

# Bank Customer Churn Analysis

**Identifying \$32.65M  
in At-Risk Assets  
Through Data-  
Driven Retention  
Strategy**

**Francis Multani**  
Junior Data Analyst  
February 2026



# The Business Challenge

Customer churn costs banks **5-7x more** than retention (McKinsey). Without predictive indicators, banks react too late, losing valuable assets and customer relationships.



Who is most likely to leave?



Why are they leaving?



What actions can prevent it?

## Dataset Context

- Source: Kaggle Bank Customer Churn dataset
- Size: 10,000 customers
- Baseline churn rate: 20.37%
- Timeframe: 8-week analysis (Jan-Mar 2025)

# Analytical Approach

Our methodology combined robust data analysis with strategic insights to develop actionable recommendations for customer retention.



## Data Exploration & Quality Validation

- 10,000 records × 14 features
- 0 missing values, 0 duplicates
- Created comprehensive data dictionary



## Feature Engineering

- Built 5 derived features (e.g., BalanceBr, DangerScore)
- Statistical hypothesis testing (t-tests, correlations)



## Risk Model Development

- Designed "Danger Score" (0-4 composite indicator)
- Chose interpretability over black-box ML

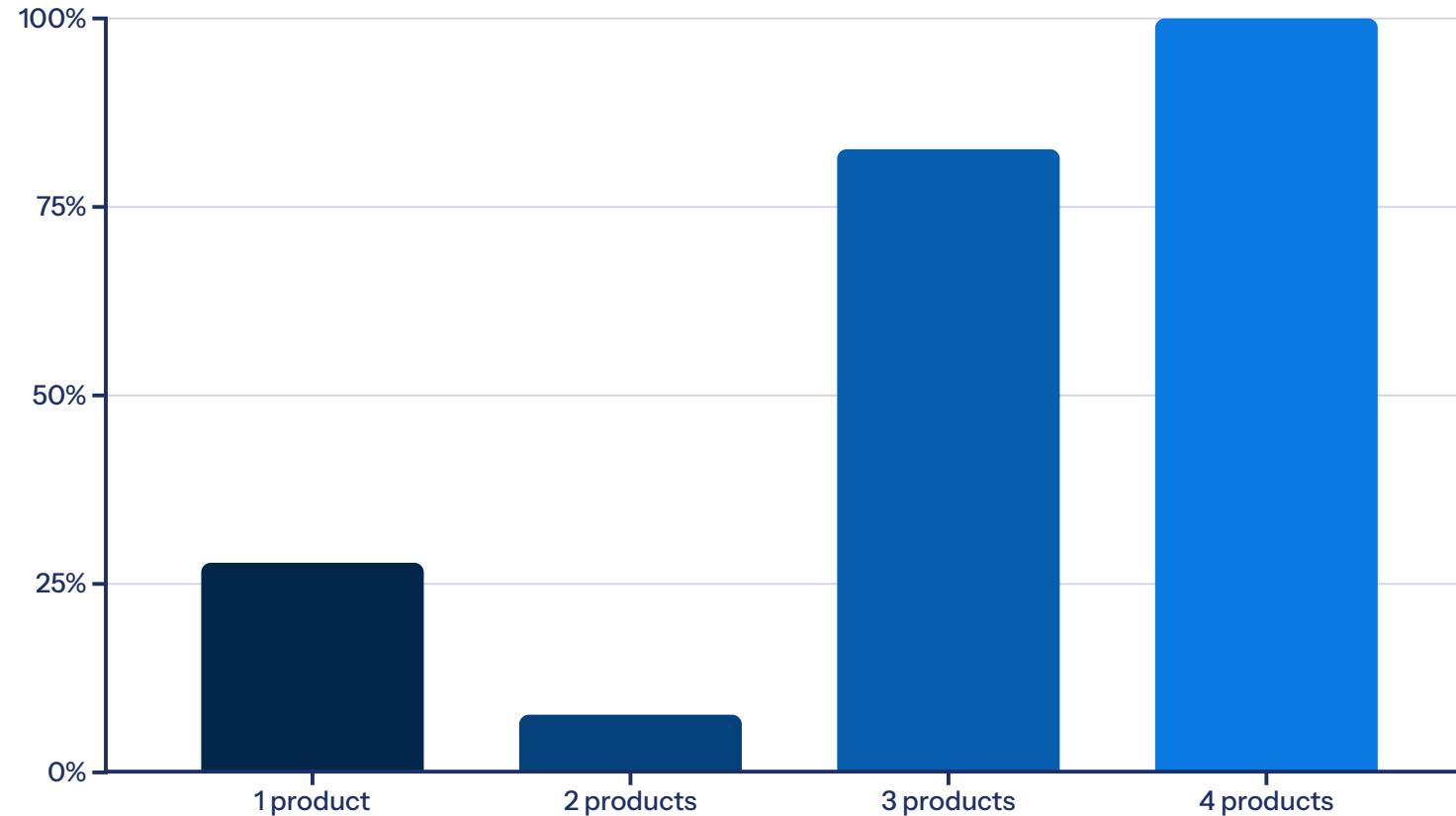


## Dashboard & Recommendations

- Interactive Power BI dashboard (French)
- 5 strategic interventions with ROI calculations

# Key Discovery #1: The Saturation Paradox

Traditional wisdom suggests '**more products = more loyalty**'. The data strongly disagrees.



Customers with exactly **2 products** are **3.7x** less likely to churn than those with 1 product.

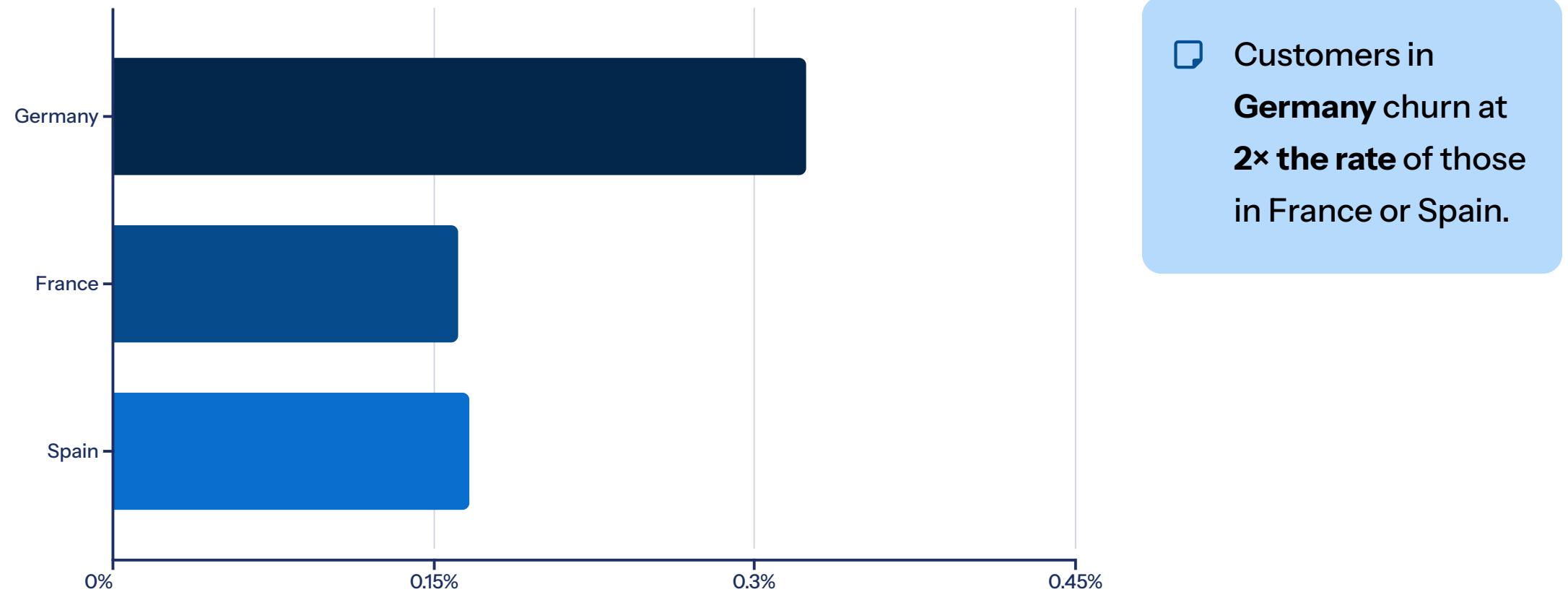
## Detailed Breakdown:

- 1 product: 27.71% churn (5,084 customers)
- 2 products: 7.58% churn (3,710 customers) Sweet Spot
- 3 products: 82.71% churn (1,005 customers)
- 4 products: 100.00% churn (201 customers)

**Business Implication:** Stop pushing 3-4 product bundles. Focus retention efforts on moving single-product customers to the critical 2-product threshold.

# Key Discovery #2: The German Anomaly

Geographic location is the **#1 churn predictor**, with significant regional differences.



## Detailed Breakdown:

- Germany: 32.44% churn (2,509 customers)
- France: 16.15% churn (5,014 customers)
- Spain: 16.67% churn (2,477 customers)

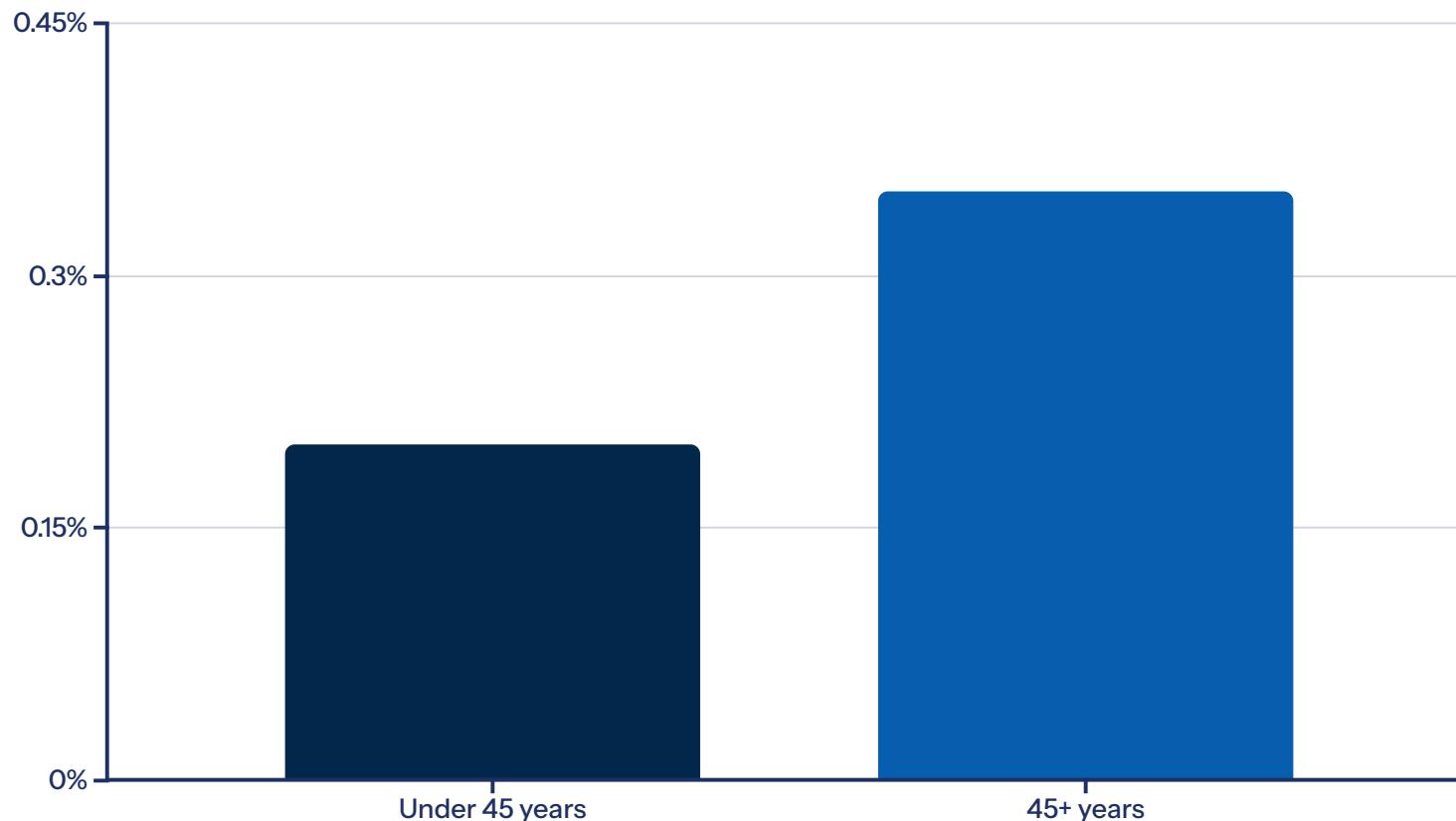
## Validation & Context:

- ✓ Data quality confirmed (no sampling bias)
- ✓ Demographics similar across countries
- ✓ External research: German market has aggressive digital challengers (N26, C24)

**Business Implication:** Requires region-specific retention pilot program targeting German competitive pressures with tailored offerings.

# Key Discovery #3: The Age Cliff

Customer loyalty decays at a specific life stage threshold.



Age 45+ is the inflection point for churn risk.

Customers under 45 years old exhibit a baseline churn rate, while those aged 45 and above show a significantly elevated churn risk.

## Hypotheses

- Retirement planning leading to consolidation of finances elsewhere.
- Switching to specialized private banking services for wealth management.
- Response to competitor offers targeting affluent older customers.

T-test confirmed: Age difference is statistically significant ( $p < 0.05$ ).

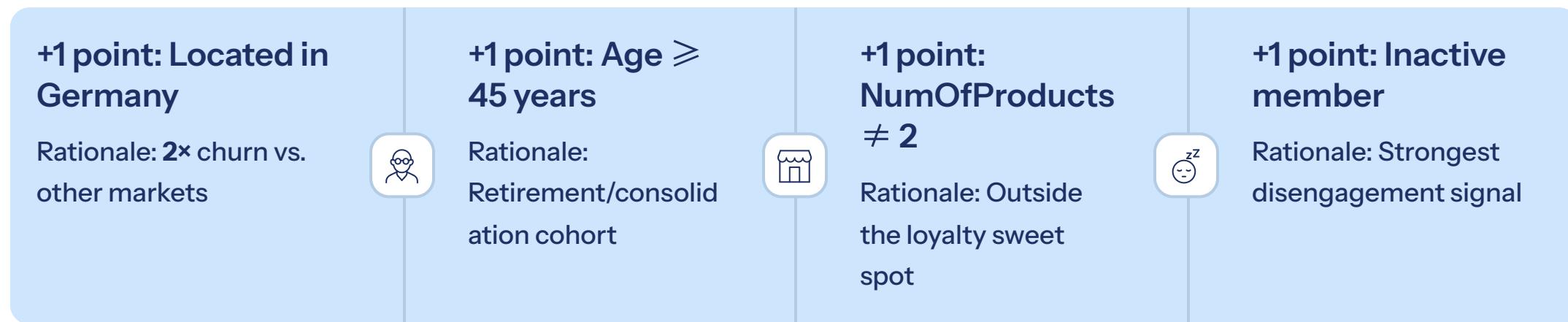
**Business Implication:** Target inactive members aged 45+ with personalized re-engagement campaigns and tailored wealth management offers.

# The Danger Score Framework

Transparent Risk Scoring Over Black-Box ML

## The Scoring Model

Each customer receives 0-4 points based on these criteria:

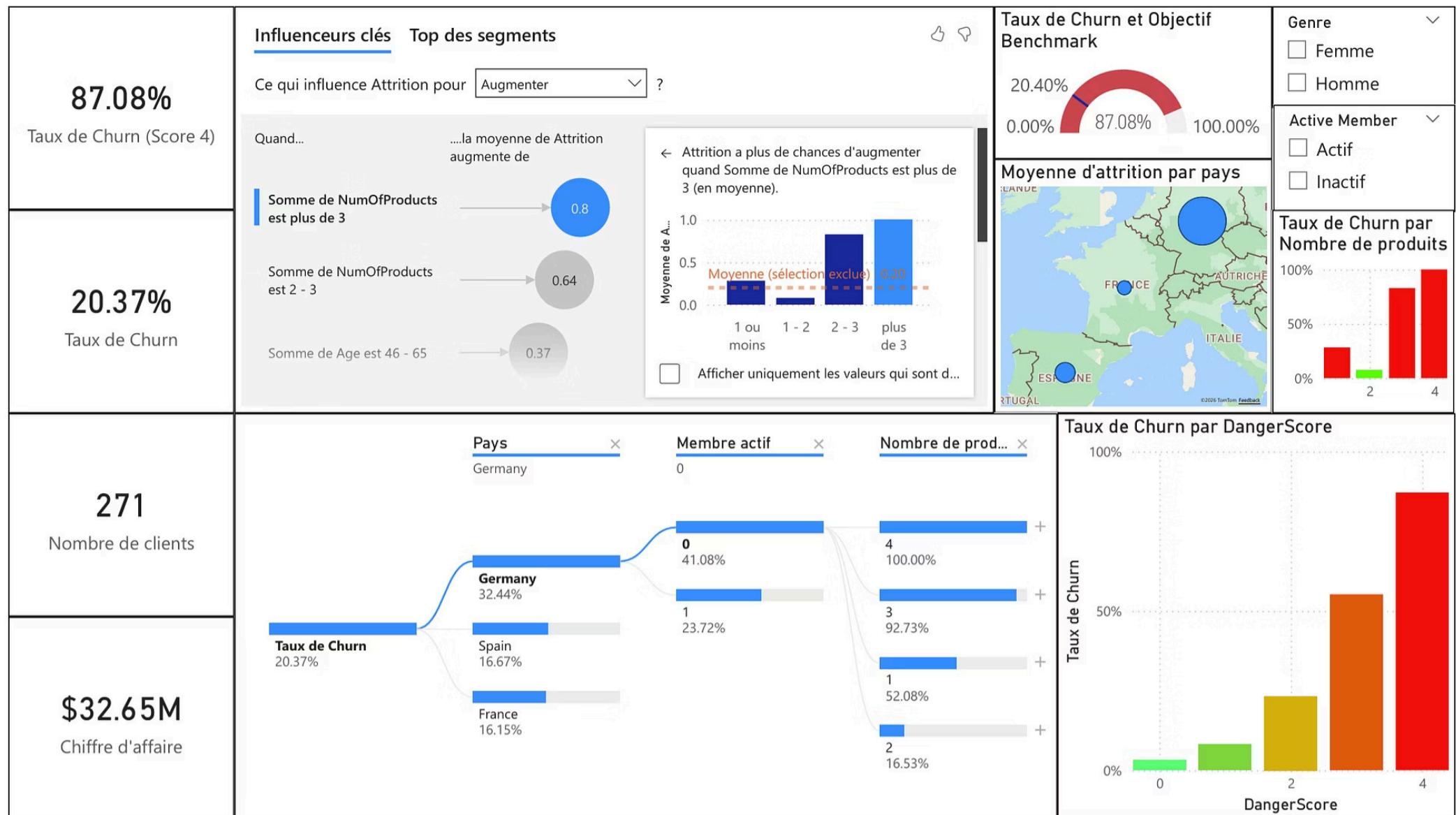


## Performance Table

Score 4	87.08%	271	\$120,495	\$32.65M
Score 3	55.11%	1,281	\$103,690	\$73.28M
Score 2	23.27%	3,172	\$96,190	\$71.04M
Score 1	8.11%	3,837	\$65,023	\$20.24M
Score 0	3.20%	1,439	\$31,112	\$1.43M

- ❑ Score 4 customers have 87.08% churn rate - 4.3x higher than the bank average (20.37%)

Chose interpretability for business adoption - stakeholders need to understand **WHY** someone is high-risk to take action. Each point = specific intervention.



# Executive Dashboard: Real-Time Risk Monitoring

Interactive Power BI Dashboard - French Localized for Romandie Market

## Executive KPIs:

- \$32.65M at risk
- 87% churn rate for highest risk segment
- 271 critical customers

## Geographic Analysis:

- Heatmap highlighting Germany anomaly

## Risk Segmentation:

- Danger Score breakdown with benchmark gauge

## AI-Powered Insights:

- Key Influencers & Decomposition Tree visuals

## Interactive Filters:

- Gender, activity status, product count

Built using DAX calculated columns and Power BI AI visuals. Dashboard enables stakeholders to generate targeted retention lists in real-time.

# 5 Strategic Recommendations with Data-Driven Impact

Actionable strategies derived from key churn drivers, with clear ROI targets and urgency levels.

IMMEDIATE

## 1. Priority Customer Retention

- **Target:** 271 Score 4 customers (\$32.65M at risk, 87% churn probability)
- **Action:** Deploy relationship managers for personal outreach within 48 hours
- **Rationale:** Highest risk × highest value = clearest intervention priority
- **Next Step:** Finance team to calculate fee waiver cost and validate ROI

30 DAYS

## 2. Single-Product Customer Campaign

- **Target:** 5,084 customers with only 1 product (27.71% churn risk)
- **Action:** Incentivize second product adoption
- **Expected Impact:** Converting 25% to 2-product tier prevents ~250 customer exits
- **Rationale:** Move customers from 27.71% risk to 7.58% risk (loyalty sweet spot)

ONGOING

## 3. Inactivity Alert System

- **Target:** Inactive members, especially aged 45+
- **Action:** Automated monitoring + multi-channel re-engagement
- **Rationale:** Inactivity is the #1 controllable risk factor in Danger Score
- **Metric:** Track inactive → active transitions and impact on churn

90-DAY PILOT

## 4. German Market Response

- **Context:** Germany shows 32.4% churn vs. 16% in France/Spain
- **Action:** Competitive analysis of N26/C24 offerings + localized retention test
- **Goal:** Close the gap toward France/Spain performance levels
- **Success Metric:** Reduce German churn rate (target: sub-25% in pilot group)

IMMEDIATE

## 5. Product Portfolio Guardrails

- **Finding:** 3-product customers = 82.71% churn, 4+ product = 100% churn
- **Action:** Cap retail customers at 2 products; reserve 3+ for business/private banking
- **Rationale:** Over-servicing creates customer confusion and guaranteed attrition
- **Implementation:** Update product sales policies and CRM rules

# From Analysis to Business Impact: Key Learnings

Bridging technical expertise with strategic business value.

## ⚙️ TECHNICAL SKILLS DEVELOPED

- **Python for production-scale analysis:** Pandas, SciPy, statistical hypothesis testing.
- **Advanced Power BI:** AI visuals (Key Influencers, Decomposition Tree), DAX, French localization.
- **Feature engineering for stakeholders:** Created interpretable brackets and risk scores vs. raw numbers.
- **End-to-end project ownership:** From Kaggle dataset to executive-ready recommendations.

## 💡 WHY THESE SKILLS MATTER (BUSINESS CONTEXT)

- **Quantified impact in business language:** \$32.65M at risk speaks to CFOs, not just data teams.
- **Stakeholder-first design:** Each Danger Score point = actionable intervention (e.g., Germany → regional pilot, Inactive → re-engagement).
- **Each technical choice served a business goal:**
  - Danger Score (0-4) → Frontline staff can explain WHY customers are high-risk.
  - French dashboard → Localized for Romandie market stakeholders.
  - Bracketing features → Enables non-technical users to filter without SQL.

## ⌚ WHAT THIS DEMONSTRATES

- **Strategic thinking:** Understood the business problem (retention ROI) before writing code.
- **Cross-functional readiness:** Can translate between technical teams and business stakeholders.
- **Swiss market awareness:** FINMA compliance, competitive landscape (N26/C24), bilingual capabilities.
- **Self-directed learning:** Took a complex 8-week project from concept to completion independently.

**Ready to deliver this analytical rigor and business mindset from day one.**