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Technology Infrastructure for Pricing and Structuring Loan Pool Sales to Institutional Investors

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ABSTRACT

When a bank sells a pool of loans to institutional investors, it sells a bundle of claims to cash flows and a body of evidence about those claims. The second made the first worth what it was worth. The completeness, consistency and verifiability of loan level data have been important concerns for buyers. Loan tapes have misstated collateral values, occupancy and borrower equity at scale. Governments in the United States and Europe have mandated asset level disclosures for securitized pools. Many sellers however still continue to build loan tapes transaction by transaction, reconciling fields by hand under deal deadlines. This article argues that pool-sale readiness should be treated as a standing technology capability rather than a per-deal exercise. To develop this argument, we iterated from the perspective of what would be required from an institutional buyer's perspective and drew on evidence about loan-level misreporting, asset-level transparency regimes, pricing in the secondary market, and emerging ledger technologies. Our contribution is fourfold: a matrix matching buyer questions to available data, a taxonomy of loan-tape misreporting types with automated validation checks, a seven-stage reference pipeline from tape ingestion and document extraction to post-sale loan-level reporting, and a four-level data-readiness maturity model. The paper examines tokenization as a candidate infrastructure and finds that, while distributed ledgers may lower issuance frictions, they cannot verify data they do not originate, implying that tape validation remains the responsibility of the seller. The paper concludes that the investment in loan level data infrastructure affects both price at sale as well as losses and disputes afterwards, for example, as sellers able to generate a tape on demand that is validated and has a data lineage, can better stand buyer scrutiny, regulatory reporting and speed to transaction.

Keywords: loan pool sales, loan tape, asset-level disclosure, securitization technology, data quality, institutional investors.

Introduction

An institutional investor bidding on a pool of loans typically never sees the loans but instead sees a loan tape, a spreadsheet or computer file with a row per loan and a few hundred columns for loan balances, rates, collateral, borrower characteristics and payments. Behind it are supporting data room documents and sampling and diligence processes to check consistency between the tape and documents. Everything the buyer believes about the pool passes through that artifact. If the tape is incomplete, the buyer has to either widen the spread or tighten their bid. If the tape is wrong, the buyer will only find out when defaults arrive and the dispute has become one of litigation, not pricing.

Historical examples have shown this is not hypothetical; in the RMBS market before 2008, intermediaries inflated borrower equity on 7% to 14% of the loans. The loans with the falsified characteristics defaulted at a higher rate compared to the other loans (Piskorski, Seru, & Witkin, 2015). A decade of research since then shows that the misreporting was indeed widespread and not priced in by the senior investors (Griffin, 2021). Regulation took a proactive position. In the United States, Regulation AB II requires standardized asset-level information for each asset included in a registered securitization (U.S. Securities and Exchange Commission, 2014). In the European Union, in accordance with the Securitisation Regulation and the technical standards thereunder, standardized loan-level templates and periodic reporting are required (European Parliament & Council of the European Union, 2017; European Commission, 2020).

Transparency changed the problem without solving it: the seller must produce, validate, ma p and maintain loan-level data to a standard that regulators and buyers can test, often at the same time, and under the compressed timetable of a competitive sale. It is a technolog y problem as much as a structuring one, and it lies at the intersection of loan-portfolio analytics, valuation engines and securitization workflows.

It is therefore presumed that a seller's readiness to perform a pool sale is a persistent facility. As long as the loan tape is valid and backed up by a consistent line, potential sellers can credibly respond to buyer due diligence and defend the seller's representation s. Four contributions substantiate this claim: a matrix of buyer due-diligence questions a nd associated data requirements, a taxonomy of types of misreporting and associated automa ted checks, a seven-step reference pipeline from tape to bid, and a data-readiness maturit y model. Legal structuring matters such as true-sale analysis and special purpose vehicle design are outside the scope of this article except where they relate to data requirements

Literature Review

3.1 Misreporting and its price

The closest to an empirical verdict about the quality of the loan tapes is in the RMBS mar ket. Piskorski et al. (2015) combine the securitization disclosures with the credit bureau data to find that misrepresented loans default 70% more frequently. Additionally, the pool s sold containing misrepresentations are not sold at a lower price, suggesting that the ma rket does not price in these misrepresentations at the time of purchase. Kruger and Matura na (2021) study collateral. They find that in 45% of purchase-loan appraisals appraised va lue exactly equaled purchase price, and appraisals outnumbered AVM estimates 60% of the ti me, by an average of 5%. Elul, Payne and Tilson (2023) show, beyond the crisis vintage, th at the third of effective investors who misreported their property as owner-occupied, defa ulted 75% more than investors who reported a property as an investor.

Griffin (2021) brings together these strands, arguing that since senior RMBS prices and th e tranches of the collateralized debt obligation indicate the marginal AAA investor was un aware of widespread fraud and ratings inflation, the technologist is defined by this. Howe ver, there are still signs of misreporting, such as multiple appraisals at the price, vari able divergence from comparable AVM values, and discrepancies on occupancy. These can be b uilt in to the tape-producing pipeline for screening.

3.2 Transparency regimes and pricing

Asset-level disclosure regimes aim to make these traces visible to potential buyers. The c leanest natural experiment is the European Central Bank's loan-level reporting initiative. Ertan, Loumioti and Wittenberg-Moerman (2017) document that securitized loans that have be en originated under the transparency regime have lower default probability, delinquency an d loss severity. Klein, Mössinger and Pfingsten (2021) document the same effect for small- business collateral. Their data set comprises 107 ABS pools backed by more than 2.8 millio n small and medium-sized enterprises' loans. In the USA, Neilson, Ryan, Wang and Xie (2022) find that asset-level disclosures required under Regulation AB II are associated with lo wer yields. They also find that most investors download the asset level information as pri ce discovery occurs. The latter finding is important, because it suggests investors use lo an-level data to price securities, and are not just ticking a compliance box.

The post-crisis reform package more generally appears to have reduced information asymmetr y. According to Flynn et al (2020) asymmetric information in commercial mortgage securitiz ation has become low since Dodd-Frank, and according to Financial Stability Board (2025) r eforms strengthened securitization markets, without strong evidence of material negative s ide effects on financing. The EU regime further mandates a quarterly cycle of the availabi lity of information regarding the underlying exposures (European Parliament & Council of t he European Union, 2017) converting the intensity of the one-off disclosure into a rhythm of periodic disclosure and publication.

3.3 Pricing loan risk for institutional buyers

Different buyers of the data need it for different purposes. CLO managers price the differ ence between the yield on loans and the cost of the tranche funding. This difference is wh at Cordell, Roberts, and Schwert (2023) show caused CLO equity to earn positive abnormal r

eturns, making loan-level credit and cash flow data valuable for structuring CLOs. Outside the primary market, trading costs fall when originators serve as market makers, which is consistent with information asymmetry. Manz, Müller, and Schiereck (2020) examine 317 NPL secondary market transactions and report evidence that, as a result of opacity, costs are incurred during transactions. The secondary market disclosures, such as portfolio size or profile of NPL portfolio, are also limited. The recent emergence of private debt funds as a critical source of loan exposure makes it possible to assess how careful they are in sourcing, underwriting, and monitoring loans through a survey of private debt investors with over $390 billion in assets (Block, Jang, Kaplan, & Schulze, 2024).

3.4 Emerging infrastructure

The first is distributed ledger technology, the shared digital ledger of transactions that underpins cryptocurrencies such as Bitcoin and Ethereum. Cong and He (2019) argue that decentralized consensus may be a facilitator for smart contracts due to its property of changing how the information is disseminated among the participants. The first empirical evidence of the reduced pricing of asset-backed securities issued on the blockchain can be found in Chen et al. (2024), who found a 31.4 basis point (13%) reduction in yield spread. This is because, as John, Kogan and Saleh (2023) observe, smart contracts cannot easily obtain data outside the blockchain. The Bank for International Settlements (2023) provides a more holistic vision of tokenised claims on unified, programmable ledgers.

A second thread is data engineering. Ehrlinger and Wöß (2022) survey data-quality measurement and monitoring tools including those focused on data quality. They find 667 tools for data quality and select 13 tools for evaluation. This also exemplifies the maturity and fragmentation of the tooling. Document understanding models, such as LayoutLM, have improved the state of the art of extracting structured information from a scanned form, increasing the score of the form-understanding benchmark from 70.72 to 79.27 (Xu et al., 2020). This is of direct use in converting the loan files into tape fields.

The literatures are largely distinct, with finance researchers estimating the costs of poor loan data, and information-technology researchers developing tools for improving data quality and extraction. Few papers address the pipeline through which the loan moves in the loan sales process.

Methodology

In the study, the design-oriented synthesis was worked backwards from the questions that institutional buyers have to answer before making a bid, which are identified in Section 3 from the transparency and pricing literature. Secondly, for each data requirement, we specified fields, conditions, constraints, sources and refresh frequency. Thirdly, we mapped the requirements to the stages of a reference data pipeline. He drew on his experience building portfolio analytics and valuation systems for an institutional, mortgage and loan asset manager's utility function including a real-time, daily pricing, profit-and-loss and exposure transparency web-based interface for a multi-billion dollar transaction, securitization and liquidity-generating workflows. Fourth, the resulting design was exercised against a stylized sale of a commercial loan pool to check that every buyer question is answered by a traceable data product.

Three caveats: first, most quantitative evidence of misreporting is based on US residential mortgages, and one has to make an argument to generalize to other commercial or small-business pools. In addition, proprietary transaction data are not used. Maturity levels in Section 6 are judgment based and are intended to be a structured hypothesis for practitioners to calibrate to their environment. The one change not mentioned during the overview was that the original pipeline implementation included the disclosure-template mapping at the end as a report step, but this was moved to follow validation once it was clear that template fields constrain what must be captured at ingestion.

Results

5.1 From buyer questions to data requirements

Table 1. The five questions every institutional buyer will ask at some stage, together with the data field and pipeline stage each involves. One reading of the table is that, at le

ast in most cases, it is not a single field that provides the answer to the buyer, but a combination of field values, their provenance and their history.

However, a CLO manager's first concern may not be the same: the most important element for a CLO manager may be how the loan credit and cash flow characteristics will behave within the tranche structure. This is because the CLO manager's return on equity depends on the difference between the yield on the loans and the funding costs (Cordell et al., 2023). A private debt fund that does a lot of borrower-level diligence and has continuing monitoring rights tends to reflect the practices its managers describe (Block et al., 2024). The whole-loan buyer acquiring the seasoned book of credit cares more about payment history and collateral currency, because it gets the servicing relationship with the credit. A single tape therefore has to answer several different lines of questioning at once. That is an argument for a validated internal data model from which buyer-specific views are generated, rather than a spreadsheet re-cut by hand for each bidder.

Table 1. Buyer due-diligence questions mapped to data requirements and pipeline stages

Buyer question	Data requirement	Pipeline stage
What exactly is in the pool?	Complete loan-level tape with stable identifiers; eligibility flags	1 Ingestion; 3 Template mapping
How reliable are the fields?	Validation results per field; exception log; document-to-tape reconciliation	2 Validation
How has the pool performed?	Payment histories, delinquency transitions, modifications, prepayments	1 Ingestion; 5 Analytics
How will cash flows be distributed?	Cash-flow model inputs; tranche or sale structure; scenario outputs	5 Analytics; 6 Bid analytics
What happens after the sale?	Ongoing loan-level reporting; representation-and-warranty tracking	7 Post-sale reporting

5.2 Types of misreporting and automated checks

Table 2 converts this evidence of misreporting into checks. No check establishes fraud. Each flags a pattern the literature associates with misstatement, so that a human reviewer can check it before the tape goes out to a buyer.

Table 2. Loan-tape misreporting types and corresponding automated checks

Misreporting type	Evidence	Automated check
Inflated collateral value	Kruger & Maturana (2021)	Flag appraisals equal to purchase price; compare to AVM estimates and flag large positive gaps
False owner-occupancy	Elul et al. (2023)	Cross-check occupancy against mailing address, tax and property-record signals
Undisclosed second liens / overstated equity	Piskorski et al. (2015)	Reconcile reported combined loan-to-value with lien and credit-bureau records
Field inconsistency	Ehrlinger & Wöß (2022)	Range, format, cross-field and temporal consistency rules
Document-tape mismatch	Xu et al. (2020)	Extract key terms from loan documents and reconcile against tape values

Figure 1 shows why these checks matter to price. In two independent studies, loans with misreported characteristics defaulted at substantially higher rates than comparable loans, a gap that is invisible in a tape that has not been validated.

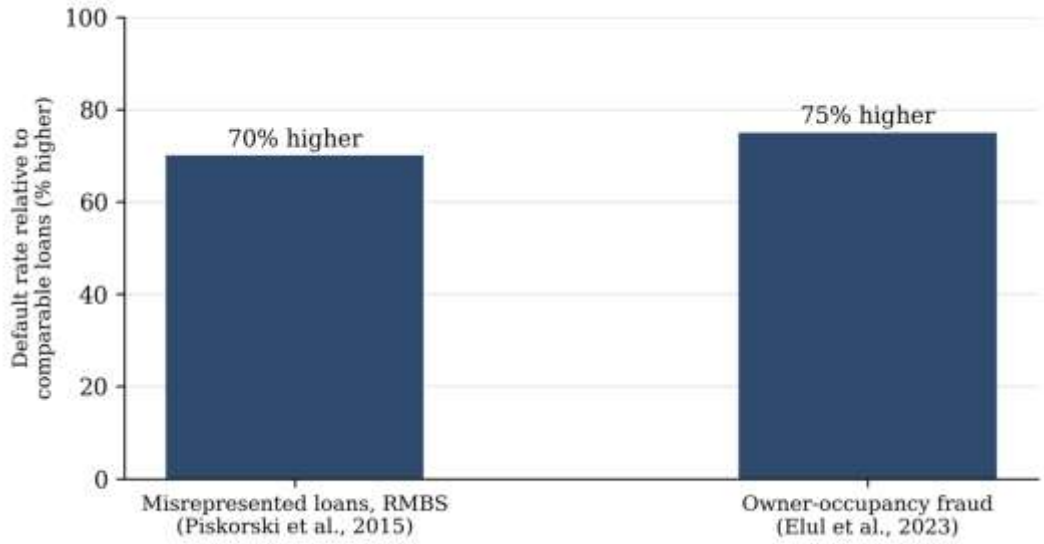


Figure 1. Increase in default rates for misreported loans relative to comparable loans, by study. Piskorski et al. (2015): loans with misrepresented borrower or collateral characteristics in pre-crisis RMBS; Elul et al. (2023): loans with false owner-occupancy claims.

5.3 The tape-to-bid pipeline

The seven-stage pipeline is illustrated in Figure 2.

1. Ingestion and extraction. The servicer and origination data are ingested to a system with stable loan identifiers, while the document extraction process extracts loan files to structured fields where the system of record is incomplete (Xu et al., 2020).
2. Validation. Field, cross-field and misreporting checks run on every refresh; exceptions are logged with owner and status rather than silently corrected.
3. Template mapping. Validated fields are mapped to the disclosure schemas that the transaction is required to provide, being Regulation AB II asset-level fields or the EU templates (U.S. Securities and Exchange Commission, 2014; European Commission, 2020). These gaps are usually surfaced before the data room opens.
4. Data room with lineage. Buyers receive the tape, documents, and validation results, each traceable to its source extract and version.
5. Cash-flow and structuring analytics. Loan-level cash flows under scenarios are mapped to the sale structure or tranche structure. The engine also determines pricing and answers buyer inquiries.
6. Bid analytics. Real-time view of bid and modeled value, profit and loss and exposure through the bid window. Re-cuts of the pool (loan removals, alterations to the structure) are counted in minutes, not days.
7. Post-sale reporting. Loan-level reporting continues on the required cadence, and representation-and-warranty exposures are tracked against the tape as sold.

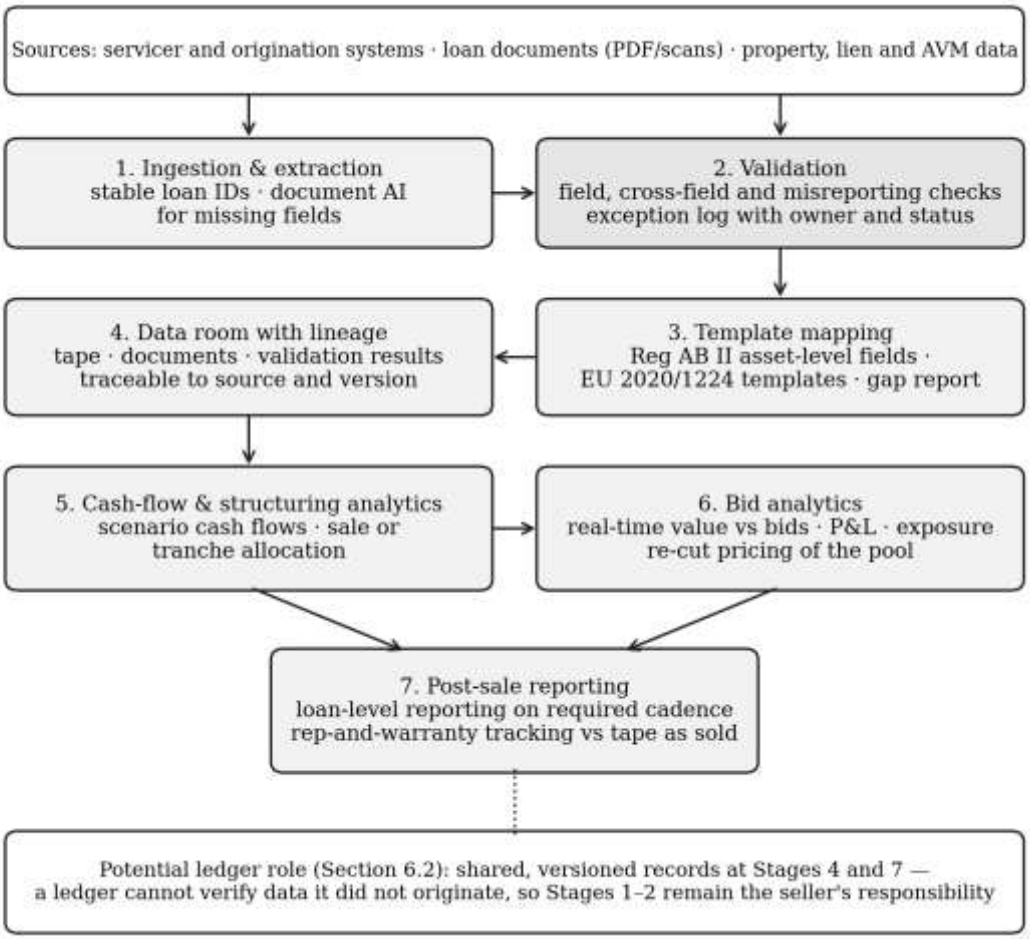


Figure 2. Seven-stage tape-to-bid reference pipeline for institutional loan pool sales.

In this stylized sale, a bank offers a pool of commercial real estate loans to a limited n umber of institutional investors or bidders. Stage 2 consists of appraisals with values at purchase price and loans with occupancy types that differ from property records. Instead o f these being found during diligence with the buyer, the seller will review them, usually correcting a small number of data errors, removing a handful of loans from the offering, a nd documenting the remainder in the exception log. During the bidding window, one bidder r equests price on the stack without the lowest-rated tranche of loans. At Stage 6, on the s ame afternoon, the reduced pool prices. The sellers distribute all buyers' questions on th e same validated data source. Post-sale reporting begins from a tape whose history is alre ady recorded.

More can be said about stage 6, where the data infrastructure and the price discovery mech anisms meet, but usually bidders do not settle on the pool as offered in a competitive bid window. They may also request exclusions, alternative cut-off dates, or sub-pool bidding, which change the cash flows, expected losses and profit or loss on holding the seller's cl aim at its carrying amount. Where the valuation engine is running directly on the validate d tape, a re-cut entails removing the subject loans, re-projecting cash flows under the sp ecified scenarios, and re-delivering a new value, gain/loss and residual exposure alongsid e the bid. Where the deal extract was prepared separately, each time a re-cut is run, ther e is the risk of a reconciliation break occurring between what the seller priced and what the buyer diligenced. Speed matters but consistency matters more: a seller who answers a r

e-cut quickly from the wrong extract has created a representation problem rather than solved a pricing one.

5.4 How disclosure regimes shape the infrastructure

Table 3 also shows a side-by-side comparison of the three most relevant disclosure regimes related to institutional pool sales. A seller subject to multiple regimes needs only to validate one internal data model and map each regime's templates. No discrete tapes are needed per regime.

Table 3. Asset-level disclosure regimes and their infrastructure implications

Regime	Scope	Granularity and cadence	Infrastructure implication
Regulation AB II (United States)	Registered asset-backed securities	Specified asset-level fields at issuance and in ongoing reports	Field-level schema mapping; ongoing reporting pipeline
EU Securitisation Regulation 2017/2402 with Delegated Regulation 2020/1224	Securitisations under EU rules	Standardized loan-level templates; quarterly reporting of underlying exposures	Template versioning; recurring validation and submission
ECB loan-level initiative	ABS used as Eurosystem collateral	Loan-by-loan data as a collateral-eligibility condition	Data quality directly tied to funding access

Discussion

6.1 A data-readiness maturity model

Institutions vary in their proximity to producing a buyer-ready tape. Table 4 provides a four-level classification system. The greatest value is added from Level 2 to Level 3, where the validation process stops being transaction-based, where exceptions are assigned to owners, and where there is an explicit regime of history tracking. There is, however, data-quality tooling available that would support Level 3, albeit across many different tools (Ehrlinger & Wöß, 2022).

Table 4. Data-readiness maturity model for loan pool sales

Level	Description	Typical time to buyer-ready tape	Principal risk
1. Ad hoc	Tape assembled manually for each deal from multiple systems	Weeks	Undetected errors; inconsistent answers to buyers
2. Repeatable	Standard extract and checklist, run per deal	Days to weeks	Validation limited to deal windows
3. Managed	Continuous validation, exception ownership, lineage, template mapping	Days	Tooling fragmentation; cost of upkeep
4. Sale-ready	Validated tape, data room and analytics available on demand	Hours to days	Over-investment for infrequent sellers

6.2 Tokenization: promise and limits

Tokenization has been described as the next infrastructure for loan pools. There is preliminary empirical evidence that issuance on a blockchain impacts lenders, as it is associated with lower yield spreads (Chen et al., 2024) and it can compress settlement and reporting with a common ledger (Bank for International Settlements, 2023). The limitation is structural: the ledger can transfer and store claims reliably, but it cannot verify claims outs

ide the ledger. A misreported appraisal written to a blockchain is still a misreported app raisal, but with a tamper-clear timestamp (John et al., 2023). Accordingly, tokenization i s complementary to the pipeline of Figure 2, but does not replace Stages 1 and 2. Perhaps the more realistic near-term use of ledgers is at Stages 4 and 7 where a shared and versio ned record of what was sold and reported can help reduce post-sale disagreement.

The validated tape and exception log with the lineage of the asset stay in the seller's da ta platform, allowing corrections and re-approvals as required. On the shared ledger, the only information written is a fingerprint of the tape as sold and each loan-level report. In this way, the seller, buyer and trustee have a way of checking that no one tampered wit h the record. The result is to realize whatever audit advantages ledgers can give, without pretending that a ledger can judge whether an appraisal or occupancy claim was true in the first place (John et al., 2023).

6.3 The counter-argument

The objection is, economically, that banks market loan pools only two or three times a yea r and incur quarterly costs of standing readiness regardless of whether a pool sells. Two counter-financial arguments lessen the point: portfolio monitoring, valuation, and regulat ory reporting use validated data in similar ways and imply similar costs of readiness. And the cost of poor data is deferred rather than avoided. Our evidence in the RMBS market sho ws that the value of misrepresented pools was not discounted at issuance, but rather these costs were incurred later in the form of defaults and disputes (Piskorski et al., 2015; Gr iffin, 2021). For a seller that cannot validate its tape, it does not save any money; inst ead, it changes the cost of validation into the cost of representation-and-warranty claims . Level 4 is not always appropriate for each institution, while a seller who sells very ra rely can stop at Level 3.

6.4 Limits

This occurs more frequently with pre-crisis US mortgages, but may not be the case with com mercial mortgages or small business loans, and fields may be defined differently in the di sclosure regimes (U.S. Securities and Exchange Commission, 2014; European Commission, 2020). For instance, the delinquency status, occupancy code or collateral value date in the EU templates do not necessarily map one-to-one with the corresponding Regulation AB II field, requiring decision documentation and review in Stage 3. Our pipeline and maturity proposal s are design proposals. Future work could explore the link between maturity and outcomes s uch as realized bid spreads or claim rates after sale across many transactions and sellers , thus validating the central tenet of this article.

Conclusion

Loan pools are priced on the basis of evidence, when buyers scrutinize loan tapes or regul ators insist on frequent asset-level data. The history of heavy misreporting shows this is reasonable because defects missed at sale become losses and disputes later. As a contribut ion we treat the production of that evidence as infrastructure: a buyer-driven set of data requirements, automated checks keyed to known patterns of misreporting, a seven-stage pipe line from tape to bid to post-sale reporting, and a maturity path that institutions can us e to decide how far to invest. It is hoped that distributed ledgers can help with exchangi ng and natively recording claims. They cannot relieve the seller of validating what goes i nto them. In practice, if a buyer asks how a field was derived, the seller should have to go to the system, not their memory, to answer.

References

1. Bank for International Settlements. (2023). Blueprint for the future monetary system : Improving the old, enabling the new. In BIS Annual Economic Report 2023 (Chapter I II). Retrieved from https://www.bis.org/publ/arpdf/ar2023e3.htm
2. Block, J., Jang, Y. S., Kaplan, S. N., & Schulze, A. (2024). A survey of private deb t funds. The Review of Corporate Finance Studies, 13(2), 335-383. https://doi.org/10 .1093/rcfs/cfae001

3. Chen, X., Cheng, Q., & Luo, T. (2024). The economic value of blockchain applications: Early evidence from asset-backed securities. Management Science, 70(1), 439-463. https://doi.org/10.1287/mnsc.2023.4671
4. Cong, L. W., & He, Z. (2019). Blockchain disruption and smart contracts. The Review of Financial Studies, 32(5), 1754-1797. https://doi.org/10.1093/rfs/hhz007
5. Cordell, L., Roberts, M. R., & Schwert, M. (2023). CLO performance. The Journal of Finance, 78(3), 1235-1278. https://doi.org/10.1111/jofi.13224
6. Ehrlinger, L., & Wöß, W. (2022). A survey of data quality measurement and monitoring tools. Frontiers in Big Data, 5, Article 850611. https://doi.org/10.3389/fdata.2022.850611
7. Elul, R., Payne, A., & Tilson, S. (2023). Owner-occupancy fraud and mortgage performance. Real Estate Economics, 51(5), 1137-1177. https://doi.org/10.1111/1540-6229.12455
8. Ertan, A., Loumioti, M., & Wittenberg-Moerman, R. (2017). Enhancing loan quality through transparency: Evidence from the European Central Bank loan level reporting initiative. Journal of Accounting Research, 55(4), 877-918. https://doi.org/10.1111/1475-679X.12162
9. European Commission. (2020). Commission Delegated Regulation (EU) 2020/1224 of 16 October 2019 supplementing Regulation (EU) 2017/2402 of the European Parliament and of the Council with regard to regulatory technical standards specifying the information and the details of a securitisation to be made available by the originator, sponsor and SSPE. Official Journal of the European Union, L 289, 1-216. Retrieved from https://eur-lex.europa.eu/eli/reg_del/2020/1224/oj
10. European Parliament & Council of the European Union. (2017). Regulation (EU) 2017/2402 of 12 December 2017 laying down a general framework for securitisation and creating a specific framework for simple, transparent and standardised securitisation. Official Journal of the European Union, L 347, 35-80. Retrieved from https://eur-lex.europa.eu/eli/reg/2017/2402/oj
11. Financial Stability Board. (2025). Evaluation of the effects of the G20 financial regulatory reforms on securitisation: Final report. Basel, Switzerland: Author. Retrieved from https://www.fsb.org/2025/01/evaluation-of-the-effects-of-the-g20-financial-regulatory-reforms-on-securitisation-final-report/
12. Flynn, S. J., Jr., Ghent, A. C., & Tchistyi, A. (2020). Informational efficiency in securitization after Dodd-Frank. The Review of Financial Studies, 33(11), 5131-5172. https://doi.org/10.1093/rfs/hhaa003
13. Griffin, J. M. (2021). Ten years of evidence: Was fraud a force in the financial crisis? Journal of Economic Literature, 59(4), 1293-1321. https://doi.org/10.1257/jel.20201602
14. John, K., Kogan, L., & Saleh, F. (2023). Smart contracts and decentralized finance. Annual Review of Financial Economics, 15, 523-542. https://doi.org/10.1146/annurev-financial-110921-022806
15. Klein, P., Mössinger, C., & Pfingsten, A. (2021). Transparency as a remedy for agency problems in securitization? The case of ECB's loan-level reporting initiative. Journal of Financial Intermediation, 46, Article 100853. https://doi.org/10.1016/j.jfi.2020.100853
16. Kruger, S., & Maturana, G. (2021). Collateral misreporting in the residential mortgage-backed security market. Management Science, 67(5), 2729-2750. https://doi.org/10.1287/mnsc.2019.3569
17. Manz, F., Müller, B., & Schiereck, D. (2020). The pricing of European non-performing real estate loan portfolios: Evidence on stock market evaluation of complex asset sales. Journal of Business Economics, 90(7), 1087-1120. https://doi.org/10.1007/s11573-020-00983-1
18. Neilson, J. J., Ryan, S. G., Wang, K. P., & Xie, B. (2022). Asset-level transparency and the (e)valuation of asset-backed securities. Journal of Accounting Research, 60(3), 1131-1183. https://doi.org/10.1111/1475-679X.12389

19. Phillips, M. A. (2025). Syndicated lending relationships, information asymmetry, and market making in the secondary loan market. Journal of Accounting Research, 63(5), 1761-1807. https://doi.org/10.1111/1475-679X.70000
20. Piskorski, T., Seru, A., & Witkin, J. (2015). Asset quality misrepresentation by financial intermediaries: Evidence from the RMBS market. The Journal of Finance, 70(6), 2635-2678. https://doi.org/10.1111/jofi.12271
21. U.S. Securities and Exchange Commission. (2014). Asset-backed securities disclosure and registration; Final rule (Release Nos. 33-9638; 34-72982). Federal Register, 79(185), 57184-57346. Retrieved from https://www.govinfo.gov/content/pkg/FR-2014-09-24/html/2014-21375.htm
22. Xu, Y., Li, M., Cui, L., Huang, S., Wei, F., & Zhou, M. (2020). LayoutLM: Pre-training of text and layout for document image understanding. In Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (pp. 1192-1200). New York, NY: ACM. https://doi.org/10.1145/3394486.3403172