

UNITED STATES
OF
FRAUD

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Intro: Exploring the problem of fraud

Fraud is a giant and ever-expanding problem in the U.S. – for businesses and consumers alike. In 2012 alone, merchants lost more than \$3.5 billion to fraud¹, and 12.7 million individuals were victims of identity theft in 2014².

But talking at a high level about the world's largest consumer market³ is painting with too broad of a brush. We wanted to dive in a bit deeper and look at exactly who's committing fraud, unearth a bit more about how they're doing it, and take a closer look about where it's happening.

- 1 Cybersource, Online Fraud Management Benchmarks
- 2 Javelin, Future-Proofing Card Authorization
- 3 United Nations Statistics Division

Who we are

At Sift Science, our real-time machine learning fraud solution helps businesses stop thieves, scammers, and spammers before they steal and engage in other bad online behavior. We distill 5,000+ fraud signals in real time using terabytes of data from transactions spanning all seven continents, then deliver a Sift Score reflecting the user's likelihood of being a good user or a fraudster.

What we did

We looked at a year's worth of data (August 2014 - August 2015) that our customers sent to our servers. In a typical year, we analyze billions of transactions, but for the purpose of this report we looked at a sample of 1.3 million transactions with shipping or billing address in the U.S. Then, we cross-referenced with third-party data from FullContact to identify gender and age. We computed the fraud rate as the number of fraud users as a fraction of all users.

Shipping addresses reflect where physical goods are being shipped. In some cases, these are the addresses of reshippers, and the goods end up in a different location. In others, it's the location where the fraudster is based.

Billing addresses reflect the information that's been filled in to validate the credit card transaction. In many cases, this reflects stolen information that's been purchased online; in other words, it's the billing information of the victim whose card was stolen. Other times, it reflects information the fraudster inputs to try their luck, since they don't possess the actual billing info.

Overall findings

- › **Users identifying as 85-90 years old have the highest fraud rate.** They are 2.5x more likely to be fraudsters than the average user.
- › **3 a.m.** is the most fraudulent time of day
- › Fraudsters are more likely to transact online during the **workweek** than a legitimate user
- › Purchases worth **\$20 or less** are 2.16 times more likely to be fraudulent
- › Users with **2-4 accounts** on the same device are **8x more likely** to be fraudulent
- › **The Midwest** appears to be the **safest region** in the U.S., while the South is heavier in fraud
- › **Orders shipped to Delaware, Florida, and Georgia** have the highest fraud rate. Most fraudulent orders are being shipped to the mid-Atlantic region, and the county with the highest fraud rate is Miami-Dade County in Florida.

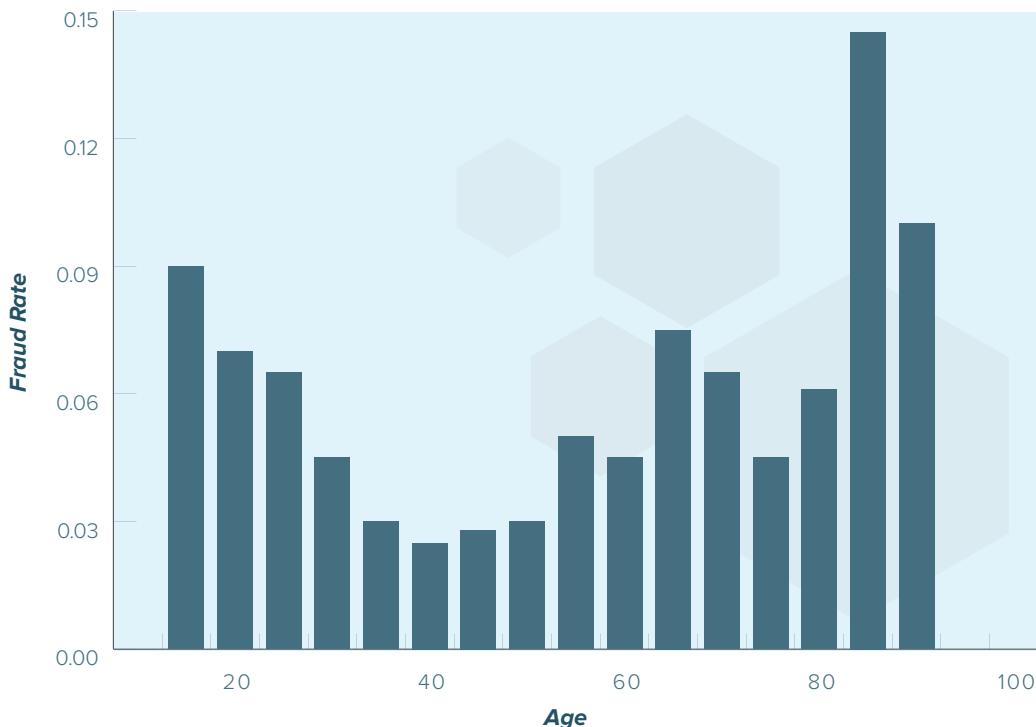
Who: The Fraughtiest Person in America

If identifying fraudsters were easy, Sift Science wouldn't be in business. Looking solely at who commits the most fraud overall, a "typical" fraudster exhibits a lot of the same qualities as a typical Internet user. For example, California is the most common state to ship fraudulent orders to, because California is the most common state to ship all orders to.

What's more useful – and interesting – is to calculate the fraud rate (the number of fraud users as a fraction of all users) for different genders, age groups, and behaviors. This analysis reveals some of the strongest signals of fraud and paints a picture of someone we like to call "The Fraughtiest Person in America."

The Fraughtiest Person in America is...

- › Male. Men are slightly more likely than women to be fraudsters
- › (Perhaps pretending to be) elderly. The 85-90 age range has the highest fraud rate. Users identifying themselves as this age are 2.5x more likely to be fraudsters than the average user
- › Buying something cheap. Orders worth \$0-\$20 have the highest fraud rate. Purchasing something worth \$20 or less makes someone 2.16x more likely to be a fraudster.
- › Shipping something to Delaware. In our geographic analysis, the second smallest state in the U.S. had the highest fraud rate based on shipping address.
- › Billing something to a credit card in Alaska. We found that the largest state in the union – and the state listed first in checkout form dropdown lists – had the highest fraud rate based on billing address.



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When viewing this data, keep in mind The Fraughtiest Person in America represents a composite of separate strong fraud signals, not a single individual who embodies all of these qualities. (So, don't assume that an 88-year-old Alaskan man buying socks for his grandson in Delaware is a fraudster...)

How: The Fraughtiest Behavior in America

So, now that we know a bit about The Fraughtiest Person in America, how exactly does he ply his trade?

Here are some common patterns and behaviors we found:

He tries out different credit cards

- › Purchases worth less than \$20 are 2.16 times more likely to be fraudulent.
- › For purchases less than \$20, the smaller the purchase amount, the more likely it's fraud.
- › What this suggests: criminals are testing whether stolen credit card information is still valid, by trying out low-value orders.

He dons multiple identities

- › A user with 2-4 accounts linked to the same device is 8x more likely to be fraudulent.
- › 4-8 accounts on a single device? 14x more likely to be fraudulent.
- › What this suggests: it's much easier to create multiple accounts to commit fraud than it is to access several different devices, so fraudsters try their luck several times from the same laptop or phone.

He works regular days (and hours)

- › Fraudsters work at night. 3 a.m. is the fraudiest time of day, regardless of time zone.
- › Fraudsters are more likely to transact online on the weekdays than a legitimate user.
- › What this suggests: The average 9-5 worker usually does their online shopping on the weekends. For fraudsters, "online shopping" with stolen credentials is their job.

He tries to outsmart fraud barriers

- › One of the most common ways to identify fraud is by looking at how long a user has had an account. Fraudsters tend to open accounts, commit their crime, and then move on.
- › Indeed, we found that accounts less than 3 days old are 3x more likely to be fraudulent.
- › However, we also identified "sleeper" fraudsters who committed their crimes after about 60 days.

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- › Accounts that are 2 months old are 2x more likely to be fraudulent than accounts that are at least 6 months old.
- › What this suggests: Fraudsters are always looking for ways around fraud-detection barriers.

Where: The Fraudiest States in America

After looking at the “who” and the “how” of fraud, we wanted to learn more about the “where” – and analyze the results through a few different lenses.

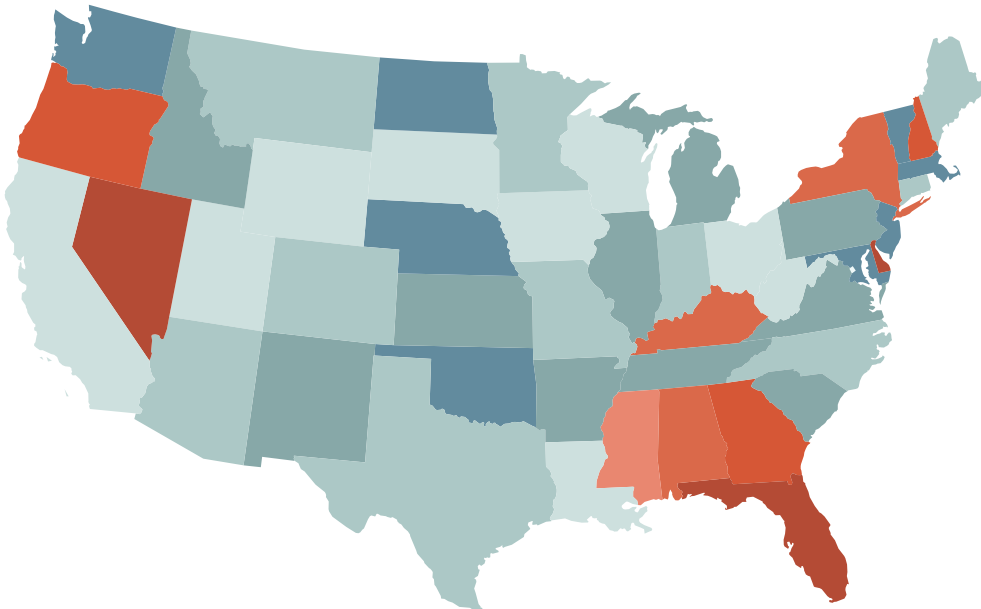
- › Regions: Were certain areas of the country more likely to have fraud?
- › Politics: Did fraud correlate with whether a state votes Republican or Democrat (red or blue, based on voting in the 2012 Presidential election)?
- › Crime rate: Do any other types of crime correlate with online fraud?
- › Population density: Do urban areas have a higher fraud rate?

As we previously mentioned, a shipping address gives clues on where a fraudster or a reshipper may be located. Meanwhile, a billing address provides a tip-off to where credit card credentials are confiscated. We classified states within regions based on divisions provided by the U.S. Census: http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

Our data revealed the lowest rate of fraud – in terms of both shipping and billing address – happens in the Midwest. However, Massachusetts had the overall lowest rate of fraud based on shipping, and the second-lowest based on billing.

And the highest rate of fraud? We found that the South was highly represented among our top 10 states with the highest fraud rate based on shipping address. And both the South and West showed up frequently when we looked at fraudulent billing addresses.

Highest fraud rate



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States with the highest fraud rate by shipping address

| RANK | STATE | REGION | DIVISION | RED / BLUE |
|------|---------------|-----------|--------------------|------------|
| 1 | Delaware | South | South Atlantic | Blue |
| 2 | Florida | South | South Atlantic | Blue |
| 3 | Nevada | West | Mountain | Blue |
| 4 | Georgia | South | South Atlantic | Red |
| 5 | New Hampshire | Northeast | New England | Blue |
| 6 | Oregon | West | Pacific | Blue |
| 7 | New York | Northeast | Mid-Atlantic | Blue |
| 8 | Kentucky | South | East South Central | Red |
| 9 | Alabama | South | East South Central | Red |
| 10 | Mississippi | South | East South Central | Red |

States with the highest fraud rate by billing address

| RANK | STATE | REGION | DIVISION | RED / BLUE |
|------|-------------|---------|--------------------|------------|
| 1 | Alaska | West | Pacific | Red |
| 2 | Delaware | South | South Atlantic | Blue |
| 3 | Arizona | West | Mountain | Red |
| 4 | Washington | West | Pacific | Blue |
| 5 | Alabama | South | East South Central | Red |
| 6 | California | West | Pacific | Blue |
| 7 | Nevada | West | Mountain | Blue |
| 8 | Ohio | Midwest | East North Central | Blue |
| 9 | Florida | South | South Atlantic | Blue |
| 10 | Mississippi | South | East South Central | Red |

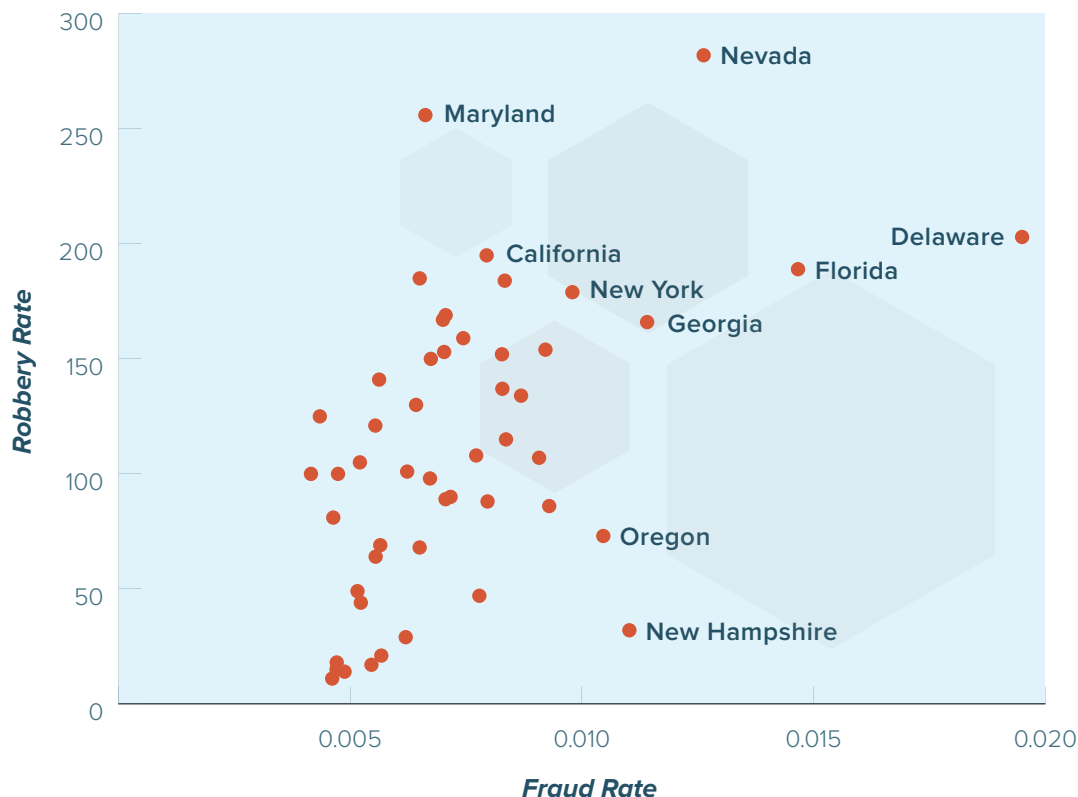
Summary:

- › Most fraudulent purchases are being shipped to the Atlantic coast.
- › Orders shipped to Miami-Dade County in Florida have the highest rate of fraud relative to all other counties in the U.S.
- › Billing addresses located in the West were more likely to be fraudulent than those in any other region
- › While it was interesting to factor in political leanings to our analysis, we didn't find a correlation between online fraud and whether a state was red vs. blue.

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Online vs. offline crime

We wondered whether crime that happened virtually would have any relationship with crime that happened in real life. We found that states in which a high rate of robbery was reported also displayed a higher rate of online e-commerce fraud. And both of these trends were correlated with a high unemployment rate.



- › Nevada, Delaware, and Florida all ranked highly for both robbery and online fraud.
- › Nevada also has the second-highest unemployment rate in the nation
- › We didn't find a correlation between online fraud and any other type of crime

Urban areas and fraud

When you imagine fraud rings, you might think of criminals hovering around a computer in a gritty urban setting. We wondered: were cities really more likely to be hubs for shady behavior, or were fraudsters hiding in less populated areas?

Our research found that contrary to what we might assume, orders shipped to urban areas were no more likely to be fraudulent than the average order.

- › Miami, New York City, Los Angeles, and Philadelphia all show a higher fraud rate than average
- › However – San Francisco, Boston, Dallas, and Chicago have lower fraud rates than average

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- › Among the top 20 cities with the most fraud (by shipping address), there were several with mid-sized populations, including:
- › Elkhart, Indiana (pop. 50,949) had a higher fraud rate than Indianapolis, Indiana (pop. 829,718)
- › Saginaw, Michigan (pop. 50,303) had a higher fraud rate than Detroit, Michigan (pop. 713,777)
- › Westminster, California (pop. 91,739) had a higher fraud rate than Los Angeles, California (pop. 3.8 million)

Conclusion

The U.S. is vast and diverse, but our big data analysis helps us unearth some interesting patterns in online fraud, so businesses have a bit more insight into where to focus their attention.

If there's one main takeaway from our research, it's that tackling fraud is complex. Often, it's the unexpected or hidden clues – like knowing that users claiming to be 85 years old are much more likely to be fraudsters than those listing their age as 40 – that provide the most value. Fraudsters are sophisticated, organized, and move quickly – but the right technology makes it easier to ferret them out, protect your business, and stay one step ahead.

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