

BANK CUSTOMER CHURN ANALYSIS

This document presents a comprehensive SQL analysis of bank customer churn, examining factors that contribute to customer attrition through various database queries.

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TABLE CREATION AND DATA TYPE MODIFICATIONS

The analysis begins with creating the necessary database structure to store customer information:

```
CREATE TABLE bank_customers (  
  customer_id INTEGER PRIMARY KEY,  
  credit_score INTEGER,  
  geography TEXT,  
  gender TEXT,  
  age INTEGER,  
  tenure INTEGER,  
  account_balance_euro NUMERIC,  
  num_of_products INTEGER,  
  has_cr_card INTEGER,  
  is_active_member INTEGER,  
  exited INTEGER,  
  reason_for_churn TEXT,  
  credit_category TEXT,  
  account_type TEXT,  
  customer_rating INTEGER,  
  account_opening_date DATE  
);
```

```
ALTER TABLE bank_customers  
ALTER COLUMN exited TYPE BOOLEAN  
USING exited::BOOLEAN;  
  
ALTER TABLE bank_customers  
ALTER COLUMN has_cr_card TYPE BOOLEAN  
USING has_cr_card::BOOLEAN;
```

Data types were modified to improve analysis accuracy:

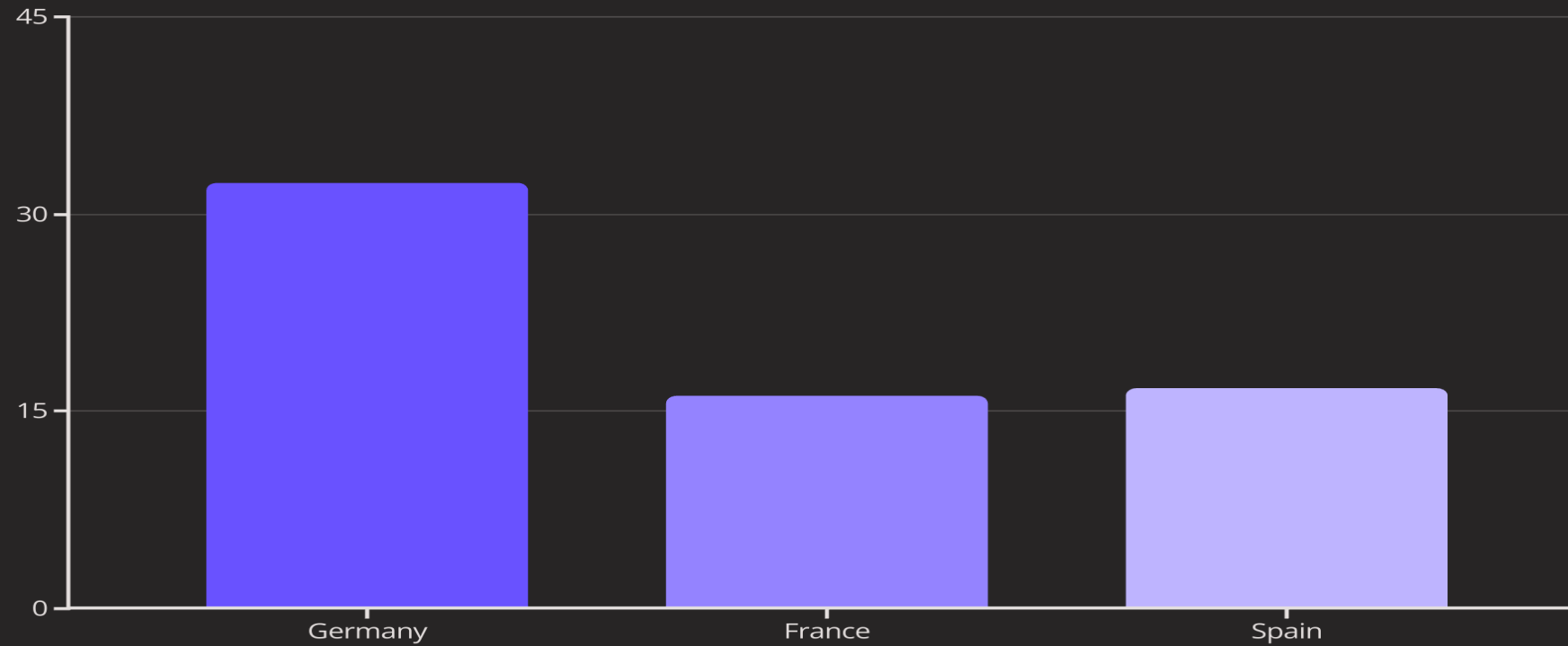
OVERALL CHURN RATE ANALYSIS

The first analysis determines the overall percentage of customers who have left the bank:

```
SELECT
  ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
COUNT(*), 2) AS churn_rate_percentage
FROM bank_customers;
```

This query calculates the percentage of customers who have exited (churned) by dividing the count of churned customers by the total customer count and multiplying by 100.

GEOGRAPHICAL CHURN ANALYSIS



```
SELECT
  geography,
  COUNT(*) AS total_customers,
  SUM(CASE WHEN exited THEN 1 ELSE 0 END) AS churned_customers,
  ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
    COUNT(*), 2) AS churn_rate_percentage
FROM bank_customers
GROUP BY geography
ORDER BY churn_rate_percentage DESC;
```

CUSTOMER PROFILE COMPARISON: CHURNED VS RETAINED

Churned Customers

Average Age: 44.83

Average Balance: €91,107.44

Retained Customers

Average Age: 37.42

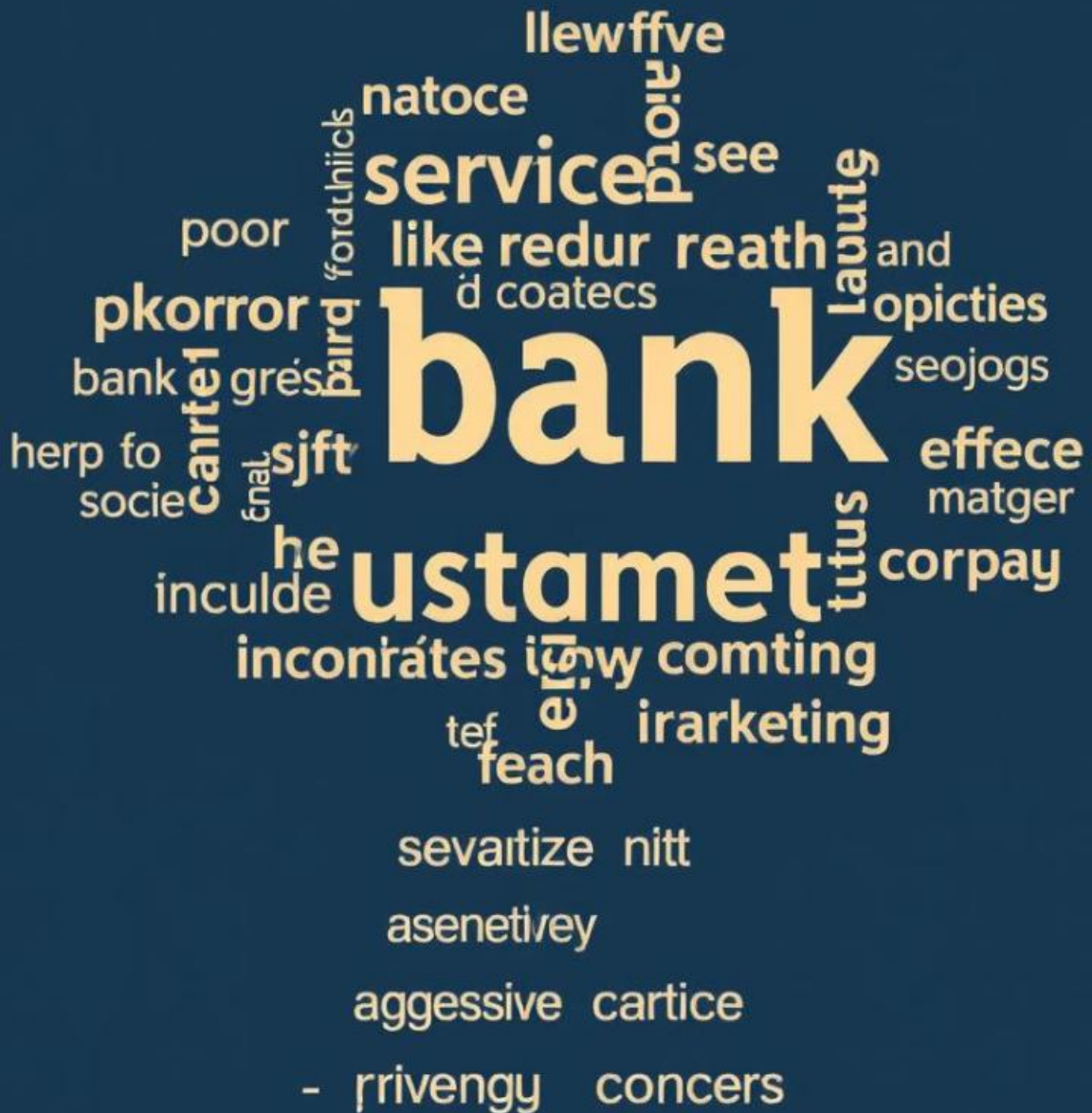
Average Balance: €76,485.21

The third query compares demographic and financial characteristics between customers who left and those who stayed:

```
SELECT
  exited,
  ROUND(AVG(age), 2) AS avg_age,
  ROUND(AVG(account_balance_euro), 2) AS avg_balance
FROM bank_customers
GROUP BY exited;
```

This analysis reveals significant differences in both age and account balance between churned and retained customers.

Top reasons why bank customers leave



TOP REASONS FOR CUSTOMER CUSTOMER CHURN

The fourth query identifies the most common reasons customers gave for leaving the bank:

```
SELECT
  reason_for_churn,
  COUNT(*) AS total
FROM bank_customers
WHERE exited = TRUE
GROUP BY reason_for_churn
ORDER BY total DESC
LIMIT 10;
```

This analysis helps prioritize improvement efforts by focusing on the most frequently cited reasons for customer attrition.

CREDIT CARD OWNERSHIP AND CHURN CORRELATION



Credit Card Holders

Churn Rate: 20.24%



Non-Credit Card Holders

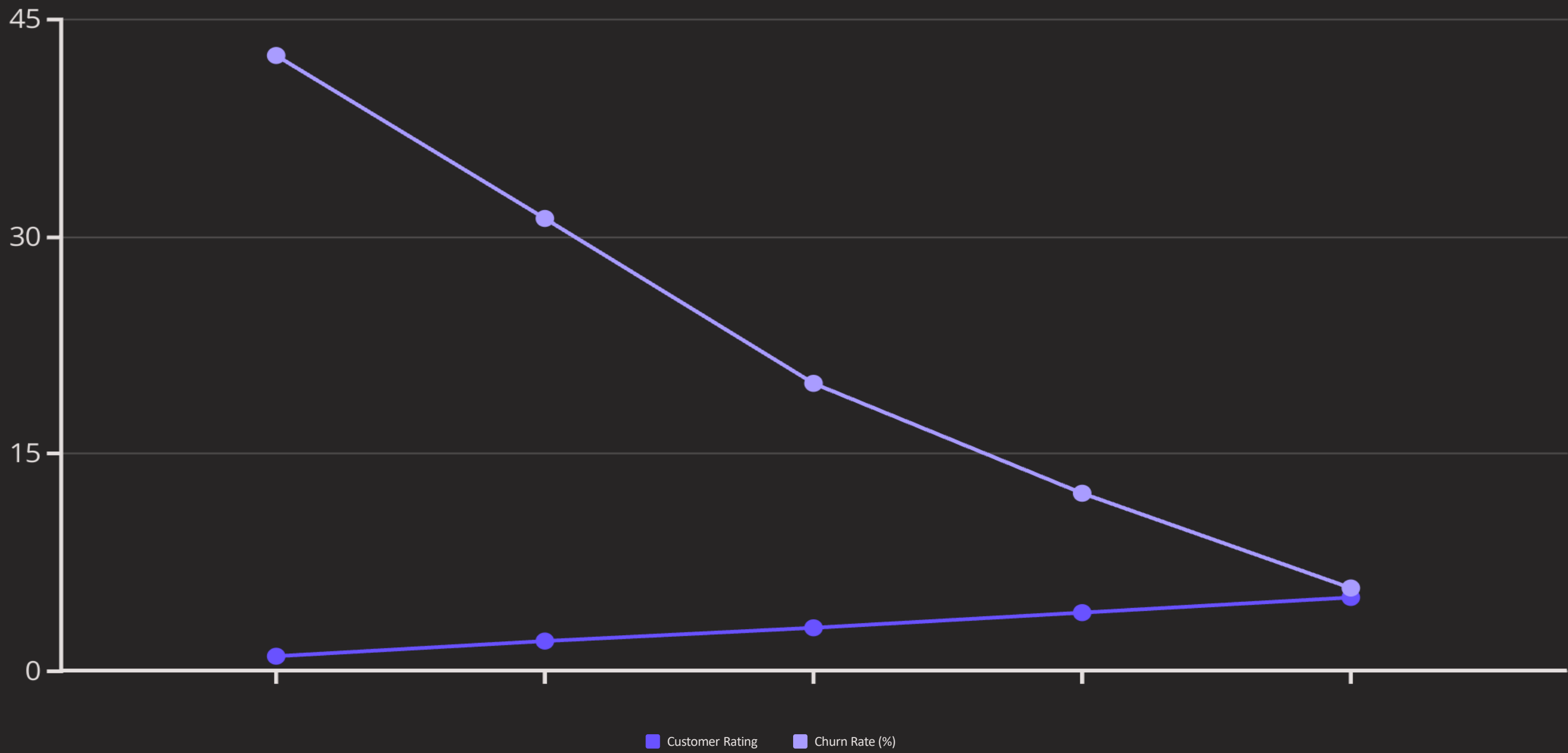
Churn Rate: 20.43%

The fifth query examines whether having a credit card affects customer retention:

```
SELECT
  has_cr_card,
  SUM(CASE WHEN exited THEN 1 ELSE 0 END) AS churned,
  COUNT(*) AS total,
  ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
COUNT(*), 2) AS churn_rate
FROM bank_customers
GROUP BY has_cr_card;
```

This analysis compares churn rates between customers with and without credit cards to determine if this product affects retention.

CUSTOMER SATISFACTION AND CHURN RELATIONSHIP



PRODUCT USAGE AND CHURN ANALYSIS

The seventh and eighth queries examine how product usage and customer tenure affect churn rates:

```
SELECT
  num_of_products,
  COUNT(*) AS total_customers,
  SUM(CASE WHEN exited THEN 1 ELSE 0 END) AS
churned_customers,
  ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
COUNT(*), 2) AS churn_rate
FROM bank_customers
GROUP BY num_of_products
ORDER BY num_of_products;
```

```
SELECT
  tenure,
  COUNT(*) AS total_customers,
  SUM(CASE WHEN exited THEN 1 ELSE 0 END) AS
churned_customers,
  ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
COUNT(*), 2) AS churn_rate
FROM bank_customers
GROUP BY tenure
ORDER BY churn_rate DESC
LIMIT 5;
```

The first query groups customers by the number of products they use, while the second identifies which tenure ranges experience the highest churn rates.

HISTORICAL AND GEOGRAPHICAL CHURN PATTERNS

Annual Churn Analysis

Examines customer churn by year of account opening



```
SELECT
    EXTRACT(YEAR FROM account_opening_date) AS join_year,
    COUNT(*) FILTER (WHERE exited) AS churned_customers,
    COUNT(*) AS total_customers,
    ROUND(100.0 * COUNT(*) FILTER (WHERE exited) / COUNT(*), 2) AS
        churn_rate
FROM bank_customers
GROUP BY join_year
ORDER BY join_year;
```



Geographic Account Type Analysis

Identifies high-risk combinations of location and account type

```
SELECT
    geography,
    account_type,
    COUNT(*) AS total_customers,
    SUM(CASE WHEN exited THEN 1 ELSE 0 END) AS churned_customers,
    ROUND(100.0 * SUM(CASE WHEN exited THEN 1 ELSE 0 END) /
COUNT(*), 2) AS churn_rate
FROM bank_customers
GROUP BY geography, account_type
ORDER BY churn_rate DESC
LIMIT 10;
```

These final queries provide insights into historical churn patterns and identify specific combinations of geography and account types that experience the highest attrition rates.