



# *Telecom Customer Churn Analysis*

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# Project Overview

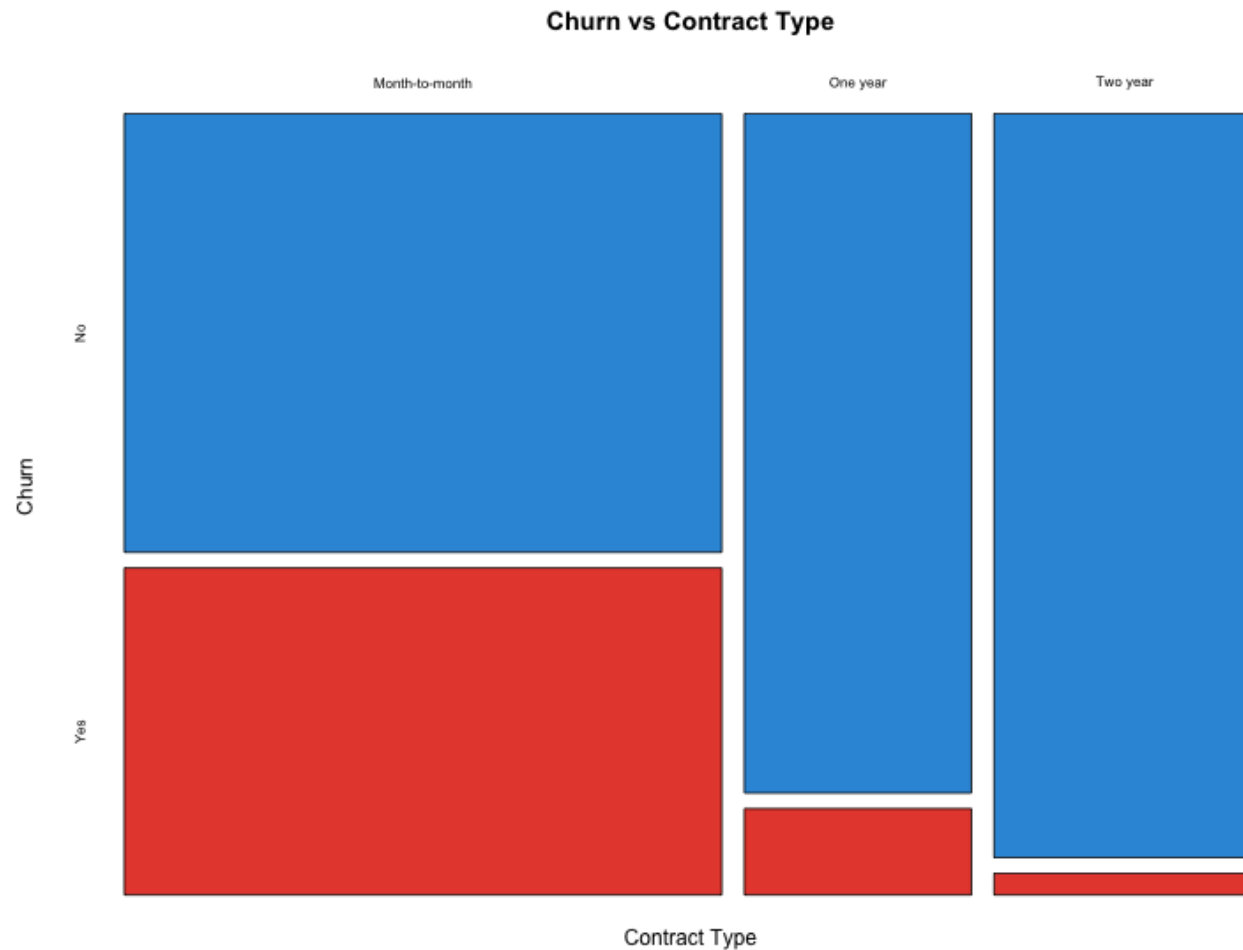
- Dataset: Telco Customer Churn (IBM Sample Data)
- 7,043 customers, 21 variables
- Goal: Understand factors that influence churn and customer value





# Data Cleaning

- Converted categorical columns
  - Handled NA in TotalCharges
  - Combined levels like "No internet service" > "No"
  - Removed customerID (non-informative)
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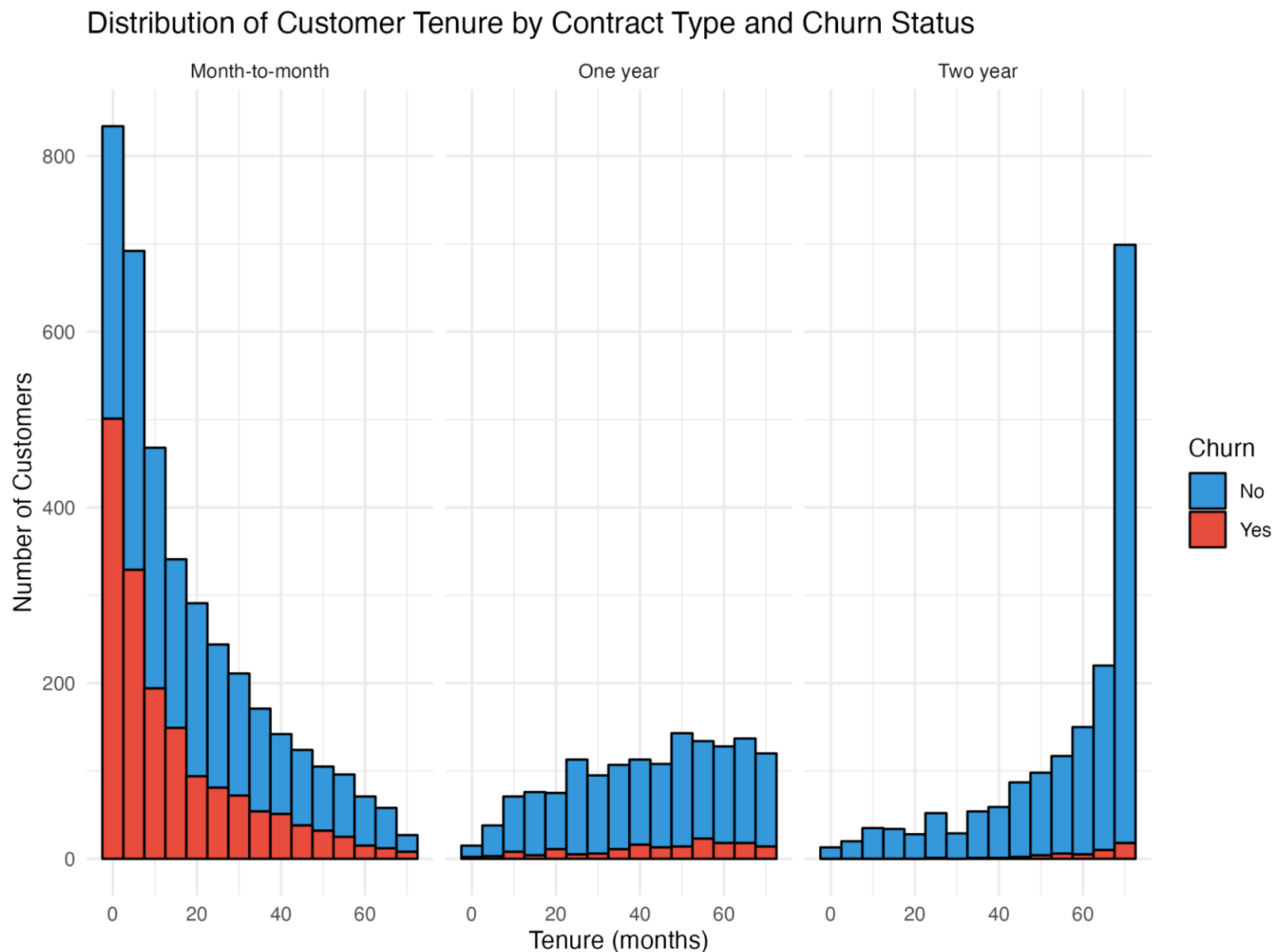


## Churn By Contract Type

- Mosaic plot
- *Key Insight:* Month-to-month contracts > much higher churn
- Long-term contracts = customer stability

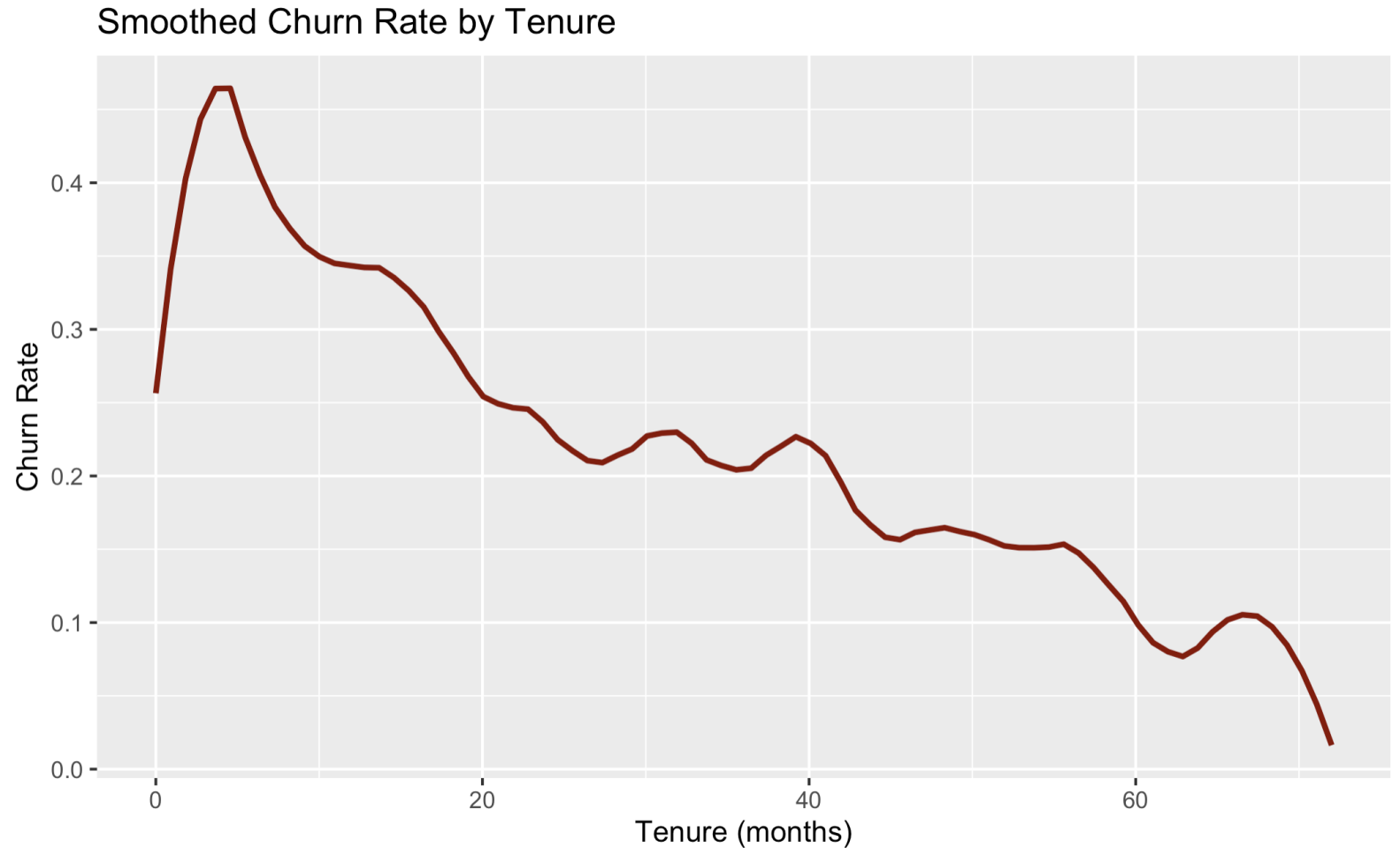
# Tenure Distribution

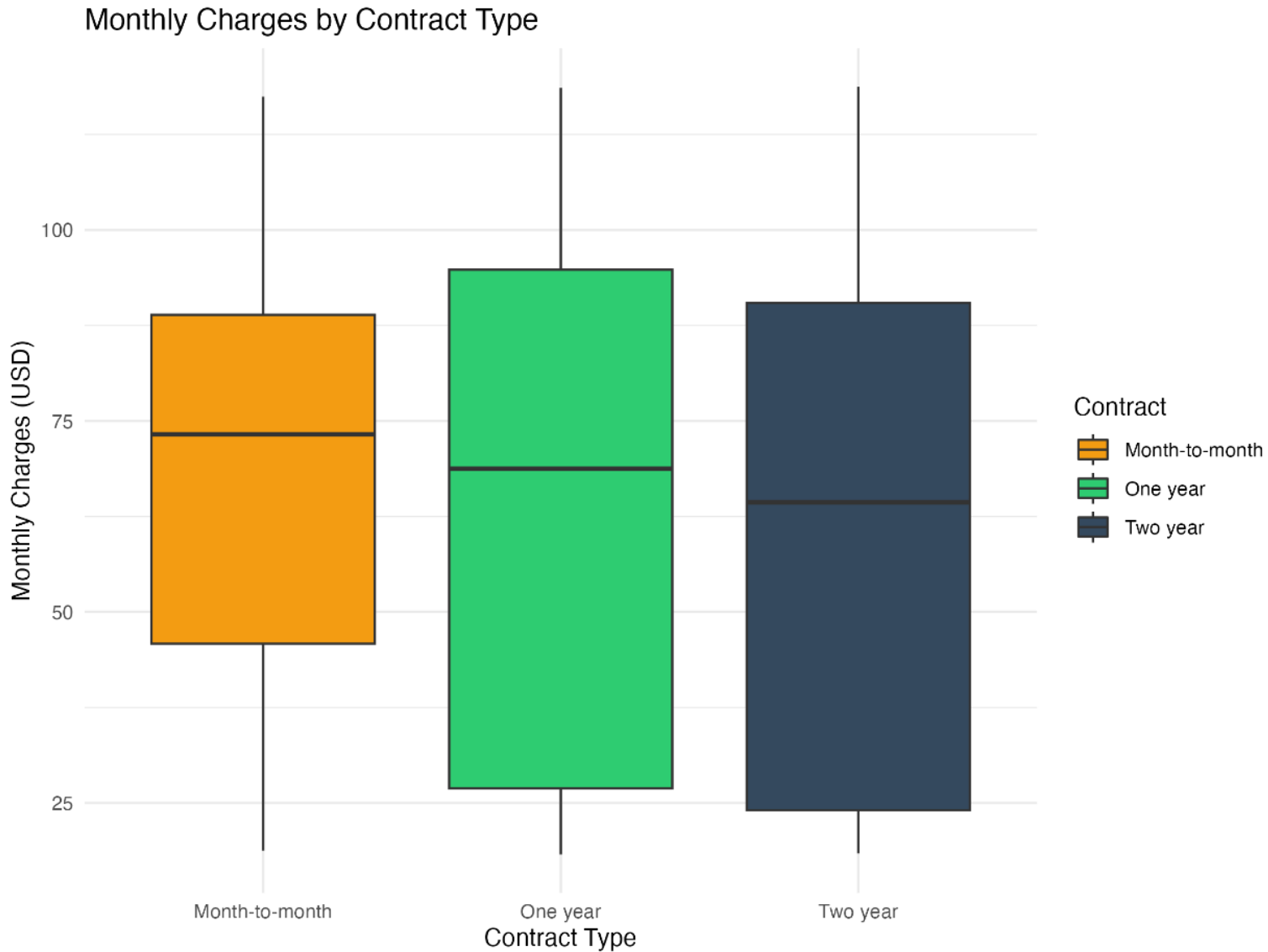
- Histogram by contract + churn
- New customers (0–5 mo) = spike in churn
- Tenured customers rarely churn
- Opportunity: Focus on new customer onboarding



# Tenure Inflection Point

- This smoothed curve shows churn is **highest in the early months**, then drops sharply and **stabilizes around month 20**.
- Retention efforts should focus on **months 1–20**, when churn risk is at its peak.
- [Plotly](#) - Animation

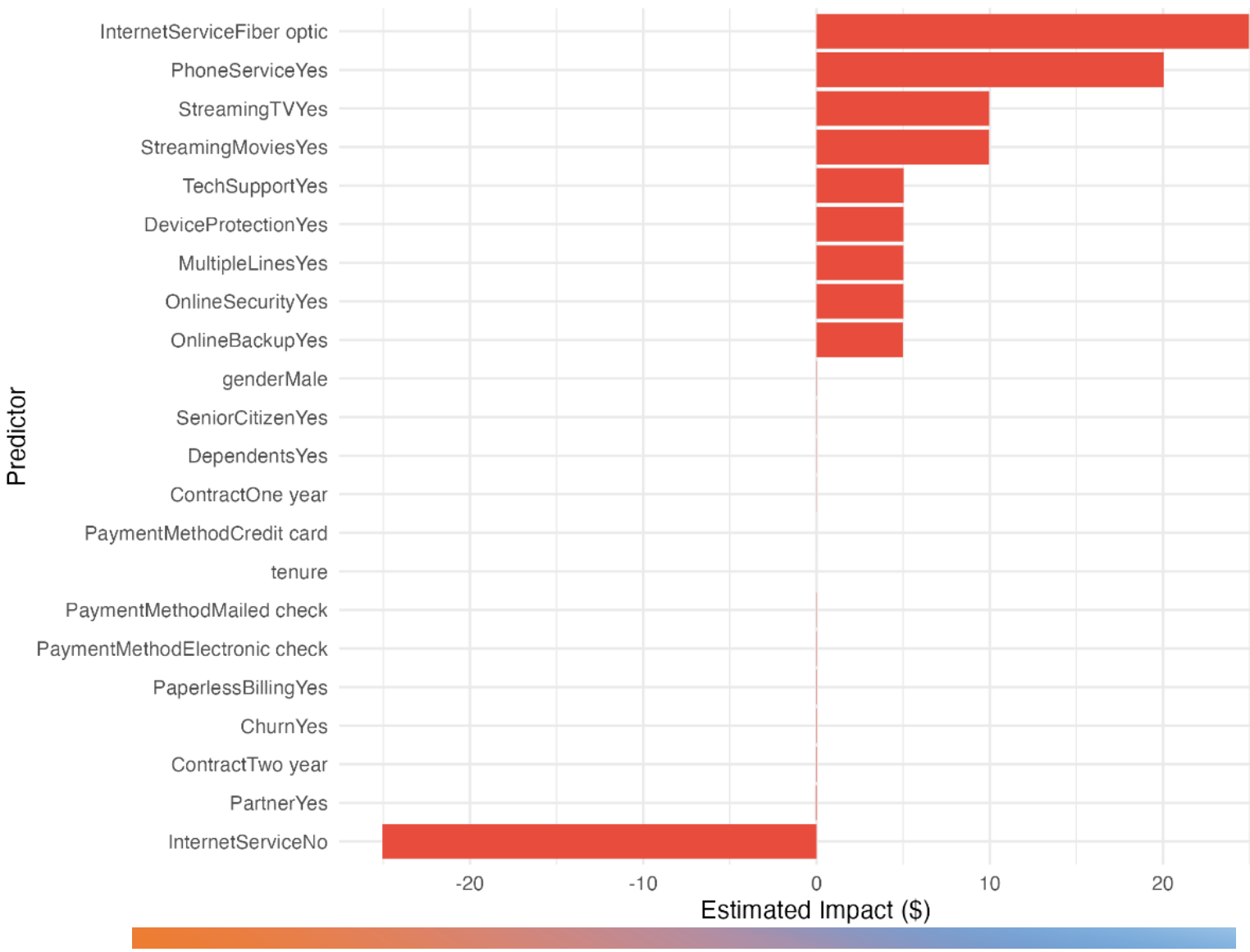




## Monthly Charges

- Key Insight: Month-to-month plans have higher and more varied charges.
- Long-term contracts = lower, more stable bills — likely due to bundling or discounts.

Regression Coefficients: Impact on Monthly Charges



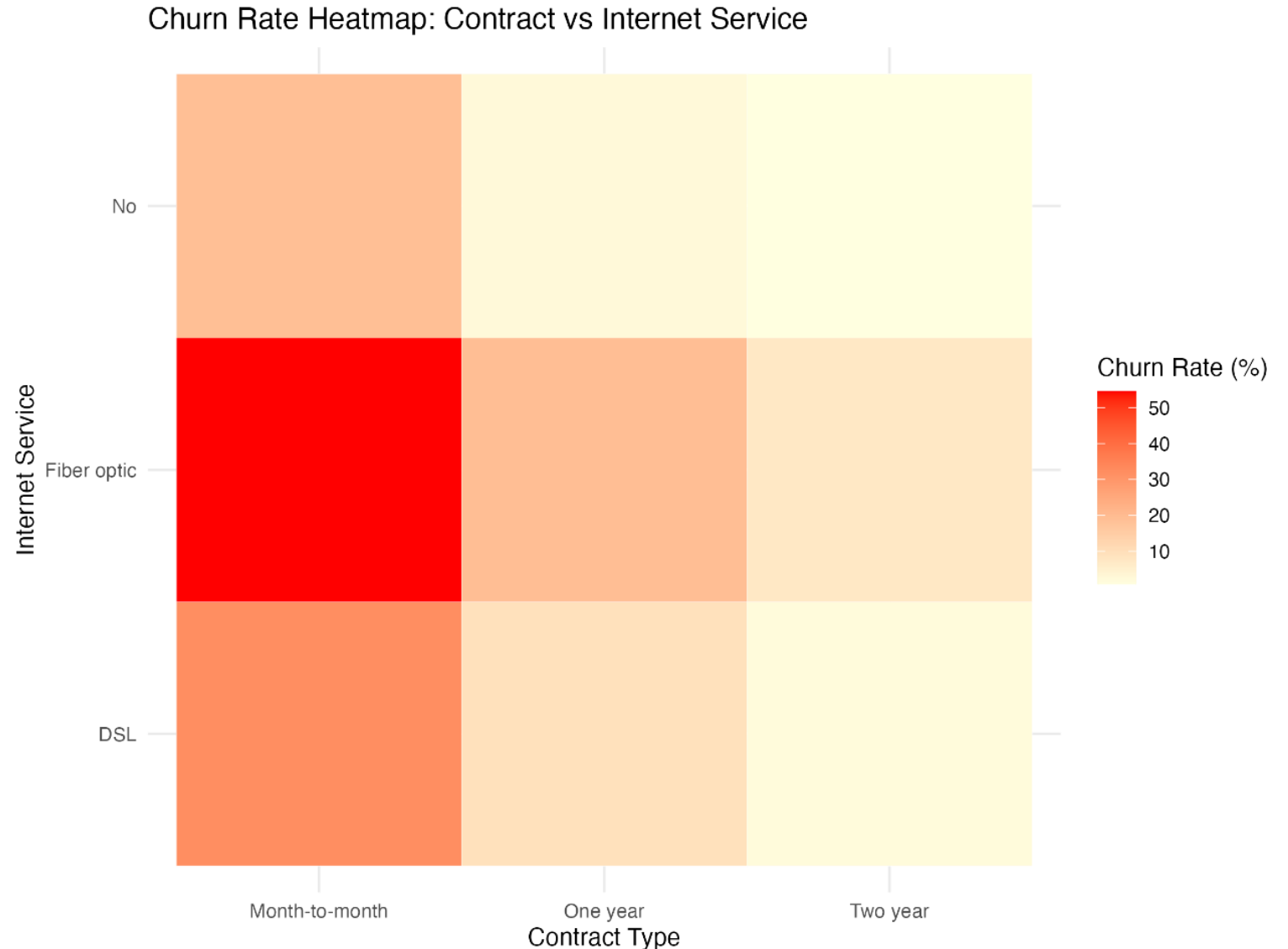
## Drivers of Monthly Charges

- Biggest cost drivers:
- Fiber optic internet
- Add-on services (Streaming TV, Tech Support)
- Month-to-month contracts
- Lower charges:
- No internet service
- Long-term contracts

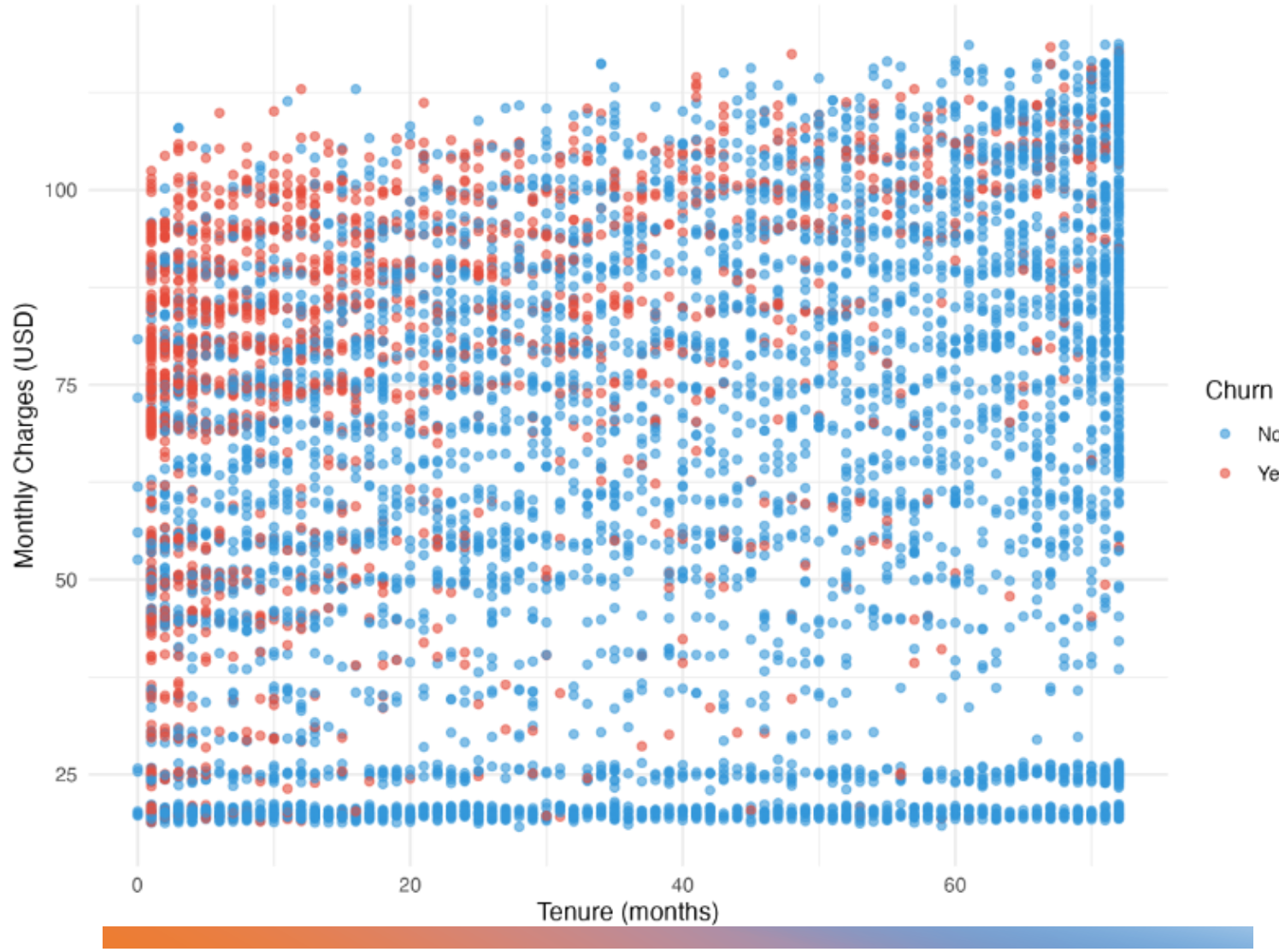


# Churn Rate by Contract Type and Internet Service

- Key Insight:** Fiber optic + month-to-month customers churn the most.
- DSL + long-term = most stable group.
- Strategy:** Offer contract incentives to fiber users or improve service quality.



Monthly Charges vs Tenure, by Churn Status



## Churn By Tenure and Monthly Charges

- **Key Insight:** New, high-paying customers churn the most.
- Loyal customers = low churn, moderate charges.
- **Opportunity:** Support early high-spenders before they churn.

# Summary



**Contract type, tenure, monthly charges, and internet service** are key churn drivers.



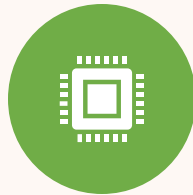
Month-to-month plans combined with high costs lead to the highest churn risk.



The **first few months** are the critical window for retention.



And customers with **fiber internet and expensive add-ons** deserve proactive attention.



By identifying these patterns, telecom providers can move from **reacting to churn** to **preventing it strategically**—all by using their data wisely.