

AI Borrowing Bases: Dynamic Collateral Eligibility for Receivables and Inventory

Using Event-Level Payment, Dispute, Dilution, Obsolescence and Concentration Evidence without Obscuring Lender Control

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Abstract

Asset-based facilities convert eligible collateral into borrowing availability through contractual definitions, advance rates, reserves and controls. The calculation can change daily as receivables are created, paid, disputed or diluted and as inventory moves, ages, becomes obsolete or changes location. Periodic certificates and fragmented operating data can leave lenders and borrowers reacting after collateral quality has already shifted.

This paper develops an AI-assisted borrowing-base framework for receivables and inventory. It combines contractual eligibility rules with event-level operating evidence, controlled valuation inputs, concentration limits, reserves, advance-rate governance and exception workflows. Machine assistance can reconcile records, detect anomalies, forecast collateral cohorts and prioritise fieldwork. Lenders retain credit judgement, legal interpretation, valuation policy, rule approval, advance-rate authority and enforcement decisions.

Five original figures and five decision tables present the eligibility engine, collateral cohorts, concentration map, advance-rate curve and exception dashboard. A worked example uses a hypothetical borrower and illustrative assumptions. All amounts, percentages, probabilities, scores, haircuts, advance rates and scenarios are management assumptions for analytical design. The paper does not provide accounting, audit, legal, regulatory, tax, investment, lending, credit, valuation, security, insolvency, technology or enforcement advice and does not recommend any facility, collateral treatment, advance rate, reserve, lender or model.

JEL Classification: G21, G32, C53, M15, D81

Keywords: asset-based lending, borrowing base, receivables, inventory, collateral eligibility, advance rate, artificial intelligence, dilution, obsolescence, lender controls

1. Begin with the facility decision

A borrowing base determines how much credit is available against defined collateral after eligibility exclusions, advance rates, reserves and limits. The immediate decision may be to approve a certificate, fund a draw, impose a reserve, investigate an exception or reduce availability. Each decision requires current evidence and authorised control.

The system should identify the facility, borrower, obligors, collateral classes, test date, reporting cut-off, commitments, outstanding amounts and requested draw. It should preserve the executed agreement and approved amendments as the source of contractual definitions. A model output cannot silently change those terms.

An AI-assisted process can accelerate reconciliation and exception detection. It should present a reproducible calculation, source evidence, rule version, model status, uncertainties and approvals.

The accountable lender or agent decides the action within delegated authority.

The funding decision should be separated from the collateral calculation. A mathematically positive borrowing base does not establish that a draw satisfies every condition, representation, event-of-default test or credit requirement. The decision record should show which conditions were checked, which were outside the engine and who confirmed them. This prevents a calculation tool from appearing to provide a legal or credit conclusion.

The borrower and lender also need a shared treatment of timing. A certificate can be accurate at its cut-off and outdated by the funding time after collections, credit notes, shipments or inventory movements. The facility process should define permitted updates, materiality, re-certification and reliance. The copilot can identify intervening events and route them for authorised treatment.

2. Define the collateral perimeter

The perimeter should identify legal entities, jurisdictions, accounts, systems, receivables, inventory, locations, currencies, liens, insurance and custodians. It should show collateral that is pledged, excluded, shared, structurally senior or outside the lender's enforceable reach. Ownership and legal interest require qualified confirmation.

Receivables can differ by product, customer, contract, invoice status, currency and governing law. Inventory can differ by raw material, work in process, finished good, serial number, warehouse, condition and market. Aggregation should not conceal attributes that determine eligibility or recovery.

The perimeter also defines data and decision cut-offs. A sale posted after certification should not appear in the approved version. A payment received after cut-off can inform the next calculation or an authorised adjustment. Version control preserves both records.

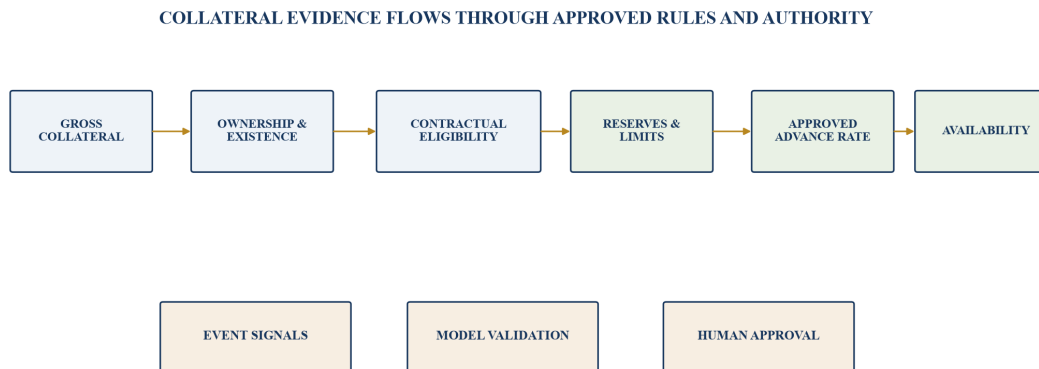
3. Construct the controlled eligibility engine

The engine begins with gross collateral records, verifies existence and ownership evidence, applies contractual eligibility rules, calculates concentrations and reserves, applies approved advance rates and reconciles availability with debt and commitments. Exceptions route to named owners and authorities.

Rules should be separated from predictive models. A contractual ageing exclusion can be deterministic. A dispute-risk model can rank invoices for review. A liquidation model can estimate a range. Each component has a different validation, change and approval pathway.

The calculation should remain reproducible without narrative interpretation. Source rows, transformations, exclusions and overrides should be traceable. A concise explanation can support review, while the numerical result should derive from controlled data and approved logic.

Figure 1. Controlled borrowing-base eligibility engine



Contractual rules, analytical signals and human authority remain distinct throughout the availability calculation.

Table 1. Minimum borrowing-base decision record

Field	Required content	Evidence	Control use
facility	agreement, commitment, maturity and parties	executed documents and amendments	legal perimeter
collateral	class, owner, location, currency and value	subledger, warehouse and third-party records	gross base
eligibility	rule, reason, amount and effective date	approved definition and source attribute	exclusions
concentration	obligor, product, location and connected exposure	controlled aggregation	caps and reserves
valuation	basis, date, method, cost and recovery assumptions	appraisal and market evidence	advance rate
exception	trigger, severity, owner, expiry and action	workflow and supporting documents	governance
availability	eligible value, advance, reserves, debt and excess	reproducible calculation	funding decision

Every availability figure should connect to controlled evidence, approved logic and authority.

4. Establish authoritative source systems

Receivable evidence can originate in order, delivery, contract, invoice, tax, dispute, credit-note, cash-application and bank systems. Inventory evidence can originate in procurement, production, warehouse, transport, sales and costing systems. The source hierarchy should be documented for every material field.

Reconciliations need tolerance, timing and ownership. Accounts-receivable subledgers should reconcile with the ledger and certificate population. Inventory quantities should reconcile across perpetual records, physical counts and third-party warehouses. Differences require classification and resolution before reliance.

Data lineage should preserve original value, transformation, user and timestamp. Manual adjustments need evidence, approval and expiry. Stale or missing fields should reduce confidence or eligibility according to approved policy rather than be filled through an unexplained assumption.

The source hierarchy should resolve conflicts explicitly. A warehouse system may show quantity while a third-party acknowledgement shows a different date or location. An invoice system may show an open amount while bank cash has arrived but remains unapplied. The hierarchy can assign provisional status, require reconciliation and prevent unsupported netting. It should preserve both records and the reason for the selected treatment.

Data-quality measures should be tied to collateral consequence. Completeness, validity, uniqueness, timeliness and reconciliation can be calculated for each source and segment. A failure affecting a small ineligible population differs from one affecting the largest eligible obligor. The dashboard should show affected value and funding impact, allowing reviewers to focus on decision materiality.

5. Verify receivable existence and validity

An invoice is not automatically collectible collateral. The process should connect it to a valid customer, contract or order, delivery or performance evidence, acceptance, invoice issuance and payment terms. Cancellation rights, side agreements and contingent performance can affect validity.

Machine assistance can match records and identify missing links. It can detect duplicate invoices, unusual sequencing, round amounts, backdating or changes in customer details. These signals require investigation and do not establish fraud or ineligibility by themselves.

Confirmation and field examination remain important controls. The lender should determine when external confirmation, document review or site work is required. The system can target samples using risk and materiality while preserving independent selection.

Invoice validity should consider performance obligations and customer acceptance where relevant. A billing record can exist before the borrower has an unconditional right to payment. Contract milestones, acceptance certificates, return rights and cancellation clauses can change collectibility. The engine should record the evidence available and route legal or accounting uncertainty rather than infer entitlement from invoice issuance.

Fraud indicators require careful governance. Duplicate addresses, unusual user activity, round-number invoices or rapid growth can justify investigation. They do not prove misconduct. The interface should use neutral exception language, restrict access and preserve evidence. Escalation should follow the lender's fraud, legal and credit procedures and protect appropriate confidentiality.

6. Track payment behaviour at event level

Payment history should distinguish contractual due date, actual receipt, partial payment, unapplied cash, deduction, reversal and write-off. Customer behaviour can vary by product, geography, invoice size and dispute type. Cohorts can reveal deterioration before a broad ageing bucket changes.

A model can estimate payment timing and expected shortfall. Its output should not replace contractual ageing rules unless the lender formally approves a change. It can identify invoices whose behaviour is inconsistent with their bucket and prioritise review.

Forecast performance should be tested out of sample and across periods. Calibration, bias and tail outcomes matter. A model that predicts average payment well can still miss the large delayed invoices that drive availability risk.

7. Identify disputes, deductions and dilution

Dilution arises when the amount ultimately collected is lower than the invoiced amount because of returns, allowances, discounts, credits, offsets or other adjustments. The analysis should use gross sales and credit events consistently with the facility definition.

Dispute evidence can appear in customer service, email, workflow, credit-note and deduction systems. Language models can classify themes and link documents, while accountable staff confirm material cases. Missing dispute data should be visible.

Historical dilution can inform reserves and advance rates. The method should consider lag because credits issued later can relate to earlier sales. Concentration by customer or product can amplify a process weakness.

The calculation should define the denominator used for dilution. Gross sales, eligible sales and collected receivables can produce different rates. Credits should be linked to the originating sale period where feasible. Otherwise recent growth can temporarily suppress the reported percentage. The method, lag and exclusions need consistency before a reserve is calibrated.

Dispute severity should reflect amount, probability, age and recovery pathway. A routine pricing deduction can differ from a quality dispute that affects an entire product cohort. Text classification can organise themes, while source documents and accountable staff support the final status. Trend analysis should show both newly opened and resolved disputes so that a backlog reduction is not mistaken for improved origination.

8. Apply ageing rules with transparent exceptions

Ageing should follow the agreement's start point, which may be invoice date, due date or another defined event. Re-ageing, extended terms and amended invoices require control. An operational system's ageing label may differ from the legal calculation.

Eligibility rules can exclude past-due receivables, cross-age customers or invoices beyond stated terms. The engine should show the triggering row and amount. Overrides require authority, evidence, duration and treatment in concentration and reserves.

Predictive signals can supplement ageing by showing deterioration within current buckets. They should support monitoring and fieldwork. The contract continues to determine eligibility until changed through the approved legal and credit process.

9. Control obligor and connected-party concentration

A high-quality receivable pool can still create loss severity when exposure is concentrated in one customer or connected group. The calculation should aggregate legal entities according to approved rules and apply concentration caps or reserves from the agreement.

The map can also show product, geography, currency, industry and payment-channel concentration. These views can explain correlated dispute or collection risk. They should not create new contractual exclusions without approval.

Proposed sales and collections can forecast concentration changes. The system can warn when availability will fall because one customer's share increases even though gross receivables rise.

10. Detect contra accounts, offsets and priority claims

A customer that also supplies the borrower may have contractual or legal rights of set-off. The system should identify shared counterparties across receivables and payables and route them for qualified review. Name matching requires controlled entity resolution.

Supplier claims, taxes, employee claims, warehouse liens and purchase-money security interests can affect recovery or priority depending on jurisdiction and facts. The data model should record identified claims and legal status without generating a conclusion.

Reserves and exclusions should follow approved documentation and credit judgement. The engine should show which exposure and collateral are affected and when the evidence was last reviewed.

11. Create receivable collateral cohorts

Cohorts can group invoices by origination month, obligor quality, product, location, terms, dispute status or collection pathway. The purpose is to observe how comparable collateral performs through time. Cohorts can reveal that recent production differs from the history supporting an advance rate.

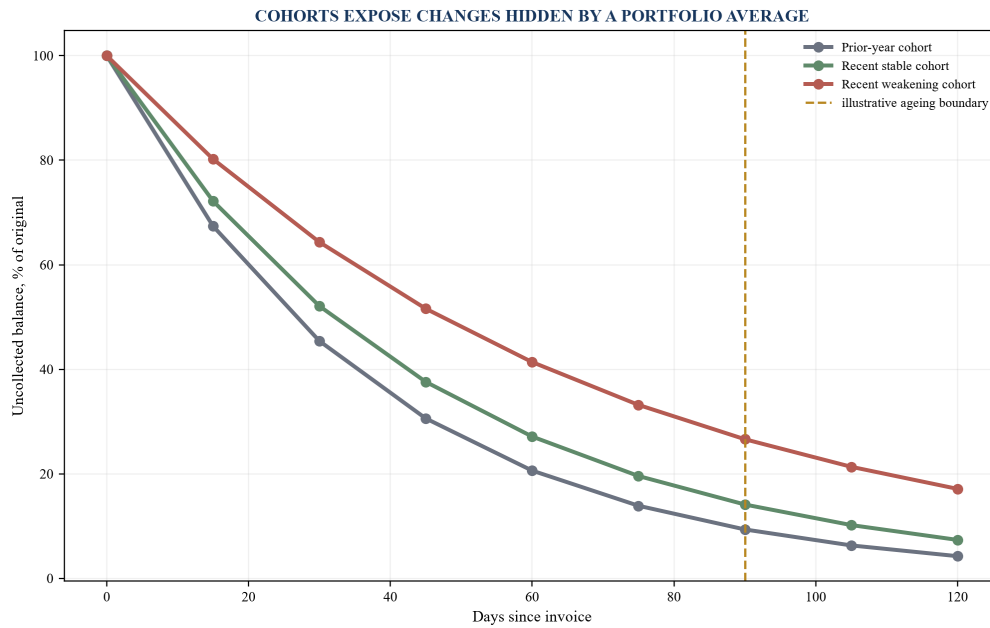
Performance measures can include payment timing, dilution, default, recovery and eligibility migration. The analysis should preserve exposure weights because a large invoice can matter more than many small invoices. Results need enough observations and clear limitations.

The lender can use cohorts to target field examination, adjust monitoring or review structure. A cohort signal should not bypass contractual eligibility and approval. It creates evidence for a credit decision.

Cohorts need protection against composition effects. A recent period may appear weaker because it contains a different customer mix, longer contractual terms or a seasonal product. The analysis can stratify or standardise populations and show both raw and adjusted results. Adjustments remain assumptions and should not replace the observed curve.

Vintage analysis can also identify migration. It can show how much collateral moves from eligible to ineligible, how long cures take and which reasons dominate. These transitions help estimate operational workload and downside availability. They can also reveal that a stable gross balance is supported by increasingly recent invoices while older collateral is failing to collect.

Figure 2. Illustrative receivable collateral cohorts



Payment curves and cohort labels are hypothetical assumptions used to show how recent performance can diverge from prior experience.

12. Define inventory ownership and control

Inventory should be owned by the pledged entity and subject to the required legal interest before it enters availability. Consigned goods, customer-owned material and goods subject to competing claims need identification. Title can depend on contracts, delivery terms and jurisdiction.

The record should connect purchase, receipt, serial or batch identity, location and quantity. Goods in transit, at processors or in third-party warehouses require specific evidence. The lender should determine control and inspection requirements.

AI can reconcile descriptions, documents and movements across systems. Ambiguous matches should become exceptions. It should not infer ownership from physical possession alone.

13. Reconcile quantity through the inventory chain

Quantity reconciliation should connect opening stock, receipts, production, transfers, sales, scrap, returns and closing stock. Negative balances, impossible movements, duplicate serial numbers and delayed postings can indicate data weakness or process failure.

Cycle counts and physical examinations provide independent evidence. The system can select samples by value, velocity, anomaly and location while retaining random or examiner-selected elements. Sampling methodology should be documented.

Shrinkage and reconciliation history can inform reserves and monitoring. Improvements should be demonstrated across repeated counts. A clean system balance without physical evidence may be insufficient for material inventory.

14. Classify inventory by recovery pathway

Raw materials, work in process and finished goods have different recovery paths. Commodity-like materials may have wider markets. Specialised components can have limited buyers. Work in process may require further cost and technical capability before sale.

Classification should reflect actual condition, specification, shelf life, certification and marketability. A financial category can be too broad for recovery. The collateral register should preserve attributes that an appraiser or liquidator would need.

The lender can establish eligibility, caps and advance rates by class. Predictive models can estimate sale pathways and stress values, subject to independent valuation and approved policy.

Recovery classification should reflect the party capable of completing or selling the goods. Work in process may have value to the operating borrower and limited value to a lender or third-party buyer. Proprietary tooling, licences, technical files, regulatory approvals and customer certifications can affect completion. The collateral analysis should identify these dependencies and the cost and time required to access them.

Finished goods can also carry hidden completion obligations. Packaging, localisation, installation, warranty or channel access can be necessary before cash is realised. A quoted market price may assume a normal sales process and continued operations. The recovery case should specify whether it assumes orderly operation, going-concern sale, bulk disposition or another premise approved by the lender.

15. Measure velocity and ageing

Inventory ageing should use a defined event such as receipt, manufacture or last meaningful movement. Transfers between locations should not automatically reset age. Rework and repackaging require controlled treatment.

Velocity can be measured through sales, usage and days on hand by item and cohort. Demand seasonality, minimum order quantities and strategic spares can affect interpretation. Slow movement is a signal, not a complete valuation.

The engine should show migration toward eligibility boundaries. Early warning gives the borrower time to sell, redeploy or address data. It also allows the lender to plan fieldwork and reserves before a certificate breach.

16. Detect obsolescence and condition risk

Obsolescence can arise through design change, technology, expiry, regulation, fashion, damage or loss of a customer programme. Evidence can include sales, engineering changes, quality holds, returns, expiry, warranty and disposal records.

Models can rank items using these signals and compare current behaviour with historical recovery. Material classifications require accountable review because an unusual item can be valuable for a specific contract or worthless outside it.

Condition and insurance evidence should be current. Goods under quality hold, damaged inventory or expired insurance may require exclusion or reserve under the approved structure.

17. Estimate net orderly liquidation value

Inventory value for lending should reflect the relevant recovery basis rather than accounting cost alone. Net orderly liquidation value can consider expected sale proceeds, completion, transport, storage, commissions, taxes, time and other recovery costs. Qualified appraisals remain central.

The analytical layer can update drivers between appraisals and identify when assumptions move outside validated ranges. It should show the last appraisal, scope, sampling, market evidence and limitations. A model estimate should not be labelled as an appraisal.

Stress cases should consider volume, time, buyer concentration and correlated disposal. Selling an entire pool can realise less than extrapolating recent small transactions.

Net value should be assessed at the relevant level of aggregation. Item-level estimates can overstate portfolio recovery when many similar units must be sold together. Discounts, storage and time can increase with pool size. A concentration adjustment or portfolio scenario can complement individual estimates, with the appraiser or credit authority determining the appropriate method.

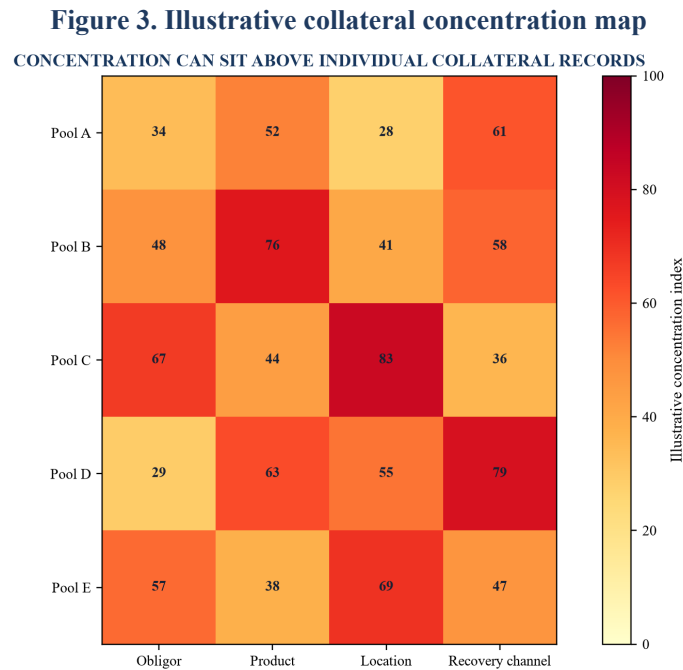
Recovery-cost assumptions should include access, count, security, transport, completion, marketing, commission, taxes and professional costs where relevant. Timing affects discounting and ongoing storage. Each cost needs a source or documented assumption. Historical recoveries can inform calibration while remaining specific to their legal, market and operational circumstances.

18. Map inventory concentration

Concentration can arise by item, family, customer programme, supplier, warehouse, country or recovery channel. A pool with many stock-keeping units can still depend on one buyer or technology. The map should reflect recovery dependencies.

Caps can limit eligible value from specified categories. Analytical warnings can identify emerging concentrations before contractual caps bind. The system should calculate both using distinct labels.

Location concentration also creates operational and catastrophe risk. Insurance, access, control and backup records should accompany the value. Third-party facilities require current agreements and acknowledgements where applicable.



Values and categories are hypothetical assumptions; the map supports review and does not define contractual caps.

Table 2. Receivables and inventory eligibility evidence

Collateral	Evidence dimension	Typical risk signal	Controlled response
receivable	existence and performance	missing delivery, dispute or cancellation	verify, exclude or reserve
receivable	ageing and dilution	re-ageing, late credit or rising deductions	cross-age, reserve or investigate
receivable	obligor concentration	connected customers or rapid share increase	apply cap and monitor
inventory	ownership and location	consignment, transit or third-party custody	confirm rights and control
inventory	condition and velocity	quality hold, expiry or slow movement	inspect, revalue or exclude
inventory	recovery value	market change or appraisal limitation	refresh value and haircut
both	priority and enforceability	competing claim or missing perfection evidence	block unsupported eligibility

Contractual language and qualified legal review determine the actual eligibility test.

19. Govern advance rates as credit decisions

An advance rate converts eligible collateral value into availability. It should reflect recovery uncertainty, control quality, monitoring, cost, timing and risk appetite. Historical convention alone is insufficient when collateral, market or control conditions change.

The analytical model can estimate loss distributions and test structure. It should show sensitivity to dilution, default, recovery, appraisal, time and concentration. The lender retains authority to approve the rate and any minimum cushion.

Rates should not adjust automatically from every data movement. A defined review process can use analytical triggers, validation and credit judgement. Emergency reductions require contractual

authority and clear governance.

An advance rate should be assessed together with eligibility definitions, concentrations and reserves. A conservative rate can still produce excess risk if weak collateral remains eligible. A higher rate can be consistent with a tightly controlled pool and strong recovery evidence. Reviewing one lever in isolation can obscure the full structure.

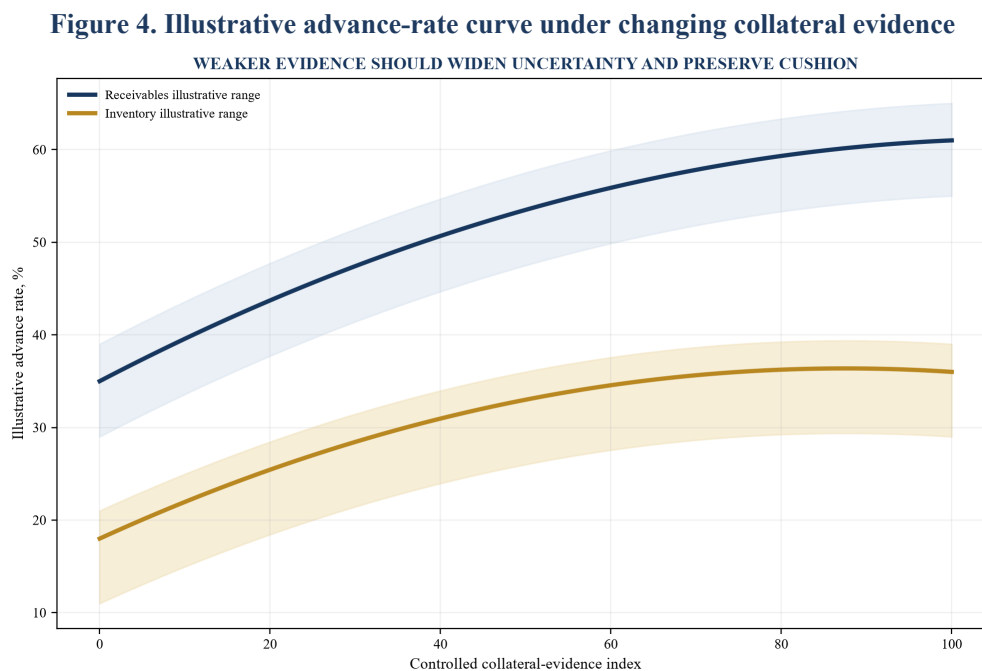
Back-testing should compare realised collections and recoveries with the assumptions supporting structure. It should account for changes in borrower operations, markets and enforcement. A favourable period does not prove that the maximum rate is safe. The committee should consider tail outcomes, data limitations and the cost and time of control before changing policy.

20. Construct the advance-rate curve

A curve can connect evidence quality and expected net recovery to a range of potential advance rates. It should include operational and legal uncertainty, not only statistical loss. The structure can impose caps even when a modelled value appears higher.

Receivables and inventory require different curves because their recovery pathways differ. Subclasses can also differ. The model should avoid false precision when appraisals, history or data are weak.

The decision packet should compare current rate, modelled range, policy boundary and proposed rate. It should identify which evidence would change the recommendation.



Rates and scores are hypothetical assumptions and do not represent market practice or a lending recommendation.

21. Design reserves by causal risk

Reserves should identify the exposure they protect. Examples can include dilution, rent, taxes, claims, inventory cost, appraisal uncertainty, customer credits, field-exam findings and availability blocks. The executed agreement and approved credit decision determine actual treatment.

A reserve needs formula or amount, evidence, owner, effective date, review and release condition. Combining unrelated concerns into one opaque amount weakens governance and makes cure difficult.

The system can calculate approved reserves and forecast how they change. It should prevent double counting where an exclusion or haircut already addresses the same risk, unless the lender intentionally applies both and records the rationale.

Reserve release should be governed as carefully as creation. A dispute reserve can decline after collection or documented resolution. An appraisal reserve can expire after accepted updated evidence. The workflow should require the named release condition and authority, preventing a reserve from disappearing merely because a reporting period changed.

Portfolio reserves can address risks that cannot be attributed reliably to individual rows. The methodology should define population, driver and allocation. Row-level and portfolio reserves should reconcile to the total certificate. When a model proposes a reserve, the decision record should show its validated range, policy boundary and approved amount.

22. Reconcile collateral with cash dominion

Cash control connects collateral conversion to debt repayment and availability. Collections should reconcile from customer receipt through lockbox, concentration account, application and facility. Unapplied cash and diversion need timely visibility.

The process should distinguish timing breaks from missing cash. Payment references, bank records and remittance data can support automated matching. Material uncertainty routes to review.

Cash dominion terms and operational arrangements require exact implementation. The engine can monitor evidence but cannot establish legal control. Bank acknowledgements, mandates and agreements require qualified confirmation.

23. Monitor availability and overadvance

Availability equals the lesser or combination of contractual commitments and borrowing-base capacity after outstanding debt, reserves and other adjustments. The calculation should show every component and currency treatment.

A forecast can identify when collateral decline, concentration or debt will create low availability or overadvance. It should show the probability range and leading drivers. Management then has time to reduce debt, add eligible collateral, seek amendment or take another authorised action.

An overadvance is a contractual and credit matter. The system should escalate according to policy and preserve decision history. It should not quietly offset the result with forecast collateral that is not yet eligible.

Availability forecasting should distinguish scheduled change from stress. Expected collections and inventory sales can support a central path when the evidence is controlled. Customer failure, dispute escalation, warehouse interruption or price collapse can form named downside scenarios. The output should show when each path crosses internal warning, minimum excess or contractual thresholds and the lead time available for response.

Currency can create additional volatility when collateral, debt and facility limits are denominated differently. The calculation should use the contractually specified rate source, date and treatment. Forecast scenarios can show translation sensitivity without changing the approved certificate method. Hedging or currency reserves require their own authority and documentation.

24. Use event signals without hidden rule changes

Event signals can include payment delay, dispute, credit memo, return, warehouse movement, quality hold, price change and customer deterioration. They can alter a forecast or priority score before a formal eligibility rule is triggered.

The interface should label contractual exclusion, analytical warning and proposed action separately. Users need to know whether an item is legally ineligible, operationally uncertain or statistically unusual. Conflating the categories can deny valid availability or fund unsupported collateral.

Signal thresholds require validation and monitoring. False positives create workload and borrower friction. False negatives can delay protection. Performance should be assessed by consequence and segment.

25. Build the exception hierarchy

Exceptions can be classified by data, eligibility, valuation, concentration, documentation, control and model status. Severity reflects amount, time, legal effect, recoverability and decision consequence. The category determines the owner and authority.

Each exception needs source, affected collateral, proposed treatment, deadline, compensating control and expiry. Repeated extensions should be visible. A temporary waiver should not become an undocumented rule.

The system can group related exceptions and identify root causes. A surge in missing delivery records may indicate an integration failure rather than many independent collateral problems.

Exception ageing matters because temporary uncertainty can become structural. The dashboard should show time open, extensions, prior owners and repeated recurrence. A low-value issue can become material when it affects a control relied upon across the population. Severity therefore combines affected value with control dependency and time.

Borrower remediation should be specific and testable. A promise to improve documentation is weaker than a defined process change, accountable owner, sample test and completion date. The lender should determine whether collateral remains excluded, reserved or otherwise treated during remediation. Closure evidence should be retained for later field examination.

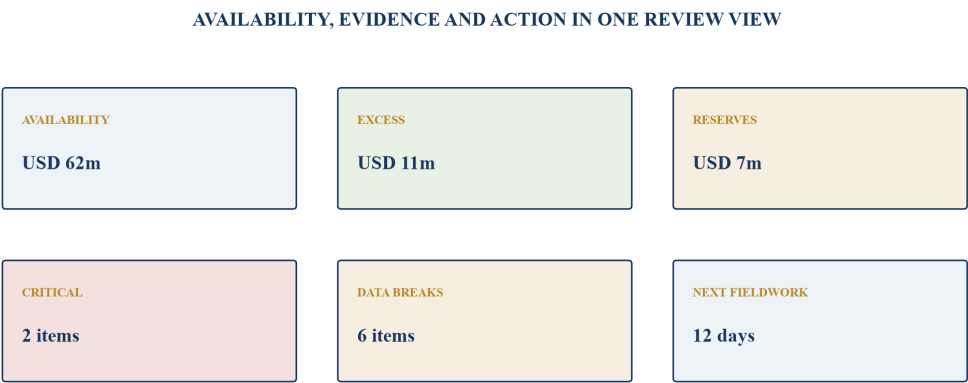
26. Create the lender exception dashboard

The dashboard should begin with funding decisions, material breaches and unresolved evidence. It can show gross collateral, eligible value, availability, excess, reserves, concentrations, cohort movement, model status and field-exam findings.

Users need drill-through to source rows and documents. Aggregate figures without lineage delay review. Data freshness and reconciliation status should appear beside the result.

Role-based views support borrower preparers, lender analysts, credit officers, agents and auditors within their permissions. Approval and edit rights remain separated.

Figure 5. Illustrative borrowing-base exception dashboard



Amounts, counts and statuses are hypothetical assumptions for control-design illustration.

Table 3. Exception decision matrix

Exception	Immediate treatment	Required evidence	Decision owner
missing source or reconciliation	hold affected collateral	authoritative record and resolved break	operations and lender analyst
contractual ineligibility	exclude according to rule	rule, source attribute and calculation	delegated approver
potential legal or priority issue	block unsupported reliance	qualified opinion and documentation	legal and credit authority
valuation outside tolerance	apply approved conservative treatment	appraisal, market and recovery evidence	credit authority
model-performance breach	suspend model-dependent recommendation	validation and remediation	model owner and credit
temporary approved exception	apply stated amount and expiry	signed approval and compensating control	authorised exception holder

Actual authority and treatment depend on the facility documents and approved credit governance.

27. Preserve field examination independence

Field examinations test books, records, collateral and controls. AI can help select samples, reconcile populations and identify anomalies. The examiner should retain independent scope and the ability to pursue unexpected findings.

Model-ranked sampling can miss unfamiliar patterns. The plan should combine material, risk-based and independent selection. Source populations and exclusions need reconciliation before sampling.

Findings should connect to collateral amount, root cause, borrower remediation and availability treatment. Closure requires evidence. The system should preserve the original finding and subsequent versions.

Fieldwork analytics should be tested for selection bias. If the model repeatedly targets the same customers or locations, other areas may receive inadequate coverage. The examination plan can set rotation, minimum random sampling and mandatory categories. Examiners should be able to override the model and record why.

Results should feed model validation without contaminating independence. Confirmed findings can improve labels and rules through controlled change. The model owner should not alter logic during an examination to make prior recommendations appear accurate. Versioned performance preserves the evidence needed for challenge.

28. Govern appraisal and valuation evidence

Appraisals should identify scope, premise, date, assets, methods, markets, assumptions and limitations. The borrowing base should use the approved value and effective date. Unsupported extrapolation across assets or periods should be visible.

Analytical monitoring can detect price, velocity or mix changes that may justify a refresh. It can also compare realised recoveries with prior estimates. Material model deviations need review by valuation and credit professionals.

Independence and conflicts should be managed according to policy. A borrower-provided estimate can inform analysis and should not be presented as an independent appraisal.

29. Validate eligibility and forecasting models

Models should have purpose, owner, inventory, data, methodology, limitations, validation and monitoring. Deterministic rules, entity matching, anomaly detection, payment forecasts and recovery estimates should be assessed according to their role and consequence.

Validation can test implementation, historical performance, stability, sensitivity and overrides. Entity matching should measure false combinations and missed links. Forecast models should assess calibration and tail error. Recovery models should compare with realised outcomes where evidence exists.

Material findings can restrict use, require conservative treatment or suspend a component. Credit decisions should not depend on a failed model while remediation remains open.

Validation should examine the complete decision chain. A well-calibrated payment model can still create poor outcomes if entity matching is wrong, source data are late or users misunderstand the score. Testing should include upstream data, transformation, interface, workflow, override and downstream calculation. End-to-end scenarios can reveal interactions missed by component tests.

Monitoring thresholds should reflect use. A model that ranks fieldwork samples can tolerate different errors from one that proposes reserves affecting funding. Material segments need separate performance because portfolio averages can conceal weakness in foreign receivables, new products or small populations. Breaches require predetermined escalation and permitted-use decisions.

30. Control generated explanations

Language models can summarise disputes, agreements and exceptions. Every material statement should link to source. The calculation should not depend on generated prose.

Prompt injection, malicious documents and confidential data require security controls. External content should be treated as data. Approved environments, access, logging and retention should match sensitivity.

Users should see uncertainty and missing evidence. Generated explanations need accountable review before they enter a credit record or borrower communication.

31. Manage legal and jurisdictional variation

Collateral rights, perfection, priority, set-off, insolvency and enforcement differ by jurisdiction and fact. The engine should store jurisdiction and legal evidence as fields. It should not generalise one legal treatment across a multinational pool.

Foreign receivables can add country, currency, enforcement and transfer risk. Inventory in another jurisdiction or third-party facility can require additional opinions and control. The actual facility documents define conditions.

Legal reviews should have scope, date, assumptions and renewal triggers. Expired or qualified evidence should become an exception rather than remain silently valid.

32. Protect borrower and customer data

Borrowing-base data can contain invoices, customers, prices, disputes, payments and bank information. Access should follow purpose and least privilege. Transfers between borrower, agent, lender, examiner and vendor require approved controls.

Data minimisation can reduce exposure while preserving decision evidence. Customer-facing documents and free text may contain unnecessary personal or confidential information. Retrieval should respect approved scope.

Security incidents can undermine both operations and collateral confidence. Response plans should connect lending, borrower, technology, security and legal owners.

33. Create immutable certification evidence

The certificate record should preserve population, cut-off, source hashes or equivalent controls, rule version, model version, adjustments, approvals and submitted result. A correction creates a new version.

Borrower certification, lender review and funding authorisation should remain distinguishable. Signatories need current authority. Workflow timestamps should respect contractual deadlines.

The evidence package supports audit, field examination and dispute resolution. It also allows retrospective analysis of how data and decisions changed.

Certification should include completeness controls over the submitted population. Record counts, control totals, ledger reconciliation and exception totals can help show that data were not omitted during transfer. Hashes or equivalent integrity controls can demonstrate that the reviewed file

matches the submitted version, subject to the organisation's approved technology.

The process should preserve evidence of system availability and fallback. If the automated engine fails near a reporting deadline, the manual calculation needs controlled templates, source extracts, review and reconciliation. Once service returns, the manual result should be compared with the system output and any difference investigated.

34. Measure economic and control outcomes

Performance measures can include processing time, reconciliation breaks, exception closure, fieldwork yield, forecast accuracy, collateral loss, recovery and funding interruption. Each metric needs a controlled definition.

The lender should avoid claiming value from alerts alone. Economic benefit requires a credible counterfactual and attributable pathway, such as avoided overadvance, lower operational cost or better facility utilisation.

Borrower outcomes also matter. Faster, predictable certification can improve liquidity planning. Excessive false positives can create delay and cost. The operating design should measure both risk and friction.

35. Report to the credit committee

The committee should see availability, excess, collateral mix, concentrations, cohort changes, advance rates, reserves, exceptions, fieldwork, model status and downside scenarios. Material changes from the approved case need explanation.

The report should distinguish contractual facts, observed data, forecasts and recommendations. It should show the requested authority and conditions. Legal and valuation uncertainties remain explicit.

Decision minutes should link to evidence and implementation. Conditions remain visible until satisfied or formally changed.

The committee should also see the reliability of the operating process. A strong collateral pool supported by frequent unexplained adjustments, late certificates or unresolved field findings can warrant a different decision from the same numbers produced through stable controls. Data, process and recovery evidence therefore belong beside the headline availability.

Trend reporting should compare like with like. Changes in legal entities, facility terms, advance rates, appraisal basis or portfolio composition can make prior periods incomparable. The report should bridge structural changes separately from collateral performance. This helps the committee identify genuine deterioration and avoids attributing a rule change to borrower behaviour.

36. Run a hypothetical worked example

Consider a hypothetical distributor with USD 92 million receivables and USD 58 million inventory. The facility has a USD 90 million commitment. Illustrative advance rates are 80 per cent for eligible receivables and 50 per cent for eligible inventory, subject to caps and reserves.

The engine excludes an assumed USD 14 million of receivables for ageing, disputes, foreign eligibility and concentration. It excludes USD 18 million of inventory for work in process,

obsolescence, location and condition. These figures are assumptions.

Before reserves, the illustrative base is USD 62.4 million receivables availability plus USD 20 million inventory availability after a contractual inventory cap, producing USD 82.4 million.

37. Apply event-level evidence to the example

The payment cohort shows that one recent customer group is collecting later than history. Contractual eligibility has not yet changed. The lender increases monitoring and selects invoices for confirmation rather than applying an automatic exclusion.

Dispute data identify late credit notes linked to one product. The approved method produces an illustrative USD 3 million dilution reserve. Inventory signals identify slow movement at a third-party warehouse, leading to an appraisal review and USD 2 million temporary reserve.

After an additional USD 2 million rent and priority reserve, total illustrative reserves are USD 7 million. Availability becomes USD 75.4 million before debt.

38. Test the funding decision

Assume outstanding debt of USD 64 million and a requested draw of USD 5 million. Current excess availability is USD 11.4 million. After the draw it would be USD 6.4 million under the illustrative case.

A downside scenario applies additional dilution, slower collections and lower inventory recovery. Excess falls below an assumed internal warning but remains positive. The lender can approve, condition, reduce or defer the request according to its documents and authority.

The worked example demonstrates connected evidence. It does not establish an appropriate facility, advance rate or decision for any borrower.

The decision packet should show sensitivity to the largest assumptions. If the dilution reserve rises by two percentage points, one concentrated obligor becomes ineligible or inventory recovery falls by ten per cent, excess availability can change materially. The lender can set monitoring triggers around these drivers and specify when a new certificate or approval is required.

It should also show operational readiness. A positive calculation is of limited use if the lockbox, control account, warehouse access, reporting or signatory arrangements are incomplete. The funding decision can therefore be conditioned on evidence outside the numerical base. Each condition needs an owner and completion status.

39. Implement the framework in ninety days

Days One to Thirty can define the facility perimeter, source hierarchy, rule library, collateral identifiers and decision authority. Teams can reconcile one certificate and document every manual adjustment.

Days Thirty-One to Sixty can build receivable cohorts, inventory movement controls, concentration maps and exception workflow. Models operate in parallel while field examiners and credit staff compare results.

Days Sixty-One to Ninety can run bounded live certification with human approval, validate performance, test fallback and decide whether to expand. Material model or data failure blocks model-dependent scope.

Implementation should select a facility with accessible evidence and material decision value. A highly complex multinational pool can expose every problem at once and delay learning. A narrow first scope can test reconciliation, eligibility, model signals, exception handling, approval and certification end to end. Expansion should add one complexity at a time, such as foreign receivables, third-party inventory or additional facilities.

Readiness also depends on operating capacity. Borrower finance, lender operations, field examination, credit, legal, valuation, model risk, data and security owners need defined responsibilities and response times. The process should be tested across reporting cut-offs and absence of key staff. A system that relies on informal knowledge cannot support a durable collateral control.

Table 4. Ninety-day implementation gates

Period	Build	Evidence gate	Decision
days 1 to 15	facility and source register	documents, owners and cut-offs confirmed	approve discovery
days 16 to 30	reconciled certificate and rule library	prior result reproduced	approve analytics
days 31 to 45	cohorts and anomaly detection	representative validation	approve parallel run
days 46 to 60	inventory, concentration and reserves	fieldwork and appraisal controls accepted	approve bounded users
days 61 to 75	live workflow with human approval	stable calculation and exception control	approve bounded use
days 76 to 90	outcome and fallback review	credit, model and operations acceptance	scale, redesign or stop

Scope should expand only after evidence and control acceptance.

40. Make collateral evidence the source of speed

Dynamic availability does not require uncontrolled rule changes. It requires faster evidence on existence, payment, dispute, dilution, ownership, movement, condition, concentration and recovery. Approved rules and credit authority convert that evidence into a funding decision.

AI can reconcile records, detect patterns, forecast cohorts and focus fieldwork. Its role should remain visible and validated. Legal rights, valuation policy, advance rates, reserves, exceptions and enforcement remain accountable lender decisions.

A durable system preserves source lineage, versioned calculation, independent review and realised outcomes. It can improve speed because reviewers receive a coherent record. It can improve control because every amount has a reason, owner and authority.

The institution should retain the ability to challenge and retire analytical components. Customer behaviour, products, markets, systems and laws change. Periodic review should confirm continued purpose, performance, data quality, control effectiveness and legal relevance. Material

weakness can lead to narrower use, stronger reserves, redesign or withdrawal according to authorised governance.

The final discipline is a complete path from collateral event to source record, from source record to approved rule, from rule to availability, and from availability to an authorised funding decision. Realised collections and recoveries then update future analysis. That closed loop creates a learning asset while preserving the distinction between prediction and control.

Borrowers also benefit from transparent causality. When availability declines, the record can show whether the driver was collection, dilution, concentration, inventory ageing, appraisal, reserve or data quality. Management can then address the operating cause rather than negotiate around an unexplained result. The same evidence can support working-capital improvement, customer remediation, stock reduction and more reliable liquidity planning. These wider benefits require separate measurement and should never inflate collateral value or substitute for lender protection.

Consistent reporting also improves dialogue among finance, operations, lenders, examiners and advisers because each party can trace the same controlled evidence.

Table 5. Board and credit-committee monitoring record

Dimension	Measure	Evidence	Decision use
availability	gross, eligible, reserves, debt and excess	certified calculation	funding capacity
quality	ageing, dilution, velocity and obsolescence	event-level cohorts	structure review
concentration	obligor, product, location and recovery channel	controlled aggregation	caps and diversification
control	reconciliations, exceptions and fieldwork	workflow and examination records	reliance
model	validation, drift and overrides	model-risk evidence	permitted use
outcome	losses, recoveries, processing and friction	realised records	calibration and redesign

Measures should connect operating evidence with credit consequence.

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