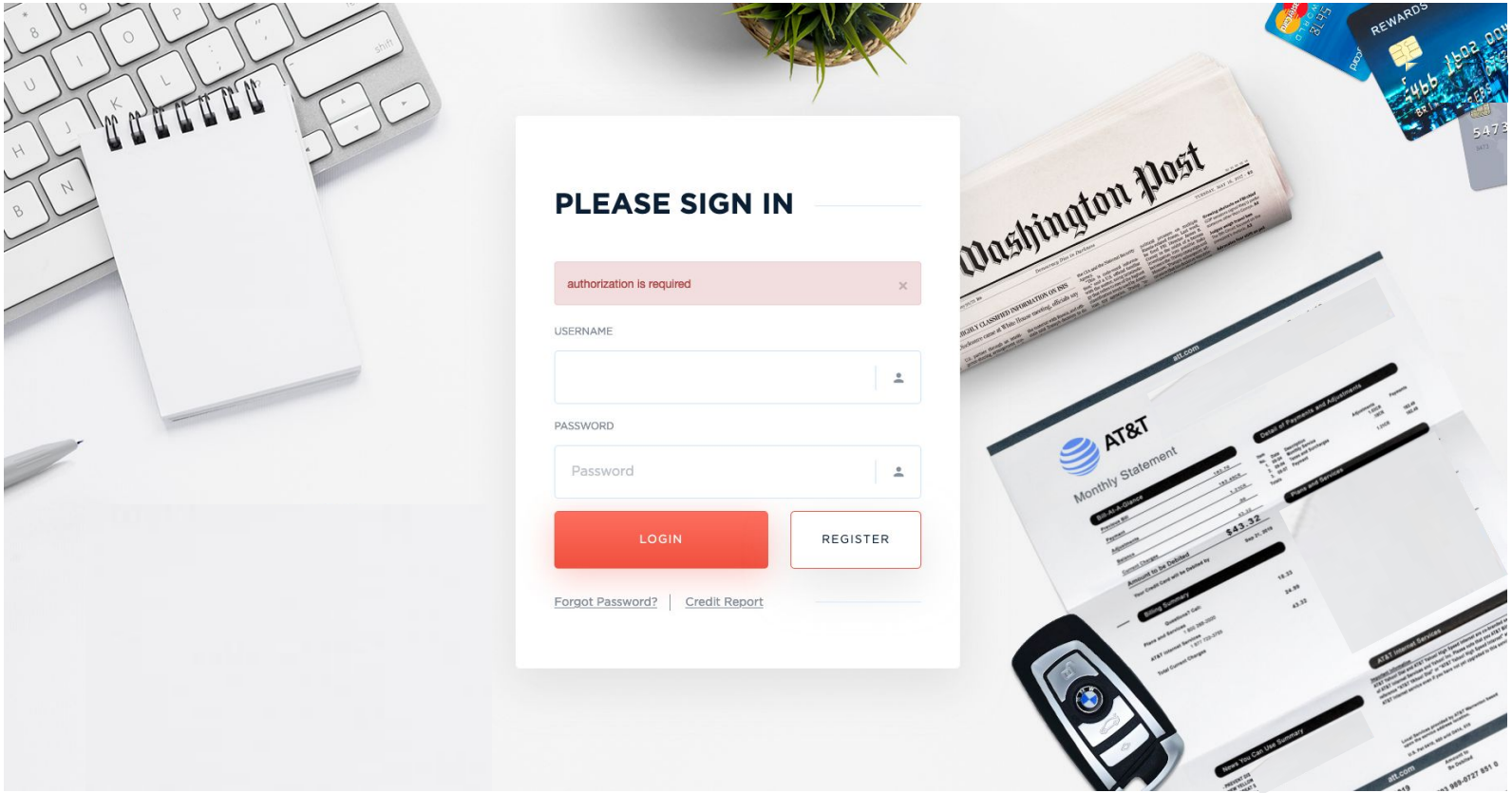
Swiped: Analyzing Ground-truth Data of a Marketplace for Stolen Debit and Credit Cards

Max Aliapoulios, Cameron Ballard, Rasika Bhalerao, Tobias Lauinger, Damon McCoy

NEW YORK UNIVERSITY


PLEASE SIGN IN
authorization is required
USERNAME
PASSWORD
Password
LOGIN
REGISTER
Forgot Password?
Credit Report
Washington Post
AT&T
Monthly Statement
REWARDS

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- Several cross consistency checks of the data

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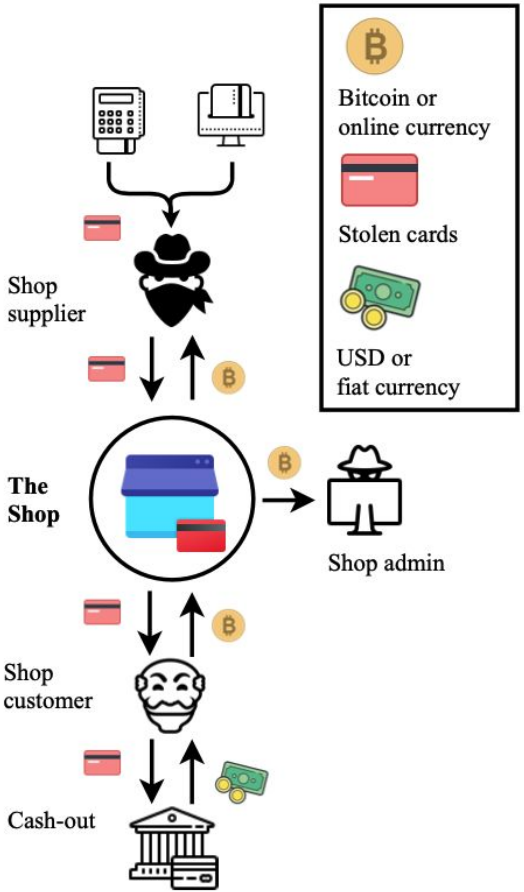
Bitcoin or
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Shop
supplier
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Shop admin
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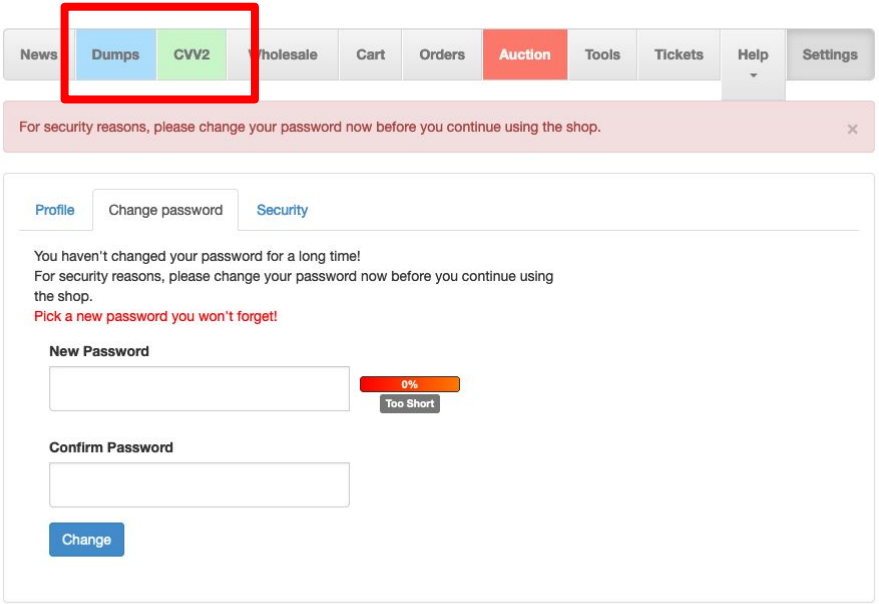
Cash-out

Magnetic Stripe vs. CNP



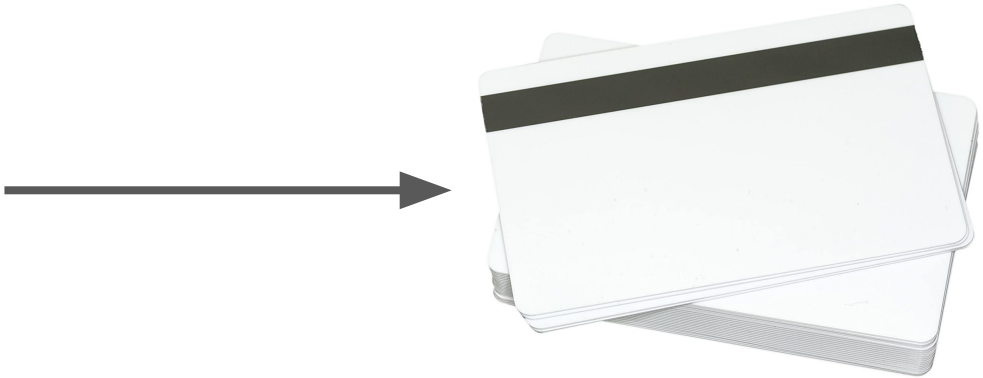
Shop Interface

Magnetic Stripe

Magnetic stripe track data

- Card holder name
- Card number
- CVV1

Magnetic Stripe



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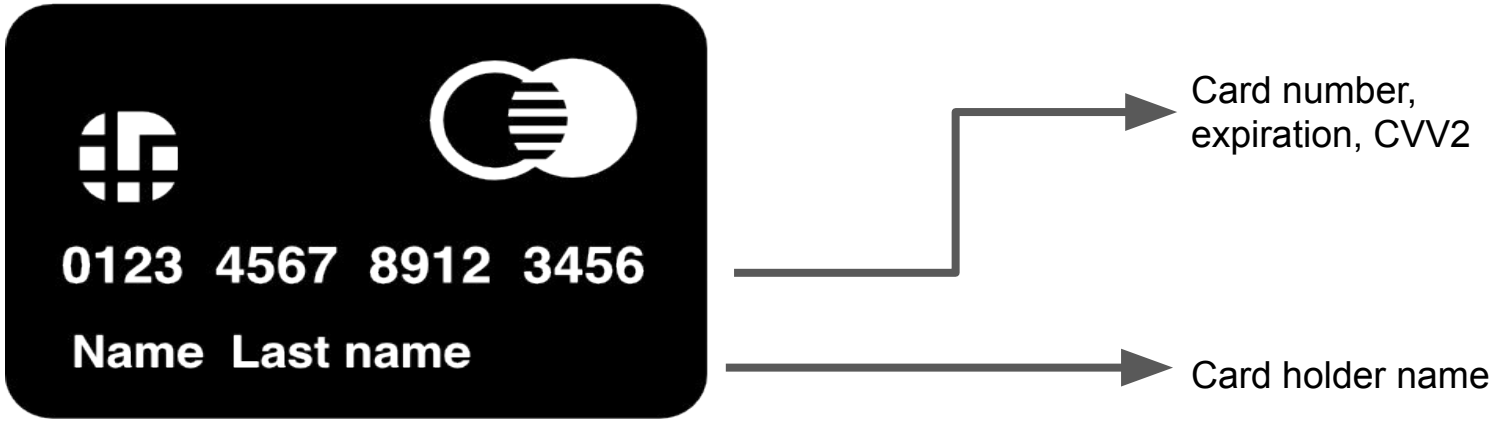
0123 4567 8912 3456
Name Last name
Card number,
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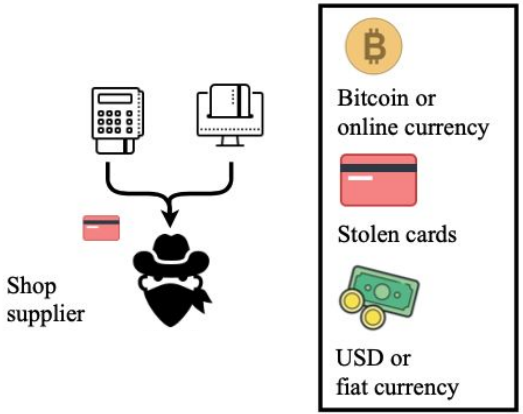
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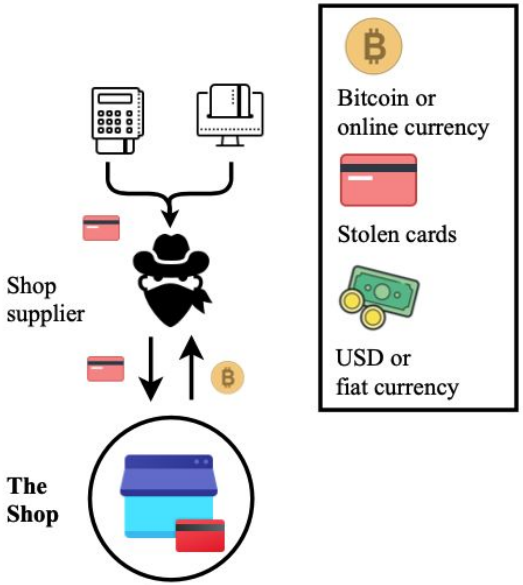
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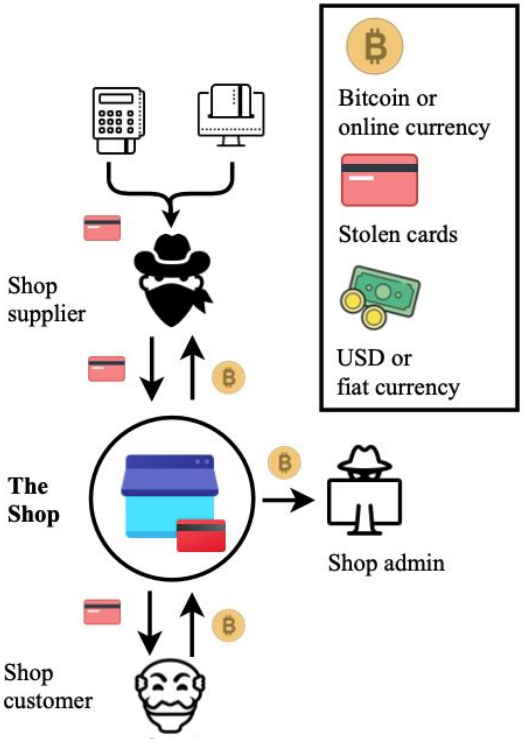
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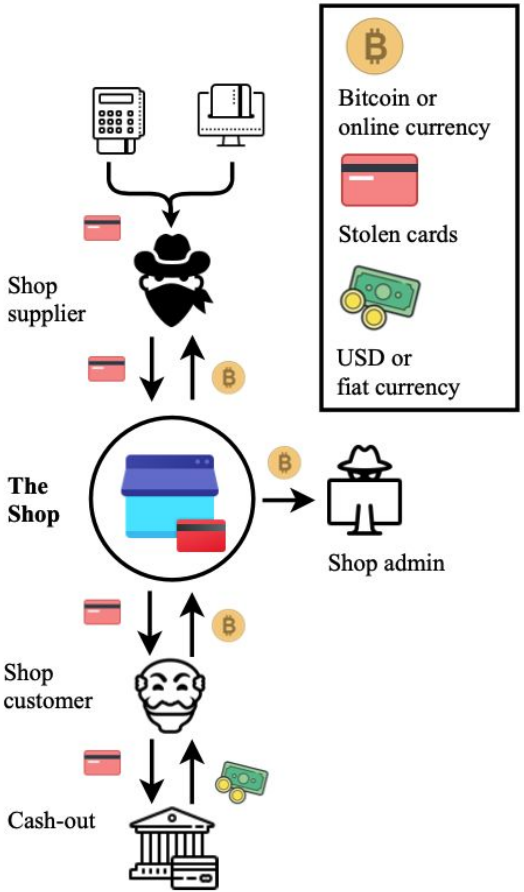
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    - **19M (97%) were magnetic stripe accounts**
    - **Relative demand for CNP was higher - shop sold 84% of all CNP inventory whereas only 40% of magnetic stripe**

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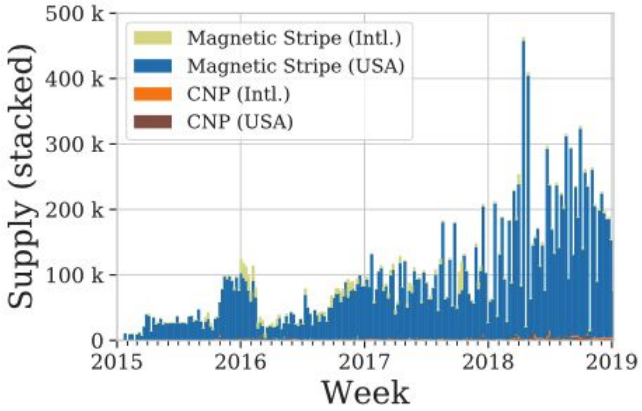
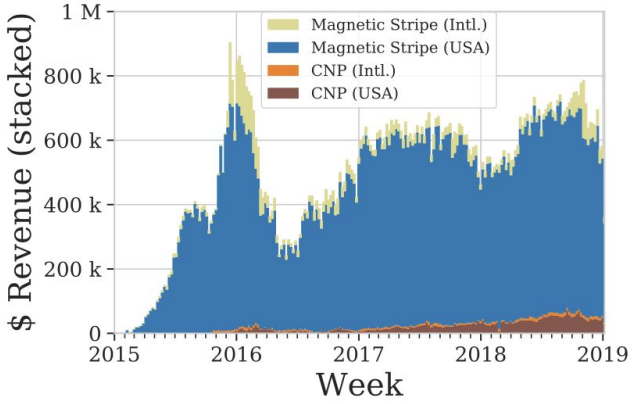
Supply & Demand

January 2015 - January 2019

Average 38k accounts per week





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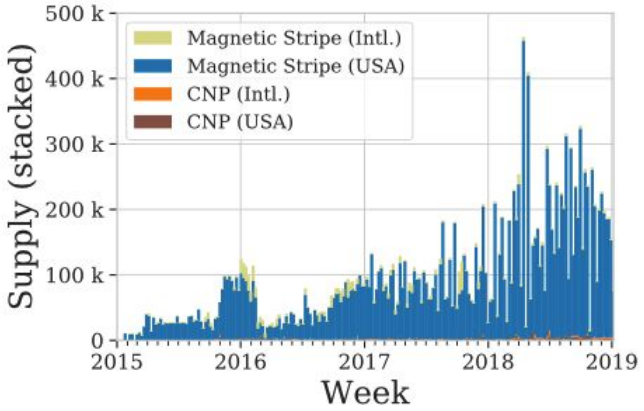

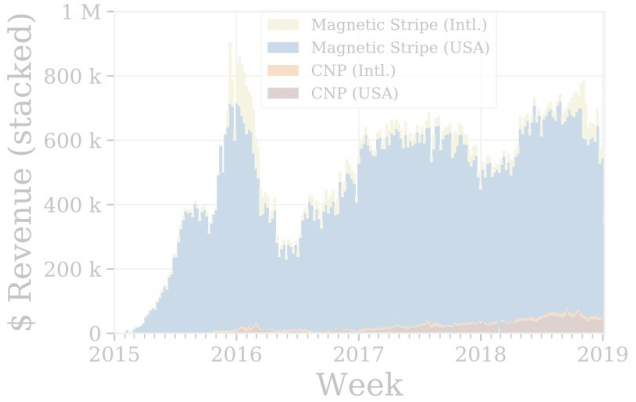

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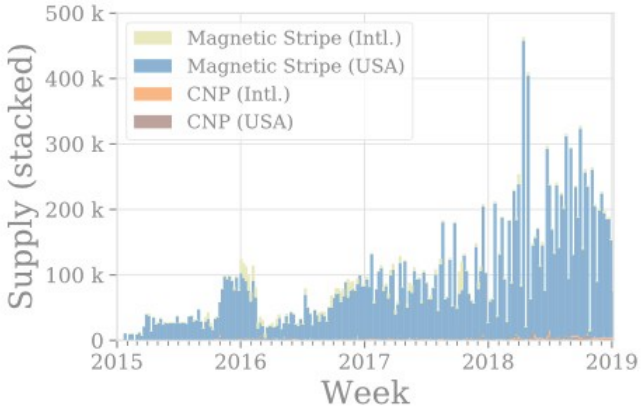

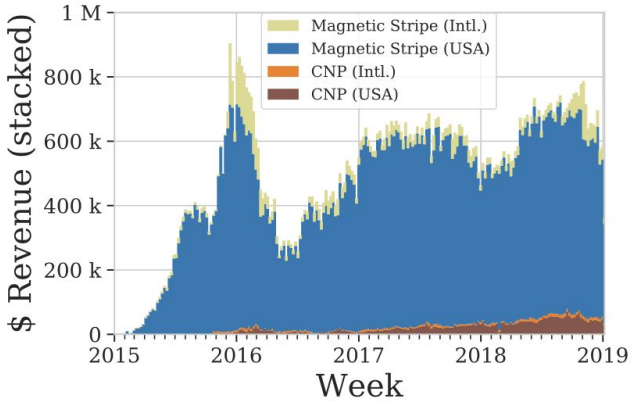

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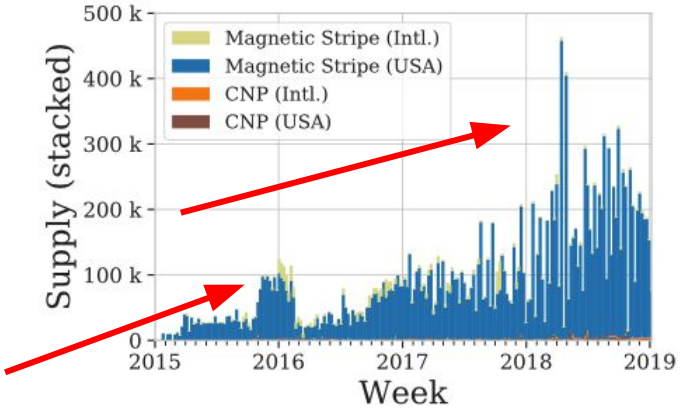

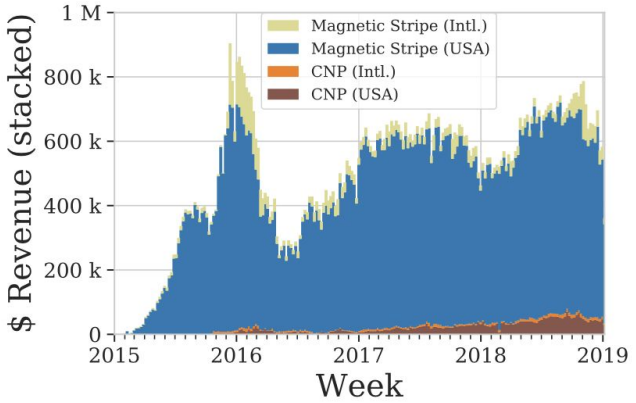

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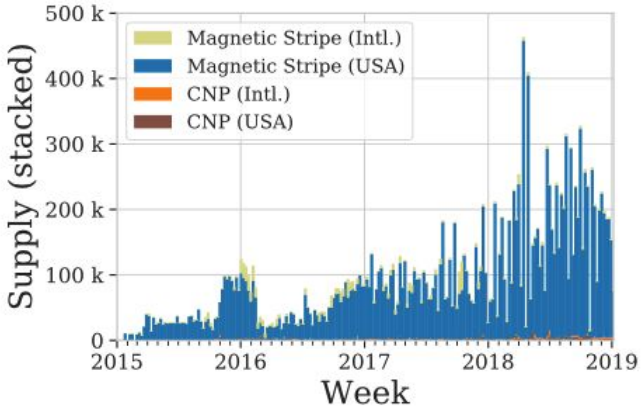

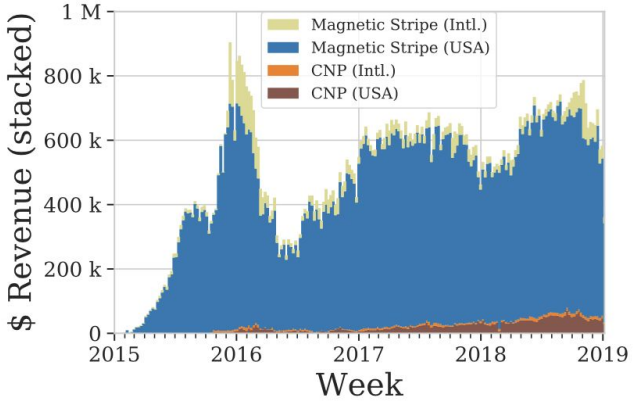

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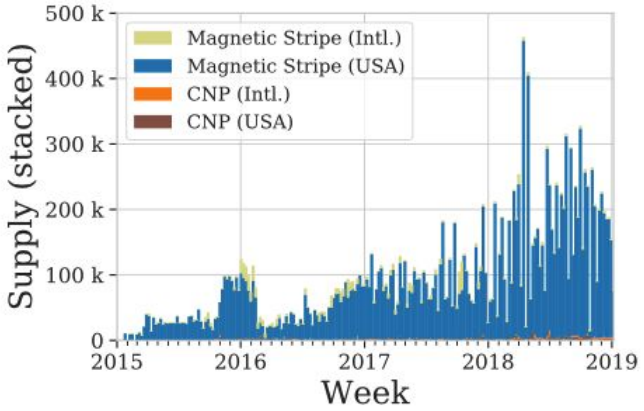
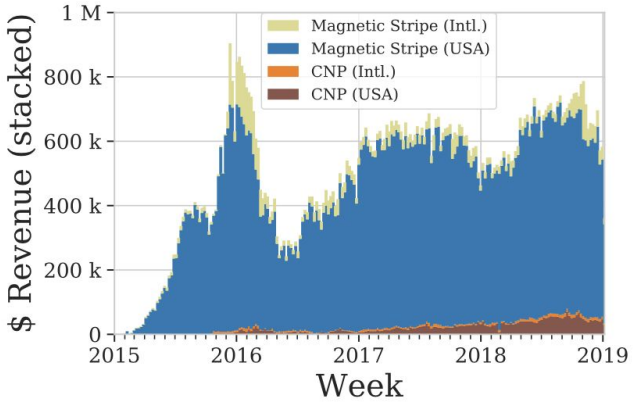
Shop had difficulty supplying more stolen CNP data which is counter to prior work



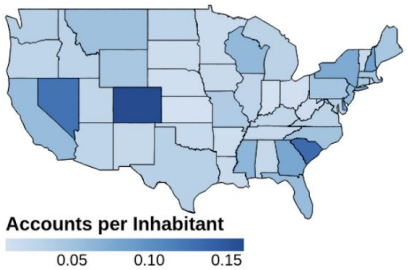


Regional Supply & Demand

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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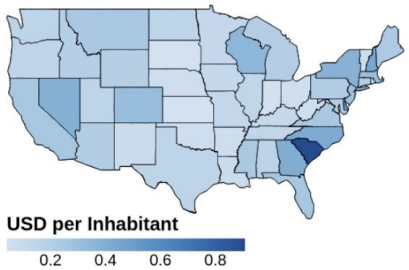

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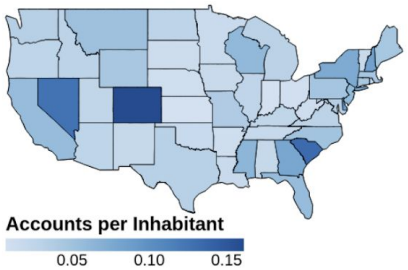

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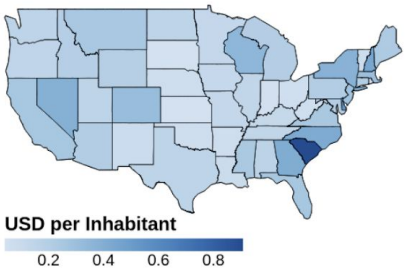

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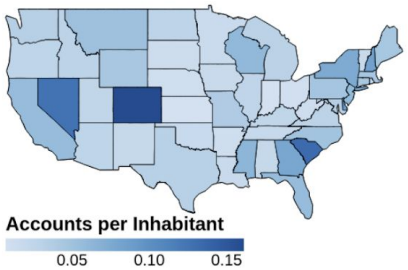

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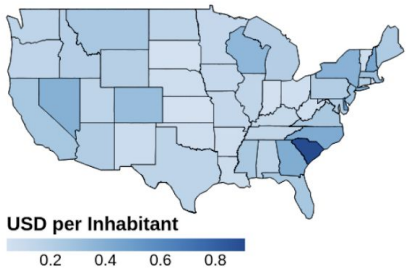

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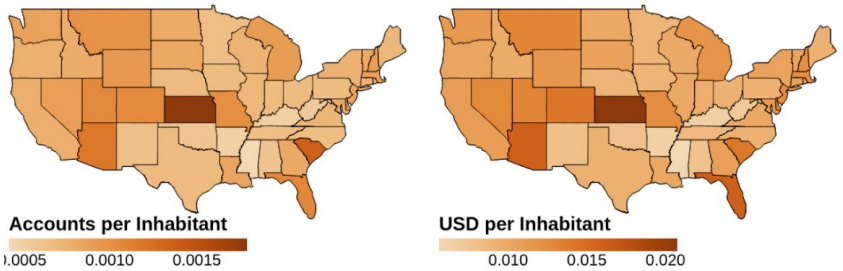
CNP

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

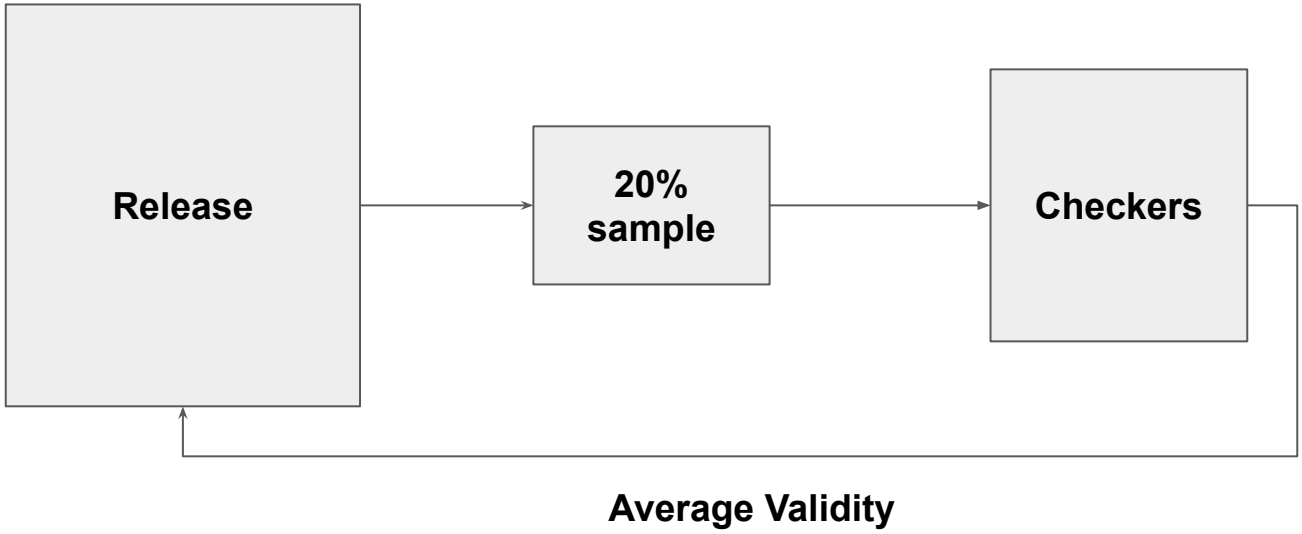


(c) CNP (supply)

(d) CNP (spending)

Pricing Strategies

Pricing Strategies - Average Validity



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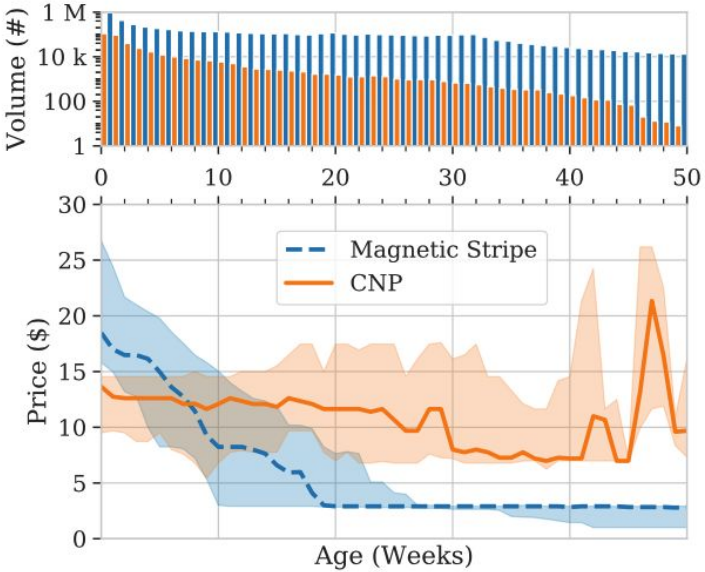
Sale price

- Time on the shop made an impact

Pricing Strategies

CNP purchase prices were more stable



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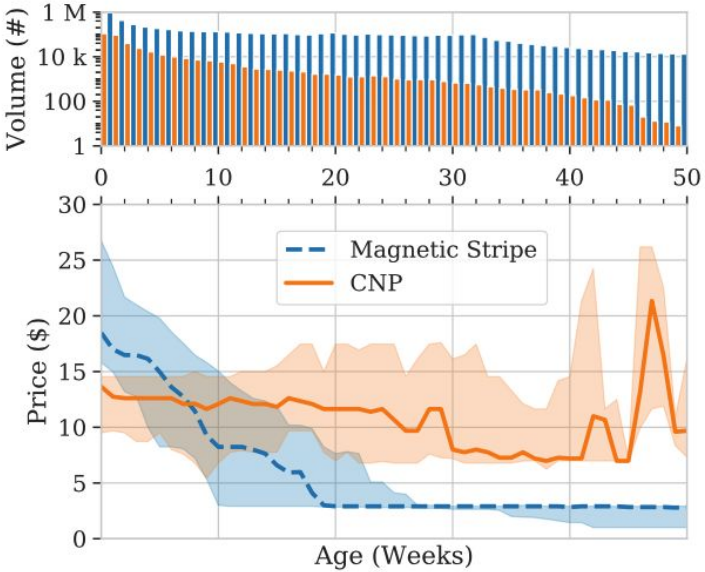
CNP stay valid longer because there is no common point of purchase



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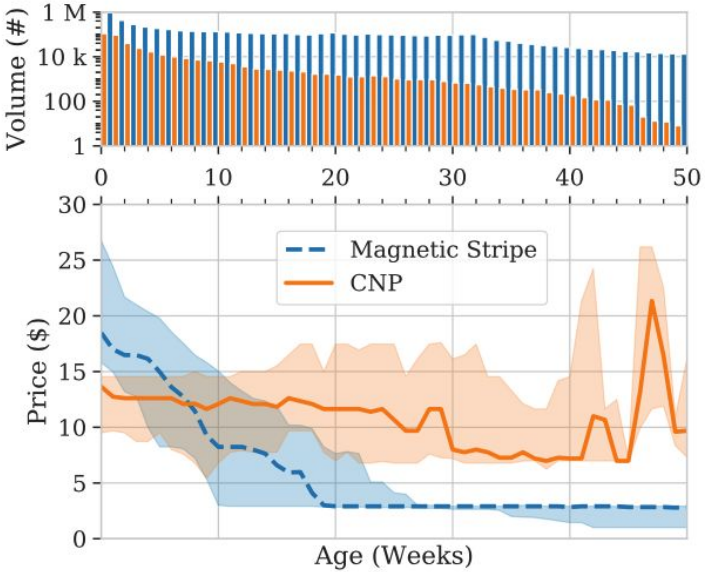
According to support tickets, magnetic stripe validity decreases over time due to banks detecting the breach source



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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

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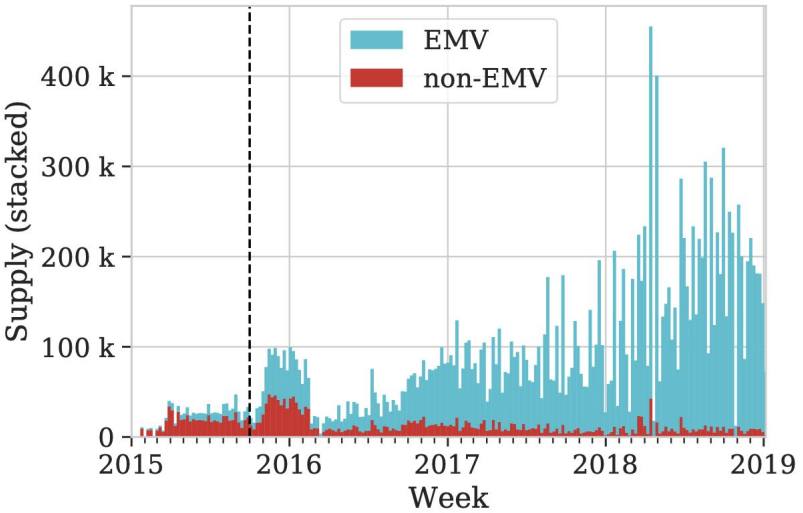

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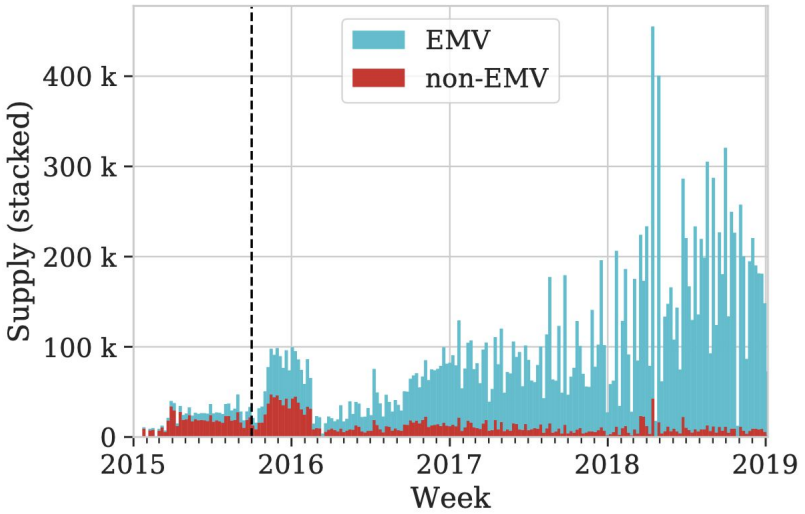
Most of the magnetic stripe data added after the liability shift was equipped with a chip



Marketplaces Finance

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

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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Carders appear to have an idea of which banks, card types, etc. are more likely to succeed for fraud

Open question whether future trends in the carding underground can be inferred from partial data, such as scrapes

Thank You