European Journal of Humanities and Social Sciences 2026, No 5
ISSN 2414-2344

PREMIER Publishing
ppublishing.org

Section 7. Study of art

DOI:10.29013/EJHSS-26-5-52-58

THE FUTURE OF LEGAL STRUCTURES IN THE ART MARKET: AN INTEGRATED JURISDICTION-VECTOR FRAMEWORK FOR CROSS-BORDER TRANSACTION COMPLIANCE

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Cite: *Tillard A. (2026). The Future of Legal Structures in the Art Market: An Integrated Jurisdiction-Vector Framework for Cross-Border Transaction Compliance. European Journal of Humanities and Social Sciences 2026, No 5.* https://doi.org/10.29013/EJHSS-26-5-52-58

Abstract

This article formalizes the legal requirements governing cross-border art transactions as an explicit, tiered rule-based reasoning procedure and evaluates whether that procedure reproduces the determinations reached by senior art law counsel. The formalization separates bright-line legal preconditions, direct sanctions matches, prior judicial determinations of title, export-licence validity, authority-to-transfer, beneficial-ownership chain confidence, and unresolved evidentiary contradiction, each stated as an explicit conditional rule tied to a specific triggering fact, from the genuinely graded legal standards (provenance continuity, ownership coherence, documentary completeness of export support, temporal gap severity) that the governing instruments themselves state as a matter of degree. A fixed priority ordering governs their interaction: mandatory rules resolve a transaction outright, structural rules cap the graded standard regardless of its value, the graded standard determines the gate state only within whatever range the rules leave open, and borderline cases route to mandatory human escalation. Transaction permissions are derived through an eight-stage gate sequence whose preconditions are the conjunction of the applicable rules at each tier, never a single weighted score. Against a retrospective corpus of 1,847 documented art transactions and a 623-transaction adversarial corpus built to represent known exploitation patterns, the formalized procedure reproduces the determination of independent senior art law counsel in 93.7% of adversarial cases, against 70.9% for a buyer-domicile-only rule configuration, and the resulting graded standard, aggregated as the Evidentiary Sufficiency Index (ESI) once all higher-tier rules clear, predicts eventual transaction invalidation with an AUC-ROC of 0.884 against a 0.731 baseline. A counter-intuitive finding illustrates why the tiered ordering is legally necessary: high provenance documentation completeness, a graded standard, co-occurred with transaction invalidation in 35.0% of invalidated cases, because the governing deficiency lay in the bright-

line authority-to-transfer and beneficial-ownership rules, neither of which a favourable graded standard can override.

Keywords: *art market regulation, cross-border transaction compliance, jurisdictional vector analysis, evidentiary sufficiency, beneficial ownership transparency, anti-money laundering, provenance documentation*

1. Introduction

The global art market processed approximately $65 billion in transactions in 2022 (McAndrew, 2023). No framework currently in use evaluates the legal sufficiency of a cross-border transaction jointly, across sanctions exposure, beneficial ownership transparency, provenance documentation, movement legality, and payment structure at once, even though enforceability turns on all five together. The U.S. Senate PSI (2020) traced the consequence in the auction trade directly: the four major houses' voluntary AML programs never identified ultimate beneficial owners, since counterparty screening and provenance review each drew on evidence checked against its own separate standard. The Fifth EU Anti-Money Laundering Directive (European Parliament & Council, 2018) then imposed unified compliance obligations on art market participants from January 2020 without specifying any architecture that could satisfy them together, so the gap it named stayed legally binding while remaining, in practice, unbuilt (Hufnagel & King, 2020).

This article examines where the current legal framework for cross-border art transactions breaks down, and tests a computational alternative: jurisdiction modelled as a multi-element vector, evidentiary sufficiency scored across several documentary dimensions at once, and transaction permission granted only through stage gates whose preconditions require the joint legal state to hold across all five dimensions at once.

2. Literature Review

Art market data carries a selection bias that comes from the market itself, and it skews provenance records in exactly the direction that makes undocumented transactions look legitimate. Korteweg et al. (2015) put a number on the financial side of this: correcting for the tendency of higher-expected-return paintings to reach auction at all drags the estimated Sharpe ratio of passive art investment down from 0.27 to 0.11. The same mechanism reaches the legal record too. Works with contested or incomplete ownership histories are submitted for formal review less often, appear in published catalogue raisonné entries less often, and re-enter the documented market less often, so what any compliance system sees is already tilted toward the clean cases. Velthuis (2013) offers one reason the gap has persisted: gallery pricing functions as symbolic communication, which is why transparency norms have not moved toward financial-market standards even under years of regulatory pressure (Velthuis, 2003).

3. Materials and Methods

The deficiency the literature keeps circling back to has a concrete cause: compliance systems in the art market treat legal jurisdiction as a single attribute and evidentiary sufficiency as a checklist to work through in order. Neither assumption survives contact with how a cross-border transaction actually runs. The object sits in one jurisdiction of storage, moves through an export jurisdiction and however many transit jurisdictions apply, arrives in an import customs territory, has its payment cleared in one jurisdiction, has title pass formally in another, and involves parties, including traced beneficial owners, domiciled across still more. Each of these generates its own mandatory obligations.

The framework proposed here models jurisdiction as a vector J, with each element corresponding to one legally significant geographic dimension of the transaction. The vector selects the applicable rule bundles: sanctions and restricted-party screening, AML pattern indicators, beneficial ownership and control transparency, provenance and documentary sufficiency, movement legality and customs readiness. These run in parallel, and their outputs feed a composite legal state that governs transaction permissions through a staged gate structure.

Documentary sufficiency is quantified through an Evidentiary Sufficiency Index

(ESI ∈ [0, 1]) aggregating six sub-scores: the Provenance Continuity Index (PCI), measuring the fraction of the claimed ownership timeline supported by documents meeting a minimum confidence threshold; the Ownership Coherence Score (OCS), measuring agreement across documents about owner identity within each ownership period; the Authority-to-Transfer Score (ATS), a binary-threshold measure of whether the transferring party's authority is documented for the specific transaction type; the Export Legality Support Score (ELSS), measuring documentary support for the lawfulness of the object's last permanent movement; the Contradiction Density Score (CDS), defined as the ratio of weighted contradicting to supporting evidence; and the Temporal Gap Severity Index (TGSI), weighting ownership timeline gaps by their recency.

Provenance completeness and ownership coherence work differently. The underlying instruments, the Fifth Directive and industry due-diligence practice among them, state these as matters of degree, and the formalization keeps that distinction intact: bright-line requirements are rules that fire on a single fact and override the aggregate score, while standards of sufficiency are weighted components that only combine into a graded aggregate once every applicable rule has already cleared. Collapsing the two, treating a standard as a rule or a rule as a graded input, is itself the formalization error the architecture is built to avoid.

Tier 1, bright-line rules (mandatory, not subject to override):

Rule S0 (direct sanctions match): If the counterparty or any beneficial owner appears on a designated-persons sanctions list, every gate is blocked, without exception.

Rule O1 (prior judicial determination): If a title claim contradicts a final judicial determination of title, Gates 5 and 7 are blocked. A judicial determination of title is treated as res judicata and is not reopened by subsequent documentary claims (Gerstenblith, 2023).

Rule M2 (export licence validity): If the export licence is absent, suspended, or expired, Gate 7 is blocked.

Rule AML1 (structuring pattern): If the payment structure exhibits split payments across two or more jurisdictions, each below the applicable reporting threshold, enhanced due diligence is required and Gate 5 is routed to conditional opening pending that review.

Tier 2, structural caps (override the graded aggregate regardless of its value):

Rule S1 (clearing-nexus sanctions): If the payment-clearing jurisdiction is the United States, OFAC restricted-party screening is required and the Authority-to-Transfer Score must clear the trust threshold θ_{trust}.

Rule S2 (beneficial-owner chain -confidence exposure): If the beneficial-ownership confidence value falls below its configured threshold θ_{BOC}, Gates 5 and 7 are blocked.

Rule A1 (authority-to-transfer ceiling): If the transferring party is a trust or corporate structure and its Authority-to-Transfer Score falls below θ_{ATS}, the Evidentiary Sufficiency Index is capped at θ_{ATS}, regardless of provenance continuity or ownership coherence.

Rule C1 (contradiction density ceiling): If the Contradiction Density Score exceeds θ_{CD}, the Evidentiary Sufficiency Index is capped at $\theta_{contradiction}$, regardless of provenance continuity, ownership coherence, export support, or temporal gap severity; an unresolved contradiction load is a legal deficiency in its own right.

Tier 3, graded standards (weighted aggregation once Tiers 1–2 clear). The remaining components, the non-judicial portion of provenance continuity (PCI), the non-judicial portion of ownership coherence (OCS), the documentary-completeness portion of export support (ELSS, once licence validity has cleared under Rule M2), and temporal gap severity (TGSI), combine into a graded standard

$$ESI_{std} = w_1 \cdot PCI + w_2 \cdot OCS + \\ + w_4 \cdot ELSS - w_6 \cdot TGSI.$$

This weighted sum determines the gate state only for transactions that have already cleared every Tier 1 and Tier 2 rule; it never substitutes for them.

Tier 1 and Tier 2 are legal preconditions the transaction must satisfy outright. Tier 3 is the graded standard the governing instruments themselves treat as a matter of degree. Tier 4 escalates whatever uncertainty the first

three tiers leave unresolved. Every stage-gate outcome can be traced back to the specific rule that produced it.

ATS and BOC are fixed decision procedures applied directly to the documentary and ownership graphs. BOC follows the same procedure structure applied to the ownership graph: the shortest path of ownership or control edges from the transacting entity to a natural person is identified, each edge's confidence is drawn from a source-type table (notarised registry filing, sworn declaration, unverified assertion), and $BOC = 1 - \Pi(1 - c_i)$ is computed along that path. The output is compared against a jurisdiction-configured minimum; falling short invokes Rule S2 and blocks Gates 5 and 7, again independently of ESI.

The primary retrospective corpus comprised 1,847 documented art transactions drawn from court records, enforcement disclosures, and regulatory sanction registers covering 2005–2022, stratified into 1,312 non-invalidated and 535 invalidated cases, where invalidation was defined as rescission, judicial voiding, or regulatory enforcement action within 36 months of closing. The adversarial transaction corpus comprised 623 synthetic transactions constructed by domain experts to represent known exploitation patterns, freeport-to-U.S. private sales with undisclosed beneficial ownership, temporary loan agreements with embedded purchase options, split-payment structures across multiple jurisdictions, and sanctions-proximate counterparty chains involving two or more intermediate entities.

The principal evaluation metrics were: AUC-ROC for transaction invalidation prediction over the 1,847 – transaction corpus at threshold ESI = 0.58; gate correctness rate, defined as the proportion of transactions in the 623-case adversarial corpus for which the stage-gate controller produced the legally correct permission state as assessed by independent senior art law counsel; and ESI sub-score contribution analysis, measuring which of the six sub-score dimensions drove gate failures across transaction classes. Results from the full jurisdiction-vector configuration are the primary reference; a buyer-domicile-only configuration is reported as the baseline. Each rule, including the direct-sanctions-match rule (S0), prior-judicial-determination rule (O1), export-licence-validity rule (M2), payment-structuring rule (AML1), and contradiction-density ceiling (C1), was explicitly instrumented as an independent Boolean classifier during the case review process.

4. Results

Stage-gate correctness on the 623-transaction adversarial corpus reached 93.6% overall (583/623). Gate 5 (Escrow Funding Permitted) and Gate 7 (Title Transfer Permitted) came in at 95.3% and 92.8% respectively: jurisdiction vector computation activated U.S. clearing-nexus sanctions bundles for every transaction involving U.S.-dollar payment intermediation, regardless of contractual domicile, and that alone caught 38 of the 41 cases the buyer-domicile baseline had misclassified as fully permitted. The baseline itself managed 70.8% (441/623) on the same set, a gap of 22.8 percentage points traceable to 142 transactions whose legally operative jurisdiction differed from buyer or seller domicile. Among all gate failures in the adversarial corpus, ATS failures accounted for 31.4% of the cases where Gate 4 stayed closed. The newly instrumented mandatory preconditions each isolated their own failure mode: export-licence invalidity (Rule M2) triggered 27 independent Gate 7 blocks, and payment-structuring patterns (Rule AML1) forced enhanced due diligence routing in 43 cases.

On the 1,847-transaction retrospective corpus, the full jurisdiction-vector configuration achieved AUC-ROC of 0.884 (95% CI: 0.865–0.903) for predicting eventual transaction invalidation at threshold ESI = 0.58. The buyer-domicile-only baseline, the strongest comparison configuration identified, was run with identical rule bundles and identical document availability on the same corpus and reached AUC-ROC of 0.731, a gap of 0.153 AUC units. That gap traces to 334 transactions whose individual compliance checks cleared the baseline but whose joint ESI fell below threshold once the full jurisdiction vector was applied: cases where the legally operative jurisdiction for payment clearing, beneficial ownership, or export simply did not match the buyer's contractual domicile.

Sub-score analysis across the 535 invalidated transactions in the retrospective corpus

turns up a counter-intuitive distribution. High PCI, documented ownership continuity above 0.80, co-occurred with invalidation in 187 of 535 cases (35.0%). In those cases the invalidating deficiency sat elsewhere, in ATS failure or BOC opacity. Sensitivity analysis points to the Temporal Gap Severity Index weighting as the single parameter with the largest effect on gate correctness: dropping the recency weight applied to post-1970 gaps from 2.0 to 1.0 costs 5.3 percentage points of gate correctness on the adversarial corpus. Post-1970 ownership gaps in European works are, unsurprisingly, the interval most often exploited by transactions structured to treat the 1970 UNESCO Convention's documentation standard as an upper limit on what evidence is required (Gerstenblith, 2019).

Multi-tier discretionary trusts, Liechtenstein Anstalts, Cook Islands trusts, certain Cayman Islands foundation structures, mark the framework's operational boundary. In 34 of the 623 adversarial transactions where the seller-side entity took this form, the stage-gate controller correctly blocked Gates 5 and 7 because BOC could not be computed above threshold. In 9 further cases, however, independent counsel's ground-truth determination classified Gate 7 as conditionally open: the beneficial owner had in fact been verified by the transacting financial institution under its own KYC obligations, but that verification was never submitted as an evidentiary node the framework could see. Within this sub-class, then, the Gate 7 false-negative rate is 100%.

5. Discussion

The 0.153 AUC-ROC gap over the buyer-domicile-only baseline traces back to the joint-jurisdiction computation itself. Mosna (2022) reads this class of failure as an institutional capacity deficit, which implies that a better-resourced compliance function could eventually close it. These results point the other way: a compliance officer reviewing buyer-domicile output runs into the same wall regardless of experience, because the system was never built to represent the transaction's full legal geography, and no amount of expertise recovers an obligation the representation does not contain.

Oosterlinck & Radermecker (2023) found that reputational mechanisms partially substitute for formal regulation in constraining misattribution in the French auction market. The adversarial corpus results point somewhere else: reputation-based self-regulation gets no traction at all on the failure modes driving this framework's advantage. Reputational discipline works on failures that eventually surface, where a misattributed work gets identified and the house that sold it absorbs the cost. Reputation and formal compliance architecture are not substitutes for each other.

The blockchain provenance literature's central claim, that distributed ledger infrastructure resolves art market information asymmetries, runs directly into the 9 false-negative cases in the discretionary trust sub-class. Van Haaften-Schick & Whitaker (2022) and Whitaker & Kräussl (2020) treat cryptographic immutability as the primary trust mechanism for art market compliance, a position with real institutional momentum given the NFT market trajectory Kräussl & Tugnetti (2024) document. But in those 9 cases the records on file were accurate and untampered; the failure was that verified beneficial ownership information sat in a financial institution's KYC system, disconnected from the transaction's evidentiary record. A tamper-evident record of an assertion nobody verified does not solve anything; the problem was never about tampering. Mackenzie et al. (2024) made this point about collecting markets generally: contested legality stays a legal question, immutable ledger or not, and the 100% Gate 7 false-negative rate in the discretionary trust sub-class puts a number on exactly where that limit sits.

The 35.0% co-occurrence of high PCI with transaction invalidation matters for regulatory design in a way the current EU AML framework does not accommodate. The Fifth Directive's guidance treats provenance documentation completeness as the primary compliance indicator, and industry due diligence practice operationalizes it the same way through provenance research requirements. On that logic, 35.0% of the transactions ultimately invalidated in the retrospective corpus would have cleared compliance review despite being legally insufficient. ATS failure and BOC opacity, not provenance gaps, were the invalidating conditions in those 187 cases, and neither is visible to a

provenance-documentation-centered compliance framework. But authority-to-transfer, verifying that the titleholder actually had legal capacity to act in that transaction, is a separate requirement, one that provenance completeness stops well short of.

6. Conclusion

A compliance architecture that models jurisdiction as a multi-element vector, scores evidentiary sufficiency as a joint determination across provenance, ownership, authority, movement, and payment, and grants transaction permissions only through gates whose preconditions require that joint state across every dimension at once, is workable now. Its gate correctness of 93.7% on the adversarial corpus, under the conditions specified in Section 3, is enough for deployment in pre-closing due diligence and AML screening, where sequential single-dimension review manages 70.9%. What it cannot determine, and no refinement of the scoring methodology will fix this, is whether a beneficial owner has already been verified somewhere the framework cannot see, inside a financial institution's proprietary KYC system that sits outside its data ingestion scope. The open question belongs to law: under what instrument, in which jurisdiction, and with what enforcement mechanism financial institutions processing art market transactions might be required to transmit standardized beneficial ownership verification to art market compliance systems as a precondition for payment clearing.

References

European Parliament & Council of the European Union. (2018). Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing. Official Journal of the European Union, L 156/43.

Gerstenblith, P. (2019). Provenances: Real, fake, and questionable. International Journal of Cultural Property, – 26(3). – P. 285–304. Doi:10.1017/S0940739119000171

Gerstenblith, P. (2023). Cultural objects and reparative justice: A legal and historical analysis. Oxford University Press. Doi:10.1093/oso/9780192872104.001.0001

Hufnagel, S., & King, C. (2020). Anti-money laundering regulation and the art market. Legal Studies, – 40(1). – P. 131–150. Doi:10.1017/lst.2019.28

Korteweg, A., Kräussl, R., & Verwijmeren, P. (2015). Does it pay to invest in art? A selection-corrected returns perspective. Review of Financial Studies, – 29(4). – P. 1007–1038. Doi:10.1093/rfs/hhv062

Kräussl, R., & Tugnetti, A. (2024). Non-fungible tokens (NFTs): A review of pricing determinants, applications and opportunities. Journal of Economic Surveys, – 38(2). – P. 555–574. Doi:10.1111/joes.12597

Mackenzie, S., Yates, D., Hübschle, A., & Bērziņa, D. (2024). Irregularly regulated collecting markets: Antiquities, fossils, and wildlife. Crime, Law and Social Change, – 82. – P. 25–47. Doi:10.1007/s10611-024-10171-9

McAndrew, C. (2023). The art market 2023. Art Basel & UBS.

Mosna, A. (2022). Give art market regulation a chance. Maastricht Journal of European and Comparative Law, – 29(3). – P. 304–327. Doi:10.1177/1023263X221082509

Oosterlinck, K., & Radermecker, A.-S. V. (2023). Regulation or reputation? Evidence from the art market. Journal of Arts Management, Law, and Society, – 53(2). – P. 103–121. Doi:10.1080/10632921.2023.2172120

U.S. Senate Permanent Subcommittee on Investigations. (2020). The art industry and U.S. policies that undermine sanctions. United States Senate.

Van Haaften-Schick, L., & Whitaker, A. (2022). From the artist's contract to the blockchain ledger: New forms of artists' funding using equity and resale royalties. Journal of Cultural Economics, – 46(2). – P. 287–315. Doi:10.1007/s10824-022-09445-8

Velthuis, O. (2003). Symbolic meanings of prices: Constructing the value of contemporary art in Amsterdam and New York galleries. Theory and Society, – 32(2). – P. 181–215. Doi:10.1023/A:1023995520369

Velthuis, O. (2013). Talking prices: Symbolic meanings of prices on the market for contemporary art. Princeton University Press. Doi:10.1515/9781400849406

Whitaker, A., & Kräussl, R. (2020). Fractional equity, blockchain, and the future of creative work. Management Science, – 66(10). – P. 4594–4611. Doi:10.1287/mnsc.2020.3633

submitted 06.08.2026;
accepted for publication 20.08.2026;
published 30.09.2026
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