Transaction Behavior (2010–2019)

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Project Background

This dataset simulates real-world payment card activity and user information, containing three integrated tables:

- **Transaction** — detailed records of each payment made by clients, including date, amount, merchant, payment channel, and merchant category code (MCC).
- **Cards** — product-level details for each card, such as brand, type, credit limit, chip capability, and potential risk flags (e.g., card_on_dark_web).
- **Users** — demographic, geographic, and financial profiles of cardholders, including age, gender, income, credit score, and debt level.

By linking these tables, we can build a complete view of user activity: **who** is transacting, **what** products they are using, **where** they spend, and **how** they interact with merchants.

In a financial services or brokerage context, understanding these patterns is essential for:

- Monitoring adoption of secure payment methods
- Detecting potential fraud or risk signals
- Supporting product and marketing strategy with data-driven insights

Project Objectives

The purpose of this analysis is to **explore and summarize user behavior** through the integration of transaction, card, and user profile data, with a focus on generating actionable insights for business and risk management.

Specifically, the analysis aims to:

1. **Quantify activity** — Measure overall transaction volume, value, and active user counts over time.
2. **Identify usage patterns** — Compare channel preferences (Chip vs Swipe) and spending across merchant categories (MCC).
3. **Segment customers** — Analyze transaction behavior by demographics (age, gender), card type, and credit score bands.
4. **Provide a monitoring framework** — Create Looker Studio dashboards for ongoing tracking of KPIs, trends, and risk indicators.

Executive Summary

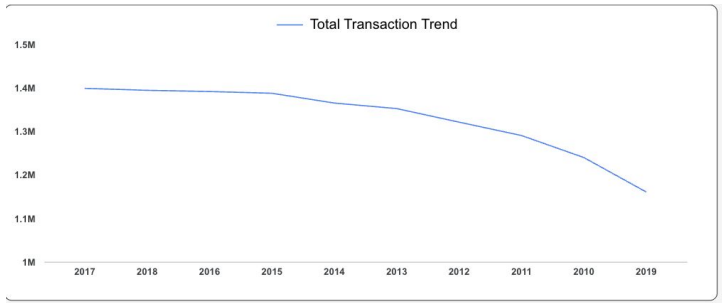
1. **Total transactions: 13.3M**
2. **Total value: $571.84M**
3. **Average ticket: $42.98**
4. **Avg monthly active users: ~1,175** (max **1,207**)

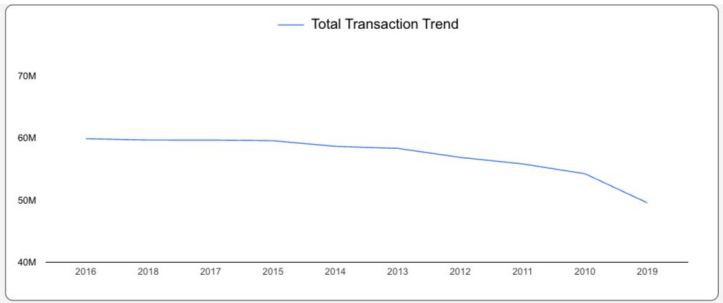
By channel (share of total):

- **Swipe: 52.4%** txns | **50.2%** value
- **Chip: 35.9%** txns | **34.2%** value
- **Unknown: 11.7%** txns | **15.6%** value

Trend Over Time

Trend Over Time





Findings

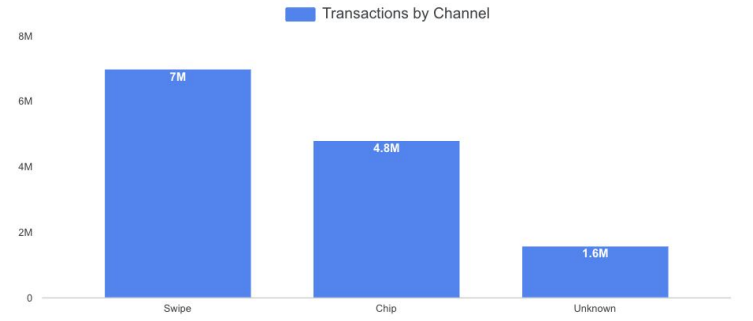
1. Peak activity by transactions: **2017** (≈ **1.40M** txns; **$59.63M** value; avg ticket **$42.61**).
2. Lowest year in sample: **2019** (≈ **1.16M** txns; **$49.51M** value).
3. Average ticket is **stable (~$43)** across years; declines in volume drive value shifts more than ticket size.

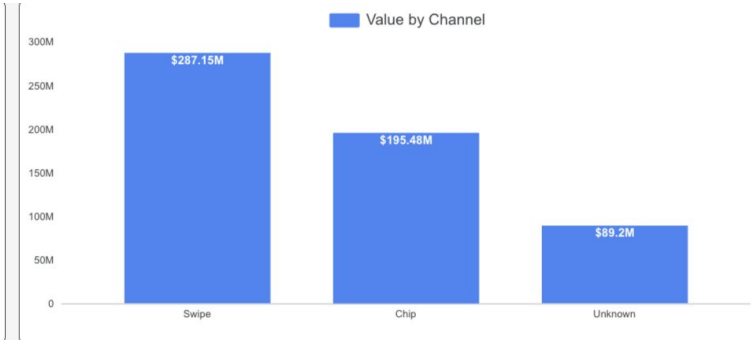
Insights

1. Stable transaction volume over the years, but active user base is relatively small, indicating high concentration of transactions per user.
2. Ticket size remains modest, suggesting most transactions are for low to mid-value purchases.

Channel Performance

Channel Performance



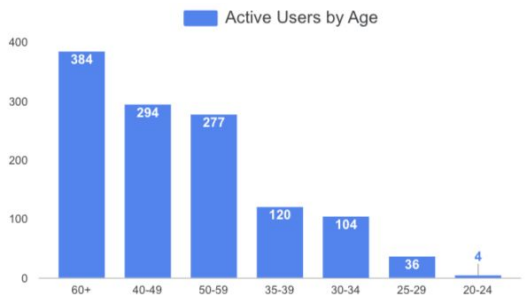


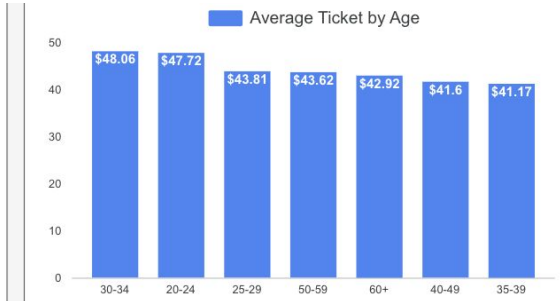
Insights

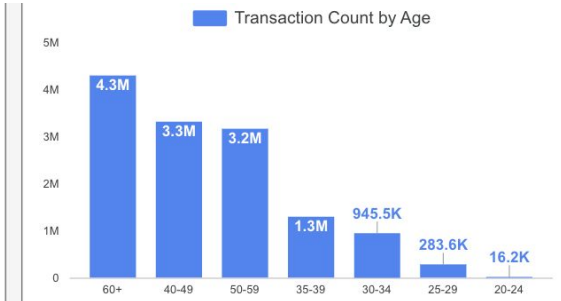
1. **Swipe dominates** volume and value (operational dependence on card-present swipes).
2. **Chip** share is sizable; continuing to promote chip usage should help security/chargeback posture without hurting average ticket (**Chip avg ticket similar to Swipe** in aggregates).
3. **Unknown channel** contributes **15.6%** of value—worth investigating classification/data-quality or specific flows mapped as “Unknown”.

User Segmentation (Age)

User Segmentation







Insights

1. **Highest average ticket** age bands: **30–34 ($48.06)**, **20–24 ($47.72)**, **25–29 ($43.81)**.
2. **Largest value contributors** (due to volume): **60+ ($184.2M)**, **50–59 ($137.9M)**, **40–49 ($137.8M)**.
3. Takeaway: older cohorts drive **total value** via frequency/size, while **30–34** delivers **highest spend per txn**.

Younger adults (25–34) may spend more per transaction despite lower total user counts. Indicates a **high-value segment** worth targeting.

When Users Transact

When Users Interact

Hour	Transaction Count
7 PM	953.5K
6 PM	943.7K
2 PM	901.8K
8 PM	900.7K
9 PM	887.8K
3 PM	880.5K
4 PM	876.4K
5 PM	871.5K
11 PM	864.7K
10 PM	858.0K
1 PM	758.9K
12 AM	482.2K
1 AM	472.6K
2 AM	457.4K
4 AM	424.5K
3 AM	423.6K
5 AM	418.9K
12 PM	183.0K
6 AM	158.9K
7 AM	140.6K
8 AM	115.6K
11 AM	115.0K
9 AM	112.8K
10 AM	103.5K

Insights

1. **Peak hour: 19:00–19:59** with **953k** txns (avg ticket **$39.14**).
2. Evening usage suggests **after-work consumption**; align campaigns/ops to evening peaks.

Indicates potential **online/night-time activity**, possibly linked to specific industries or demographics (shift workers, nightlife, e-commerce).

ACTIONABLE RECOMMENDATIONS

Expand Active User Base to Drive Long-Term Growth

Insights

Users aged **20–34** have the **highest average ticket** ($48–$50) but are **underrepresented** in active user count.

Majority of transactions come from older segments, indicating **untapped younger market potential**.

💼 Business Benefit:

✅ Increases overall transaction volume
✅ Improves lifetime value through early customer acquisition
✅ Diversifies user base, reducing dependency on older segments

Step by Step Actionable Recommendations

How — **Launch targeted acquisition campaigns for younger segments (20–34)**

Step	Description
1	Identify top cities with high transaction value & low penetration in 20–34 age group.
2	Partner with merchants popular among younger audiences and offer exclusive promotions.
3	Track campaign impact on active user count and adjust targeting for optimal ROI.

Optimize Channel Strategy to Increase Security & Modernization

Insights

Swipe accounts for almost half of transactions and value.

Chip & contactless adoption remains moderate, posing potential **security risks** and **missed efficiency gains**.

💼 Business Benefit:

✅ Enhances payment security
✅ Improves transaction processing speed
✅ Aligns with industry modernization trends

Step by Step Actionable Recommendations

How — **Incentivize migration to chip & contactless payments**

Step	Description
1	Educate merchants & customers on security and speed benefits.
2	Offer transaction fee discounts for chip/contactless usage.
3	Track channel adoption rates and fraud reduction over 6 months.

Interactive Dashboard

[Click for link]