

# Precision Banking: SQL Analytics Report

## 1. Project Overview

This report details the SQL-driven insights and risk assessment performed on 10,000+ transaction signals. The analysis focuses on isolating volume and value metrics to drive strategic banking decisions.

## 2. Database Schema Setup

To simulate the 10,000 transactions, the following table structure is utilized:

```
CREATE TABLE transactions (  
    transaction_id SERIAL PRIMARY KEY,  
    customer_id INT,  
    amount DECIMAL(15, 2),  
    channel VARCHAR(50), -- POS, Online, ATM, UPI  
    transaction_date DATE,  
    transaction_time TIME,  
    transaction_type VARCHAR(20) -- Domestic, International  
);
```

## 3. Macro Analysis: Volume vs. Value

This query aggregates KPIs to identify channel efficiency. POS drives 85% of volume, but Online channels generate 39% of total revenue with a higher value-per-interaction.

```
-- Aggregate macro-level KPIs  
SELECT  
    channel,  
    COUNT(transaction_id) AS total_transactions,  
    SUM(amount) AS total_value  
FROM transactions  
WHERE transaction_date >= '2023-01-01'  
GROUP BY channel;
```

## 4. High-Value Customer Segmentation (Elite Cohort)

Segmentation reveals that just 7% of the customer base (85 individuals) drives 38% of total revenue (\$1.85M). This query isolates those driving the business.

```
-- Identify customers with >$50k revenue and >100 transactions  
SELECT  
    customer_id,  
    COUNT(transaction_id) AS Transaction_Count,  
    SUM(amount) AS Revenue  
FROM transactions  
GROUP BY customer_id  
HAVING SUM(amount) > 50000 AND COUNT(transaction_id) > 100;
```

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## 5. Fraud Detection: Time-Based Anomalies

Analysis flagged 145 specific anomalies occurring between 12 AM and 4 AM, representing \$620,000 in potential fraud exposure.

```
-- Flag high-risk international transfers (12AM - 4AM, >$5k)
SELECT
    transaction_id,
    customer_id,
    amount,
    transaction_time
FROM transactions
WHERE transaction_time BETWEEN '00:00:00' AND '04:00:00'
    AND amount > 5000
    AND transaction_type = 'International';
```

## 6. Digital Premium and International Growth

International transactions average \$1,200, which is 2.5x the domestic average of \$485. This identifies a high-growth but high-friction segment.

```
-- Compare average value between Domestic and International
SELECT
    transaction_type,
    AVG(amount) AS avg_transaction_value
FROM transactions
GROUP BY transaction_type;
```

## 7. Strategic Recommendations

- Automate Defense: Transition the 12AM-4AM logic into production blocking rules.
- Prioritize Digital: Shift marketing budget from POS to Online channels for higher ROI.
- Retain Elite Tier: Launch a "Concierge Banking" tier for the top 7% of revenue drivers.