

# Lesson 7.1 Exercises: Why Regulation Exists — AML, KYC, and Financial Crime

## Module 7: The Compliance Problem

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Digital Finance — BSc Course

## Exercise 1: Risk-Based Customer Classification

**Scenario:** You are a compliance analyst at a European bank. Classify each of the following customers as **Low**, **Medium**, or **High** risk and specify whether SDD, CDD, or EDD is required.

#	Customer	Key Characteristics
1	German pension fund	Regulated entity, domestic, transparent ownership
2	Cash-intensive restaurant chain	15 locations, family-owned, significant daily cash deposits
3	Shell company in the BVI	Nominee directors, ultimate owner is a PEP from a grey-listed country
4	UK university	Public institution, receives government funding
5	Crypto exchange (licensed)	Registered in Singapore, serves global clients, handles \$500M/month volume

### Tasks:

- For each customer, identify the risk factors across all four dimensions (customer, geographic, product/service, channel).
- Assign a risk level (Low/Medium/High) and the corresponding due diligence level (SDD/CDD/EDD).
- For Customer 3, list the specific EDD steps you would take before accepting the relationship.

*Difficulty: Introductory–Intermediate — tests application of the risk-based approach.*

## Exercise 2: Structuring Detection

**Scenario:** A bank customer's cash deposit history for the past 10 business days is as follows (synthetic data, amounts in USD):

Day	Branch	Amount
Day 1	Main St.	\$9,800
Day 2	Oak Ave.	\$9,600
Day 3	Main St.	\$9,900
Day 4	(no deposit)	—
Day 5	Park Rd.	\$9,700
Day 6	Oak Ave.	\$9,500
Day 7	Main St.	\$9,850
Day 8	Park Rd.	\$9,400
Day 9	Main St.	\$9,750
Day 10	Oak Ave.	\$9,600

### Tasks:

- Calculate the total cash deposited over the 10-day period.
- How many Currency Transaction Reports (CTRs) would have been triggered? (Threshold: \$10,000.)
- What structuring red flags can you identify? List at least three specific indicators.
- Draft a one-paragraph SAR narrative describing the suspicious activity.

*Difficulty: Intermediate — requires pattern recognition and narrative writing.*

## Exercise 3: Beneficial Ownership Tracing

**Scenario:** You must determine the beneficial owners of **Target Corp** (the customer). The ownership structure is:

- **Person A** owns 60% of  **Holding X**
- **Person B** owns 40% of  **Holding X**
- **Holding X** owns 50% of  **Target Corp**
- **Person C** owns 100% of  **Shell Y** (incorporated in the Cayman Islands)
- **Shell Y** owns 30% of  **Target Corp**
- **Public shareholders** (widely held, no individual >5%) own 20% of  **Target Corp**

### Tasks:

- Calculate Person A's indirect ownership of Target Corp.
- Calculate Person B's indirect ownership of Target Corp.
- Calculate Person C's indirect ownership of Target Corp.
- Using a 25% beneficial ownership threshold, who qualifies as a beneficial owner?
- Person B is a PEP. Does this change the due diligence level even though B's ownership is below 25%? Explain.

*Difficulty: Intermediate — requires multi-step ownership calculation.*

## Exercise 4: SAR Pipeline Economics

**Scenario:** A mid-sized bank's AML transaction monitoring system has the following annual metrics (synthetic data):

Metric	Value
Total transactions monitored	50,000,000
Alerts generated	180,000
Alerts escalated to Level-2 investigation	18,000
SARs filed	3,600
SARs that led to law enforcement action	72
Average analyst cost per Level-1 alert review	\$25
Average analyst cost per Level-2 investigation	\$150
Average cost per SAR filing	\$500
Annual technology cost (monitoring + screening)	\$8,000,000

### Tasks:

- Calculate the false positive rate at the alert level (Level-1 to Level-2 escalation).
- Calculate the total annual cost of the AML program (technology + analyst costs + SAR filing).
- Calculate the cost per SAR filed and cost per law enforcement action.
- If a new AI system could reduce false positives by 50% while maintaining the same SAR filing rate, what would the annual savings be?

*Difficulty: Intermediate–Advanced — requires cost analysis and computation.*

## Exercise 5: Sanctions Screening Challenge

**Scenario:** Your bank receives the following wire transfer instruction:

Field	Value
Sender	Petrochemical Trading LLC, Dubai, UAE
Sender's bank	First Gulf Bank, Abu Dhabi
Amount	\$2,400,000
Beneficiary	Industrial Supplies GmbH, Hamburg, Germany
Purpose	"Payment for industrial equipment — Invoice 2024-3847"
Intermediary bank	Deutsche Bank AG, Frankfurt

Your screening system flags two potential hits:

- 1 The sender's name partially matches a sanctioned entity: "Petrochemical Trading Co." (sanctioned under EU Russia sanctions)
- 2 The sender's jurisdiction (UAE) is not sanctioned but is a known transshipment hub

**Tasks:**

- a What additional information would you request to resolve the potential name match?
- b If the match is confirmed as a **true hit**, what must the bank do immediately?
- c If the match is a **false positive**, what documentation must the bank retain?
- d How does the UAE's status as a transshipment hub affect your risk assessment even if the sanctions hit is cleared?

*Difficulty: Advanced — requires sanctions compliance reasoning.*

## Exercise 6: De-Risking Impact Assessment

**Scenario:** A major US bank decides to terminate all correspondent banking relationships with banks in the Pacific Island nations due to AML risk concerns. The affected countries rely on remittances for 20–40% of GDP.

### Data (synthetic):

- Annual remittance volume to the region: \$2.5 billion
- Number of correspondent relationships terminated: 45
- Alternative formal channels available after de-risking: 8 (at 3x the cost)
- Estimated shift to informal channels (hawala, cash couriers): 30% of volume

### Tasks:

- Calculate the additional cost burden on remittance senders if 70% of the volume shifts to the remaining formal channels at 3x the previous cost (assume previous average cost was 7% of remittance value).
- Estimate the dollar volume now flowing through unmonitored informal channels.
- Argue both sides: Is de-risking a **rational compliance decision** by the bank, or is it a **failure of the AML framework**?
- Propose two policy interventions that could reduce de-risking while maintaining AML integrity.

*Difficulty: Advanced — requires economic analysis and policy reasoning.*

## Exercise 7: Designing an AML Program for a Neobank

**Scenario:** A new digital-only bank (neobank) is launching in Germany. It will offer current accounts, debit cards, and instant EUR transfers. All onboarding is digital (video-KYC or eID). The bank expects 500,000 customers within two years.

### Tasks:

- a Design the key components of the neobank's AML program. For each of the 9 AML program components discussed in class, specify how a digital-only bank would implement it differently from a traditional bank.
- b The neobank wants to offer accounts to customers in 15 EU countries. What additional AML challenges does cross-border operation create?
- c Propose a transaction monitoring strategy that balances detection effectiveness with the false positive problem. What thresholds and rules would you set for the first year?
- d The neobank's CEO asks: "Can we use AI to replace human compliance analysts entirely?" Draft a 3-sentence response explaining why this is or is not feasible under current regulations.

*Difficulty: Advanced–Integrative — requires synthesis of all lesson concepts.*

## Exercise 8: The AML Effectiveness Debate

**Scenario:** You are presenting to the board of a large European bank. The board has asked for an honest assessment of whether the bank's €120 million annual AML investment is "worth it."

### Data (synthetic):

- AML program cost: €120M/year
- SARs filed: 8,200/year
- SARs leading to asset freezing or prosecution: 164 (2%)
- Estimated criminal funds passing through the bank undetected: €500M–€2B/year
- Last regulatory fine (5 years ago): €45M
- Industry average cost of a major AML fine: €500M–€2B

### Tasks:

- Calculate the "cost per successful law enforcement outcome" ( $€120\text{M} / 164$ ).
- Present the **business case** for maintaining the current investment level (consider fines, license risk, reputation).
- Present the **reform case** — what specific changes could make the €120M more effective?
- Take a position: Is the current AML system a necessary cost of operating in the financial system, or is it an example of "compliance theater"? Support your argument with data from the exercise.

*Difficulty: Advanced–Integrative — requires critical analysis, financial reasoning, and argumentation.*