVT Module represented about 2.2% of total Ethereum stake as of January 2026, up roughly threefold from two years prior ^[10]. That is genuine progress. It is also a rounding error against the concentration it is meant to correct, and it illustrates

the deeper point: decentralization at the protocol layer has to be continuously *engineered against* the economics of scale, because scale wins by default.

1.4 Test Three: Did it become money?

The clearest natural experiment available is El Salvador, which in September 2021 became the first country to make bitcoin legal tender with mandatory merchant acceptance, a government wallet, and a \$30 onboarding subsidy, as favorable a set of initial conditions as any monetary experiment has ever received.

The results were unambiguous. An NBER-affiliated household survey found that most registered users downloaded the Chivo wallet only to claim the subsidy, and 60% made no other transaction ^[11]. A 2022 business survey found that roughly 97.75% of firms had not made a single sale in bitcoin ^[11]. By 2024, only about 8% of Salvadorans reported having paid with bitcoin, and the share of remittances flowing through crypto channels had declined to under 1% ^[12]. A January 2025 university poll found 92% of Salvadorans had not used bitcoin in 2024 ^[13]. The IMF's own assessment concluded that adoption as legal tender had not produced visible improvements in financial inclusion, despite substantial public subsidy of transaction costs ^[11]. Two-thirds of the population considered the project a failure ^[11]. In January 2025, mandatory acceptance was repealed under an IMF program ^[13].

The usage curve declined steadily from 2021 onward, well before IMF pressure arrived. The policy did not kill adoption; adoption had already failed.

Meanwhile, the retail experience of the asset itself has been poor for most participants. The BIS constructed a dataset covering crypto exchange app usage across 95 countries from 2015 to 2022 and estimated that between 73% and 81% of retail investors lost money on their initial investment; the same analysis found that as prices rose and smaller users bought, the largest holders were selling ^[14]. The BIS also observed that the 2022 turmoil (Terra/Luna, FTX) had little discernible effect on broader financial conditions, underscoring what it called the largely self-referential nature of crypto as an asset class ^[14].

A self-referential asset class is, almost by definition, not a financial system.

1.5 Test Four: Did it create credit?

This is the test crypto fails most completely, and it is the one that matters most for the thesis of this paper.

A financial system is not primarily a payments network. It is a credit allocation mechanism. Its central function is to move purchasing power from those who have it to those who can productively use it, priced by risk, and

enforced over time. DeFi has never done this.

Because blockchains are pseudonymous and lack native identity or enforcement, decentralized lending protocols are structurally required to be *overcollateralized*: a borrower must post more value than they receive ^[15]. This is not a design preference that will be optimized away; it is the necessary consequence of removing identity, recourse, and reputation from the transaction. And it inverts the entire purpose of credit. Overcollateralized lending is unavailable to precisely the people credit exists to serve, those with future income but insufficient present assets. As one survey of the category put it, overcollateralized borrowing does not reach those in need; in practice it is used to construct leveraged positions in the same assets ^[16].

The scale mismatch is instructive. In the United States, unsecured consumer credit (credit cards, personal loans, student loans) is one of the largest categories of household finance; the unsecured personal loan market alone stood at \$178 billion in a single quarter of 2022, exceeding the total value locked across all of DeFi at the time by a wide margin ^[17]. Crypto did not compete with this market. It could not participate in it.

Efforts to build undercollateralized lending on-chain have been instructive in a different way: the protocols that worked did so by *reimporting* the institutions crypto set out to remove. A survey of sixteen undercollateralized protocols found that the most successful (Maple, Goldfinch, Clearpool, Atlendis) closely model traditional finance, aggregating pooled liquidity and lending to whitelisted institutional borrowers who pass KYC and credit-rating procedures ^[15]. The conclusion of that analysis is that the inability to implement effective decentralized identity and creditworthiness assessment remains the single biggest bottleneck to permissionless undercollateralized lending ^[15].

Put plainly: to lend money to someone without full collateral, you must know who they are, you must have a claim on them, and you must be able to record whether they paid. Those are institutional functions. No ledger design removes them.

1.6 Test Five: Did the institutional landscape decentralize?

This is the decisive measurement, and it is rarely made.

If crypto were decentralizing finance, we would expect to observe, over its lifetime, an increase in the number of independent entities capable of taking deposits and extending credit. The opposite occurred.

The United States had 4,336 FDIC-insured commercial banks and savings institutions at the end of 2025, down from a post-1940 peak of 14,496 in 1984 ^[18]. Commercial banks alone fell from approximately 9,530 in 1996 to roughly 3,806 by the end of 2025, a decline of about 60% ^[19]. The decline is driven overwhelmingly by mergers rather than failures, and it is not being offset by new entrants: 412 new banks formed in 1984, and never fewer

than 93 per year between 1995 and 2007, but only 86 new banks formed in the fifteen years from 2010, an average under six per year ^[20]. Between 2020 and 2025, 46 new charters were issued, roughly eight per year ^[21].

The arithmetic is straightforward: when an industry loses dozens of institutions a year and gains a handful, the count keeps falling ^[18]. Regulators have begun to respond. In June 2026 the FFIEC and its member agencies issued a joint statement affirming support for de novo depository formation and committing to streamline the application process ^[19]. But even a substantial increase in charter approvals would not reverse the trend at its current pace.

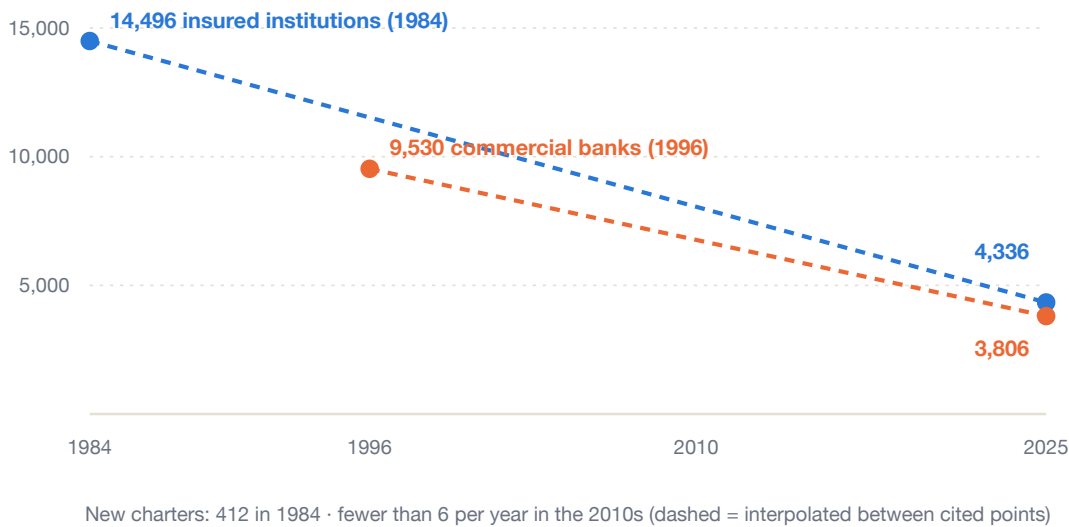


Figure 2. The institutional layer consolidated. FDIC-insured institutions fell from 14,496 (1984) to 4,336 (2025); commercial banks from 9,530 (1996) to 3,806. Dashed lines interpolate between cited points. Sources: FDIC.

So: over the exact period during which decentralized finance became one of the largest capital-attracting narratives in modern technology, the number of institutions in the United States legally permitted to hold deposits and originate credit fell by more than half. Financial power did not disperse. It consolidated. Crypto was not the cause of that consolidation, but it also did nothing to arrest it, because it was never operating at the layer where consolidation happens.

1.7 What crypto did accomplish

Intellectual honesty requires an accurate scorecard rather than a rhetorical one, and the case in this paper does not depend on denying crypto's genuine achievements.

Blockchain systems solved the double-spend problem without a central operator, a real and durable computer-science result. They demonstrated that a settlement network can run continuously for over fifteen years without a controlling entity. They produced meaningful innovation in cryptographic tooling, in programmable settlement, and in zero-knowledge proof systems that are now finding application well outside crypto. Stablecoins have become genuinely useful payment and settlement instruments at very large volume, and in economies with capital controls, unstable currencies, or expensive remittance corridors, dollar-denominated tokens provide real access that would otherwise be unavailable. Tokenization of real-world assets is an active and plausibly durable line of infrastructure work.

None of that is nothing. It is simply not decentralization of the financial system. It is a new settlement substrate, and a new settlement substrate, however good, still runs beneath the same institutional layer.

Part II. The Category Error

2.1 Two different things called "decentralization"

The confusion at the heart of the last decade is that a single word has been used for two unrelated properties.

Ledger decentralization asks: how many parties must agree for a transaction record to be considered valid? This is a question about consensus, validator distribution, and censorship resistance at the protocol level.

Institutional decentralization asks: how many independent entities can make a lending decision, hold pooled capital, and enforce a claim? This is a question about charters, balance sheets, underwriting authority, and legal standing.

These are orthogonal. A system can have a perfectly distributed ledger and near-total institutional concentration, which is approximately what exists today, where a highly distributed record is written primarily by a handful of pools, exchanges, and issuers. Conversely, a system can run on entirely centralized ledgers

(ordinary bank core systems) while having thousands of independent institutions making independent credit decisions, which is roughly what the United States had in 1984.

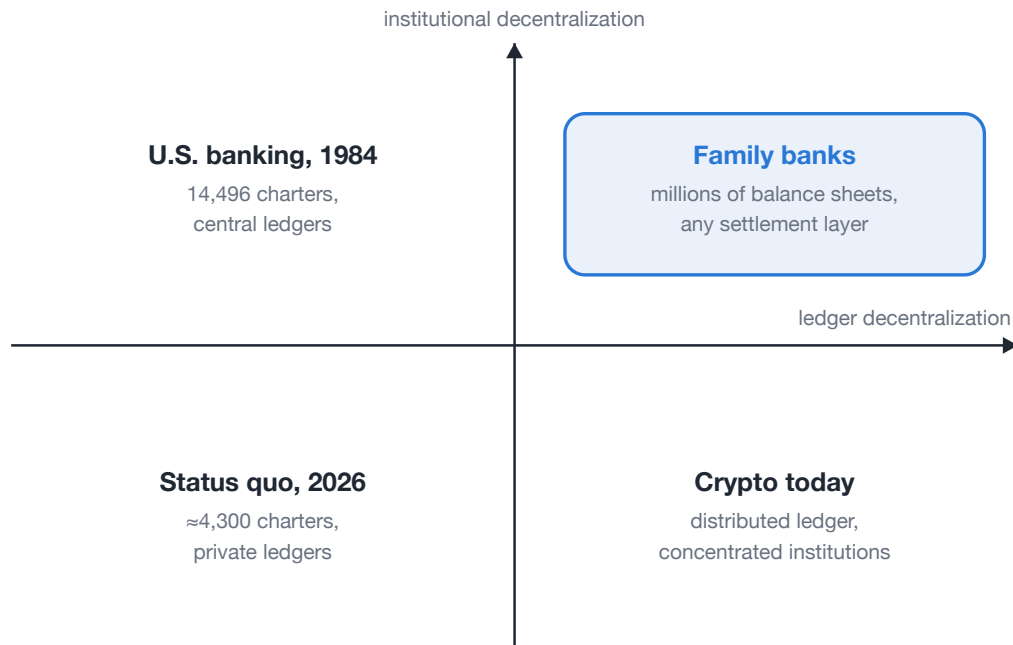


Figure 3. Two things called decentralization. Ledger decentralization and institutional decentralization are orthogonal. The quadrant crypto never reached is the one where credit access lives.

The second condition is the one that determines whether an individual can get a loan. The first does not.

2.2 What a bank actually is

The enthusiasm for the public ledger, we would argue, came from an implicit and mistaken model of what a bank is, as though a bank were fundamentally a database of balances, and therefore replaceable by a better database.

A bank is a bundle of at least seven functions:

1. **Pooling:** aggregating capital from many parties into a deployable balance sheet
2. **Maturity and liquidity transformation:** funding long-dated claims with short-dated liabilities
3. **Underwriting:** assessing the probability that a specific person repays a specific obligation
4. **Documentation:** creating a legally enforceable instrument

5. **Servicing:** collecting, applying, amortizing, and handling delinquency over time
6. **Reporting:** converting repayment behavior into portable reputation
7. **Payment access:** connecting the balance sheet to rails, cards, and networks

Exactly one of these, the balance record inside (1), is a ledger function. The other six are institutional, legal, and relational. This is why replacing the ledger changed so little: it substituted the least differentiated component of the stack while leaving the actual sources of institutional power untouched. Underwriting authority, legal enforceability, servicing capability, and access to credit reporting infrastructure remained exactly where they were.

The public ledger was a genuinely elegant answer to a question (*who keeps the record?*) that was never the binding constraint. The binding constraint was, and remains, *who is allowed to decide?*

2.3 The precedent nobody learned from: peer-to-peer lending

Crypto was not the first attempt to decentralize finance without decentralizing institutions. Peer-to-peer lending ran the same experiment a decade earlier, with a cleaner design and a more direct assault on the credit layer, and it re-centralized completely.

The original 2007–2008 pitch was that everyday savers would fund loans to everyday borrowers through an online marketplace, capturing the spread that credit card issuers had been taking. For a period, the model appeared to work. But institutional capital was cheaper and faster to raise than retail capital, it is easier to raise \$100 million from an institution than from tens of thousands of individuals ^[22], and the funding mix shifted steadily toward institutions. LendingClub retired its retail Notes platform effective December 31, 2020, and completed its acquisition of Radius Bank in February 2021 ^[23]^[22]. The company that had defined peer-to-peer lending resolved the model by *becoming a bank*.

The retail-funded marketplace has effectively wound down as a US consumer category; what survived under the same brand names is an institutional asset class with retail loan origination as the front end ^[24].

The lesson is precise and it generalizes: **decentralizing the source of funds, without decentralizing the institution that underwrites and services, produces re-centralization**. Capital always aggregates toward the lowest cost of funds. If the institutional layer remains scarce, whatever you build on top of it will be absorbed into it.

This is exactly what happened to crypto, one layer further out. And it is why we believe the correct intervention has to happen at the institution.

Part III. The Oldest Bank

3.1 The largest lender in the world has no charter

There already exists a lending institution with more counterparties, more geographic coverage, better information about its borrowers, and a longer operating history than any bank on earth. It has never been chartered, never been capitalized, never been supervised, and has never had a single line of software written for it.

The evidence for its scale is not anecdotal.

Globally. The World Bank's Global Findex 2025 found that in low- and middle-income economies, about 24% of adults borrowed formally in 2024 (from a bank, credit card, or mobile money account) while an additional 35% relied on informal sources such as family or friends ^[25]. Business borrowing follows the same pattern: of the 15% of self-employed adults who borrowed for business purposes, most borrowed only informally ^[25]. In an earlier round, family and friends were identified as the first-line source of emergency funds for 30% of adults in developing economies, rising to roughly 50% in the Middle East and North Africa ^[26].

Across most of the world, the family is not a supplement to the credit system. It is the credit system.

In the United States. The pattern holds even in the deepest consumer credit market in history. A 2026 survey found that 40% of homeowners received financial help with the down payment on their current home, up from 35% in 2023, rising to 78% of Gen Z homeowners and 56% of millennials, against just 12% of baby boomers ^[27]. Sixteen percent of homeowners say their parents helped directly with the down payment, rising to 27% among Gen Z ^[27]. A separate survey found 59% of parents have provided or plan to provide financial assistance toward a child's home purchase ^[28], and a 2026 study found nearly three-quarters of parents would consider financially supporting a child's home purchase, with 29% of those parents rating it as more important than helping pay for college ^[29].

The driver is structural, not cyclical. The median age of the American first-time homebuyer reached 40 in 2025, up from 30 in 1990, as home prices rose nearly twice as fast as incomes and the time required to save a down payment stretched from roughly three years to nearly ten ^[28]. Family capital is not filling a temporary gap. It is filling a permanent one.

The coming supply. Cerulli Associates projects approximately \$124 trillion in US wealth transferring through 2048, with \$105 trillion flowing to heirs and \$18 trillion to charity; nearly \$100 trillion of that comes from Baby Boomers and older generations. More than half the total, \$62 trillion, comes from high-net-worth and ultra-high-net-worth households, who represent just 2% of all households ^[30].

The reflexive framing treats this as an inheritance and asset-gathering event. We think that framing is a failure of imagination. A \$124 trillion pool of household capital, concentrated in exactly the families whose younger members face the worst credit access conditions in modern history, is not primarily an inheritance. **It is an unlevered, uncoordinated, uninstrumented lending balance sheet.**

3.2 Why the family is the natural credit institution

The family is not merely a large lender. On the specific dimensions that determine whether credit can be extended, it is a structurally superior one.

Information. The central problem in lending is asymmetric information: the borrower knows more about their own repayment prospects than the lender does. Institutions solve this expensively and imperfectly, through bureau data, scores, and documentation. A parent has what economists call *soft information*, direct, longitudinal, unfalsifiable knowledge of a borrower's character, work habits, health, relationships, and trajectory. No underwriting model has access to a better dataset, and no bureau file is as predictive as twenty-five years of direct observation.

Enforcement. Crypto's overcollateralization requirement exists because pseudonymous protocols have no recourse. Families have the opposite problem: recourse is *too* strong, socially enforced and permanently binding. The mechanism DeFi could not manufacture is the one families have in surplus.

Cost of capital and acquisition. A family bank has no cost of customer acquisition, no branch network, no marketing spend, and, critically, capital that is already pooled and already allocated to the benefit of the same beneficiaries. The lender and the ultimate beneficiary of the loan are frequently the same balance sheet across time.

Alignment. A commercial lender's optimum is the borrower who carries a balance indefinitely at maximum tolerable cost. A family lender's optimum is the borrower who succeeds and stops needing to borrow. These are opposite objective functions, and the second is the one credit is theoretically supposed to serve.

3.3 The economics of a lender who is not trying to make money

Every credit relationship has two prices. The first is the stated rate. The second, less visible and often more consequential, is the terms: how much flexibility exists when circumstances change, what happens during a bad quarter, whether prepayment is permitted, whether the structure can be renegotiated without penalty.

Commercial lenders must set both prices against an exogenous return requirement built from cost of funds, capital charges, expected loss, servicing cost, and margin. Family lenders have no such requirement, and the consequences of that difference are larger than they first appear.

On rate. The intuition that a family lender is making a sacrifice by charging the Applicable Federal Rate is usually wrong. The AFR is a floor set by statute, not a discount granted by the lender, and it is benchmarked to Treasury yields. For a parent whose alternative use of the capital is a conservative fixed income allocation, lending at 4.87% is not charity. It is a comparable or better risk-adjusted return with a counterparty they know better than any bond issuer they own. The apparent generosity is largely an artifact of comparing the AFR to a consumer lending rate that contains an intermediary's entire cost structure.

On terms. This is where the real asymmetry lives, and it is not primarily about kindness. A commercial lender cannot offer genuine flexibility because it cannot observe the borrower's true state. It sees a missed payment, not the reason for it, and forbearance carries loss recognition, servicing cost, and regulatory classification consequences. A family lender observes the reason directly and can forbear at nearly zero cost. That capability makes structures available that no bank will write: interest-only during a residency or graduate program, seasonal amortization matched to a business cycle, a payment holiday during a job transition, no origination fee, no prepayment penalty, no mortgage insurance, no score gate, no co-signer requirement. These are not concessions. They are the natural output of a lender with better information and no capital charge.

The closed loop. The deeper point is structural rather than relational. In a typical arrangement the borrower is a residual beneficiary of the balance sheet doing the lending. Interest paid to a bank leaves the family permanently. Interest paid to the family bank stays inside the estate the borrower will eventually inherit. At the level of the household unit across time, intra-family interest is not a cost. It is an internal transfer.

Consider a \$300,000 loan over thirty years. At the June 2026 long-term AFR of 4.87%, the payment is roughly \$1,587 per month and total interest is roughly \$271,000, all of it retained inside the family balance sheet. At a commercial rate of 6.75%, the payment is roughly \$1,946 and total interest is roughly \$400,000, all of it permanently exported. The borrower gains roughly \$359 per month of cash flow. The family gains that plus the entire retained interest stream.

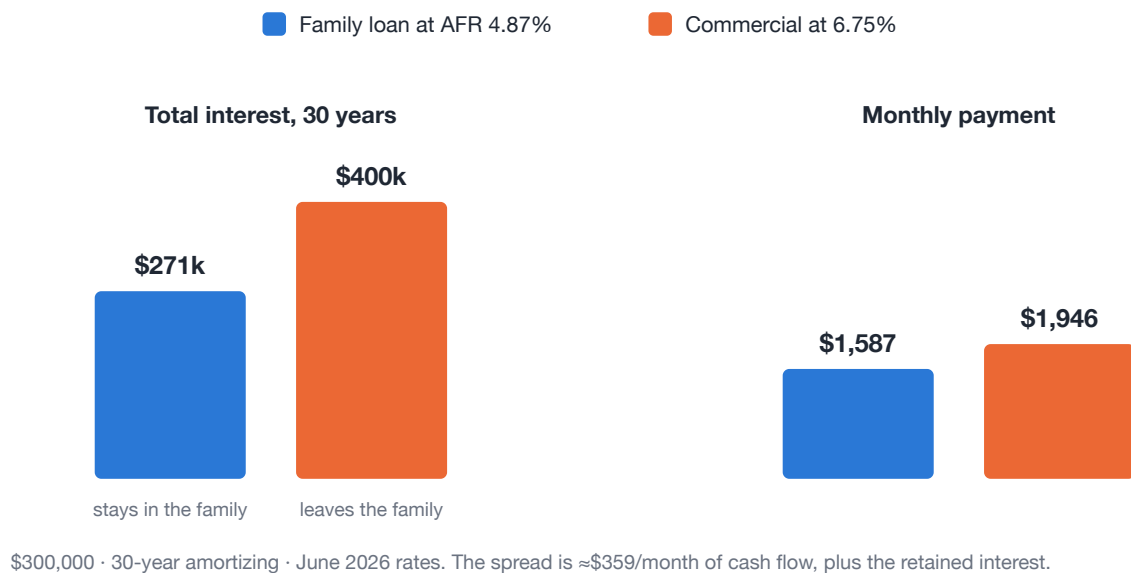


Figure 4. The spread the family is already paying. \$300,000 over 30 years: family loan at the June 2026 long-term AFR versus a commercial mortgage. Interest either stays inside the estate or leaves it.

This reframes the whole instrument. **A gift is deployed once. A loan is deployed indefinitely.** The same \$300,000 gifted to one child is gone from the family balance sheet the moment it moves. Lent, it finances a home, returns with interest, finances a business, returns again, finances a graduate degree, and finances the next generation's first home, compounding internally at the AFR while eliminating external interest leakage on every cycle. Measured over a generation, the loan is the more generous instrument, not the less generous one, which is close to the opposite of how most families understand the choice.

The spread the family is already paying. The cleanest statement of the opportunity is this: most families with meaningful assets are simultaneously a net saver and a net borrower. Parents hold capital earning a market yield. Children hold liabilities paying a market cost plus an intermediary's spread. A bank sits between two balance sheets that share a surname, an estate plan, and a set of beneficiaries, and captures the difference. Intra-family lending does not create a new financial advantage. It stops exporting one that already exists.

Three honest qualifications. First, interest received is ordinary income to the lender. At a 32% marginal rate, roughly \$87,000 of the \$271,000 above leaks to tax, leaving approximately \$184,000 retained. That is meaningfully less than the gross figure and dramatically more than the zero retained under external financing. Second, where multiple heirs exist, returned interest flows into a pool the borrower shares, so the borrower captures only a fractional benefit. This is a feature rather than a defect, since it prevents one child from being silently subsidized at the others' expense, but it makes "free money" an overstatement from the individual

borrower's perspective. Third, capital lent at the AFR may underperform the lender's alternative portfolio allocation, and that drag is real. The correct comparison is not the loan yield against the portfolio return, but the loan yield against the rate the borrower would otherwise pay a third party. The gap between those two numbers is the spread being disintermediated.

One risk worth naming. A lender who is not motivated by profit is still motivated by something. Flexible terms can quietly become conditional terms, and a credit relationship inside a family can become an instrument of control, approval, or leverage. This is the mirror image of the relational hazard discussed in §5.4, and the mitigation is the same: a written charter with terms fixed in advance, a defined and impersonal servicing process, and governance that does not require anyone to ask a parent for a favor twice.

3.4 Why it fails anyway

If the family is such a good lender, why is family lending so often a disaster?

Because it has every input of a bank except the operating system. The functions that make an institution an institution (documentation, underwriting discipline, servicing, reporting, governance) are absent. What remains is capital and goodwill, deployed without structure. Specifically:

It is legally fragile. The Supreme Court held in *Dickman v. Commissioner* (1984) that interest-free loans between family members constitute gifts for federal gift tax purposes ^[31]. Congress responded with Internal Revenue Code §7872, which establishes that a family loan bearing interest at or above the Applicable Federal Rate, properly documented and actually repaid, is respected as bona fide debt rather than recharacterized as a gift ^[32]. The AFR is published monthly and sits well below commercial rates: in June 2026, 3.85% short-term, 4.13% mid-term, and 4.87% long-term ^[33]. The compliance pattern that holds up is well established: a signed promissory note stating principal, rate, payment schedule and maturity; payments actually made on schedule via traceable transfers; and records kept by both parties ^[33]. Absent that, the IRS generally presumes transfers between family members are gifts, and can recharacterize the loan accordingly, triggering gift tax filing obligations and consuming lifetime exemption ^[34].

The legal framework for the family bank has existed since 1984. Almost nobody complies with it, because complying requires infrastructure that does not exist.

It builds no credit. The single most valuable thing a young borrower can receive is not the money. It is the *record* of having repaid it. Family loans are invisible to the bureaus. A child who repays \$40,000 to a parent over six years, flawlessly, emerges from that experience with exactly the same credit file they started with. The most reliable credit performance data in the household is systematically discarded. Meanwhile, roughly 7 million American adults have no credit record at all, and about 25 million more hold files that cannot generate

a score, approximately 32 million people whose problem is not that they are risky, but that they are unobserved [35].

It has no servicing layer. Without amortization schedules, payment tracking, automated reminders, and defined delinquency handling, repayment depends on memory and willingness to raise an uncomfortable subject. The predictable result is drift, then resentment, then a damaged relationship, and a lender who resolves never to do it again.

It is invisible to advisors. A wealth advisor managing a family's portfolio typically has no visibility into the loans that family is making off-balance-sheet, no ability to model them, no way to document them, and no product to offer around them. A material category of family capital allocation sits entirely outside the advisory relationship.

3.5 Proof that formalization is the missing variable

The claim that infrastructure is the binding constraint is testable, and it has been tested.

Rotating savings and credit associations (*tandas, susus, hui, chit funds*) are among the oldest financial institutions in existence, operating on social trust with no legal enforcement. They work well by their own terms, with low transaction costs and high repayment, but historically produced no lasting benefit for participants' access to formal capital, because none of the repayment behavior was recorded anywhere that mattered.

San Francisco's Mission Asset Fund tested what happens when you change only that one variable. Beginning in 2007, MAF took the traditional lending circle structure and added a single institutional layer: it formalized the loans and reported repayment to the credit bureaus [36]. An independent evaluation by San Francisco State University's Cesar Chavez Institute, covering more than 600 participants across five Bay Area communities over two years, found an average credit score increase of 168 points, alongside an average \$1,000 reduction in participant debt [37]. For participants who began with no credit score at all, 72% ended their first lending circle with a score of 620 or above [38]. Repayment ran at approximately 99% [36].

No new capital was introduced. No new lenders were created. The loans were the same loans that had been happening informally for generations. The only change was that they were documented, serviced, and reported, and that change converted invisible people into creditworthy people at a scale and effectiveness no algorithmic underwriting innovation has matched.

That is the entire thesis of this paper in a single case study. **The capital already exists. The trust already exists. The relationship already exists. What is missing is the institution.**

Part IV. The Thesis: A Micro-Bank in Every Family's Name

4.1 Definition

We define a **family micro-bank** as a named, governed, persistent financial entity organized around a family unit, possessing:

- **A charter document:** governing rules specifying who may borrow, under what conditions, at what terms, with what approval process, and what happens on default
- **A pooled balance sheet:** capital contributed by one or more family members, held for the purpose of lending to members
- **An underwriting policy:** an explicit standard applied consistently, rather than case-by-case negotiation under emotional pressure
- **Compliant instruments:** promissory notes meeting §7872 requirements, priced at or above the applicable AFR, executed and stored properly
- **A servicing ledger:** amortization, payment collection, application of payments, balance tracking, delinquency workflow
- **A reporting channel:** furnishing repayment performance to credit bureaus so that repayment builds portable creditworthiness
- **A payment surface:** eventually, deposit accounts and issued cards in the family bank's name

That list is deliberately the same seven functions enumerated in §2.2. The family already possesses the capital, the information, and the enforcement. Pari supplies the rest.

4.2 The stack

Layer 1: Origination. Structuring the ask. Determining a rate, a term, an amortization schedule, and a repayment structure the borrower can actually sustain and the lender can actually accept. This is where the emotional negotiation currently happens and where most family lending fails before a dollar moves.

Layer 2: Documentation and compliance. Generating the note, applying the correct AFR by term, capturing signatures, handling state-specific requirements, and producing the artifacts that survive IRS scrutiny and estate settlement.

Layer 3: Servicing. Payment collection over ACH, application to principal and interest, statements to both parties, automated reminders, delinquency handling, restructuring, and forgiveness workflows that account for gift tax consequences. This layer is what converts a conversation into an institution, because it removes the parent from the collections role.

Layer 4: Reporting. Furnishing repayment data so the borrower's performance becomes a portable asset. This is the layer that turns a private transfer into public creditworthiness, and it is the layer the Mission Asset Fund evidence indicates is the highest-value single addition.

Layer 5: Payment surface. Deposit accounts and issued cards under the family bank's name, so that the family bank becomes a place capital sits rather than only a place capital moves through.

4.3 Underwriting: relationship context plus real-time cash flow

The family holds the best qualitative dataset in consumer credit and the worst quantitative one. A parent knows, with a confidence no model can match, whether their child finishes what they start, whether they are honest under pressure, and whether their current situation is a phase or a pattern. What a parent does not know is whether that child can actually carry \$1,850 a month, what obligations already sit against their income, or how volatile their deposits have been over the past eighteen months. Soft information answers the character question. It does not answer the capacity question, and family lending fails on capacity far more often than on character.

Two developments make it possible to supply the missing layer without giving up the advantage of the first.

Open banking supplies verified capacity data. Consumer-permissioned access to deposit and card account data produces a direct view of income, income volatility, existing debt service, recurring obligations, and expense floor. The regulatory position in the United States is unsettled and should be stated plainly: the CFPB finalized its Personal Financial Data Rights rule under Section 1033 of the Dodd-Frank Act in October 2024, but the rule was challenged, a federal court enjoined enforcement, and the Bureau is engaged in a reconsideration rulemaking, with a revised proposal submitted for review in August 2026 ^[49]^[50]. The first compliance deadline of April 1, 2026 passed without becoming a binding trigger ^[50]. What this affects is the cost, standardization, and legal certainty of access, not its existence. Permissioned data access operates today through commercial aggregator agreements and industry API standards, and it will continue to whatever the

rule's final shape. We would rather build on a capability that exists commercially than on a deadline that has already moved twice.

Cash-flow data is empirically strongest exactly where family lending concentrates. FinRegLab's independent analysis, conducted with Charles River Associates across data from multiple non-bank providers, found cash-flow variables predictive of credit risk across diverse populations and products, and found that cash-flow data frequently improved risk discrimination among borrowers whom traditional scoring rated as presenting similar default risk ^[51]. Its 2025 study comparing modeling approaches found that the machine learning model combining credit bureau data with cash flow data was the most predictive overall and across all subgroups, with the strongest models increasing approvals by roughly 4% at mainstream risk cutoffs while reducing approvals among consumers who went on to struggle ^[52]. Parallel work on small business lending found the gains largest for low-score owners whose businesses were less than five years old ^[52].

That pattern is the family lending population almost exactly. Intra-family borrowers skew young, thin-file, self-employed, or recently transitioned, which is precisely the segment where bureau data carries least signal and cash-flow data carries most. Roughly 32 million American adults are invisible or unscorable to the bureaus ^[35], and a meaningful share of them have a parent who would lend to them today if they could size the loan responsibly.

What the AI layer actually does. It is a translation and structuring layer, not a decision oracle, and the distinction matters for both safety and credibility. Its functions are:

- **Structuring.** Convert an amount and a purpose into a specific instrument: principal, correct AFR by term, amortization schedule, and a payment sized to observed cash flow volatility rather than to a static debt-to-income ratio.
- **Continuous underwriting.** A family loan is a ten to thirty year relationship, not a point-in-time decision. Ongoing permissioned data allows deterioration to be detected before it becomes a missed payment, and a restructure to be proposed before a delinquency exists to be embarrassed about.
- **Compliance checking.** Select the correct AFR by term at origination, generate a §7872-compliant note, flag when a proposed forgiveness crosses the annual exclusion, and flag structures that invite recharacterization as a gift.
- **Depersonalizing the decision.** This is the most underrated function. The single most damaging moment in family lending is a parent telling a child what they can and cannot afford. Moving that determination into a system, with a transparent basis the borrower can inspect, removes the parent from the role of judge. The relational argument in §3.3 and the underwriting argument here are the same argument viewed from two sides.

The three-layer thesis. Underwriting quality is a function of what you can observe. A commercial lender has hard data and no soft information. A family has soft information and no hard data. Neither has the structuring capability to convert observation into a priced, documented, serviceable instrument. Combining decades of direct observation, real-time permissioned cash flow, and a structuring layer produces an underwriting position that neither a bank nor a family can reach alone. We believe this is the strongest defensible claim in the product, and it is testable against realized loss rates.

Limits and design commitments. Three, stated as constraints we hold ourselves to rather than as risks to be managed later.

First, **privacy inside the family is a first-order concern, not an afterthought.** Handing a parent a live feed of an adult child's transactions would create exactly the surveillance dynamic the product exists to prevent, and would do more relational damage than the awkward conversation it replaces. The design commitment is that the borrower permissions the data, the model consumes it, and the lender receives a decision, an affordability range, and a risk indicator, never a transaction ledger.

Second, **fair lending obligations attach the moment this becomes a decisioning system used at scale.** Adverse action requirements under ECOA and Regulation B, model explainability, and disparate impact testing are design requirements from the first version, not a compliance retrofit. FinRegLab's own follow-on work with banks under the OCC's Project REACH addresses precisely the governance question of how machine learning underwriting models should be managed ^[52], and that literature is the standard we intend to be measured against.

Third, **the model recommends and the charter decides.** Cash-flow data lags, can be gamed, and misreads irregular income. AI output should enter a human governance process defined in advance by the family's own rules, not execute an approval. An automated lender inside a family would reproduce the impersonality that made commercial credit unsatisfying in the first place.

4.4 The sequence, and why lending comes first

The maturity path is: **Lend → Ledger → Account → Debit → Credit.**

Lending first, because it is the only entry point that is simultaneously (a) already happening at enormous volume, (b) high-stakes enough to justify adopting software, (c) legally structured but under-served, and (d) generative of the data required for every subsequent product. A family bank that has serviced eighteen months of intra-family loans has an underwriting history, a payment history, a governance record, and a compliance file. Those are the raw materials for issuing an account. Nothing about the sequence can run in reverse. A debit card in a family's name with no lending history underneath it is a novelty product.

We are explicit that this sequence takes years and that the later stages carry regulatory dependencies discussed in §4.6.

4.5 Distribution: why RIAs are the right channel

A micro-bank per family requires a chartering authority, some entity that assesses whether a family is ready, helps structure the governance, sees the whole balance sheet, and carries fiduciary responsibility for the outcome. In the United States, that entity already exists and is already regulated: the Registered Investment Advisor.

The channel is at record scale. The number of SEC-registered advisers reached 16,544 at the end of 2025, an increase of 674 firms or 4.2% over 2024, with client counts, employees, and assets all at record highs ^[39]. (Aggregate reported regulatory AUM figures for the channel run into the hundreds of trillions but include substantial double-counting across advisers and sub-advisers, and should be treated as a measure of channel breadth rather than of distinct assets.) Most SEC-registered advisers are small businesses ^[40], which is to say, the distribution channel for a decentralization thesis is itself decentralized.

Four properties make RIAs the correct partner:

1. **Fiduciary standard.** An RIA is legally obligated to act in the client's interest. Intra-family lending structured correctly is frequently the highest-return, lowest-risk capital deployment available to a client family. The advisor has an affirmative reason to raise it.
2. **Balance sheet visibility.** The advisor already knows what the parents hold, what liquidity exists, and what the estate plan says. No other party in the family's life has that view.
3. **Existing trust at the moment of decision.** Family lending conversations happen adjacent to estate planning, gifting strategy, and liquidity events, conversations the advisor is already in the room for.
4. **Retention economics.** Advisors face a well-documented attrition problem at the generational handoff, losing assets when the primary client dies and no relationship exists with the heirs. A family bank creates a structural, product-level relationship with the next generation *before* the transfer, not after.

The RIA does not become the lender. The family does. The RIA becomes something closer to a chartering and supervisory body, the entity that helps constitute the institution and holds it to a standard.

4.6 What we are not claiming

Three limits on the thesis, stated plainly, because a white paper that omits them is marketing.

This is not a charter play. Pari does not intend to become a bank, and the account and card stages of the roadmap depend on partnership with chartered institutions under a banking-as-a-service structure. That structure carries real, demonstrated risk. The 2024 collapse of the middleware provider Synapse stranded roughly 100,000 consumers and left substantial customer funds unreconciled across partner banks ^[41]^[42]. Regulators responded with enforcement actions against sponsor banks, a proposed FDIC recordkeeping rule requiring daily reconciliation and identification of beneficial owners in custodial accounts ^[42], and a supervisory posture holding that a fintech cannot outsource regulatory credibility to its sponsor bank ^[43]. Concentration risk in the sponsor relationship is real. Blue Ridge Bank's 2024 exit from BaaS displaced roughly 70 fintech partners ^[44].

We regard these as design constraints rather than objections. They imply a specific architecture: real reconciliation rather than pooled ledger abstraction, a mature BSA/AML program owned in-house rather than assumed from the partner, and multi-bank redundancy over time. They also imply that the lending and servicing stages of the roadmap, which do not require deposit-taking, must stand on their own economics, which is how Pari is built.

This does not replace banks. Chartered institutions will continue to perform maturity transformation, deposit insurance, and systemic liquidity provision. The claim is additive: that a large volume of credit currently either not extended, or extended badly and invisibly, can be extended well and recorded properly.

This does not solve credit access for people without family capital. See §5.2. It is the most serious objection to the thesis and it deserves a direct answer rather than a deflection.

4.7 The measurable claim

The reason we believe this is decentralization in a way crypto was not is that it is countable.

In 1984 the United States had 14,496 institutions capable of taking deposits and originating credit. Today it has roughly 4,336, and adds fewer than ten per year ^[18]^[20]. Every dollar and every developer-hour spent on ledger decentralization over the past fifteen years moved that number by zero.

A family bank is a new balance sheet, with its own governance, its own underwriting policy, its own capital, and its own credit relationships, legally distinct, independently directed, and not a branch of anything. It does not require a charter to lend to its own members, which is precisely why it can scale to a number that chartered institutions cannot.

If the thesis is right, the count of credit-originating balance sheets in the United States rises from roughly four thousand to something in the millions. That is the metric. It is unambiguous, it is auditable, and it is the one

that actually corresponds to what people meant when they said they wanted finance decentralized.

Part V. Objections and Responses

A thesis worth funding is a thesis worth attacking. The strongest arguments against this paper are set out below, with our responses, and in two cases with a concession.

5.1 "Crypto has not failed. Stablecoins won, and that is the real product."

This is the strongest defense of crypto and it is substantially correct on its own terms. Stablecoins settle enormous volume, provide dollar access in economies where dollar access is otherwise costly or prohibited, and have become genuine payments infrastructure.

But it concedes the argument of this paper rather than rebutting it. Fiat-backed stablecoins represent roughly 92% of stablecoin market capitalization ^[45]; Tether alone holds approximately 59% of the stablecoin market, and Tether and USDC together account for about 93% of total stablecoin capitalization ^[46]. These are centralized liabilities of private issuers holding reserves in Treasuries, with contractual freeze and blacklist authority written into the token contracts. Between 2023 and 2025, Tether blacklisted 7,268 addresses and froze approximately \$3.29 billion, while Circle blacklisted 372 addresses and froze roughly \$109 million ^[47]. In April 2026, Tether coordinated with OFAC to freeze approximately \$344 million in a single action ^[48].

Whatever one's view of the merits of those actions, and many were plainly appropriate law-enforcement cooperation, this is not a decentralized monetary system. It is a private, dollar-denominated payments network with unilateral asset-seizure capability broader than that of most commercial banks, which typically require legal process. Crypto's most successful product is the one that most thoroughly abandoned crypto's founding premise.

5.2 "Family banks entrench inequality. You are building infrastructure for the already-wealthy."

This objection is partly correct and we concede it. Family capital is unequally distributed. Cerulli projects that 2% of households will transfer more than half of the \$124 trillion in play ^[30]. Formalizing intra-family lending will, in the near term, disproportionately benefit families that have capital to lend. Pari's initial distribution through RIAs serving high-net-worth households makes this more true, not less, for the first phase of the company.

Three responses, offered as mitigation rather than refutation:

First, the inequality exists whether or not the infrastructure exists. Wealthy families are already lending to their children, undocumented, unpriced, and unreported. Formalization does not create the advantage; it makes it visible, legally sound, and taxable at the correct basis. There is a reasonable argument that an unmeasured wealth transfer system is worse for equity than a measured one.

Second, the credit-reporting layer is redistributive in effect even when the capital is not. The Mission Asset Fund evidence is drawn from low-income immigrant communities with no capital and no credit files, and the mechanism that produced 168-point score improvements ^[37] was documentation and reporting, not capital. That mechanism is portable to any pooled lending group (extended family, church, mutual aid network, fraternal organization) and does not require wealth to function. We regard extension into non-affluent structures as an obligation of the thesis, not an afterthought.

Third, the counterfactual for a young borrower without family capital is not "an equal playing field." It is 24%+ credit card APR. Reducing the cost of capital for the households that can access family lending does not worsen that borrower's position; expanding the definition of who can form a lending pool might improve it.

We do not claim this objection is fully answered. We claim it is answerable and that the work is ours to do.

5.3 "This is a fintech with a good story. Calling it decentralization is rhetoric."

The test is whether the definition offered in this paper is doing analytical work or just relabeling. We would argue it is doing work, because it is falsifiable in a way the crypto definition was not: count the independent credit-originating balance sheets before and after. If that number does not rise, the thesis is wrong.

The fair version of this objection is different and sharper: Pari is a central point of failure. Every family bank runs on one company's software, one company's compliance program, and one company's sponsor bank relationships. If Pari fails, do the family banks fail?

The honest answer is that this is a real architectural risk, and the mitigation is that the *institution* must be more durable than the software. A family bank whose charter, notes, and payment history exist as portable legal artifacts survives its vendor. A family bank that exists only as rows in a proprietary database does not. Data portability, exportable legal documents, and non-exclusive servicing are design requirements, not features, and we would hold the thesis to that standard.

5.4 "Money destroys families. You are industrializing a known relationship hazard."

The premise is right and the conclusion is backwards. Family lending damages relationships today *because* it is unstructured: no schedule, no documentation, no defined delinquency process, and a lender who must personally chase repayment from someone they love.

Every one of those failure modes is an absence of infrastructure. An amortization schedule removes ambiguity about what is owed. Automated servicing removes the parent from the collections role. A written charter converts an emotional negotiation into a policy question decided in advance. A defined forgiveness path makes generosity deliberate rather than a slow surrender.

Mission Asset Fund's ~99% repayment rate ^[36] is evidence that socially-embedded lending performs extremely well *when structured*. The structure is the safeguard.

5.5 "Advisors will not sell this. It does not generate AUM."

This is the most serious commercial objection, and it is an empirical question rather than a philosophical one. Intra-family lending can reduce AUM in the short run, since capital lent is capital not managed.

The counter-argument is that it converts a single-generation relationship into a multi-generational one at the precise moment when advisors most commonly lose assets, and that firms are already prioritizing generational engagement for exactly this reason. But we would not ask a reader to accept this on argument alone. Pari's LOI conversion and RIA retention data is the relevant evidence, and it should be evaluated on results.

5.6 "Regulators will not permit families to issue cards."

Correct today, and the roadmap accounts for it. Nothing in the near-term product requires a family to be a bank: intra-family lending, documentation, servicing, and credit furnishing are all activities performed by non-

depository entities under existing law. The account and card stages depend on the sponsor-bank framework and on a mature compliance program, with the constraints described in §4.6. We would rather state the sequence honestly than claim a regulatory path that does not exist yet.

Part VI. How the Thesis Should Be Measured

We propose that this argument be judged against metrics, not narrative. Four candidates:

1. **Credit-originating balance sheet count.** The number of distinct, independently governed entities originating documented, serviced, reported credit. Baseline: ~4,336 FDIC-insured institutions ^[18]. This is the primary metric.
2. **Formalization rate.** The share of intra-family lending that is documented at or above AFR, serviced on a schedule, and reported to bureaus. Baseline: effectively zero, since no infrastructure exists to measure it.
3. **File creation.** The number of previously unscored or credit-invisible individuals who obtain a scoreable file through family-originated credit. Baseline population: roughly 32 million American adults who are invisible or unscorable ^[35]. Benchmark for effect size: the 168-point average improvement observed in formalized lending circles ^[37].
4. **Cost-of-capital delta.** The spread between what a household member pays a family bank at AFR (3.85% to 4.87% depending on term as of June 2026 ^[33]) versus the commercial alternative available to them. This is the direct welfare transfer created by the infrastructure.

If these numbers move, the thesis is right. If they do not, it is not, and no amount of framing should rescue it.

Conclusion

The decentralization movement was correct in its diagnosis and wrong in its target. Financial power *is* excessively concentrated; the number of institutions permitted to make credit decisions *has* collapsed; ordinary people *are* subject to the terms of a shrinking set of very large balance sheets. All of that is true, and it is worth a generation of effort to change.

But the concentration does not live in the currency. It lives in the charter. It lives in the small number of entities that may pool capital, assess risk, extend credit, and record who repaid. Replacing the dollar with a token, and the ledger with a chain, left every one of those entities exactly where it was, and over the same period, their number was cut by more than half.

The enthusiasm for the public ledger was understandable. It was a beautiful piece of engineering that solved a real problem. But it answered *who keeps the record* when the binding question was always *who is allowed to decide*, and the distance between those two questions is the distance between fifteen years of effort and a financial system that did not decentralize.

The oldest bank in the world has been operating this entire time. It has more borrowers than any institution on earth, better information than any underwriting model, and stronger enforcement than any smart contract. It has never had a charter, a ledger, a servicing system, or a single line of software. It runs on trust, memory, and goodwill, and it fails routinely for want of the most basic institutional apparatus.

Pari is building the operating system for the bank of mom and dad. Not because family lending is a niche worth digitizing, but because the family is the only institution in the financial system that is already decentralized, and giving it an operating system is the shortest path from four thousand credit-issuing balance sheets to four million.

Decentralization was never going to arrive through the currency. It arrives one family bank at a time.

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Note on Method and Limitations

This paper argues a position and should be read as such. Three limitations are worth stating explicitly.

First, several secondary sources are used for statistics that originate with primary institutions (FDIC, Cerulli, IAA, World Bank). Where a claim is load-bearing for the argument (the bank count, the de novo rate, the Findex borrowing split, the wealth transfer projection) readers should verify against the primary source before relying on it.

Second, some figures reflect single-vendor or single-snapshot measurements. Mining pool shares, staking concentration, and stablecoin market shares all move; the June 2026 snapshots cited here document a condition, not a constant.

Third, the central empirical claim of Part IV, that formalizing intra-family lending produces measurably better outcomes for families at scale, rests on analogy to the Mission Asset Fund evidence rather than on direct evidence from the intra-family context, which does not yet exist. Generating that evidence is the work.

Pari, pariapp.com

Research, thesis, and argument by Yoshi Mua.

Drafting assistance by Claude (Anthropic).

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