

SOVARA

INSTITUTIONAL CAPITAL. REAL-WORLD ASSETS. BLOCKCHAIN INFRASTRUCTURE.

Finance that reaches the real economy

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About this document

This white paper is published by Sovara for informational and educational purposes. It is intended for a broad audience: institutional investors, development finance practitioners, supply chain finance professionals, and anyone seeking to understand how blockchain-based financial infrastructure is changing the economics of lending in emerging markets.

The paper explains the structural problem and why productive businesses in emerging markets remain chronically underfunded despite abundant institutional capital. It describes the technology that makes a different approach possible, and sets out where that technology is being applied first. It does not make a specific investment case. That case is made separately.

For investors and development finance professionals interested in understanding the investment opportunity, you may request a copy of the Investment Memorandum by email on investor@sovarausd.com.

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EXECUTIVE SUMMARY

1. The infrastructure gap in global finance

The shortage of affordable capital for productive businesses in emerging markets is one of the most consequential and persistent failures of the global financial system. It is not caused by a lack of willing lenders or a shortage of money. The International Finance Corporation (IFC) estimated the credit gap for micro, small, and medium enterprises (MSMEs) in emerging and developing markets at approximately \$5.7 trillion in its March 2025 report, based on 2019 data. When the same methodology is extended to current GDP projections and includes informal sector participants, who represent a significant share of productive business activity in frontier markets, the estimated gap grows to \$12.6 trillion annually. The gap has grown, not closed.

The IFC's analysis identifies the root cause plainly: not a shortage of capital, but a failure of the financial infrastructure that connects capital to borrowers. Intermediary chains inflate perceived risk. Collateral requirements exclude productive businesses with no fixed assets. Point-in-time credit assessments cannot capture the operational reality of businesses whose value is embedded in supply chains rather than balance sheets.

Sovara is building the infrastructure that addresses these failures directly. This paper explains the problem, describes how a new class of financial technology makes a different approach possible, and sets out where that technology is being applied first.

Three innovations. One integrated platform.

The platform rests on three interlocking capabilities. First, oracle-fed supply chain data functions as dynamic, continuously updated collateral, replacing the static document-heavy assessments of traditional lenders. Second, smart contracts enable continuous monitoring and automated execution across the loan lifecycle, removing the manual credit committee delays that make traditional finance ill-suited to seasonal and supply chain-linked businesses. Third, a stablecoin settlement layer allows businesses to access US dollar (USD) capital and repay in local currency without bearing foreign exchange (FX) risk, removing the single largest barrier to international capital access for frontier market borrowers.

None of these capabilities is entirely new. What is new is their integration into a single permissioned infrastructure purpose-built for institutional-grade direct-to-business lending in emerging markets.

\$12.6T Annual MSME finance gap globally (2025 est.)	29% Finance gap as share of GDP in developing countries	5x Growth in on-chain RWA market, 2022 to mid-2025 (WEF, 2025)	96% Cost reduction in blockchain cross-border settlement vs. traditional rails (WEF, 2026)
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THE PROBLEM

2. An information problem, not a money problem

The finance gap in emerging markets has a structural cause that is well understood in the academic and policy literature but poorly addressed by the financial infrastructure that has evolved to serve it. The cause is information asymmetry: the systematic inability of lenders to assess the credit quality of productive businesses that do not generate the kinds of data that traditional lending systems are built to read.

The seminal work of Stiglitz and Weiss (1981) established that when lenders cannot distinguish between high-risk and low-risk borrowers, they respond by raising interest rates across the board and rationing credit. The result is that creditworthy businesses are denied finance or priced out of it; not because they are genuinely high risk, but because the lender has no mechanism to verify that they are not. Decades of subsequent research, including the International Monetary Fund's (IMF) 2024 analysis of financing barriers across multiple emerging market jurisdictions, has confirmed this dynamic as the primary driver of the gap.

The gap between institutional capital and productive businesses is not a shortage of money. It is a failure of the systems that assess, verify, and price credit risk across the distance between them.

2.1 Quantifying the gap

In March 2025, the IFC published its first updated MSME finance gap estimate since 2017. Using 2019 gross domestic product (GDP) data, the most recent year for which comprehensive enterprise survey data was available, the report estimates the credit gap in emerging and developing markets at approximately \$5.7 trillion. The IFC notes this figure covers formal-sector businesses only and applies conservative assumptions about informal sector participation.

Applying the IFC's own methodology to current GDP projections, and incorporating the informal sector on the basis that a significant share of productive business activity in frontier markets falls outside formal registration, produces an estimate of \$12.6 trillion annually. This figure reflects economic growth in emerging markets over the intervening years, expanded definitions of productive businesses, and the documented post-pandemic contraction of credit access in frontier economies. The IFC's 2025 report itself notes that improved data coverage would likely produce higher estimates.

Regionally, sub-Saharan Africa accounts for over \$330 billion of the gap annually. Latin America adds approximately \$1.8 trillion. East Asia and the Pacific, driven largely by the scale of China's informal sector and the trade-finance intensity of manufacturing-oriented supply chains, accounts for approximately \$7.3 trillion. These are not theoretical shortfalls. They represent businesses that cannot purchase inputs, expand operations, or bridge the gap between productive activity and payment receipt.

2.2 Why collateral requirements exclude the most productive borrowers

Traditional lending systems require fixed asset collateral: property, equipment, audited financial statements, and a credit history that is legible to a formal banking system. In emerging markets, the most productive businesses frequently do not hold the assets that qualify as collateral under traditional standards. An agricultural operator sitting on a crop inventory worth several hundred thousand dollars, with satellite-confirmed planting progress and documented input purchases, fails a conventional bank's collateral screen because none of those assets appear on the approved list. A mining cooperative with confirmed commodity deliveries to an investment-grade buyer fails because the receivable against that buyer is not on the list either.

A 2024 study published in Cogent Economics and Finance confirmed that smaller businesses exhibit a higher level of information asymmetry than larger corporations, making it more difficult to access formal capital precisely because they face challenges in conveying their actual standing to lenders. The assets that demonstrate creditworthiness for e.g., supply chain performance, operational throughput, verified buyer relationships, are invisible to the systems lenders use to make decisions.

2.3 The intermediary chain and its cost

Capital does not travel directly from institutional source to productive business. It flows through a chain: development finance institutions (DFIs) to wholesale lenders, wholesale lenders to correspondent banks, correspondent banks to local commercial banks, local banks to the borrower. Each entity in the chain adds a margin. Each applies its own risk assessment to a business it has never directly evaluated. Each slows the process.

The result is a cost of capital to the end borrower that is almost entirely disconnected from the actual risk of the underlying asset. By the time institutional capital reaches a frontier market borrower, the effective rate is typically 3 to 5 times the cost of the original capital. None of the intermediate steps added credit quality to the transaction. They only added cost.

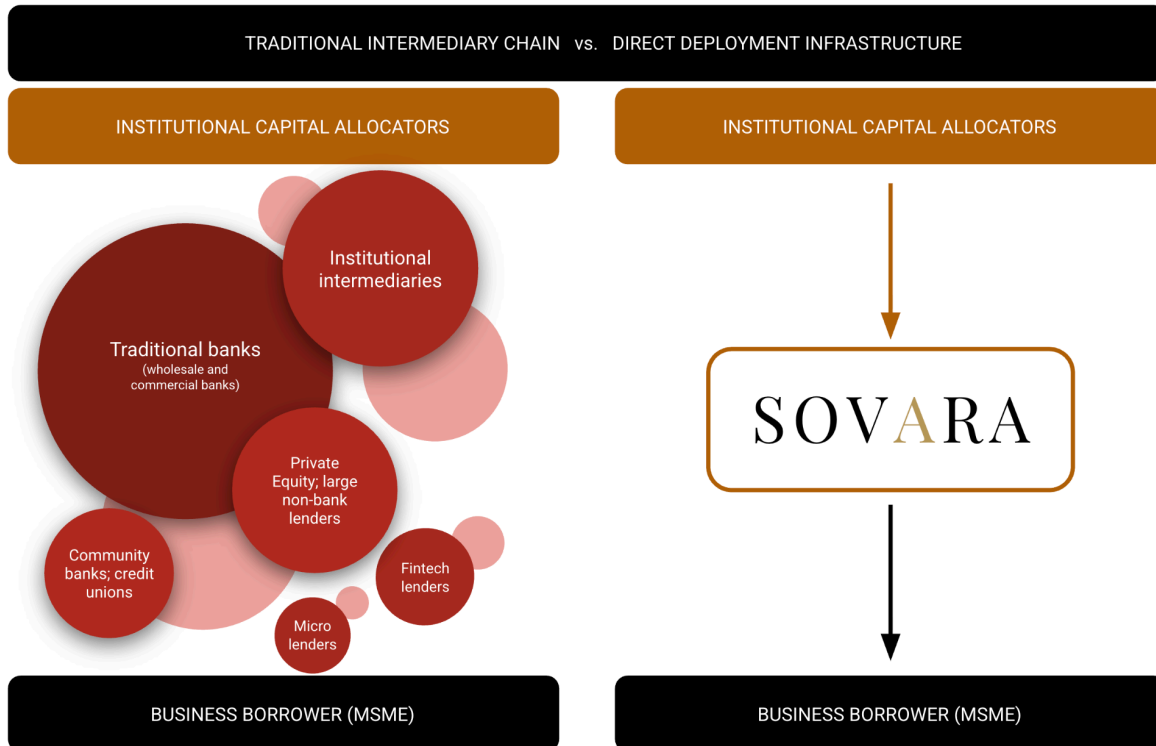


Figure 1: The traditional intermediary lending chain versus direct deployment infrastructure. Each intermediary layer extracts margin without adding credit quality to the underlying transaction.

2.4 Why fintech improved access but not affordability

The fintech lending wave of the past decade made genuine progress on one half of the problem. Mobile-first underwriting, digital disbursement, and alternative data scoring extended credit to segments of the business lending market that traditional banks had never served. The IFC's September 2025 MSME Banking in the Digital Era handbook documents this shift: fintech lenders reduced origination time, lowered transaction costs, and served businesses that formal banks would not.

But fintech largely did not restructure the intermediary economics. Capital still flowed through the same chain. The International Committee on Credit Reporting's (ICCR) 2024 report on alternative data in credit risk assessment notes that while alternative data has improved access, the cost of capital for underserved businesses has not fallen proportionally, because the data improvements have been applied within an intermediary structure whose margin extraction is largely unchanged.

The deeper limitation is that fintech's alternative data approach relied on proxies such as mobile money transaction history, social data, and e-commerce behavioural signals that are useful for

consumer micro-credit decisions but inadequate for the working capital needs of a sizeable agricultural operation or a mining cooperative with a large institutional offtake agreement. Serving those businesses requires data specific to their productive activity, not approximations derived from adjacent digital behaviour.

2.5 The foreign exchange barrier

For businesses in frontier markets, accessing international capital involves more than interest rate risk. Foreign exchange volatility adds a cost layer that, in many markets, makes USD-denominated borrowing economically impractical regardless of the headline rate.

A business borrowing in US dollars and generating revenue in a frontier currency carries full FX risk for the duration of the loan. Hedging instruments exist in some markets but are expensive, operationally complex, and frequently inaccessible to the smaller borrower. Standard Chartered's 2025 analysis of stablecoins in emerging markets documents that demand for USD-pegged instruments in high-inflation economies is driven primarily by the desire for monetary stability: businesses want access to the world's reserve currency but cannot afford to carry the risk of holding it unhedged.

The result is that the deepest and most liquid pools of institutional capital including USD-denominated funds managed from New York, London, and Singapore, are effectively unavailable to the businesses most in need of them. The FX barrier is not a technical problem that finance has chosen not to solve. It is a problem that, until recently, there was no efficient mechanism to address at scale.

2.6 Where the research says intervention has the most impact

Kingson's analysis of the finance gap, drawing on IFC, World Bank, and Asian Development Bank (ADB) data, identifies supply chain finance (SCF) as the highest-impact category for closing the gap: SCF products could address 15 to 25% of the global gap if barriers to verifiable data and platform adoption are reduced. This finding is consistent with the broader literature. The IFC Supply Chain Finance Knowledge Guide and the Alliance for Financial Inclusion's May 2025 analysis of digital public infrastructure both identify SCF as the category where technology-enabled intervention has the clearest path to scale.

The reason is structural. SCF is uniquely positioned to benefit from verifiable data because supply chains generate it continuously as a matter of course. The same operational activity that creates the need for working capital like planting a crop, extracting a mineral, delivering a commodity, also generates the documentation that can verify the business's performance. The challenge has always been capturing that documentation in a form that is tamper-resistant, standardised, and legible to a lender. That is precisely what blockchain-based oracle infrastructure makes possible.

3. How the technology works

Three distinct but interdependent technologies make direct-to-business lending at institutional standards viable in markets where it was not previously possible: oracle-fed supply chain data as a dynamic credit layer, smart contract execution as a replacement for manual credit committee processes, and stablecoin settlement as a solution to the foreign exchange barrier. Each has a substantial and growing body of academic and institutional research behind it. This section explains how each works and why the combination changes the economics of emerging market lending.

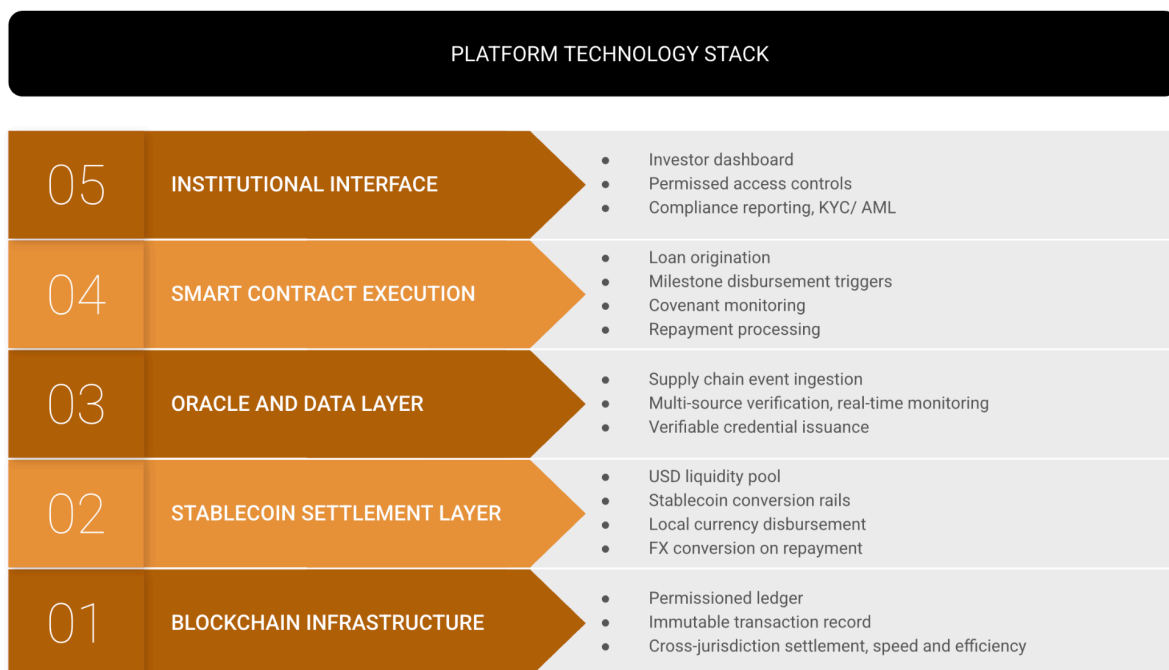


Figure 2: The platform technology stack. Each layer serves a distinct function. The oracle and data layer bridges real-world supply chain events to on-chain smart contract execution. The stablecoin settlement layer handles USD-to-local currency conversion invisibly for both borrower and investor.

3.1 On-chain data as a credit proxy: the theoretical basis

The core insight behind using supply chain data as credit collateral is that operational performance is a better predictor of repayment capacity than static asset ownership but only if the operational data is verifiable. The challenge that has historically prevented supply chain data from functioning as credit collateral is not its evidential value. It is its integrity: paper-based supply chain documents are fragmented, inconsistently formatted, and straightforward to falsify.

The academic literature has converged on blockchain as the mechanism that resolves this. A 2025 peer-reviewed paper on credit risk prevention in blockchain-driven SCF systems found that on-chain data enables smart contracts to optimize the credit execution and supervision process, playing a key role in preventing and controlling credit risks. The mechanism is the immutability property of blockchain records: once a supply chain event is verified and recorded on-chain, it cannot be altered without invalidating the cryptographic signature that confirms it.

Queensland University of Technology's 2022 analysis of blockchain smart contracts for SCF identified the mechanism more precisely: digital assets representing supply chain positions like warehouse receipts, delivery confirmations, and inventory records function as collateral equivalents because their on-chain representation is verifiable by any party with access to the ledger, without requiring a trusted third-party intermediary to authenticate them.

The November 2024 bibliometric review in Administrative Sciences, covering 446 articles on blockchain-enabled SCF published across ScienceDirect and Scopus, documented the rapid maturation of this field: the consensus finding across the literature is that blockchain addresses the information asymmetry problem in supply chain lending by creating a shared, immutable record that all parties can trust without trusting each other.

What verifiable supply chain data captures that traditional data cannot

Traditional credit data	Oracle-fed supply chain data
Balance sheet: annual, audited, and backward-looking	Satellite crop health indices: continuous, forward-indicating, tamper-resistant
Property title: static, illiquid, requires third-party valuation	Warehouse receipt on-chain: continuously verified, commodity-priced in real time
Bank statement as cashflow evidence: periodic, bank-dependent	Logistics tracking milestones: event-driven, multi-source verified
Credit bureau score: thin or absent for frontier market businesses	Delivery confirmation against named institutional buyer: receivable quality anchored to the buyer, not the business
Annual covenant tests: identify problems weeks after they arise	Continuous oracle monitoring: anomalies flagged in real time, intervention possible before breach

3.2 Smart contracts: replacing the credit committee for routine decisions

A smart contract is a self-executing programme stored on a blockchain that carries out defined actions when specified conditions are verified. The Federal Reserve Bank of St. Louis's 2021 analysis of blockchain-based financial markets described smart contracts as the mechanism that allows financial services to operate in an open, interoperable, and programmable way, removing the need for discretionary human intervention in decisions that can be governed by verifiable rules.

In a lending context, the manual credit committee process, which can introduce 4 to 6 week delays between a business's request for a drawdown and its receipt of funds, exists because each disbursement decision requires a human review of current conditions. If those conditions can be captured by verifiable on-chain data, and if the disbursement rules can be encoded in a smart contract, the human review step becomes unnecessary for routine decisions that fall within pre-approved parameters.

For agricultural finance, where the timing of capital access relative to agronomic cycles has measurable consequences for yield, a 4 to 6 week delay on a fertiliser drawdown is not an administrative inconvenience. It is a yield loss. Smart contract-governed milestone disbursement which releases capital automatically when satellite data confirms planting has occurred, or when a warehouse receipt confirms produce has been deposited, restores the temporal alignment between capital need and capital access.

The 2024 paper on decentralised finance (DeFi) integration in SCF published in *Frontiers* describes this shift as moving from sequential to simultaneous processing: traditional finance executes compliance, risk assessment, and disbursement as sequential steps, each requiring the previous to complete. Smart contracts execute them simultaneously against verified on-chain data, compressing the process from weeks to hours.

Smart contracts do not replace credit judgment. They automate the execution of credit decisions that have already been made thereby releasing capital when verified conditions are met, without requiring human intervention for each routine event.

3.3 The stablecoin settlement layer: solving the FX barrier

The emergence of regulated, USD-pegged stablecoins as settlement infrastructure represents the most significant recent development in the practical feasibility of cross-border emerging market lending. Stablecoins provide a mechanism for moving USD value across borders in near real time, at a fraction of the cost of correspondent banking, without requiring either party to navigate complex international banking relationships.

The institutional momentum behind this shift has accelerated materially. The EY-Parthenon survey of 350 financial institution and corporate executives, conducted in June 2025, found that 54 percent of non-users expected to adopt stablecoins within 6 to 12 months, and that most respondents project 5 to 10% of cross-border payments, representing \$2.1 to \$4.2 trillion annually by 2030, will be executed via stablecoin rails. The IMF's 2025 analysis of stablecoin cross-border flows confirms that stablecoin cross-border transactions have surpassed those of unbacked crypto assets and the gap has widened.

Fireblocks' 2025 survey of payments infrastructure found that B2B stablecoin payment volumes grew from under \$100 million per month in early 2023 to over \$6 billion per month by mid-2025. The World Economic Forum's (WEF) March 2026 analysis found that blockchain-based cross-border payments can settle in near real time at up to 96 percent lower cost than traditional correspondent banking routes. At that cost differential, the economics of extending USD capital to frontier market businesses changes fundamentally.

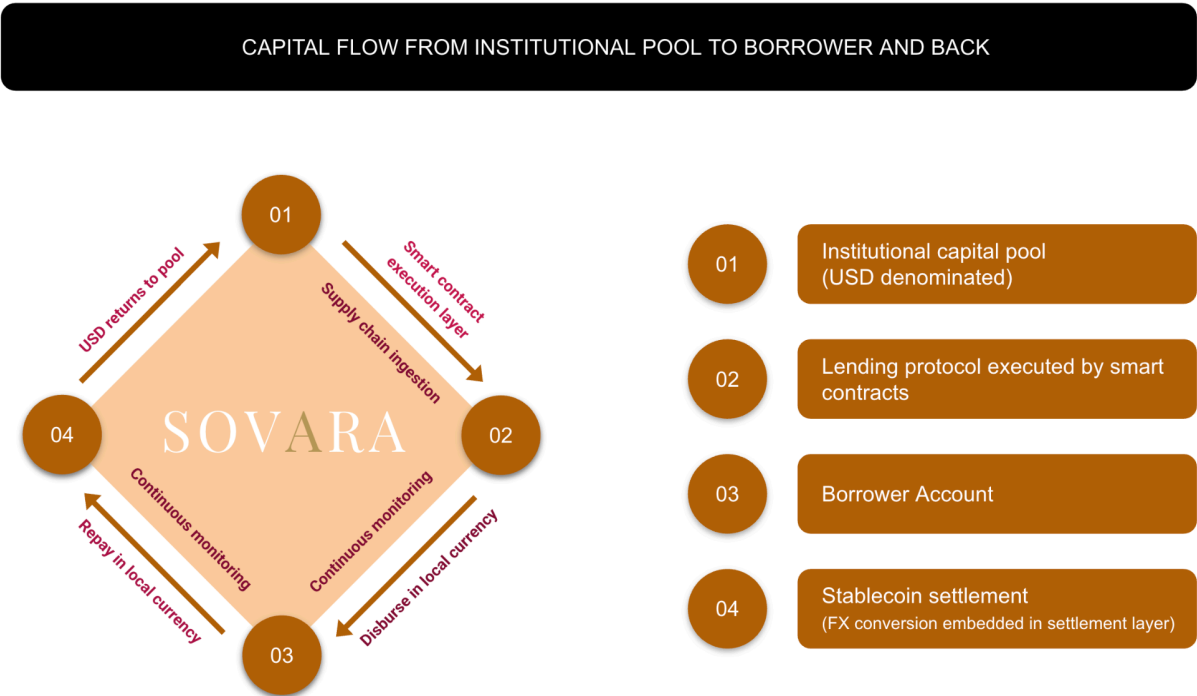


Figure 3: End-to-end capital flow from institutional pool to business borrower and back. The stablecoin settlement layer handles USD-to-local currency conversion at disbursement and the reverse at repayment. Both the investor and the borrower operate in their preferred currency throughout.

3.4 The convergence: why now

Each of these three technologies has existed in some form for several years. What has changed is their simultaneous maturation to a level of reliability and institutional acceptance that makes integrating them into a regulated lending product viable.

The IMF's April 2026 note on tokenised finance, authored by the director of the IMF's Monetary and Capital Markets Department, frames this maturation explicitly: tokenisation represents a structural shift in financial architecture rather than a marginal efficiency improvement, one that enables atomic settlement, continuous liquidity management, and embedded compliance in ways not previously achievable. The BIS Annual Economic Report 2025 reaches a similar conclusion, describing programmable financial infrastructure as the basis for a fundamentally different set of economic arrangements.

The WEF's January 2026 report on digital assets identifies the current period as one in which blockchain transitions from experimental applications to the foundations of new digital financial market infrastructure. Regulatory frameworks that were missing in earlier years including the Markets in Crypto-Assets Regulation (MiCA) in Europe, the GENIUS Act in the United States, Monetary Authority of Singapore (MAS) frameworks in Singapore, are now in place. The institutional infrastructure is following.

Aave's chief executive described their V4 architecture of their lending protocol in early 2026 as "completely modular, which means it can extend into new use cases and potentially lending against data." The reference to data-backed lending reflects growing institutional recognition that verifiable, oracle-fed supply chain data represents the next frontier in real-world asset (RWA) finance.

4. Where the technology applies first

Not all business lending contexts benefit equally from oracle-fed supply chain data. The technology has the highest impact where supply chain data is rich, continuous, and directly indicative of repayment capacity and where traditional collateral requirements have been the primary barrier to credit access. Two sectors meet these criteria most clearly at this stage of the technology's development: agricultural finance and mining and resources finance.

Both sectors are identified in Kingson's low-hanging fruit analysis as among the highest-impact categories for SCF-based intervention. Both generate the kinds of supply chain artefacts like origination certificates, warehouse receipts, assay certificates, offtake agreements, and delivery confirmations that function directly as on-chain verifiable credentials. And both have documented, substantial demand for working capital that existing financial infrastructure does not adequately serve.

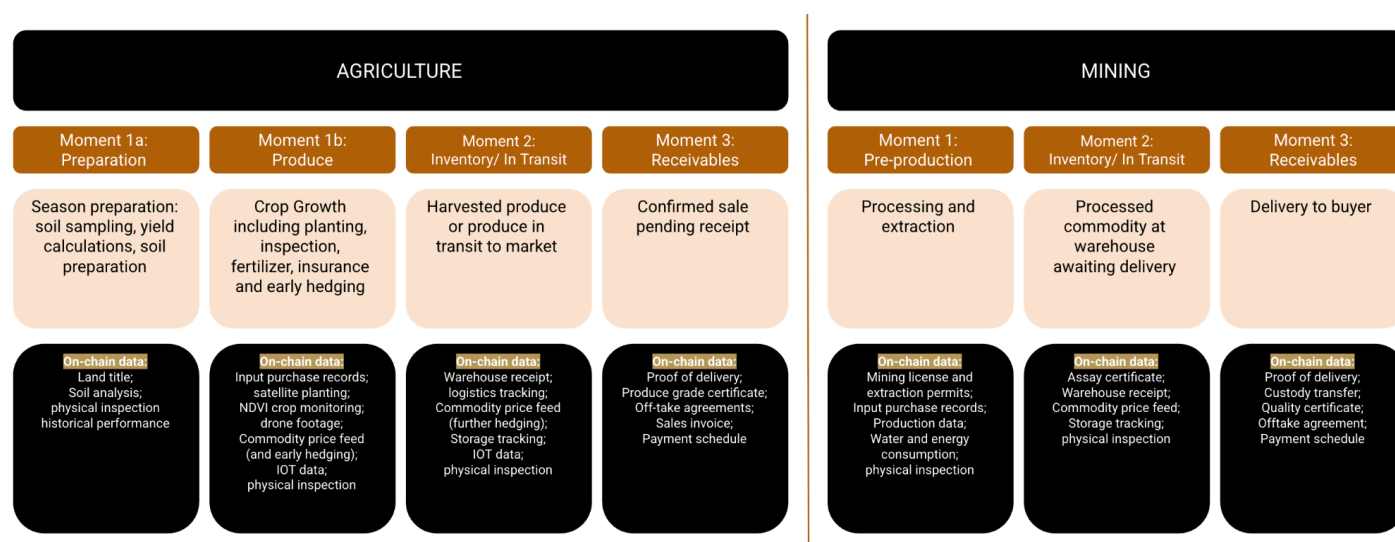


Figure 4: The Three Lending Moments framework applied across agricultural and mining supply chains. Each moment carries a distinct risk profile and a different on-chain data layer available to verify the credit position.

4.1 Agricultural finance

Agricultural businesses in emerging markets represent one of the most consistently undercapitalised productive asset classes in the global economy. The gap is not primarily a consequence of genuine credit risk. It is a consequence of the mismatch between how agricultural value is created, embedded in supply chains, seasonal, and difficult to express in balance sheet terms, and how traditional lenders are structured to assess it.

Research published in *Frontiers Blockchain* in January 2025 on blockchain oracles for agricultural insurance demonstrates the practical maturity of Internet of Things (IoT)-and-oracle-based agricultural data infrastructure: decentralised oracle networks fed by IoT sensors, satellite data, and weather feeds can now provide multi-source verified agricultural data that is tamper-resistant and continuously updated. This is precisely the data layer that supply chain finance for agriculture requires.

The three lending moments in agricultural supply chains

Lending moment	What it finances	Verifiable on-chain data anchor
Pre-production	Seasonal inputs: seed, fertiliser, chemicals, land preparation. Capital needed before the productive asset physically exists.	Land title, input purchase records, satellite planting confirmation, Normalised Difference Vegetation Index (NDVI) crop health index at intervals, weather data
In-transit and inventory	Harvested produce at aggregation point or in transit to market. Asset exists; revenue not yet realised.	Warehouse receipt, produce weight confirmation, logistics tracking milestones, storage condition IoT feeds, commodity price feed
Receivables	Confirmed sale pending payment. Produce delivered; settlement outstanding against a named buyer.	Proof of delivery, sale agreement, produce grade certification, payment schedule, buyer confirmation

Traditional bank financing for seasonal agricultural operations is structured around periodic drawdowns, each of which may require a return to the credit committee which can introduce delays of 4 to 6 weeks that can have direct consequences when input timing is agronomically critical. Smart contract disbursement releases capital when the on-chain data confirms the specified condition is met. The credit decision has already been made at origination; the execution is automated against verified milestones rather than scheduled intervals or committee approvals.

An integrated facility can also bundle crop insurance and price hedging into the structure. These products address the two most significant risks facing agricultural operators in emerging

markets: weather-related crop loss and commodity price volatility. The insurance policy and forward contract are recorded as on-chain verifiable credentials, integrated into the covenant monitoring layer, and transparently visible to investors.

4.2 Mining and resources finance

Small-scale and mid-scale mining operators in Africa, Latin America, and Southeast Asia routinely carry receivables against investment-grade counterparties that they cannot finance. The structure is straightforward: the operator has physically delivered verified commodity to a large named mining house or commodity trader; the buyer's obligation to pay is contractually confirmed in an offtake agreement; but the settlement window is 60 to 120 days. During that period, the operator has deployed its capital, delivered its product, and has no access to bridging finance.

The credit risk in this transaction does not sit with the mining operator. It sits with the named institutional buyer, whose credit quality is substantially higher. In a functioning financial infrastructure, the receivable against that buyer would be financeable at a rate reflecting the buyer's credit quality. In frontier markets, it typically cannot be financed at all.

The three lending moments in mining supply chains

Lending moment	What it finances	Verifiable on-chain data anchor
Processing and production	Working capital for extraction and processing operations. Raw material is being transformed into saleable commodities.	Input purchase records, extraction permit documentation, IoT production data, energy and water consumption records
Inventory and storage	Processed commodity at warehouse, awaiting a buyer. Asset exists and is independently verifiable.	Assay certificate (grade, weight, purity), warehouse receipt, commodity price feed, storage condition monitoring
Delivery to settlement	Physical commodity delivered to named buyer; payment pending. Credit risk sits with the buyer, not the operator.	Proof of delivery, custody transfer confirmation, offtake agreement terms, commodity price at delivery, payment milestone schedule

The delivery-to-settlement product is the highest-conviction first deployment in mining finance. The on-chain data layer including proof of delivery, custody confirmation, offtake agreement, and commodity price feed is sufficient to underwrite the transaction without requiring a full credit assessment of the mining operator. The credit decision is effectively an assessment of the buyer's creditworthiness, which is assessable from available data.

4.3 Scalability to additional verticals

Agriculture and mining are the first sectors for deployment because they meet the current criteria for oracle-fed supply chain lending most completely. The oracle and smart contract architecture developed for these two sectors is not sector-specific. Any supply chain-linked lending context where operational performance is continuously documented and where verifiable milestones can be defined as disbursement conditions is addressable with the same underlying infrastructure. Infrastructure finance, trade receivables, processor and aggregator working capital, and commodity trading finance are all candidates as the data and verification layer matures.

5. The landscape this infrastructure operates within

Understanding the market context for blockchain-based supply chain lending requires examining three dimensions: the scale of the financing need, the existing approaches that have attempted to address it and their limitations, and the macro environment that determines whether a new approach can attract the capital it needs to function.

5.1 The size and distribution of the gap

The IFC estimates that MSMEs account for 90% of businesses, over 70% of employment, and approximately 50% of GDP globally. In emerging markets and developing economies, 70% of these businesses lack adequate financing. The gap is not evenly distributed. East Asia and the Pacific accounts for the largest share, approximately \$7.3 trillion, driven by the scale of China's informal sector and the trade-finance intensity of manufacturing-oriented supply chains. Sub-Saharan Africa and Latin America together account for over \$2 trillion annually.

Within the gap, SCF represents the most accessible segment. Kingson's analysis estimates that SCF products could address 15 to 25% of the global gap if data and platform barriers are reduced. At \$12.6 trillion total, that represents a \$1.9 to \$3.2 trillion addressable segment for supply chain-linked lending alone.

\$12.6T Global finance gap (2025 est.)	\$1.9–3.2T Addressable via supply chain finance (Kingson, 2025)	\$24B Non-stablecoin RWA on-chain market, mid-2025 (WEF)	\$4.2T Projected stablecoin cross-border payment volume by 2030 (EY-Parthenon)
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5.2 The evolution of private credit and family office allocation

The macro environment for the kind of exposure this infrastructure creates has shifted materially over the past decade. Global private credit assets under management have grown from approximately \$500 billion in 2012 to over \$2 trillion by 2025, driven by institutional allocators

seeking yield, diversification, and uncorrelated exposure in an era of compressed returns in public markets.

Family offices have been among the fastest-growing allocators to private credit. The traditional private credit market is increasingly competitive at the large end — leveraged buyout financing, infrastructure debt, and investment-grade private placements are crowded with capital. This pressure is pushing sophisticated allocators toward differentiated exposure: emerging market supply chain credit, real-economy asset-backed lending, and impact-aligned private credit are exactly the categories where family offices and endowments are actively building positions.

The WEF's January 2026 review of finance in 2025 explicitly identifies asset tokenisation and private credit as the two categories where technology and institutional capital converged most consequentially during the year. The RWA market data supports this: the non-stablecoin on-chain RWA market grew from approximately \$5 billion in 2022 to more than \$24 billion by mid-2025, a fivefold increase in three years reflecting institutional confidence rather than speculative retail activity.

Development finance institutions, foundations, and pension funds are increasing allocations to emerging market private credit for overlapping reasons: impact mandates, ESG frameworks, and the search for uncorrelated yield. The blended finance structures that accommodate concessional and commercial capital in the same vehicle are becoming standard rather than exceptional. The infrastructure that Sovara is building is designed from the ground up to support these structures.

5.3 Where this approach fits in the landscape

The existing landscape for RWA-backed lending can be understood in terms of what each approach addresses and what it leaves unresolved. A candid assessment is more useful than a promotional one.

Approach	What it addresses and what it leaves unresolved
Traditional bank lending	Institutional compliance standards and regulatory acceptance. Does not address collateral flexibility, processing speed, or cost in frontier markets. Access to capital remains constrained/ deployment limited. Cannot read supply chain data as a credit input.
Development finance institutions	Patient capital with genuine risk appetite for frontier markets. Constrained by indirect deployment through intermediary banks, which reintroduces the margin and delay problems DFIs are designed to reduce.
Fintech lenders	Improved access and digital disbursement. Capital still flows through the existing intermediary chain. Cost of capital and affordability for borrowers remain

Approach	What it addresses and what it leaves unresolved
	high and out-of-reach. Alternative data adequate for consumer micro-credit but not for supply chain-linked business lending at meaningful ticket sizes.
General-purpose RWA tokenisation protocols	On-chain transparency and open participation. Provide infrastructure for originators rather than end-to-end direct lending. Compliance and permissioned access for institutional investors remains underdeveloped in most open protocols.
Undercollateralised DeFi business credit	Addresses real-economy business lending in emerging markets using off-chain underwriting. Has not systematically bridged to oracle-fed, continuously monitored supply chain data as the primary collateral layer.
Integrated supply chain lending infrastructure	Combines verifiable supply chain data, automated milestone execution, FX-efficient settlement, and institutional-grade compliance in a single platform. Addresses the combination that no single existing approach resolves.

The gap that none of the existing approaches closes is the integration of all four requirements simultaneously: verifiable real-world supply chain data as dynamic collateral, automated execution against that data, FX-efficient settlement across currency boundaries, and institutional-grade compliance. The players closest to this in RWA tokenisation infrastructure and in undercollateralised emerging market credit address subsets of the problem. None has assembled the full stack for supply chain-linked direct lending in frontier markets at institutional standards.

6. Risks and how the architecture addresses them

Direct-to-business lending in emerging markets through blockchain infrastructure involves real risks. This section addresses them honestly. The purpose is not to dismiss risk but to describe the structural mitigations built into the approach and to acknowledge where risk remains.

6.1 Credit risk

The primary risk in any lending business is borrower default. In emerging market business lending, industry benchmarks for default rates range from 8 to 12% in the absence of supply chain data monitoring. The academic literature on blockchain-enabled SCF consistently identifies two mechanisms that reduce realised default rates below this benchmark: better-informed origination, enabled by verifiable supply chain data rather than financial statement proxies, and earlier intervention, enabled by continuous monitoring rather than periodic covenant testing.

Milestone-triggered disbursement provides an additional structural mitigation: capital is advanced against verified operational progress rather than committed in full at origination. The credit exposure at any point in the loan cycle reflects what has been verified on-chain, not what has been projected.

6.2 Oracle and data integrity risk

The credit quality of oracle-fed supply chain lending depends on the integrity of the oracle layer. If data from a single source can be manipulated or is inaccurate, the credit decision built on it is compromised. The consensus approach in the literature is multi-source verification, requiring consistent readings from multiple independent data sources before any milestone is confirmed on-chain. The January 2025 paper on blockchain oracles for agricultural insurance in *Frontiers Blockchain* describes this as the foundational requirement for reliable oracle-fed systems; redundancy and independence of data sources are what create trust in the aggregate signal.

Cryptographic signing of oracle outputs provides tamper-evidence: any alteration to a verified data point invalidates the signature and is immediately detectable. Human oversight at origination and for out-of-parameter events provides a further layer of control during the period when system track records are being established.

6.3 Foreign exchange risk

The stablecoin settlement layer is designed to remove FX risk from the borrower. The residual FX exposure within the infrastructure is managed through the FX conversion margin built into the loan pricing, which provides a buffer against normal currency movements. In markets with higher currency volatility, additional provisions are incorporated into the facility structure.

The IMF's 2025 note on stablecoins in emerging markets flags the risk that rapid stablecoin adoption could amplify currency substitution in economies with weaker monetary systems, a regulatory consideration addressed by operating within permissioned, compliance-governed structures rather than open protocols, and by maintaining close awareness of monetary policy conditions in each operating jurisdiction.

6.4 Regulatory and jurisdictional risk

Cross-border lending in emerging markets operates across multiple regulatory jurisdictions. The permissioned, closed-end structure adopted for initial deployments is specifically designed to maintain compliance with applicable securities, lending, AML, and Know Your Customer (KYC) frameworks in each jurisdiction. Regulatory frameworks for tokenised assets and stablecoin settlement are evolving: the GENIUS Act in the United States, MiCA in Europe, and MAS frameworks in Singapore have provided foundational clarity in the jurisdictions most relevant to institutional capital deployment.

6.5 Smart contract and technical risk

Smart contract code, once deployed, is difficult to modify. Errors in contract logic can have financial consequences that are not easily reversible. The mitigation is independent security auditing before deployment, conservative upgrade protocols that require governance approval for any modification, and human oversight during the initial period of operation when contract behaviour in real-world conditions is being validated. The approach adopted for initial deployments treats automation as a tool for executing well-defined decisions, not for making novel ones.

Risk category	Principal structural mitigation
Credit risk	Supply chain data improves origination quality; milestone disbursement limits exposure to verified progress; continuous monitoring enables early intervention
Oracle and data integrity	Multi-source verification before milestone confirmation; cryptographic signing provides tamper-evidence; human oversight for anomalous readings

Risk category	Principal structural mitigation
Foreign exchange	Stablecoin settlement layer removes FX risk from borrower; FX margin buffer in loan pricing; additional provisions for high-volatility markets
Regulatory and jurisdictional	Permissioned closed-end structure; bank-grade KYC/AML; evolving regulatory frameworks in major jurisdictions provide increasing clarity
Smart contract and technical	Independent security auditing; conservative upgrade protocols; human oversight in initial deployment phase
Geopolitical and market	Geographic and sector diversification; conservative advance rates; close monitoring of conditions in target markets

CONCLUSION

7. What mature infrastructure in this space looks like

The convergence of oracle-verified supply chain data, smart contract execution, and stablecoin settlement infrastructure creates the conditions for a fundamentally different approach to emerging market lending. Not a better version of what already exists but a structurally different approach that addresses the information asymmetry problem at its root rather than working around it.

When this infrastructure matures, the outcome for businesses is specific and measurable: a crop producer who can access working capital against satellite-verified planting progress, without a 4 to 6 week credit committee review, in the local currency they operate in, at a cost that reflects the actual risk of their productive activity rather than the perceived risk of their asset base. A mining cooperative that can bridge the gap between commodity delivery and payment settlement against the verified creditworthiness of the institutional buyer, not their own thin credit file.

The market for this infrastructure is growing. The WEF's 2026 digital assets outlook identifies the current period as one of transition from experimental deployment to financial market infrastructure; a transition characterised by regulatory clarity, institutional participation, and the development of standards that make interoperability possible. The IMF's April 2026 note on tokenised finance frames the same shift as a structural reconfiguration of how trust and settlement are organised across the global financial system.

Neither of these institutions is making a promotional argument. They are describing what the evidence shows is happening. The technology is being deployed. The regulatory frameworks are in place. The institutional capital is present and looking for credible vehicles.

What has been missing is the origination infrastructure; the on-ground capability to identify, underwrite, and monitor real-economy assets in emerging markets at the standards institutional investors require. Building that infrastructure, connecting it to the settlement layer, and demonstrating that it works with real supply chain data and real transactions is the work underway.

Finance that reaches the real economy is not a slogan. It is an engineering problem. The components needed to solve it are available simultaneously for the first time.

Sovara is currently in early conversations with advisors, and institutional investors. To learn more about the platform, published research, or investment access, reach out to us at investor@sovara.usd.com.

Glossary of Terms

Term	Definition
ADB	Asian Development Bank. A multilateral development finance institution headquartered in Manila.
Assay certificate	An independent laboratory document confirming the grade, purity, and weight of a mineral commodity sample.
DeFi (Decentralised Finance)	Financial services and products built on blockchain infrastructure that operate without central intermediaries.
DFI (Development Finance Institution)	A government-backed or multilateral institution that provides financing to support economic development in emerging markets.
FX (Foreign Exchange)	The conversion of one currency to another. FX risk refers to the potential for adverse currency movements to increase the effective cost of a loan or investment.
IFC (International Finance Corporation)	The private sector arm of the World Bank Group, focused on investment and advisory services in developing countries.
IMF (International Monetary Fund)	An international organisation providing financial stability oversight, policy advice, and loans to member countries.
IoT (Internet of Things)	A network of physical devices embedded with sensors and connectivity, enabling real-time data collection and transmission.
KYC / AML (Know Your Customer / Anti-Money Laundering)	Regulatory compliance processes requiring financial institutions to verify client identities and monitor for suspicious activity.
MiCA (Markets in Crypto-Assets Regulation)	The European Union's comprehensive regulatory framework for digital assets and crypto-asset service providers.
MSME	Micro, Small, and Medium-sized Enterprise. Businesses below defined thresholds for employees, revenue, or assets. Definitions vary by jurisdiction.
NDVI (Normalised Difference Vegetation Index)	A satellite-derived measure of plant health and canopy density used in agricultural monitoring.

Term	Definition
NDF (Non-Deliverable Forward)	A foreign exchange derivative settled in USD rather than the local currency, used in markets where the local currency is not freely convertible.
Offtake agreement	A contractual commitment by a buyer to purchase specified quantities of a commodity from a seller at defined terms.
Oracle	A system that connects blockchain-based smart contracts to external real-world data sources, delivering verified data on-chain.
RWA (Real-World Asset)	A physical asset, right, or financial instrument represented as a digital token on a blockchain.
SCF (Supply Chain Finance)	Financial products that optimise cash flow by allowing businesses to access capital against verified supply chain data, receivables, or confirmed buyer obligations.
Smart contract	A self-executing programme stored on a blockchain that carries out defined actions automatically when specified, verifiable conditions are met.
Stablecoin	A digital currency pegged to the value of a reference asset, typically the US dollar, designed to maintain price stability.
USD (US Dollar)	The United States dollar, the world's primary reserve currency and the denomination used for institutional capital pools on the platform.
Verifiable credential	A cryptographically signed digital certificate that asserts a verified fact about a real-world object, entity, or event.
WEF (World Economic Forum)	An international non-governmental and lobbying organisation based in Cologny, Switzerland.
Warehouse receipt	A document issued by a storage facility confirming that specified commodities are held in custody at that location.

Key Sources and Further Reading

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