In-Class Assignment TP2: Trust Stack Cost Breakdown

Digital Finance – BSc Course Prof. Dr. Joerg Osterrieder

Context. A $1M cross-border commodity trade (EU seller → US buyer) touches five trust intermediaries. Typical rack-rate fees in 2025: (a) seller's bank FX + payment, 0.50%; (b) clearinghouse settlement, 0.10%; (c) auditor attestation on shipment docs, $2,500 flat; (d) credit-rating agency premium on buyer's LC, 0.15%; (e) escrow agent (LC confirming bank), 0.40%. Tokenised alternative: on-chain escrow smart contract + oracle + stablecoin, total gas + oracle + spread ≈ $800.

Q1. Compute the **total trust-intermediary cost** of the traditional stack in both absolute $ and percentage terms.

Solution. Bank FX = $1M × 0.50% = $5,000; clearing = $1,000; auditor = $2,500; rating = $1,500; escrow = $4,000. **Total** = $14,000, i.e. **1.40%** of notional. Over a $100B-a-year counterparty, the stack absorbs $1.4B/year — this is the "trust tax" and is the single largest cost line in cross-border trade finance (World Bank estimates the global trust tax at $120B/year).

Q2. Compute the **savings** (absolute and %) of the tokenised alternative vs. the traditional stack.

Solution. Savings = $14,000 − $800 = $13,200 per trade, i.e. a **94.3%** reduction. Across a $100B book this is $1.32B/year retained. Caveat: the $800 tokenised cost omits (i) legal-wrapper fees for RWA issuance (often 10–30 bps), (ii) on-chain KYC/AML screening ($0.10–1.00/tx via Chainalysis), and (iii) insurance premiums for smart-contract risk. A realistic fully-loaded cost sits at 30–40 bps, still ≈70% cheaper than the traditional stack.

Q3. Which *two* of the five intermediaries are **hardest to replace** on-chain today? Justify in one line each.

Solution. Auditor (c) — physical shipment inspection cannot yet be oracleised end-to-end; IoT sensors + satellite imagery cover <30% of commodity flows, so a human auditor is still the last-mile truth. **Credit-rating agency** (d) — on-chain credit scoring based on wallet history covers only ≈ 5% of institutional borrowers; off-chain cash-flow analysis still dominates. Banks (a), clearinghouses (b) and escrow agents (e) are all directly replaceable by a DvP smart contract with stablecoin settlement. Acceptable alternative: (e) escrow if the student argues legal-recourse requirements.