Trustless Business Models – Quiz

Module 3: The Trust Problem

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Digital Finance — BSc Course

Question 1

The lecture describes the "trust tax" as the cumulative fees extracted by intermediaries. Approximately how much does a cross-border remittance of €1,000 cost in total trust-related fees?

- A. Less than 1%
- B. 3–7%
- C. 15–20%
- D. Exactly 0% because digital transfers are free

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- (D) Exactly 0% because digital transfers are free

Answer: (B) Cross-border remittances involve transfer fees (€5–25), FX spreads (1.5–4%), and correspondent bank charges (€15–30), totaling 3–7%. These fees pay for the chain of trust intermediaries between sender and receiver.

Question 2

In DeFi lending, borrowers must deposit collateral worth **more** than the loan amount. What is this practice called, and why is it necessary?

A. Undercollateralization — it reduces the borrower's risk

B. Overcollateralization — because there is no identity verification or legal enforcement, the protocol needs a financial buffer to cover potential default

C. Fractional reserve banking — the protocol lends out more than it holds

D. Insurance pooling — the extra collateral insures other borrowers

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- (D) Insurance pooling — the extra collateral insures other borrowers

Answer: (B) Overcollateralization replaces trust in the borrower's identity and creditworthiness with a financial guarantee. If the collateral's value drops below a threshold, the protocol automatically liquidates it to repay lenders — no court or credit score needed.

Question 3

A DAO (Decentralized Autonomous Organization) wants to change its fee structure. How are decisions typically made?

- (A) The founder decides unilaterally
- (B) Token holders vote on proposals, with voting power proportional to tokens held
- (C) A traditional board of directors meets quarterly
- (D) Government regulators approve all changes

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Answer: (B) DAOs use on-chain governance: any token holder can submit a proposal, and votes are weighted by token holdings. If the proposal reaches a quorum (minimum participation threshold) and a majority, it executes automatically via smart contract.

Question 4

What does “composability” mean in the context of DeFi, and why is it sometimes called “money legos”?

A. DeFi protocols can only work with one specific blockchain

B. DeFi protocols are open, permissionless, and can be combined like building blocks — the output of one protocol becomes the input of another

C. DeFi protocols require a license to use

D. Composability means that DeFi protocols are composed by a central authority

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Answer: (B) Composability means any DeFi protocol can plug into any other without permission. You can borrow on Aave, swap on Uniswap, and deposit into Yearn — all in a single atomic transaction. This permissionless interoperability is why the ecosystem is called “money legos.”

Question 5

Self-sovereign identity (SSI) allows individuals to control their own digital credentials. How does this differ from traditional identity systems?

- SSI stores all personal data on a public blockchain visible to everyone
- In SSI, the individual holds verifiable credentials in a digital wallet and chooses what to share, rather than relying on a centralized database controlled by a government or company
- SSI eliminates the need for any form of identification
- SSI requires biometric data to be stored by a trusted third party

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Answer: (B) SSI inverts the traditional model: instead of a central authority holding your data and deciding who can verify it, you hold cryptographic proofs (verifiable credentials) in your own wallet. You selectively disclose only what is needed — for example, proving you are over 18 without revealing your birthdate.

Question 6

The lecture describes “programmable money” as digital currency with built-in rules. Which of the following is an example?

- A credit card with a spending limit set by the bank
- Government stimulus payments that expire after 90 days if not spent, enforced by code in the digital currency itself
- A savings account with a minimum balance requirement
- A wire transfer that requires manual approval by a compliance officer

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Answer: (B) Programmable money has rules embedded in the currency itself, enforced by code rather than by a bank's policies. The e-CNY pilot in China tested stimulus money with expiry dates — the currency automatically became unusable after the deadline, requiring no human enforcement.

Question 7

Coase's transaction cost theory (1937) argues that firms exist to reduce the cost of coordinating economic activity. How does the lecture apply this to trustless business models?

- A. Trustless systems increase transaction costs, making firms more important
- B. When smart contracts reduce coordination costs below what a firm can achieve, some intermediary functions can be performed by protocols instead of companies
- C. Coase's theory is irrelevant to digital finance
- D. Trustless systems replace all firms with DAOs

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Answer: (B) Coase argued that firms exist because market transactions are costly. If smart contracts and protocols reduce those costs sufficiently, some functions traditionally performed by firms (lending, asset management, governance) can be handled by autonomous protocols — but only where coordination costs genuinely fall below the firm's cost floor.

Question 8

A borrower deposits $15,000 in ETH as collateral on Aave and takes out a $10,000 stablecoin loan (150% collateral ratio). The price of ETH drops 40%. What happens next?

A. Nothing — the borrower keeps the loan and the collateral

B. The protocol automatically liquidates some or all of the collateral to repay the loan, because the collateral value ($9,000) has fallen below the liquidation threshold

C. Aave contacts the borrower and asks for more collateral

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Answer: (B) After a 40% drop, the $15,000 collateral is worth $9,000, which is below the $10,000 loan. The protocol's smart contract automatically liquidates the collateral to protect lenders — no phone call, no court order, no negotiation. This is how DeFi replaces trust with code.

Question 9

De Beers uses blockchain (Tracr) to track diamonds from mine to retail. What specific trust problem does this solve?

A. It prevents diamonds from being stolen during transport

B. It creates an immutable provenance record, so buyers can verify that a diamond was ethically sourced and not a conflict diamond

C. It makes diamonds cheaper by removing intermediaries

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Answer: (B) The trust problem in the diamond supply chain is provenance: buyers want to know where a diamond came from. Blockchain creates an immutable chain of custody that cannot be altered after the fact, replacing trust in paper certificates with verifiable digital records.

Question 10

A property worth $500,000 is tokenized into 10,000 tokens at $50 each. A student in Zurich buys 100 tokens ($5,000). Which trustless business model does this represent, and what is the key benefit?

A. Programmable money — the student can program the tokens to pay rent automatically

B. Tokenized real estate with fractional ownership — the student gains exposure to property investment at a fraction of the cost, with ownership recorded on-chain

C. A DAO — the student now governs the property through token voting

D. Self-sovereign identity — the student proves property ownership without a notary

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Answer: (B) Tokenized real estate allows fractional ownership: instead of needing $500,000, the student invests $5,000 for a 1% stake. The ownership claim is recorded on a blockchain, and rental income can be distributed proportionally via smart contract.

Question 11

A DAO has 1,000 token holders. A proposal to change the protocol's fee from 0.3% to 0.5% receives 400 votes in favor and 100 against. The quorum requirement is 30% of total tokens. Does the proposal pass?

A. No — it needs more than 500 votes (a majority of all token holders)

B. Yes — 500 votes cast exceeds the 30% quorum (300 tokens), and 400 in favor is a majority of votes cast

C. No — DAO proposals require unanimous consent

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Answer: (B) The quorum requirement of 30% means at least 300 tokens must participate. With 500 votes cast (400 + 100), the quorum is met. Since 400 out of 500 votes (80%) are in favor, the proposal passes and the smart contract executes the fee change automatically.

Question 12

The lecture contrasts traditional platforms (locked-in, proprietary) with DeFi protocols (composable, permissionless). A user borrows stablecoins on Aave, swaps them on Uniswap, and deposits the result into a yield protocol — all in one transaction. What property of DeFi makes this possible?

- (A) Central coordination by a single company
- (B) Atomic composability — all three operations execute as one indivisible transaction on a shared blockchain, with no permission needed from any protocol
- (C) Government regulation requiring interoperability
- (D) API agreements between the three platforms

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Answer: (B) Atomic composability means the entire chain of operations either succeeds completely or fails completely — there is no partial execution. Because all protocols share the same blockchain and are permissionless, they can be combined freely without business agreements.

Question 13

The lecture identifies an "innovation ceiling" in traditional banking: compliance, legacy systems, and trust requirements cap how fast, cheap, or accessible services can become. Which structural feature of banks is the **primary** driver of this ceiling?

- A Banks use outdated programming languages
- B Banks' cost structure (staff 40–55%, compliance 5–10%, capital reserves 8–12%, IT legacy 10–15%) creates a cost floor that DeFi protocols operate below
- C Banks are not interested in innovation
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- (D) Regulators deliberately prevent banks from improving

Answer: (B) The innovation ceiling is structural, not a sign of inefficiency. Banks must maintain branches, staff, compliance teams, capital reserves, and legacy IT — these are the cost of being trusted institutions. DeFi protocols, which replace trust with code, can operate below this cost floor.

Question 14

The lecture argues that trustless business models are "genuinely new," not just cheaper versions of existing services. Which feature of DeFi lending supports this claim **most strongly**?

A. DeFi loans have lower interest rates than bank loans

B. DeFi lending is accessible to anyone with crypto collateral, regardless of identity, credit score, or geography — a category of borrower that traditional banks cannot serve

C. DeFi protocols use the same lending logic as banks

D. DeFi platforms have better mobile apps

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Answer: (B) DeFi lending serves a genuinely new market: pseudonymous borrowers who have crypto assets but no credit history, bank account, or legal identity recognized by traditional finance. This is not a cheaper version of bank lending — it is a category that banks structurally cannot serve.

Question 15

The lecture presents the European eIDAS framework alongside Self-Sovereign Identity (SSI). What is the key tension between these two approaches?

A. eIDAS is digital and SSI is paper-based

B. eIDAS relies on government-issued credentials verified by central registries, while SSI gives individuals control over their own credentials — creating tension between state authority and individual autonomy

C. There is no tension — eIDAS and SSI are the same system

D. eIDAS is only used in Switzerland, while SSI is global

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Answer: (B) eIDAS provides a regulated, government-backed digital identity framework. SSI decentralizes identity to the individual. The tension is between institutional trust (governments vouch for identity) and self-sovereign trust (cryptographic proofs replace institutional verification). Most real-world systems will likely combine elements of both.

Question 16

IBM Food Trust uses blockchain to track produce from farm to supermarket. A critic argues: "The blockchain only records what someone types in — garbage in, garbage out." Is this criticism valid?

A. No — blockchain automatically verifies that all input data is correct

B. Yes — blockchain ensures records are immutable and transparent once entered, but it cannot verify the accuracy of off-chain events (e.g., whether the produce was actually organic)

C. No — supply chain blockchains use AI to verify all physical claims

D. Yes — but only because IBM's implementation is flawed

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Answer: (B) This is a fundamental limitation of supply-chain provenance systems. Blockchain guarantees that recorded data cannot be tampered with after entry, but it cannot independently verify physical-world events. The "oracle problem" — bridging real-world data to on-chain records — remains a core challenge.

Question 17

A traditional bank charges 2–7% for a personal loan (origination, credit check, servicing, insurance). A DeFi protocol offers the same loan size at lower fees but requires 150% overcollateralization. Which borrowers would rationally prefer the DeFi option?

- A. All borrowers, because lower fees always dominate
- B. Borrowers who hold significant crypto assets but lack a credit score, bank account, or access to traditional banking — the overcollateralization requirement is acceptable because the alternative is no loan at all
- C. No borrowers, because overcollateralization is always worse
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Answer: (B) For someone with crypto wealth but no credit history (e.g., a freelancer in a developing country, or a crypto-native investor), DeFi lending offers access that banks cannot provide. The 150% collateral requirement is a real cost, but it is preferable to being excluded entirely.

Question 18

The lecture warns that programmable money has both promising applications (targeted subsidies, disaster relief) and concerning implications (social control, surveillance). A government proposes programmable stimulus payments that can only be spent on food and rent. Which risk does the lecture identify as **most concerning** about this approach?

- A The technology is too expensive to implement
- B Mission creep — temporary spending restrictions could become permanent, and the government gains the power to control what citizens can buy
- C Food and rent are not important spending categories
- D Programmable money cannot work offline

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- (C) Food and rent are not important spending categories
- (D) Programmable money cannot work offline

Answer: (B) The lecture identifies mission creep as the primary concern: once the infrastructure exists to restrict spending, the restrictions can expand. What starts as targeted disaster relief could evolve into permanent government control over purchasing decisions, especially if there are no legal safeguards.

Question 19

A student claims: "DeFi eliminates all intermediaries and all risk." Using the lecture's framework, identify the **strongest** counter-argument.

A. DeFi protocols charge fees, so they are intermediaries

B. DeFi replaces some intermediaries (banks, escrow services) but introduces new risks — smart contract bugs, oracle failures, governance attacks, and regulatory uncertainty — and new forms of trust (trust in code, in protocol governance, in the security of the blockchain)

C. DeFi is illegal in most countries

D. DeFi always has higher fees than traditional finance

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Answer: (B) "Trustless" does not mean "riskless." DeFi removes the need to trust specific institutions but requires trust in smart contract code (which can have bugs), oracle data feeds (which can be manipulated), governance mechanisms (which can be captured by whales), and the underlying blockchain's security. Risk shifts form, it does not disappear.

Question 20

The lecture asks: "Which intermediaries can be replaced by code — and which cannot?" Based on the six business models presented, which intermediary function is **hardest** to replace with code?

- A. Recording transactions on a ledger
- B. Enforcing contract terms automatically
- C. Verifying real-world events and identities that exist off-chain (e.g., confirming that a diamond is ethically sourced or that a building actually exists)
- D. Matching buyers and sellers in a marketplace

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Answer: (C) Recording and enforcement are well-suited to code (blockchains record, smart contracts enforce). Matching can be automated via order books or automated market makers. But verification of off-chain reality — confirming physical-world facts — requires oracles, human inspectors, or trusted data sources, which reintroduce trust dependencies.