

Legal Liability for the Misuse of Artificial Intelligence in Electronic Commercial Transactions.

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Abstract

Where autonomous AI plays an intermediary role in e-commerce, fault-based liability requires a human decision point. However, the abandonment of fault-based liability is institutionally characterized by the 2025 abandonment of the EU's AI Liability Directive. Using doctrinal-comparative analysis of the EU AI Act, the revised Product Liability Directive, the US, China, the UAE and the UNCITRAL Model Law on Automated Contracting, this article argues that the EU AI Act's high-risk taxonomy does not capture everyday pricing agents. It proposes Autonomous Commercial Agency Liability (ACAL) a three-tiered model graded by transactional autonomy, that extends the PLD's strict liability logic to all comparators..

Keywords: artificial intelligence liability, autonomous AI agency, electronic commerce, strict product liability, EU AI Act, AI Liability Directive, algorithmic pricing, black-box opacity

Introduction

Global retail e-commerce is projected to reach USD 6.42 trillion by 2025 (eMarketer, 2026). The agentic-AI market, projected at USD 46.74 billion in 2025, is projected to reach USD 175.11 billion in 2030 (Mordor Intelligence, 2026). By 2030, there is expected to be USD 3-5 trillion in agentic commerce (McKinsey & Company, 2025). And an increased proportion of these transactions are not priced or concluded by a human. This is the empirical predicate for the central claim of this article.

Fault-based liability logically would require a human decision point, which is not available for a deep learning system. Deep learning systems are not programmed but rather learned, and their outputs can be difficult to identify even for developers of such systems. This article terms this black-box opacity the evidentiary failure that defeats foreseeability and causation, the predicates on which fault-based liability depends.

The 2022 draft AILD by the European Commission was an early sign of change, as it proposed a reversal of the burden of proof through disclosure orders and by creating a rebuttable presumption that a causal link was proved (European Commission, 2022). It was the most serious fault-based-tort retrofit attempt. The Commission withdrew the draft in February-October 2025 (European Commission, 2025; Bird & Bird, 2025) when the amended Product Liability Directive (Directive (EU) 2024/2853) for the first time extended strict, no-fault liability for defective "products" to software and AI.

Moffatt v. Air Canada (2024 BCCRT 149), in which a chatbot misrepresents a bereavement-fare policy, is the easy case, deterministic and traceable to a retrievable policy. The harder case, Moffatt does not reach, is where there is no retrievable policy: a chatbot output traces to no retrievable policy, anywhere. It thus meets two challenges: (i) showing Regulation (EU) 2024/1689 Annex III's exclusion of ordinary pricing agents without creditworthiness function to the only Article 50 transparency obligations and (ii) addressing them through ACAL tested against the US, China, and UAE, given that UNCITRAL's Model Law (2024) cannot serve as an attribution layer.

2. Literature Review and Critical Discussion

AI commercial liability scholarship has generally developed in parallel, without creating a unified model of liability severity once AILD-withdrawal occurs. This review identifies five independent lines of inquiry and common gaps between them.

2.1 Strand One: Foundational liability-typology scholarship

The typology of Beckers and Teubner (2022), which labels vicarious liability "actants", enterprise liability "hybrids" and fund-based liability "crowds", helped shape the Act and is the most-cited pre-AI Act typology. Its "actant" liability has since been rejected, however, because it assumed a single standard of fault, which the AILD no longer has. Contingent on Section 4's tiers, the harmonized standard is re-created on the PLD's strict-liability basis.

2.2 Strand Two: Fault-based AI tort scholarship overtaken by the AILD withdrawal

A second strand sought to complement, rather than replace, fault-based reform. Soyer and Tettenborn (2022) proposed introducing strict liability for injuries directly caused by AI, and a fault-based regime for economic

harm. This assumption collapsed when the AILD was withdrawn. Noto La Diega and Bezerra (2024) argued that the AILD's ex post relief was inadequate for generative AI, so ACAL can be considered its heir.

2.3 Strand Three: The risk-based-regulation critique

A third strand critiques the apparatus of the AI Act. Kretschmer et al (2023) argue its ex ante, compliance-based risk tiers are weak proxies for potential safety and deterrence, rather than bureaucracy, should be the goal of liability law. The article operationalizes this intuition through the four criteria in Section 4.

2.4 Strand Four: AI agency and contract-formation scholarship

One seam concerns the allocation of contracts: Torrance and Tomlinson (2024), Zhai (2026), and UNCITRAL's Model Law (2024) all resolve attribution without taking liability into account. ACAL closes this seam downstream.

2.5 Strand Five: Algorithmic pricing literature, and the synthesis

Lastly, a fifth strand documents algorithmic pricing's economic impact in competition law, not private liability. Bichler et al. (2025) find 28% higher retail-gasoline margins in Germany following algorithmic pricing in the absence of explicit communication. The DOJ/FTC March 2024 Report and *United States v. RealPage, Inc.* (2025) confirm that pricing tools can ease coordination without agreement; nobody asks whether the output was a product defect.

These papers do not address the AILD's abandonment, the PLD's extension, the AI Act's blind spot, or attribution under UNCITRAL. ACAL does so, drawing on Calabresi's cheapest-cost-avoider theory. These theories explain the AILD's closed-off foreseeability and causal traceability through black-box opacity.

Table 1. Literature Positioning Matrix

Source	Domain	Relation to AILD withdrawal	Liability mechanism proposed	Gap relative to ACAL
Beckers & Teubner (2022)	Tort typology	Pre-withdrawal; assumes future fault standard	Vicarious / enterprise / fund-based typology	No operative mechanism post-withdrawal
Soyer & Tettenborn (2022)	Tort	Pre-withdrawal; relies on AILD fallback	Strict (injury) + fault-with-presumption (economic harm)	Economic-harm limb now unserved
Noto La Diega & Bezerra (2024)	Tort	Pre-withdrawal critique of AILD mechanism	Ex post liability as safety incentive	Mechanism critiqued no longer exists
Kretschmer et al. (2023)	Regulatory theory	Pre-PLD finalization	Developer/deployer split (endogenous/exogenous)	No transactional-autonomy specificity
Torrance & Tomlinson (2024); Zhai (2026); UNCITRAL (2024)	Contract attribution	Independent of AILD	Attribution of contract to principal	Silent on liability severity
Bichler et al. (2025); DOJ/FTC (2024)	Competition economics	Independent of AILD	Antitrust/structural remedy	No products-liability frame for individual harm

3. Comparative Legal Analysis

This section maps the allocation of liability or non-liability for autonomous AI commercial agency at the level of each jurisdiction to the criteria operationalized in Section 4.

3.1 European Union: the pivot from fault to product/risk liability

Systems include prohibited, high-risk, limited-risk (Article 50 transparency), minimal-risk and general-purpose (Regulation (EU) 2024/1689, effective 1 August 2024). High-risk systems in Annex III include biometric identification, critical infrastructure, employment, creditworthiness, and law enforcement. Commercial pricing agents are excluded and regulated under Article 50's low thin disclosure, not defect, standard. The revised Product Liability Directive (Directive (EU) 2024/2853, OJ L 302, 23 October 2024, p. 1, in force from 9 December 2026)

brings software and AI agents within the Directive's "product" definition, providing strict liability for failure to provide updates/patches, and requiring disclosure with a presumption of defectiveness if disclosure requirements are not met. However, in its place, the AILD was proposed in September 2022 and withdrawn in October 2025 (European Commission, 2025; Bird & Bird, 2025): the EU Digital Fairness Act (2025 consultation) is intended to complement Section 5.

3.2 United States: fragmented, fault-retentive, and competition-law-centred

There is no analog to the US federal statute; Colorado's SB24-205 established a reasonable care standard for AI creators and users, but was repealed in favor of Colorado's SB26-189 (adopted 15 May 2026), which apportions liability based on relative fault, the doctrinal inverse of the EU pivot. Algorithmic pricing harm has been addressed through antitrust (DOJ/FTC, 2024; *United States v. RealPage, Inc.*, 2025). An algorithmic pricing bill by Senator Klobuchar (S. 3686) was not passed into law.

3.3 China: ex ante administrative licensing rather than private liability litigation

China's administrative licensing regime regulates commercial harm from AI. The Algorithm Recommendation Provisions (2022) require filing/self-assessment and prohibit discrimination in pricing/recommendation targeting. The Generative AI Measures (2023) impose legal and security obligations and enforce compliance via administrative sanction (like the E-Commerce Law) rather than damages claims. There is no equivalent to the PLD fallback.

3.4 United Arab Emirates: the uncodified fault-based default

UAE does not have any artificial intelligence (AI) specific liability law, although the Civil Transactions Law (Federal Decree-Law No. 5 of 1985) establishes a general fault standard. Such standard has never been applied in the UAE's courts to the standard of black-box opacity. The UAE AI Charter (2024) proposes twelve non-binding principles. Also in Abu Dhabi, Law No. 3 of 2024 provides a machinery of oversight, not of liability allocation, and several other laws opt for default fault.

3.5 The international soft-law layer: UNCITRAL Model Law on Automated Contracting

UNCITRAL's Model Law on Automated Contracting (2024) provides that there is a layer of attribution: user contracting (Art. 7), all reasonable reliance is excused for the counterparty unless the counterparty knows (Art. 8), and the result (Art. 9). The overlay is not concerned with compensation, and that is left to ACAL's tiers.

Table 2. Comparative Liability Regimes

Jurisdiction	Governing instrument(s)	Liability trigger/standard	Treatment of black-box opacity	Private compensation channel	Leading instrument/case
European Union	AI Act; revised PLD; withdrawn AILD	Strict (PLD) for products; transparency-only (Art. 50) for ordinary commercial agents	Addressed via PLD disclosure/presumption mechanism	Yes, via PLD strict liability	Directive (EU) 2024/2853
United States	No federal statute; Colorado SB24-205/SB26-189	Fault, apportioned by relative fault	Not directly addressed	Yes, fault-based; limited for algorithmic harm	SB26-189 (2026)
China	Algorithm Recommendation Provisions (2022);	Administrative filing/assessment	Addressed via ex ante licensing, not litigation	Largely no (administrative enforcement)	2022 Provisions

Jurisdiction	Governing instrument(s)	Liability trigger/standard	Treatment of black-box opacity	Private compensation channel	Leading instrument/case
	Generative AI Measures (2023)				
UAE	Civil Transactions Law (1985); AI Charter (2024)	Generic fault default	Not addressed	Yes, in theory; untested for AI causation	Federal Decree-Law No. 5 of 1985
UNCITRAL (cross-cutting)	Model Law on Automated Contracting (2024)	Attribution, not liability severity	Not applicable (attribution layer)	N/A (upstream of liability)	Arts. 7–8

Table 3. Regulatory Timeline, 2022–2026

Period	Event
2022	AILD proposed (Sept.); China Algorithm Recommendation Provisions effective (Mar.)
2023	China Generative AI Measures effective (Aug.)
2024	AI Act enters into force (Aug.); PLD adopted (Oct.); Colorado SB24-205 enacted; <i>Moffatt v. Air Canada</i> decided (Feb.); UNCITRAL Model Law adopted; UAE AI Charter issued (Jul.)
2025	Industry coalition calls for AILD withdrawal (Jan.); Commission announces AILD withdrawal (Feb.); Digital Fairness Act consultation launched (Jul.); RealPage settlement proposed (Nov.); AILD formally withdrawn (Oct.)
2026	Colorado SB26-189 signed (May); AI Act Annex III high-risk obligations apply (Aug.); PLD applies to new products (Dec.)

Table 4. Empirical Indicators

Indicator	Value	Source
Global retail e-commerce sales, 2025	≈ USD 6.42 trillion (≈20.5% of retail sales)	eMarketer (2026)
Global retail e-commerce sales, 2026 (forecast)	≈ USD 6.88 trillion	eMarketer (2026)
Agentic AI in retail/e-commerce market size, 2025	≈ USD 46.74 billion	Mordor Intelligence (2026)
Agentic AI in retail/e-commerce market size, 2030 (forecast)	≈ USD 175.11 billion (30.2% CAGR)	Mordor Intelligence (2026)
Projected agentic commerce transaction value by 2030	USD 3–5 trillion	McKinsey & Company (2025)
Algorithmic-pricing margin effect, German retail gasoline	≈ +28%	Bichler et al. (2025)
RealPage settlement	Data-staleness restrictions; 3-year monitor; no fine	<i>United States v. RealPage, Inc.</i> (2025)

4. Proposed Framework: Autonomous Commercial Agency Liability (ACAL)

The article's original contribution is a portable, criteria-based liability allocation model filling the AILD withdrawal's regulatory gap focused on, but not limited to, the use of commercial transactional agency rather than AI risk generally.

4.1 Four operational criteria

We compare determinism (rule-traceable/ emergent?), transactional authority (merely recommends? or autonomously binds and engages UNCITRAL Article 7?), reversibility and oversight (how may a human resist the outputs of the algorithmic process until the effects of its output are made manifest?); and traceability (to what extent may the basis for the output be reconstructed per the PLD's obligation?).

4.2 The three-tier liability ladder

Tier I , Fault Retained. Fully deterministic, rule-based systems that are still fully human-reviewable, including scripted chatbots and static pricing rules. Ordinary fault standards apply, as in Moffatt: the output can be traced to some design choice.

Tier II , Rebuttable Strict Liability. Generative or adaptive systems that have advisory rather than determinative authority. Indeed, strict liability for defect should be rebutted by PLD-style disclosure/provision of information, post-market surveillance, etc., realizing Kretschmer et al.'s (2023) prescription without reviving AILD's barred fault inquiry.

Tier III - Absolute Strict (Product) Liability: Fully autonomous pricing or purchasing agents with ultimate authority over the transaction, with no human in the loop. The merchant will always be liable to the PLD as its "economic operator", but will be contractually indemnified against the developer.

4.3 Reconciliation with UNCITRAL attribution

Consequently, ACAL's approach is downstream of UNCITRAL attribution: once attributed to the merchant under Article 7, the standard of a merchant's liability (not the fact) is determined, thus preserving the effect on Article 8 of estoppel.

4.4 Anticipated objections

ACAL's tiered approach alleviates these concerns about innovation, since only final-authority, no-oversight systems are allowed to operate at Tier III. This strict-liability insurance approach is already in place elsewhere. There are concerns, too, that mischaracterizing ACAL as severity supplement would negatively add double regulation to the AI Act. Cross-border enforceability is addressed with Tier III indemnification, whereby the merchant, who can be found in the consumer forum, is mainly liable and has contractual indemnification against the developer.

4.5 ACAL as an explicit articulation of an implicit EU trajectory

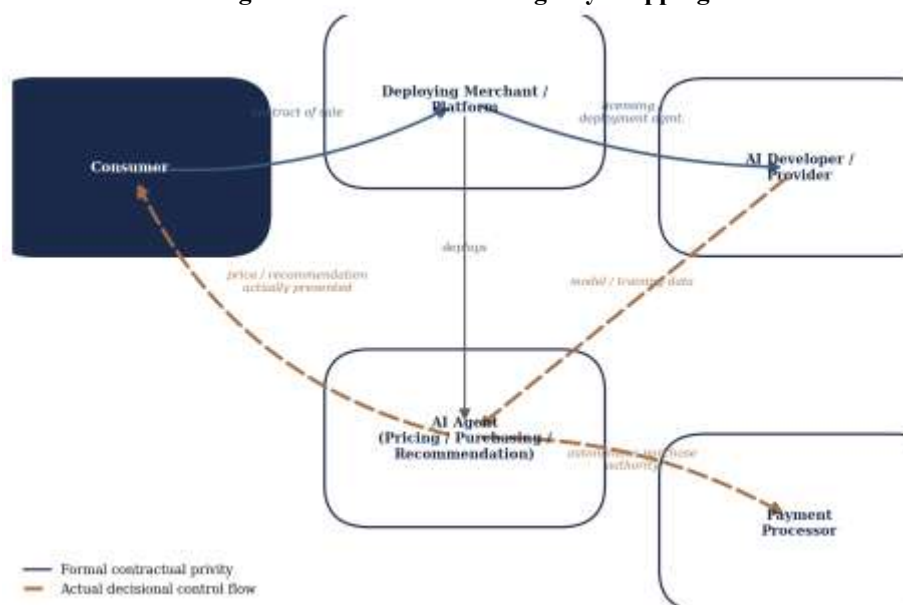
The ACAL logic is implicitly captured in the AI Act and the new PLD (which codify similar risk categories and extend strict liability to AI "products"). This article seeks to make the ACAL logic explicit, and exportable abroad to the US, China, and the United Arab Emirates (UAE).

Table 5. ACAL Criteria-to-Tier Matrix

Criterion	Tier I indicator	Tier II indicator	Tier III indicator	EU doctrinal anchor
Determinism vs. emergence	Explicit, retrievable rule	Emergent, but advisory only	Emergent, with binding effect	Art. 50 transparency / PLD disclosure / PLD strict liability
Transactional authority	None (informational)	Recommendatory, human confirms	Final (price-setting or contract conclusion)	UNCITRAL Art. 7 attribution trigger
Reversibility/oversight	Full human review	Human checkpoint before effect	No meaningful checkpoint	PLD rebuttable disclosure (Tier II) vs. none (Tier III)
Data/decision traceability	Fully traceable	Partially traceable, reconstructable	Limited; opacity-constrained	PLD disclosure obligation

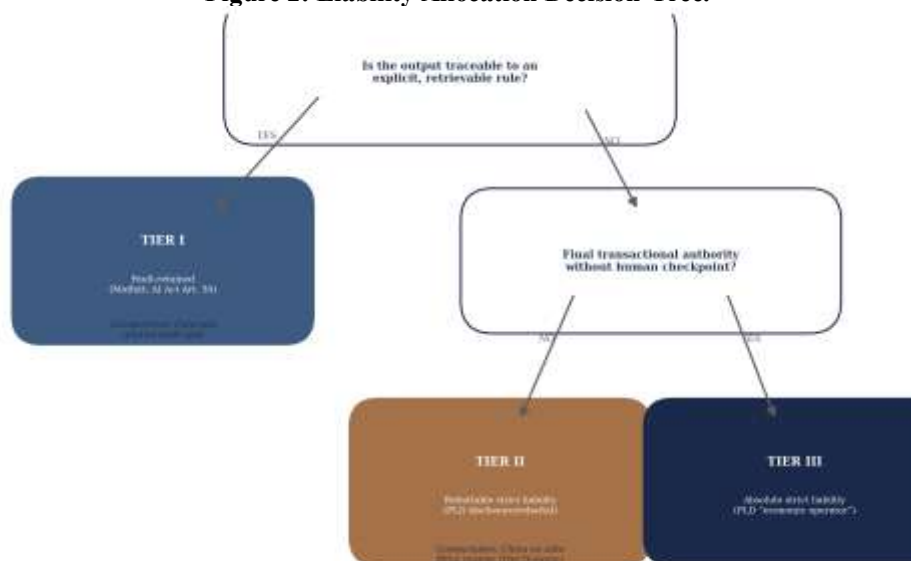
4.6 Visual blueprints

Figure 1: AI-to-Merchant Agency Mapping.



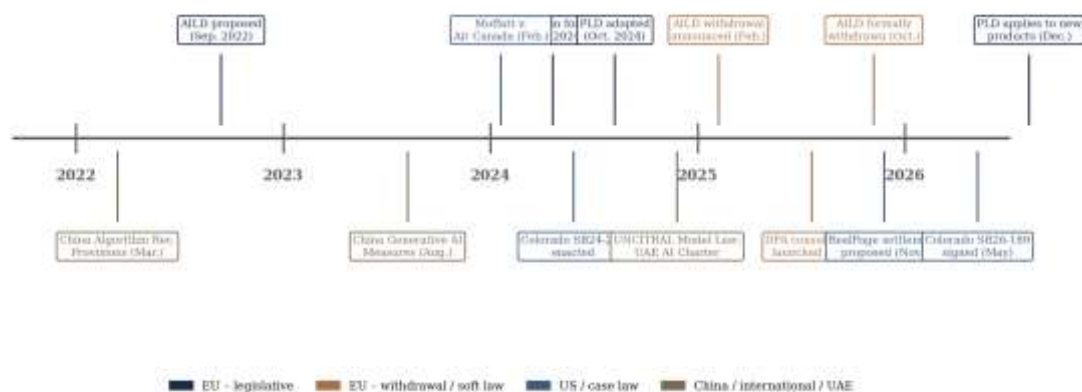
Below is the schematic representation of the five actors involved in the AI-mediated transaction: the Consumer, the Deploying Merchant/Platform, the AI Agent, the AI Developer/Provider, and the Payment Processor. The two structurally distinct relationships between the five actors are also depicted. Solid edges represent privacy: the consumer's contract of sale with the merchant, and the merchant's licensing or deployment agreement with the developer. Dashed edges represent decisional control, e.g. the recommendation or price which the consumer adopts, the model and training data which the developer supplies the agent, and the authority over the payment processor which the agent exercises (ambit of purchase autonomy) in executing the funding request to pay the merchant. The analytical payoff is the mismatch between the two layers. Under Tier I and Tier II operation though, the dashed layer is roughly co-wide-ranging with the solid layer because the human checkpoint or a retrievable rule keeps the deploying merchant in functional control of what it outputs. By contrast, under Tier III autonomy, the decision the consumer actually relies on is generated outside that privacy chain, in the developer-supplied model rather than any rule authored by the merchant. This is precisely the structure that UNCITRAL's Article 7 attribution rule (designed for simple electronic agents) is not designed to accommodate, and why ACAL layers a liability-severity test onto attribution, not vice-versa: The merchant is still a legal bottleneck to the consumer, but liability must reach through the merchant to the developer of the model which caused the result in the first place.

Figure 2: Liability Allocation Decision-Tree.



In Figure 2, the ACAL framework is operationalized using a two-question diagnostic tree. The four criteria of Table 5 are integrated into a single decision-making route for the first question: whether the output can be traced to a rule. If so, the diagnostic tree returns to Tier I. The case remains fault-based, as the output is auditable against a known, human design choice (such as Moffatt and the AI Act's Article 50 transparency obligation). If the answer is no (meaning the output was emergent and model-generated), the output is on second-tier rebuttable strict liability cases (Tier II) if the model has final transactional authority without further human checkpoint. If the model is subject to a human checkpoint that can confirm/reject the output, Tier II cases are keyed to the PLD's disclosure and rebuttal mechanism. The cases without a checkpoint where the determination is binding on the decision-maker at first instance determine Tier III absolute strict liability, keyed to the "economic operator" standard in PLD. Thus, Colorado has a Tier I relative-fault apportionment, China's ex ante algorithm-filing system is a rough Tier II correlative. The only doctrinal gap identified by this article is the lack of a Tier III correlative in the UAE. The tree should thus be understood not as a flowchart which offers jurisdiction-specific answers but as a common metric against which the actual systems of all four comparators can be plotted, and their divergences might be measured.

Figure 3: Regulatory Convergence Timeline.



In this sub-section, Figure 3 depicts the 2022-2026 regulatory history on one horizontal bar, showing that the two EU instruments move in opposite directions in time. With that, the AI Liability Directive goes from its proposed date in September 2022, to its announcement that it would be withdrawn in February 2025 to its formal withdrawal in October 2025. The Product Liability Directive arc starts with its proposed October 2024 adoption and ends with its December 2026 application to new products. The EU is abandoning a fault-based measure while finalizing a strict liability measure at the same time. This suggests that fault-based regimes are, in fact, being displaced, rather than added upon. Moffatt v. Air Canada and the coming into force of the AI Act above mark periods of case law and risk-tiered regulation in the withdrawal-adoption timeline. The lower band reflects events in the three other comparators whose timelines are shown below that band: the 2022 and 2023 China algorithm and generative AI measures, the enactment and replacement of the Colorado AI statute in 2024 and 2026, and the 2024 UNCITRAL Model Law and 2024 UAE AI Charter. It also reflects the DOJ/FTC consultation and November 2025 RealPage settlement on pricing algorithm liability. Upper and lower bands together show that the EU fault-to-strict-liability pivot is not happening in isolation. Every comparator jurisdiction produced a liability-relevant instrument in the same four-year window, meaning that it is empirically plausible to treat the period 2022 to 2026 as a period of regulatory convergence, rather than four independent regulatory developments.

5. Conclusion and Policy Recommendations

The article argued fault-based liability has been institutionally abandoned at precisely the jurisdiction that has tried hardest to repair it. The EU's AILD withdrawal thus verifies black-box opacity defeats fault liability's foreseeability and causation predicates. The EU's revised PLD extended strict liability. The successor ACAL explicitly states that Tier I retains fault liability where a human decision point is retained, while Tiers II and III extend strict liability apportioned to the amount of autonomy.

Given these comparisons, the EU should close the Annex III blind spot by including a provision in a Digital Fairness Act or PLD delegated act that classifies Tier III agents as higher-disclosure entities, and the US should

extend Colorado-style fault apportionment toward PLD-style strict liability (instead of simply antitrust liability) for Tier III agents. China should link algorithm-filing and algorithm compliance to a private compensation path. UAE and like-polities should introduce explicit AI-agency tiering related to ACAL Tiers II-III. This is because fault defaults cannot capture opaque algorithmic causation, and these conclusions are doctrinal-comparative and depend upon instruments not yet fully in force. The exportability to polities beyond the four comparators is an empirical question. Future research should study Tier III pricing, case law after 2026 that decides the meaning of "economic operator" in the PLD, and enforcement of cross-border indemnification..

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