Main Drivers of Bank Customer Churn

Nick Amateau

Why Churn Matters

- Customer churn is costly: up to 50% of an employee's annual salary.
- Retaining customers is cheaper than acquiring new ones.
- Predicting and understanding churn allows better retention strategies.
- A deep understanding of how churn varies with factors like age, balance, credit score, and engagement allows banks to:
  - Create smarter retention strategies
  - Target at-risk customers early
  - Boost overall profitability

Data Overview

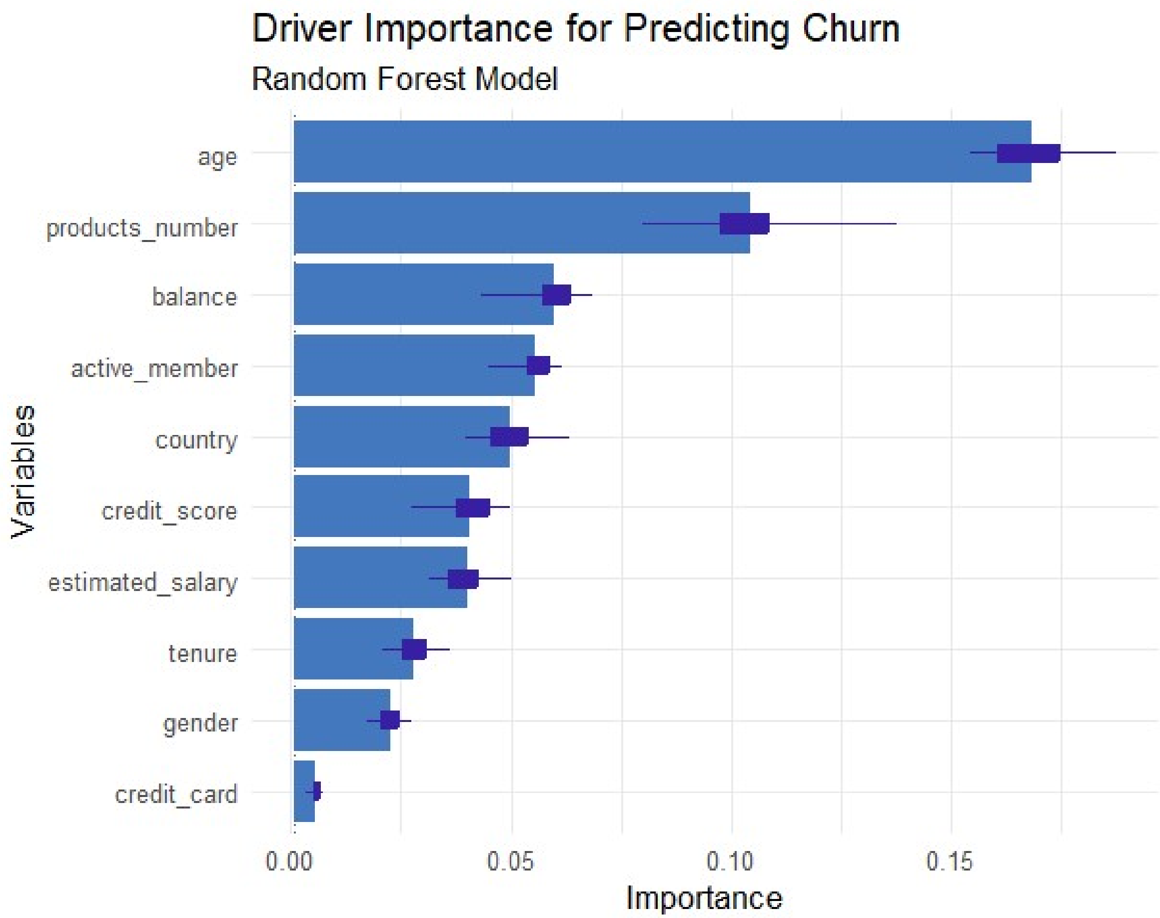
- Dataset: Bank Customer Churn dataset
- Rows: 10,000+ customers
- Target variable: Churn (Yes/No — whether the customer left the bank)
- Features included:
  - Demographic data (Age, Gender, Country)
  - Financial information (Credit Score, Balance, Estimated Salary)
  - Engagement data (Products owned, Tenure, Active Member status, Credit Card usage)

Predictive Model: Random Forest

- I trained a Random Forest with 500 trees on 70% of the data to accurately capture complex relationships that drive customer churn.
- The RMSE of the model is .3241
- A random guess would result in an RMSE around 0.5. Our model achieved 0.3241, showing it captures real patterns and meaningfully improves churn prediction over guessing

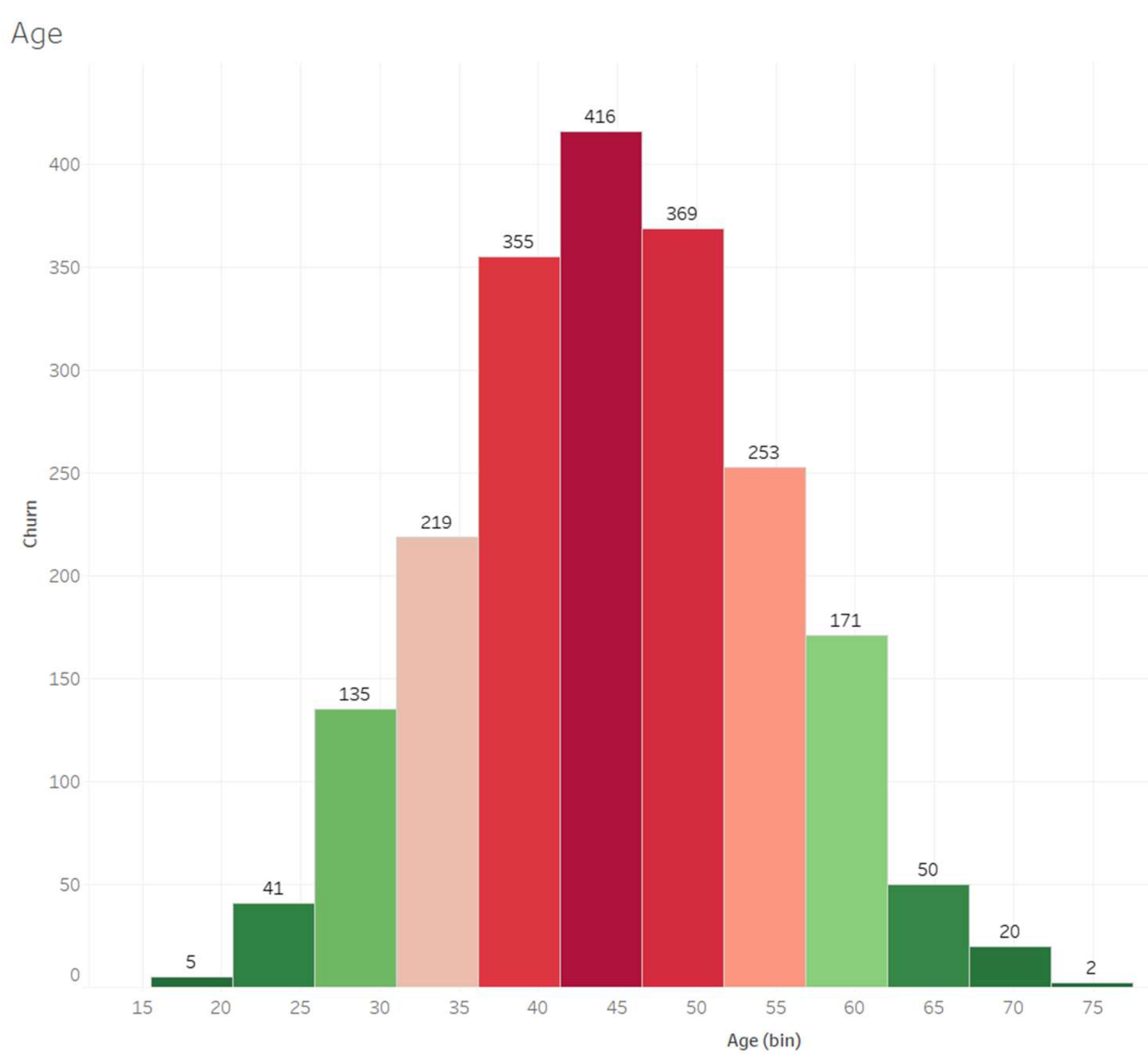
Variable Importance

- Age is by far the most important driver of churn.
- How many products a customer has is the second strongest predictor.
- Balance is the third strongest driver.



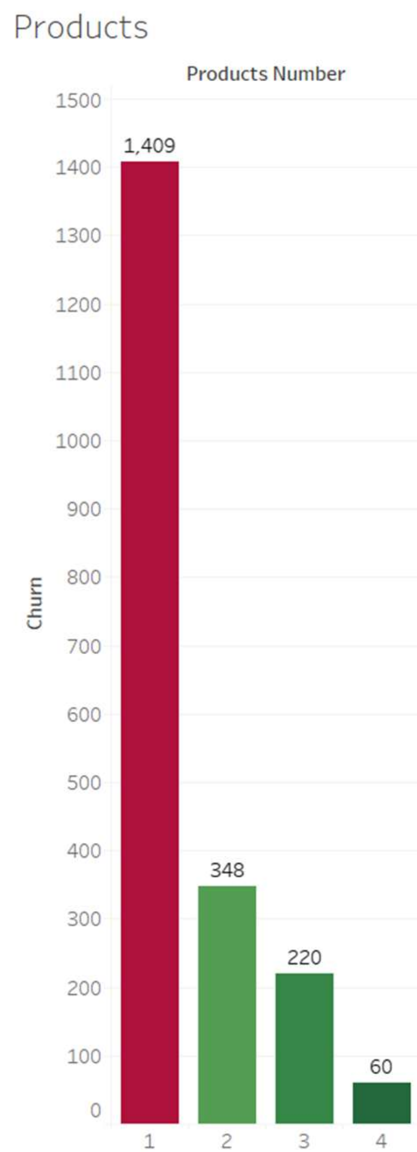
Main Driver: Age

- Churn risk is highest among customers aged 35–50.
- Outside of this range, customers are more loyal.
- We should prioritize retention strategies focused on this middle-age group.



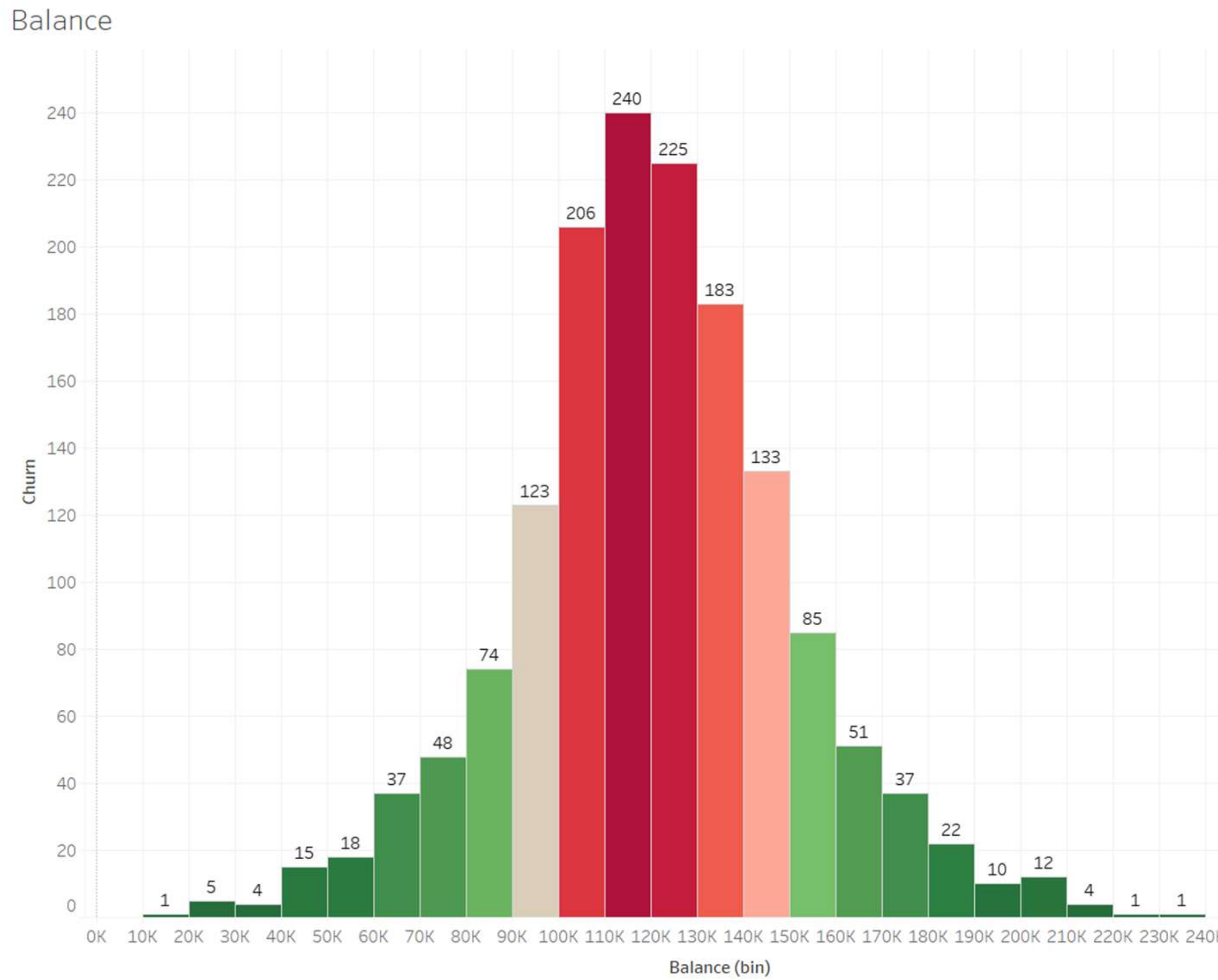
Main Driver: Products

- Most churn happens among customers who only have 1 product.
- Customers with 2+ products are significantly less likely to churn.
- A cross-selling strategy focused on customers who currently have only one product. Encouraging these customers to add a second product, such as a savings account, credit card, or loan.



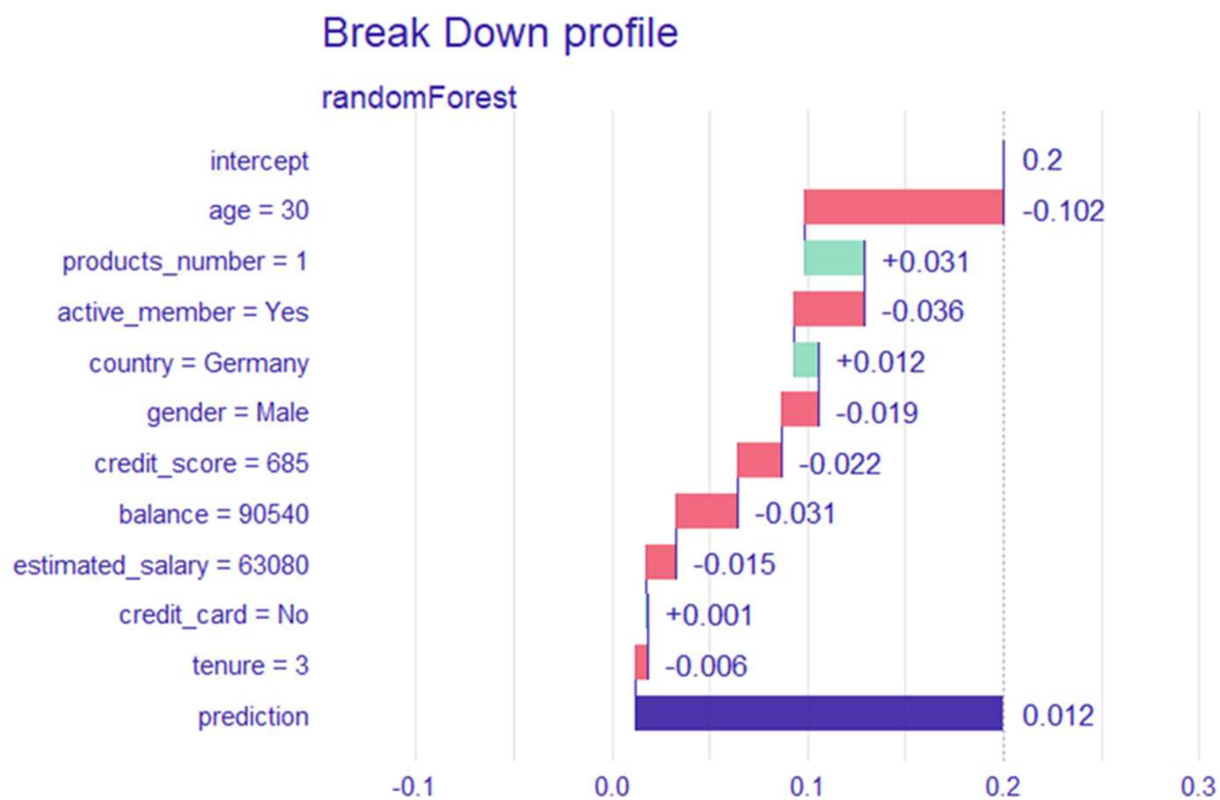
Main Driver: Balance

- Churn risk is highest among customers with balances between $100K and $140K.
- Customers with much higher or lower balances are more loyal.
- We should target mid-balance customers with personalized offers to reduce their churn risk.



How the Model Built an Individual Prediction

- Most characteristics of this customer — like their age, balance, and active membership — decreased their churn risk.
- Only one factor, having just one product, really increased their risk, but the overall probability stayed very low.
- The model predicts this customer has a 1.2% chance of churning. So, this customer is considered very low risk — almost certain to stay with the bank.



Final Takeaways and Recommendations

- Churn is most likely among customers aged 35–50 and those with mid-range balances ($100K–$140K).
- Customers with only one product are significantly more likely to leave the bank.
- Most other factors (gender, credit card, salary) have minimal impact compared to these drivers.
- Recommendations:
  - Prioritize retention efforts on middle-aged and mid-balance customers.
  - Launch cross-selling campaigns to increase the number of products per customer.
  - Focus engagement strategies on customers who are young and have balances near $100K–$140K.