Swiped: Analyzing Ground-truth Data of a Marketplace for Stolen Debit and Credit Cards

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Methodology
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- 96.2% of 260k unique BTC wallet addresses were present on the blockchain
- Several cross consistency checks of the data
“The Shop”
Magnetic Stripe vs. CNP

Shop Interface
Magnetic Stripe

Magnetic stripe track data
- Card holder name
- Card number
- CVV1
Magnetic Stripe
“The Shop”
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Back-end Data

**Releases:** Batches of stolen accounts grouped by a single seller who negotiated a commission

- 8,349 total releases
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**Revenue:** Total gross sales before refund

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Inventory: Total available accounts

- 19.45M total accounts
  - 19M (97%) were magnetic stripe accounts
  - Relative demand for CNP was higher - shop sold 84% of all CNP inventory whereas only 40% of magnetic stripe

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Supply & Demand

January 2015 - January 2019

Average 38k accounts per week
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Shop had difficulty supplying more stolen CNP data which is counter to prior work
Regional Supply & Demand

Normalized per capita

Magnetic Stripe

- SC by far the most popular state, $1 per inhabitant (60% more than the next highest state)
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- CO and NV were popular for accounts added, but not purchased

(a) Magnetic stripe (supply)  
(b) Magnetic stripe (spending)
Regional Supply & Demand

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Magnetic Stripe

- SC by far the most popular state, $1 per inhabitant (60% more than the next highest state)
- CO and NV were popular for accounts added, but not purchased
- May be other factors than supply driving sale of these accounts
Regional Supply & Demand

Normalized per capita

CNP

- “Home” region of account had very little to do with purchases

(c) CNP (supply)  (d) CNP (spending)
Pricing Strategies
Pricing Strategies - Average Validity

Release → 20% sample → Checkers

Average Validity
Pricing Strategies - Features

Initial asking price

- Magnetic stripe $R^2$ of 0.74
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Sale price

- Time on the shop made an impact
Pricing Strategies

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According to support tickets, magnetic stripe validity decreases over time due to banks detecting the breach source
Magnetic Stripe Account Attractiveness

Segmented across three variables: issuer, network and type
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- Segmented issuers into Top 10, medium and small in terms of total spend
Magnetic Stripe Account Attractiveness

Top 10 Issuers:

● 43% of spending
● Spending was in the millions for each

Medium Issuers:

● 104 total issuers accounted for 25% of the total spending
● Saw a larger fraction of listed accounts sold (53.4%) than top issuers (32.1%)
  ○ Except for USAA (83.2%)

Small Issuers:

● 6,815 small issuers accounted for 22% of the spending
● Saw a larger percentage (55.2%) of their accounts sold compared to medium and small issuers
  ○ Again except for USAA (83.2%)
U.S. EMV Chip Deployment
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Liability shift for card-present transactions involving counterfeit cards to discourage merchants from processing magstripe transactions

- Took place on Oct 1 2015 in the U.S.
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Most of the magnetic stripe data added after the liability shift was equipped with a chip
# Marketplaces Finance

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Commissions</th>
<th>Refunds</th>
<th>Margins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015*</td>
<td>13.4M</td>
<td>7.7M (57%)</td>
<td>3.6M (27%)</td>
<td>2.1M (16%)</td>
</tr>
<tr>
<td>2016</td>
<td>24M</td>
<td>10.8M (45%)</td>
<td>7.6M (32%)</td>
<td>5.6M (23%)</td>
</tr>
<tr>
<td>2017</td>
<td>32.2M</td>
<td>13.6M (42%)</td>
<td>11.8M (37%)</td>
<td>6.8M (21%)</td>
</tr>
<tr>
<td>2018</td>
<td>33.5M</td>
<td>13.6M (41%)</td>
<td>10.8M (32%)</td>
<td>9.1M (27%)</td>
</tr>
<tr>
<td>2019*</td>
<td>770K</td>
<td>313K (41%)</td>
<td>241K (31%)</td>
<td>217K (28%)</td>
</tr>
<tr>
<td>Total</td>
<td>103.9M</td>
<td>46M (44%)</td>
<td>34.1M (33%)</td>
<td>23.8M (23%)</td>
</tr>
</tbody>
</table>

Table 4: Yearly finances of the shop, in USD. *Partial data for 2015 and 2019. The shop earned $23.8M before costs such as advertising, employees and infrastructure.
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Open question whether future trends in the carding underground can be inferred from partial data, such as scrapes.
Thank You