Executive summary — what the data shows and why it matters

We analyzed the loan portfolio to understand where risk and return are concentrated and to produce practical recommendations for pricing, products, channels and customer treatment. The dataset contains loan-level information (loan and customer IDs, age, gender, salary and other income, loan amount, product type, credit score, tenure, interest rate, EMI, current status and a delinquency flag), plus channel, issue date and region. Overall the book is profitable but unevenly priced: delinquency is concentrated in identifiable segments while interest rates are broadly similar across risks. That gap creates both risk and opportunity.

Below I present the main insights, each paired with the supporting chart or table from the notebook outputs and short interpretation/actionable guidance.

Portfolio composition and loan-size patterns

- Insight: Personal loans are the largest and most dispersed category by loan amount; Education, BNPL and Mortgage also have large average balances.
    - Supporting data: Loan amount distribution chart (log scale) and summary stats table by product type.
    - Table (Product, loans, avg_loan_amount, median_loan_amount, p90_loan_amount):

Product_Type	loans	avg_loan_amount	median_loan_amoun
Personal	410	264,191,804.53	272,005,206.5
Education	106	248,717,109.69	228,024,773.5
BNPL	95	248,265,935.73	240,611,630.0
Mortgage	169	246,944,962.59	247,697,136.0

Product_Type	loans	avg_loan_amount	median_loan_amoun
Auto	220	231,497,777.09	219,316,300.0

- Why it matters: Large tickets concentrate both revenue and loss potential — product-level decisions (pricing, tenure, channel limits) will materially affect portfolio P&L.

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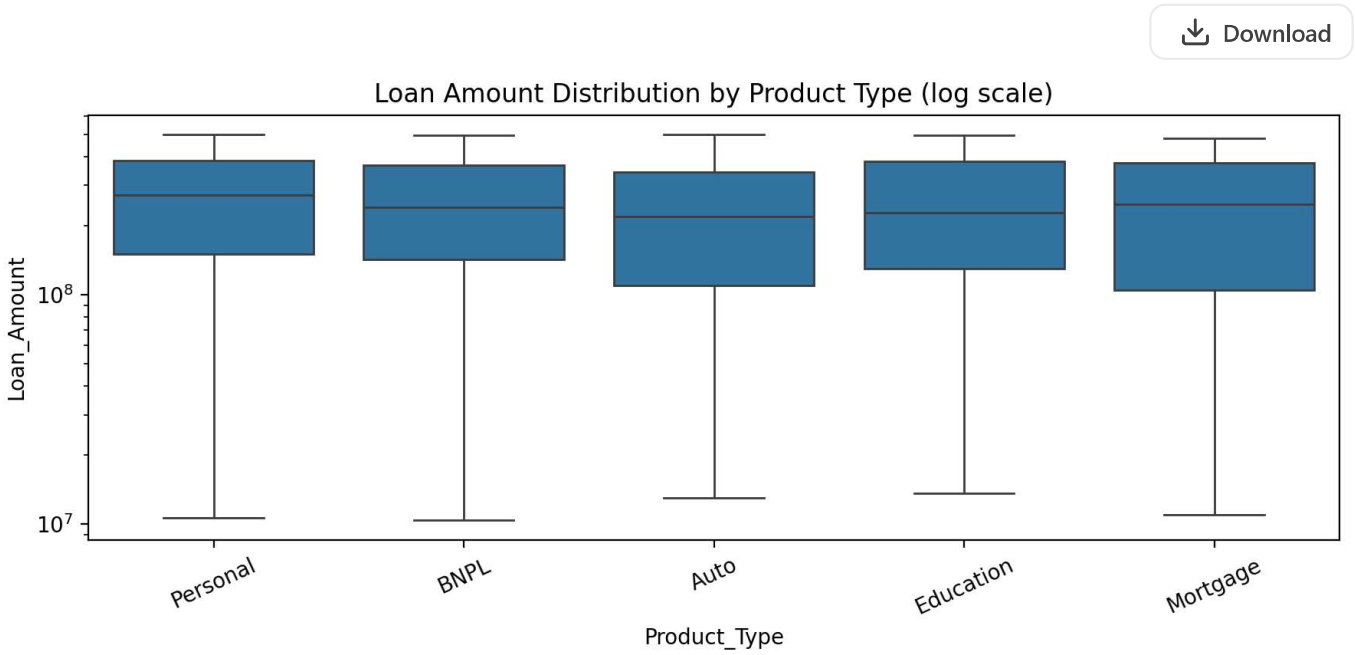

Age and delinquency

- Insight: Delinquency rises from the youngest adult group into mid-age bands and then moderates; the 36–55 bands show the highest delinquency rates in this sample.
  - Supporting data: Delinquency by age-group bar chart and table.
  - Table (Age_Group, loans, delinquency_rate):

Age_Group	loans	delinquency_rate
18-25	124	0.1452
26-35	210	0.1857
36-45	223	0.2108
46-55	250	0.2200
56-65	193	0.1658
66+	0	

- Why it matters: Age bands can help prioritize outreach and underwriting rules; mid-life customers in this book carry elevated risk.

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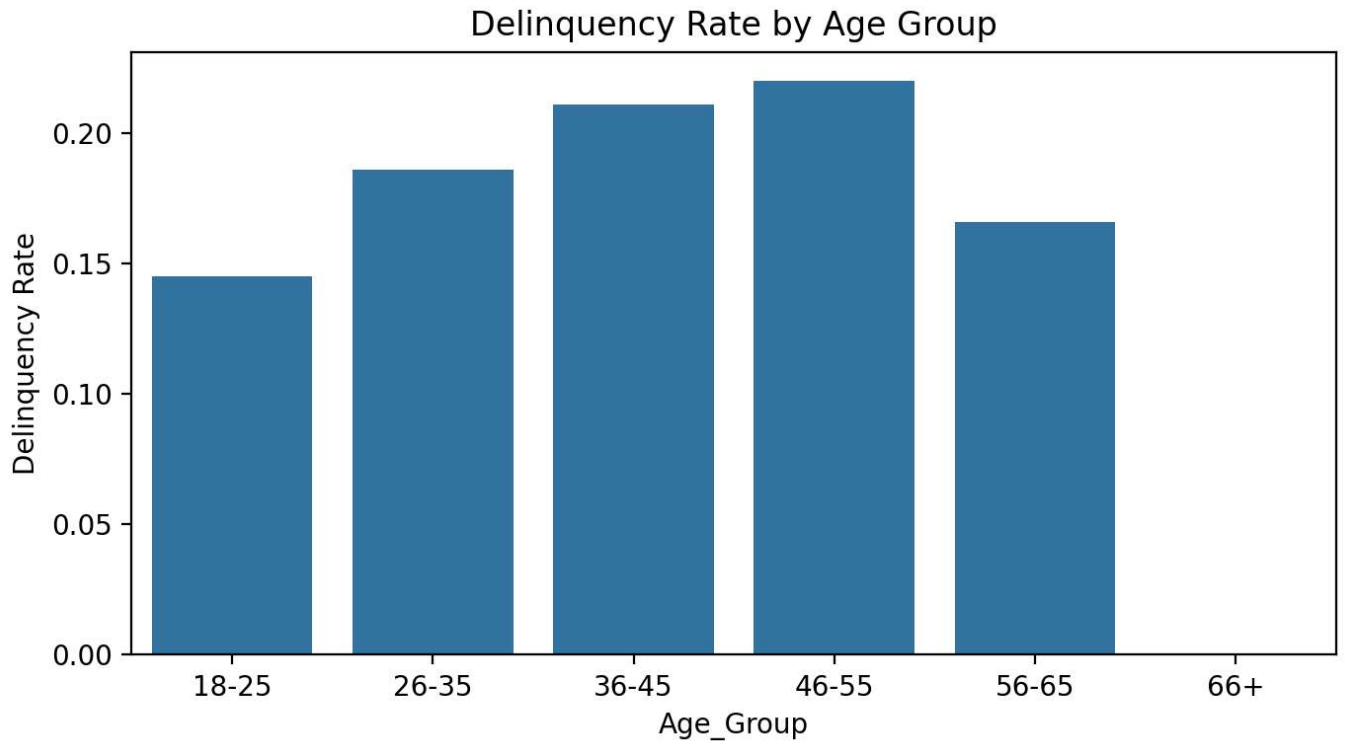

Debt-to-Income (DTI) and risk segmentation

- Insight: Delinquency generally increases as DTI rises, but the relationship and sensitivity vary by product — a single DTI cutoff is unlikely to work optimally across all products.
    - Supporting data: Delinquency vs DTI-bucket by product chart and the detailed product × DTI bucket table (volume, delinquency rate, avg DTI).
    - Table (excerpt showing pattern across product × DTI buckets; full table available in workbook):

Product_Type	DTI_Bucket	loans	delinquency_rate
Auto	<=20%	62	0.2097
Auto	35-50%	35	0.3429
Education	50-65%	7	0.7143
Mortgage	65%+	19	0.4737
Personal	<=20%	157	0.2293
BNPL	35-50%	16	0.3125

    - Why it matters: Use product-specific DTI rules and price bands rather than a one-size-fits-all DTI cap.

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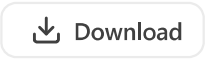

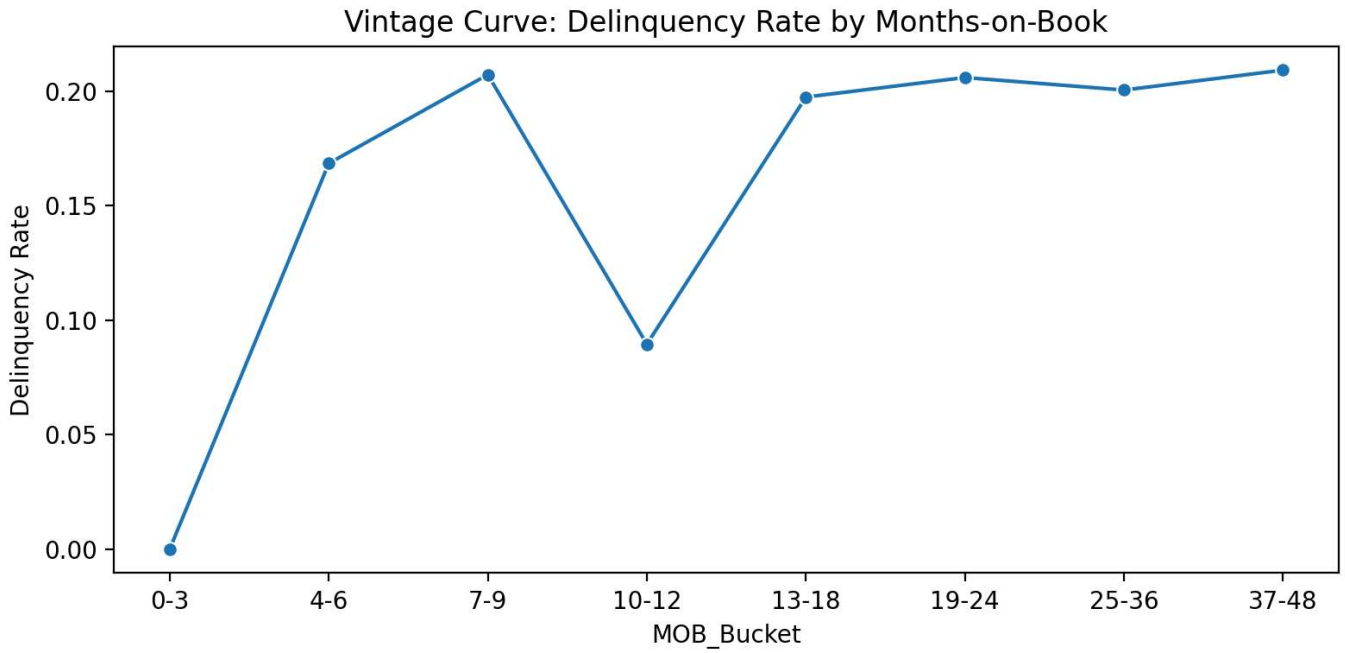

Vintage performance (Months-on-Book)

- Insight: Early vintages have low counts and noisy rates; delinquency stabilizes in the thicker MOB buckets (4–36 months) around ~18–21% in this dataset.
    - Supporting data: Vintage curve chart and table.
    - Table (MOB_Bucket, loans, delinquency_rate):

MOB_Bucket	loans	delinquency_rate
0-3	5	0.0
4-6	89	0.1685
7-9	82	0.2073
10-12	67	0.0896
13-18	162	0.1975
19-24	165	0.2061

MOB_Bucket	loans	delinquency_rate
25-36	344	0.2006
37-48	86	0.2093

- Why it matters: Expectation-setting for collections; early intervention is useful but sample sizes can be small — focus effort where volumes and rates make it material.

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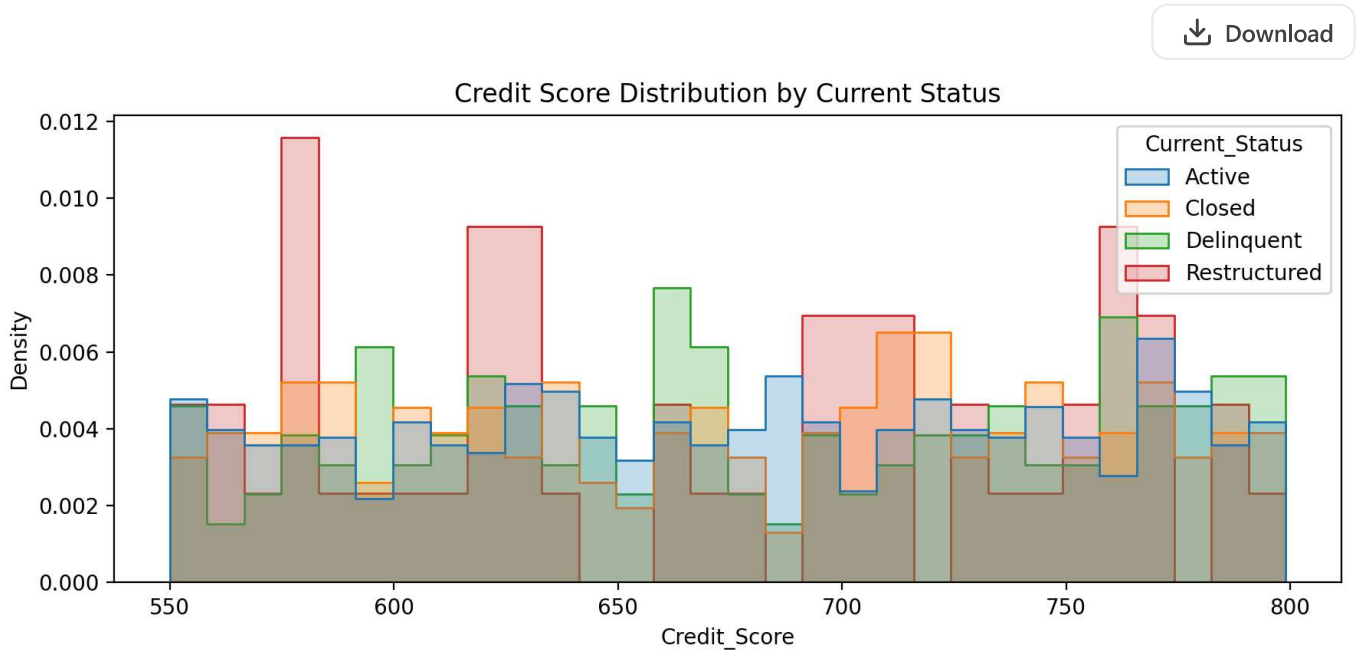

Credit score and current loan status

- Insight: Credit score distributions overlap substantially across statuses, though delinquent accounts have slightly higher average score in this sample; score alone will not perfectly separate risk.
  - Supporting data: Credit score distribution chart and summary table by Current_Status.
  - Table (Current_Status, loans, avg_score, p25, median, p75):

Current_Status	loans	avg_score	p25
Delinquent	157	680.41	619.0
Active	606	677.30	617.25
Closed	185	676.08	613.0
Restructured	52	671.27	608.5

- Why it matters: Combine score with behavioral & affordability measures (e.g., DTI, tenure, channel) to improve discrimination.

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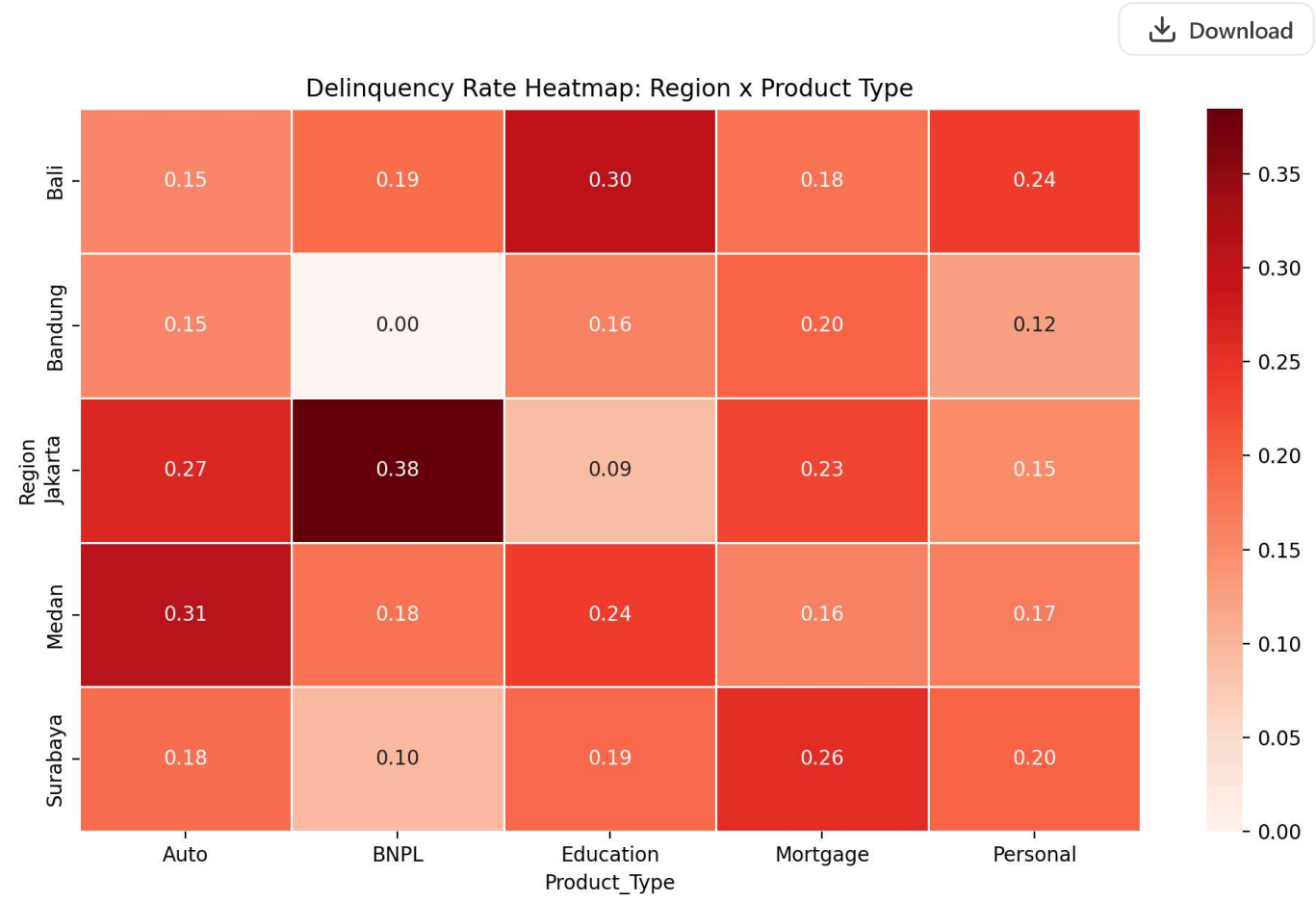

Region × Product concentration and materiality

- Insight: Some region–product cells show high delinquency but low counts; paired volume and rate views show where risk is material (high rate + high volume) versus noisy (high rate, low volume).
    - Supporting data: Delinquency-rate heatmap and loan-count heatmap.
    - Why it matters: Prioritize policy or partner fixes where high rates align with substantial volumes rather than reacting to isolated noisy cells.

Images:

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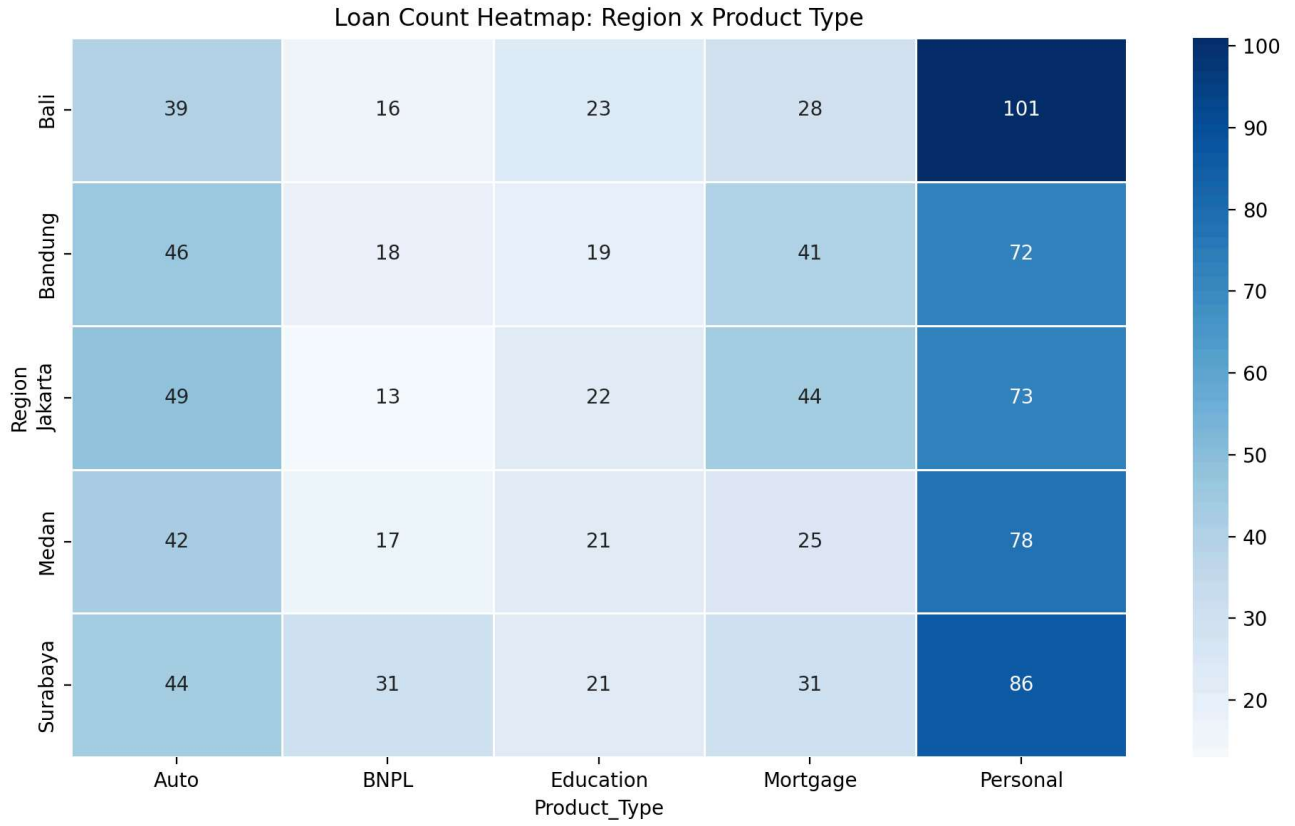

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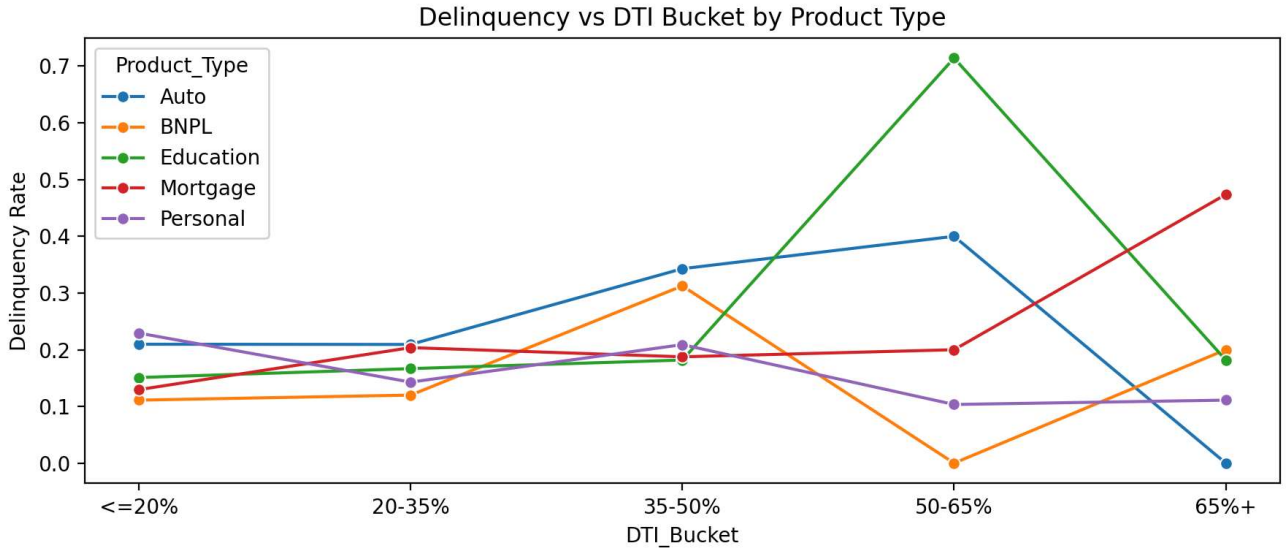

Business decision tests: risk-based pricing and scenario

- Insight: Interest rates are similar across score buckets despite differing delinquency; this indicates under-pricing of risk in lower-score segments.
    - Supporting data: Pricing summary by score bucket.
    - Table (Score_Bucket, loans, avg_interest, delinquency_rate, avg_loan_amount):

Score_Bucket	loans	avg_interest	delinquency_rate
<600	187	15.5676	0.2139
600-649	206	15.8090	0.1748
650-699	190	16.2333	0.2000
700-749	201	16.2296	0.1542
750+	216	16.1530	0.2130

    - Why it matters: The book is not strongly priced to risk; there is opportunity to improve returns via a tiered pricing approach.

- Scenario (what happens if interest rates increase by +2% for Credit Score < 650):
  - Supporting outputs (simulation):
    - Base revenue proxy: 12,985,363,856,736.05 (relative index)
    - Scenario revenue proxy: 13,634,312,921,408.05
    - Base portfolio delinquency: 19.1%
    - Scenario portfolio delinquency: 19.886%
  - Interpretation: A modest pricing increase for sub-650 materially improves interest revenue while raising overall delinquency only slightly in this conservative simulation. Pair pricing with underwriting adjustments and monitoring.

Short conclusions and recommended priorities (closing summary)

- Align pricing to risk: adopt a tiered risk-based pricing grid (anchor on score and DTI). Sub-650 (and especially <600) should face higher rates or tighter exposure limits; mid/high-score borrowers should be rewarded with better pricing.
- Use product levers (tenor, limits, collateral) to manage higher-risk segments rather than pricing alone — create tiered product variants (Preferred / Standard / Essential).
- Prioritize acquisition and growth in channel–product pairs with high profit index and manageable delinquency; tighten or reprice channels that deliver poor risk-adjusted returns.
- Operationalize targeted customer treatment: proactive outreach and early intervention for at-risk segments improves cure rates and reduces loss.
- Monitor closely: track delinquency, revenue and NPS by segment after changes; iterate quickly.

Conclusive summary: the portfolio delivers healthy revenue, but risk and pricing are misaligned. Moving to risk-based pricing, product-tiering, channel rebalancing and targeted customer engagement will improve risk-adjusted returns while protecting portfolio quality.

If you'd like next: I can (a) export the full channel×product ranking and the playbook CSV as downloadable files, or (b) produce the one-page slide visuals (PNG/PPT) based on the slide outline.