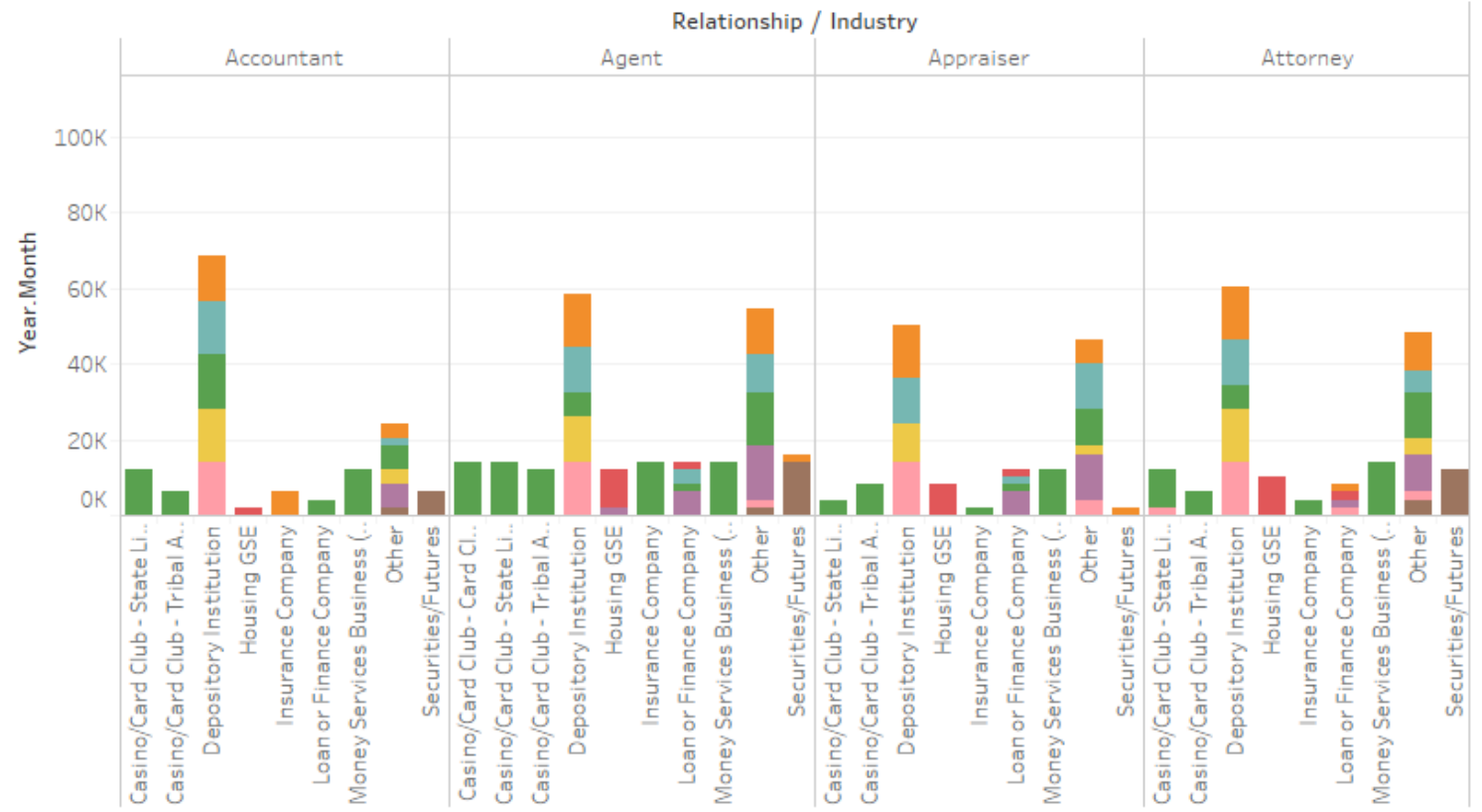


2012 -2017 Financial Crime Analysis --- a country level study

Ziyue Zhong & Wen Wang

Abstract

- The goal of this project is to conduct analysis on financial crimes records (2012 -2017) in terms of industry, product, suspicious activity, relationship and regulator.



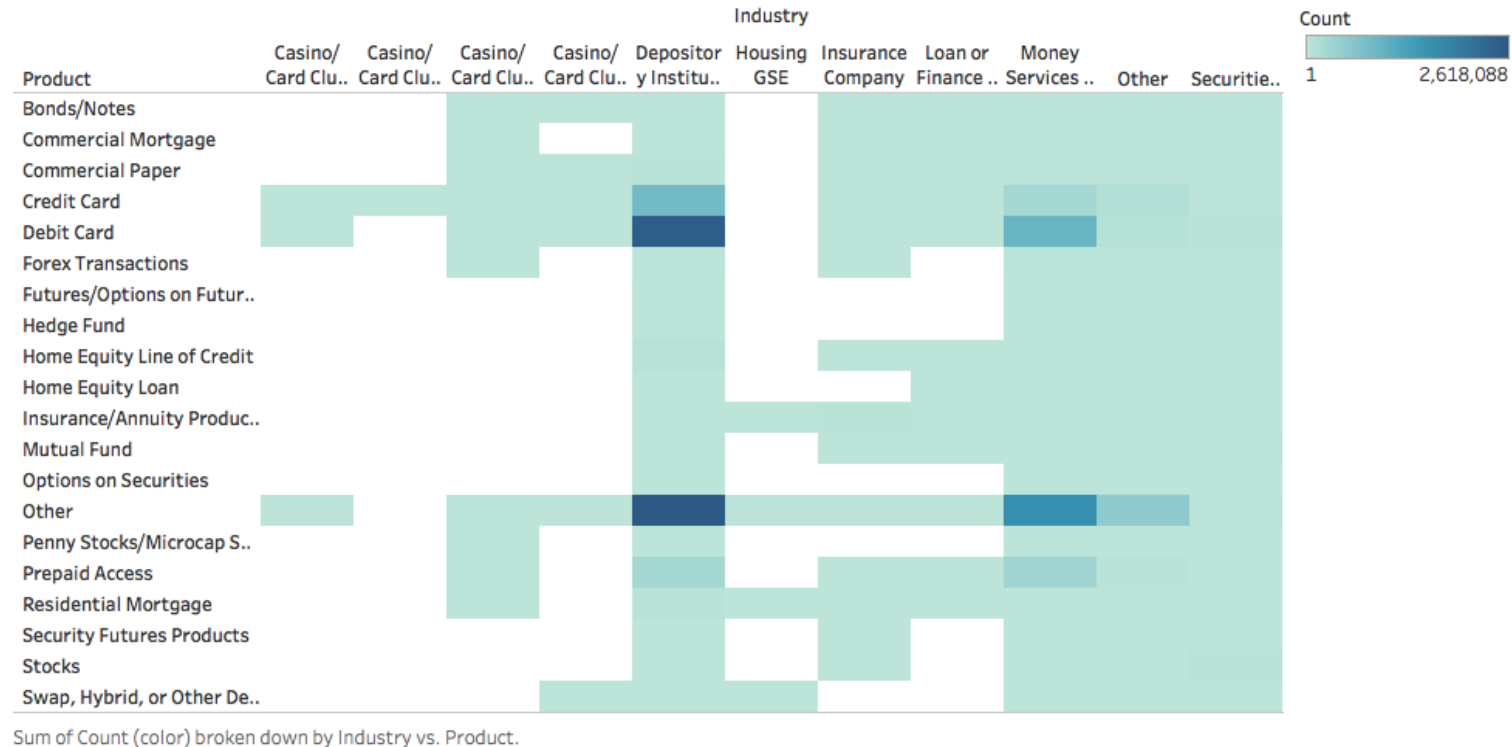
Data Description

- Data Source
 - Data was extracted from *UNITED STATES DEPARTMENT OF THE TREASURY*. <https://www.fincen.gov/reports/sar-stats>
- Data Size
 - From 2012 to 2017, with 6 variables and 62,760 records .

Data Description

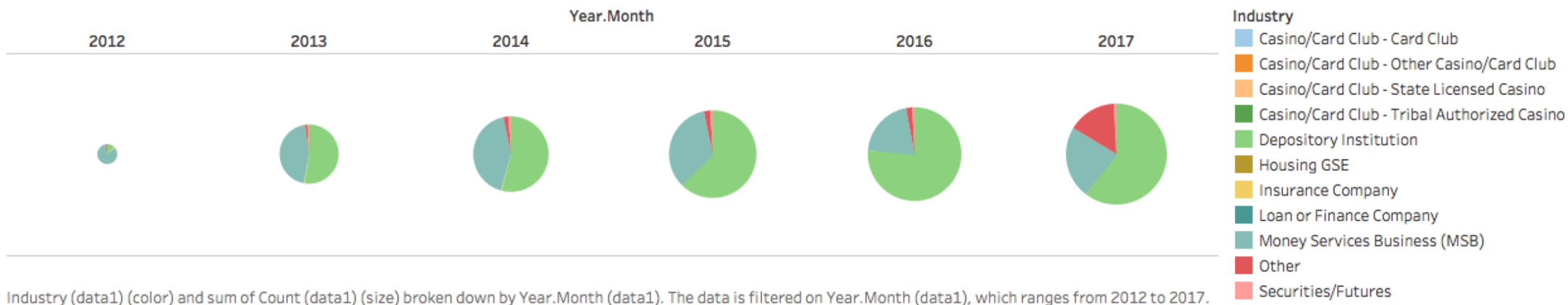
Variables	Description	Data Type
Year	Time of the report was e-filed	Ordinal
Industry	Classified industry of crimes	Categorical
Suspicious Activity	Type of activities to judge a crime	Categorical
Product	Platforms of crimes happened	Categorical
Instrument	Carriers of crimes happened	Categorical
Count	Sum count of crimes	Numerical

Financial Crimes of industry & product



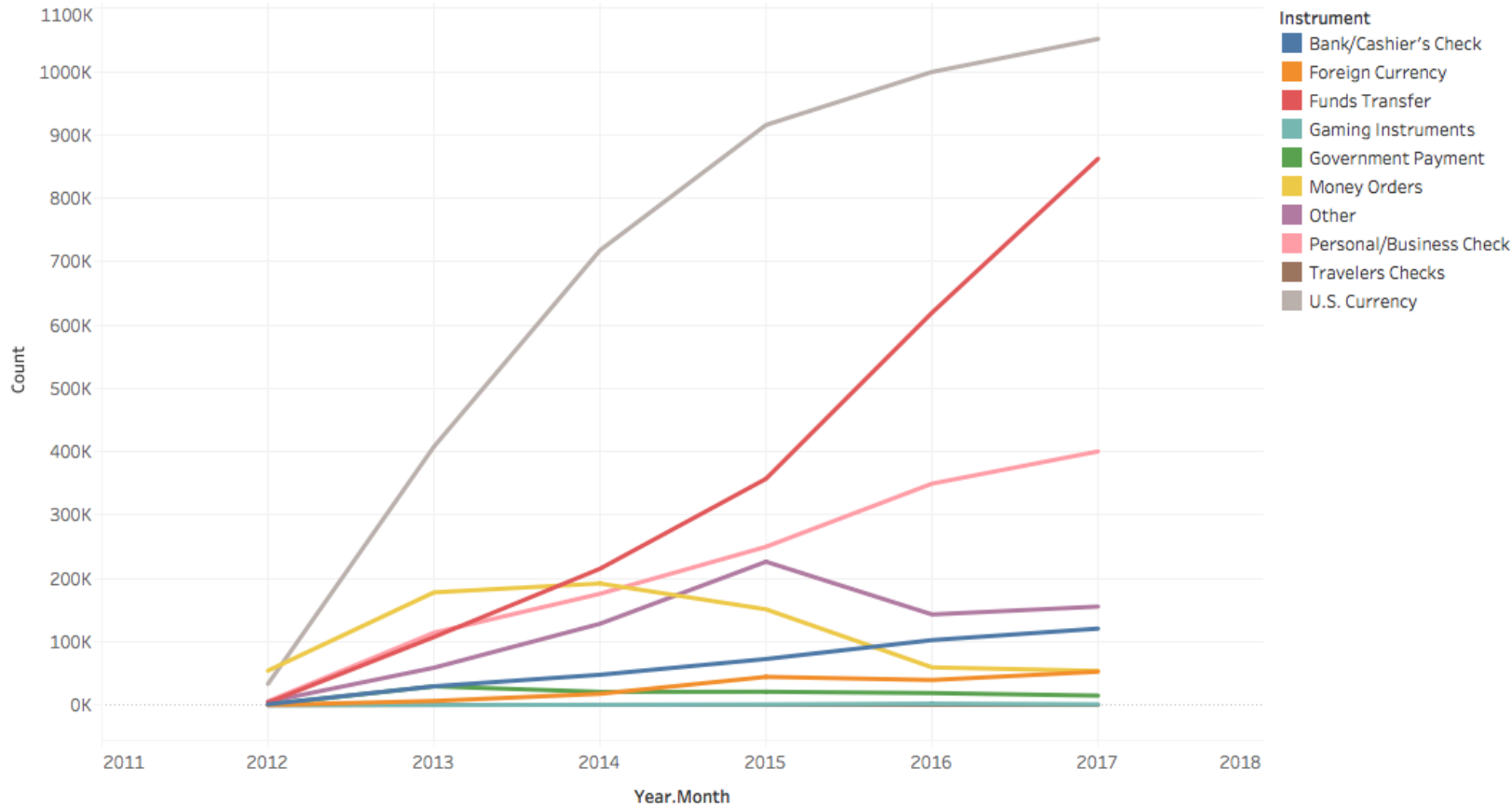
- This graph analyzes the financial crime from different industries and products; The color represents the number of financial crimes in each industry & product combination.
- The combination of depository institution and credit card, depository institution and debit card, money service and debit card have the highest number of financial crime.

Industry distribution during 2012-2017



- The graph illustrates the proportion of suspicious activities in various industries;
- The pie size represents the sum quantity of suspicious activities in that year. It is obvious that the quantity becomes bigger and bigger;
- The graph can tell that proportion of suspicious activities in depository institution rises fastest, while that of money service business seems to have a stable increase.

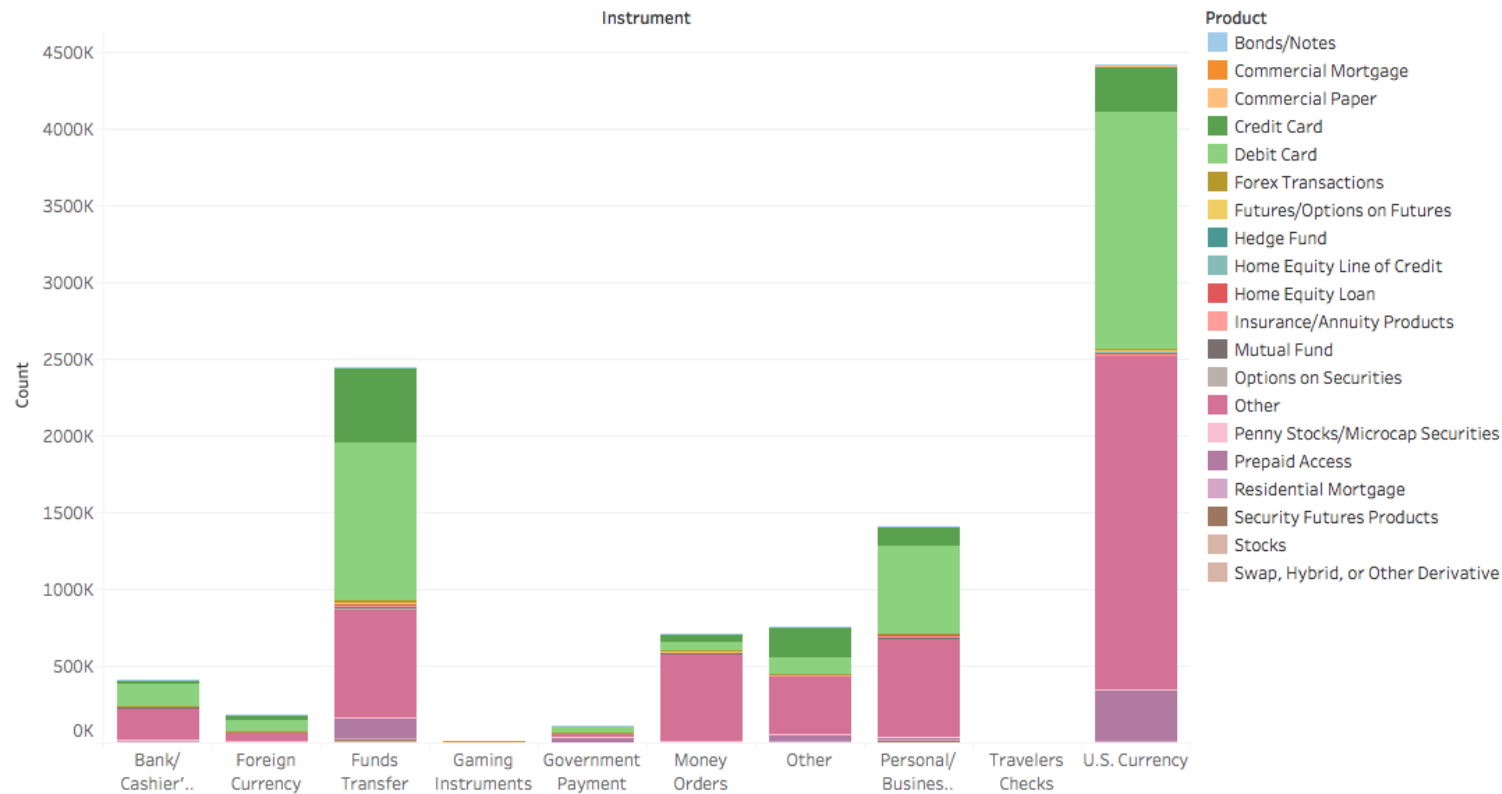
Fluctuation of total financial crime in instruments during 2012-2017



The trend of sum of Count for Year.Month. Color shows details about Instrument. The view is filtered on Year.Month, which ranges from 2012 to 2017.

- The lines with different colors indicate distinct instruments;
- As shown to us, U.S. Currency has the highest financial crime activities during 2012-2015;
- The fund transfer increase sharply since;
- Personal/Business Check have steady growth rate, while other instruments have comparably smooth conditions.

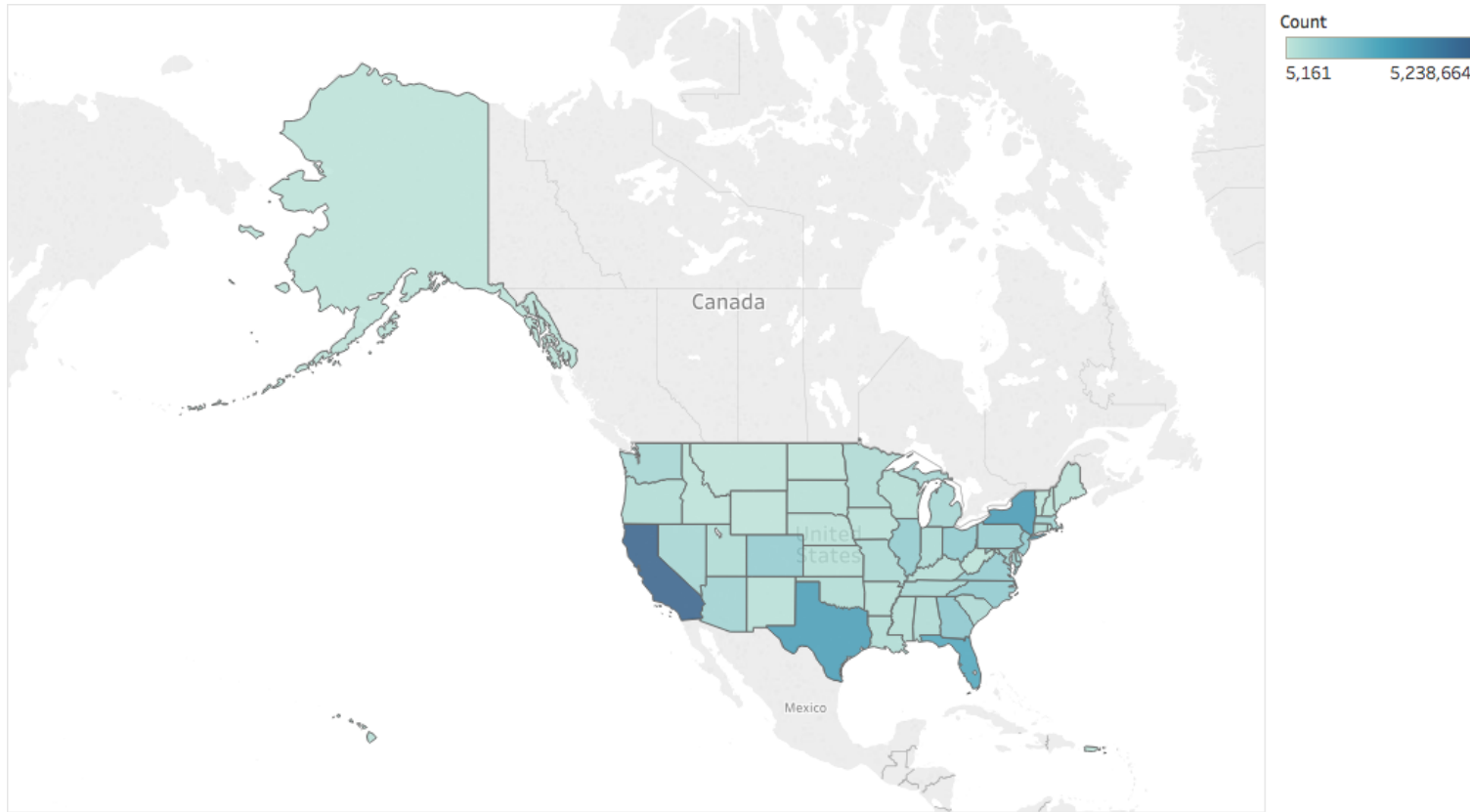
Suspicious activities in instrument and product



Sum of Count for each Instrument. Color shows details about Product.

- The chart displays the composition of instruments suspicious crime by products;
- U.S. Currency owns most suspicious records and it is mainly composed by product debit card as well as prepaid access;
- Funds Transfer possesses the second place with large quantity of crime from debit card, credit card and prepaid access;
- Debit card crime is most frequent among these instruments.

Map of suspicious crime distributions in United States

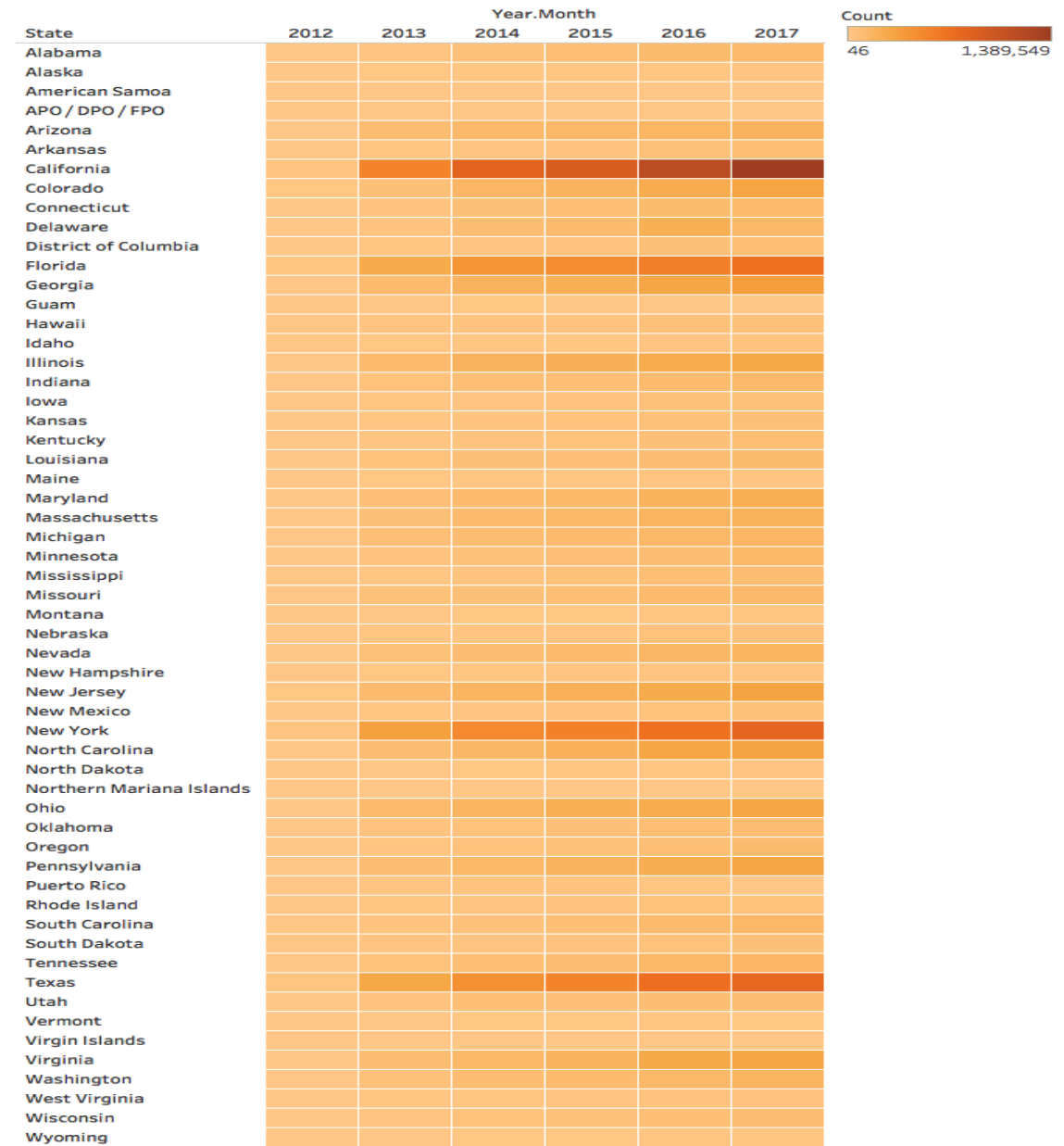


Map based on Longitude (generated) and Latitude (generated). Color shows sum of Count. Details are shown for State. The view is filtered on Longitude (generated) and Latitude (generated). The Longitude (generated) filter keeps non-Null values only. The Latitude (generated) filter keeps non-Null values only.

- This map covers the suspicious crime amount for whole USA area;
- As the picture shows, the places that suspicious crime mostly happens are California, Texas, Florida and New York states;

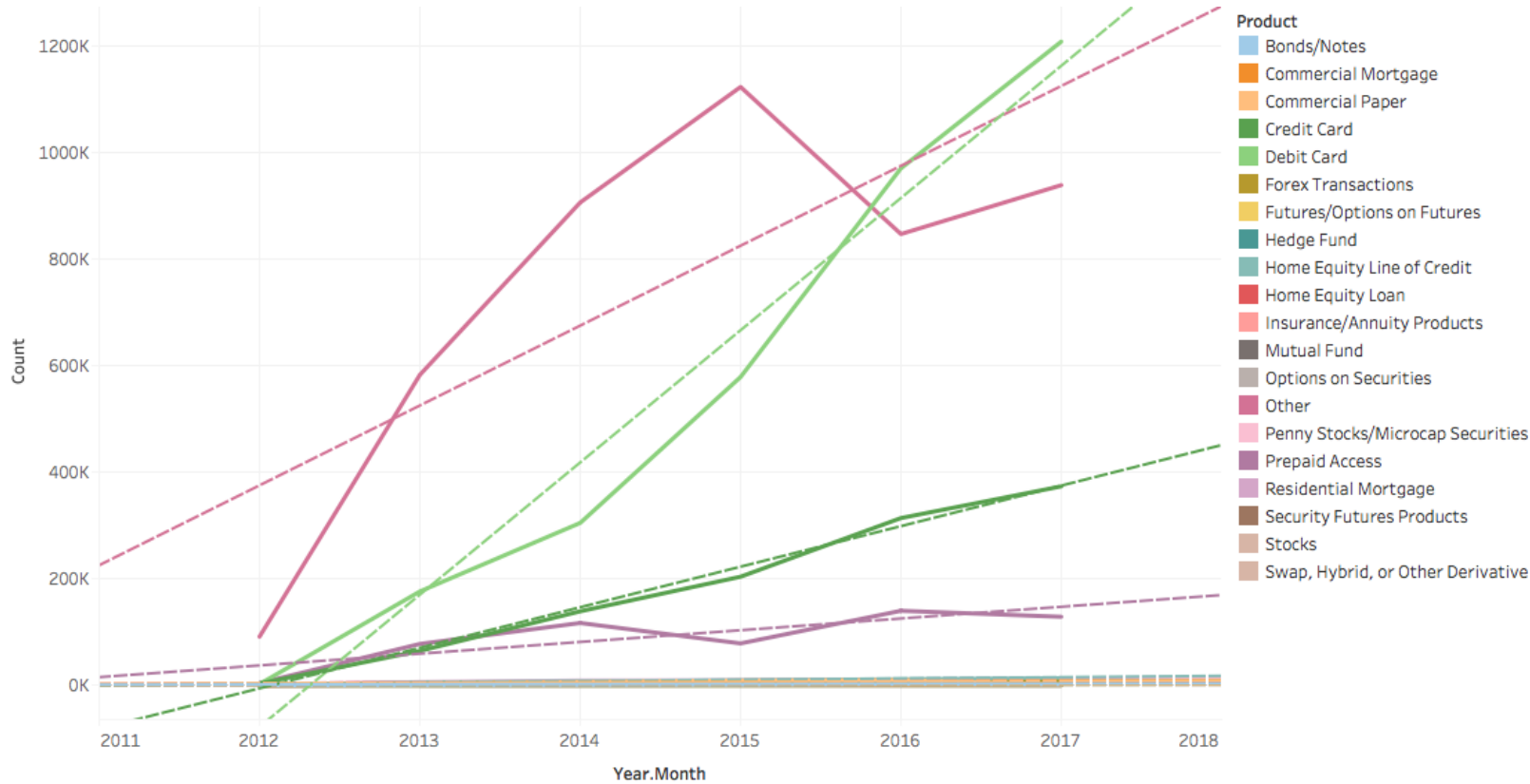
Number of financial crimes in each states during 2012-2017

- The table on the right shows the number of crimes happened in various states from 2012 to 2017;
- The darker the color is, the more crimes happen in that state/year;
- California has a increasing crime situation since 2013, which is similar to those of Florida, Georgia, New York and Texas. However, California has a severest condition.



Sum of Count (color) broken down by Year.Month vs. State. The data is filtered on Year.Month, which ranges from 2012 to 2017. The view is filtered on sum of Count and State. The sum of Count filter keeps non-Null values only. The State filter excludes Marshall Islands, Micronesia, Federated States and Palau.

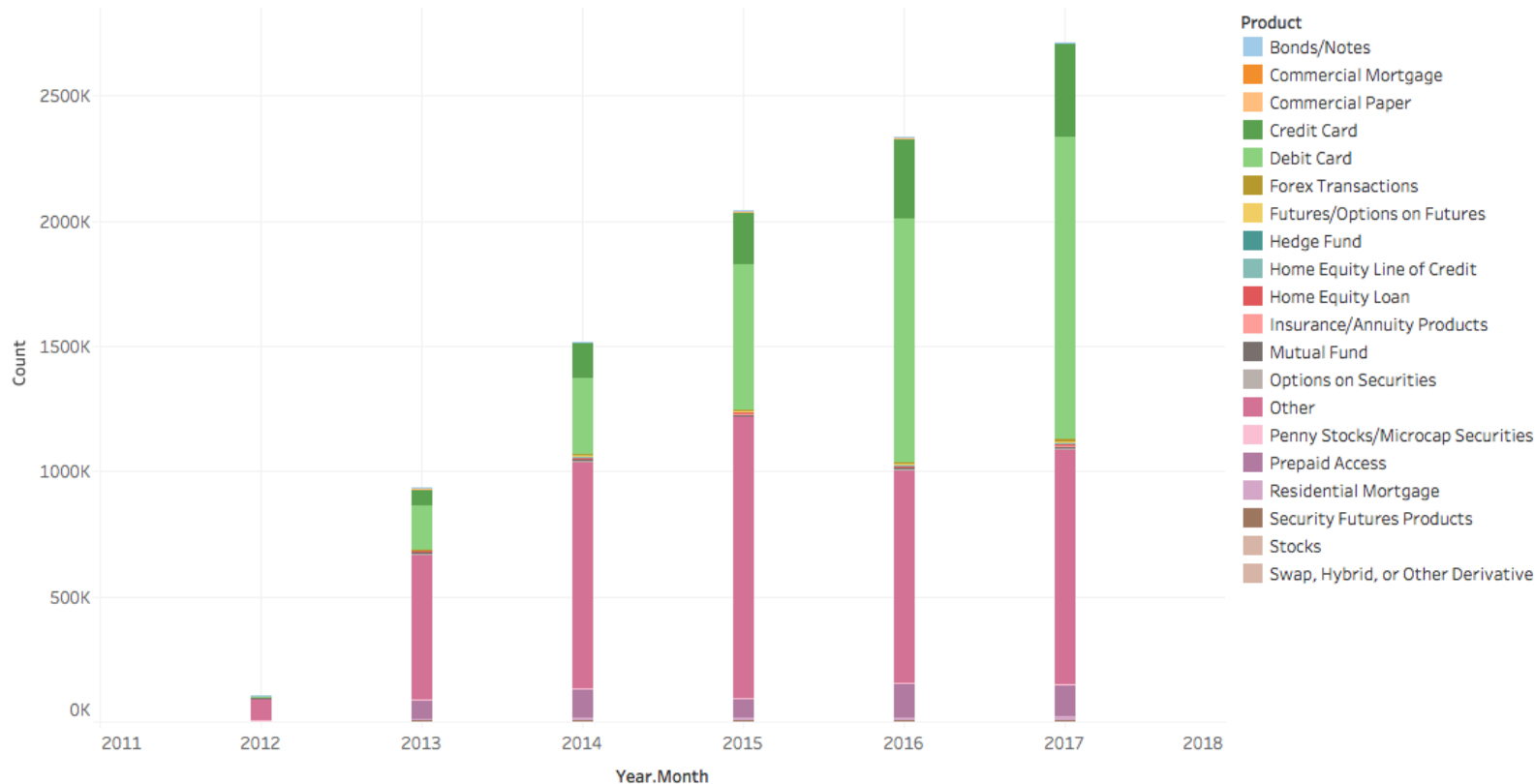
Fluctuation of total financial crime in products during 2012-2017



The trend of sum of Count for Year.Month. Color shows details about Product. The view is filtered on Year.Month, which ranges from 2012 to 2017.

The diagram shows the sum counts of financial crime from different products sale; Except the 'others', debit card has the highest crime amount and keeps increasing and its growth rate keep increasing 2012-2017; Except debit card, credit card and prepaid access, other products have no significant change during the period.

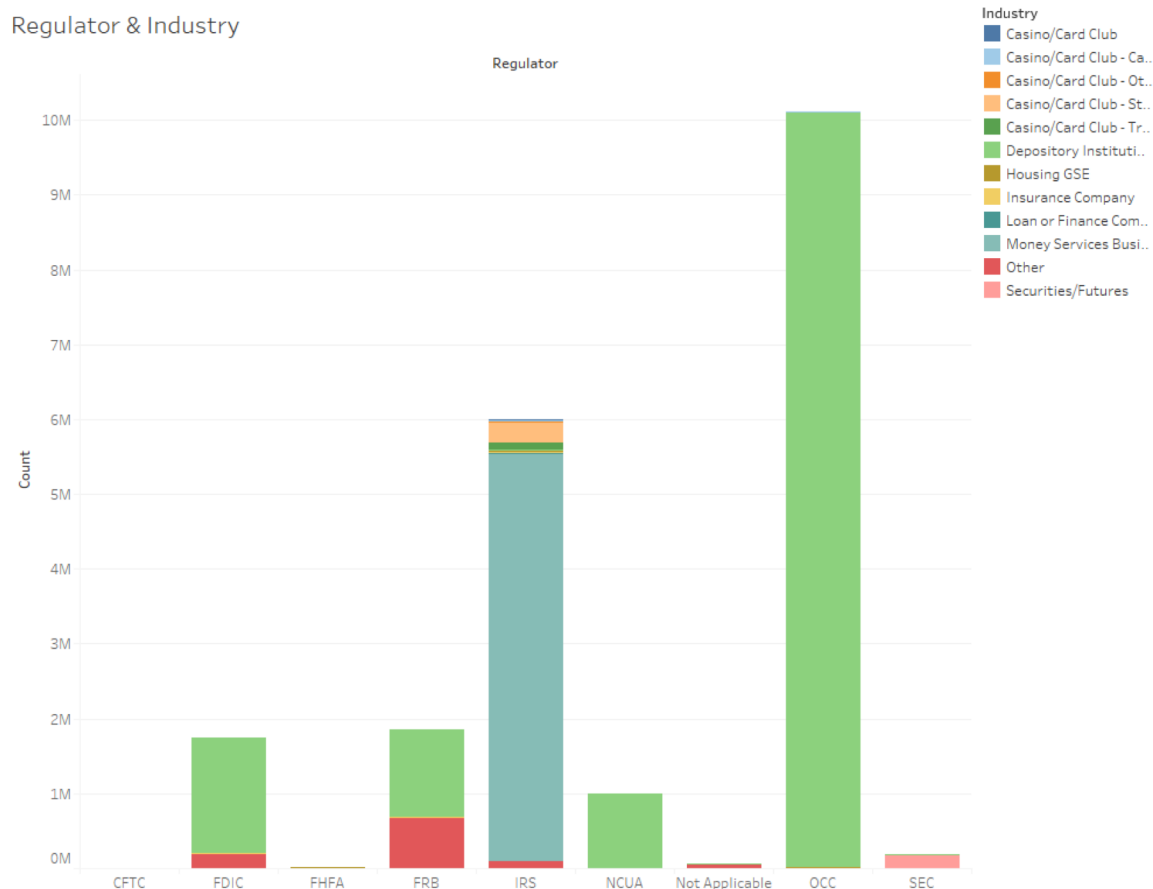
Suspicious crime from products during 2012-2017(From sum aspect)



The plot of sum of Count for Year.Month. Color shows details about Product. The view is filtered on Year.Month, which ranges from 2012 to 2017.

- This diagram shows the sum count of crime of all products from 2012-2017;
- Sum of financial crimes increases year by year, especially in 2013: the crime achieved an incredible influx;
- All the sum counts are mainly made up by credit card, debit card, other products and prepaid access crime.

Suspicious crime in regulator and industry during 2012-2017



- This graph shows the distribution of crime from various industry in certain regulator;
- The NCUA and OCC only have depository institution. But OCC has much more records than NCUA;
- However, IRS has more crimes from Casino/Card club-card club;
- Crime conditions of other regulators consist of depository institution.

Sum of financial crimes by different activities during 2012-2017

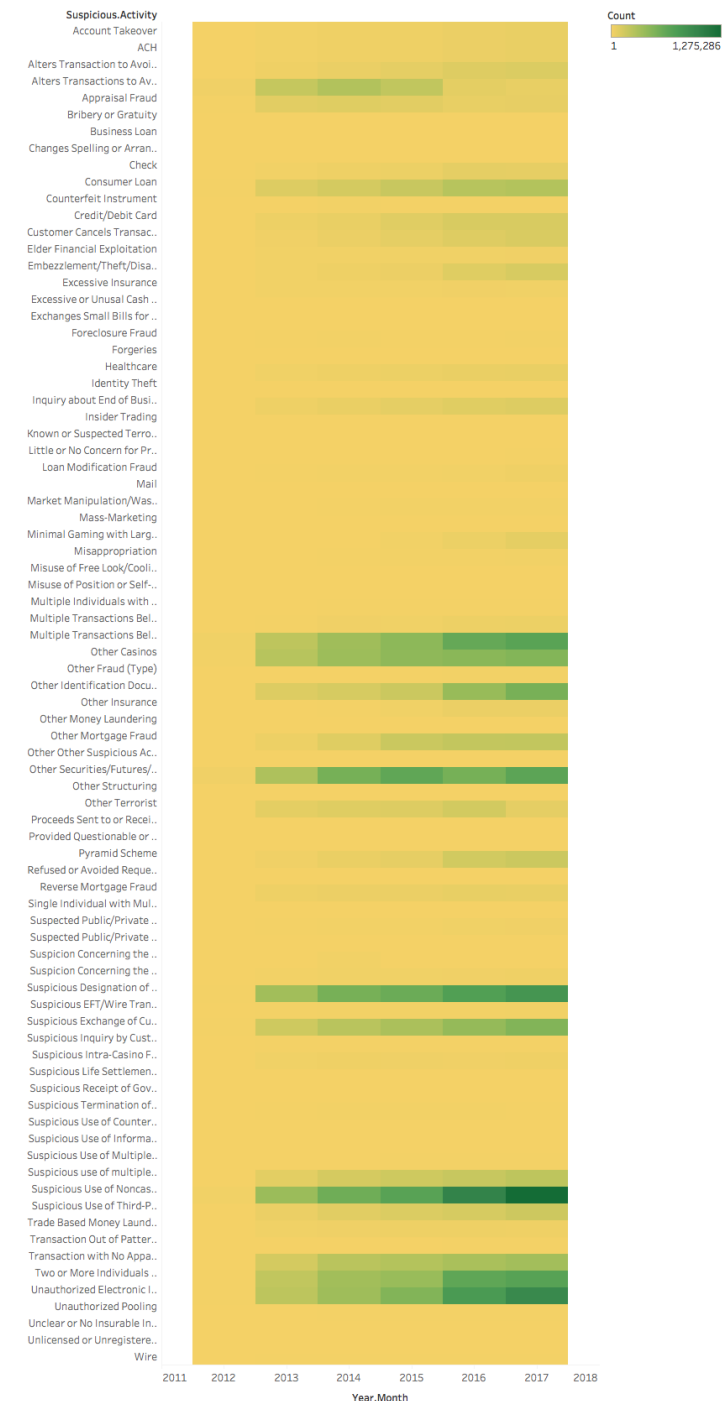


Suspicious.Activity. Color shows details about Suspicious.Activity. Size shows sum of Count. The marks are labeled by Suspicious.Activity.

- The bubble chart for sum of financial crimes of different activities
- Sea-blue bubble has the biggest size, which means crimes of suspicious use of multiple transaction locations happened most;
- Suspicious concerning the source of funds, two or more individuals working together and a few more activities also have substantial quantity of crimes.

Condition of suspicious crimes from 2012-2017

- The table shows crimes happened in different activities during 2013-2018.
- The darker the green, the sever the situation be of each suspicious activity.



Condition of suspicious crimes from 2012-2017

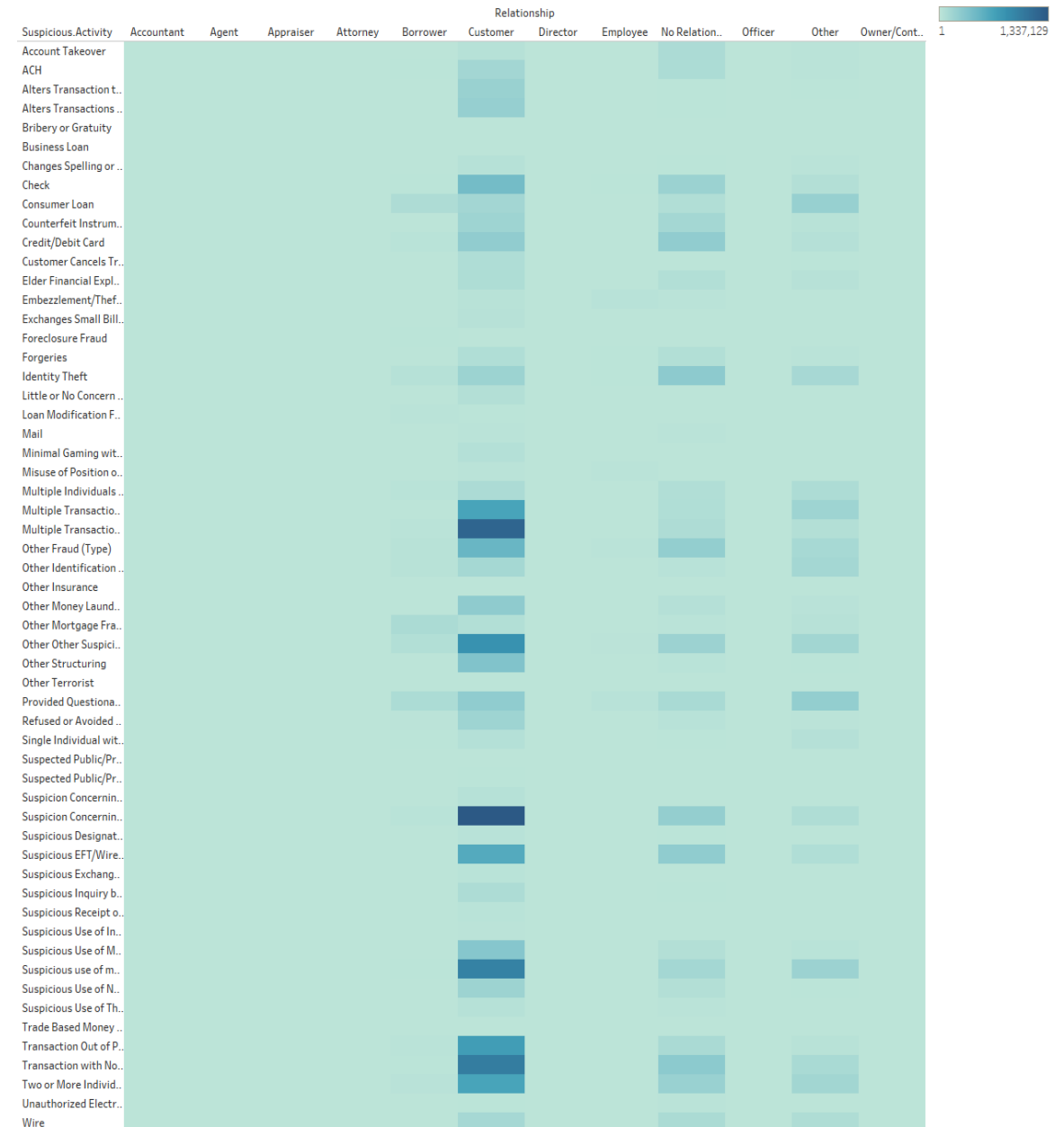


- Suspicious activity like ‘two or more individuals working together’ and ‘transaction with no apparent economic, business or lawful purpose’ increase in a yearly base.

Financial crimes in suspicious activities and relationships during 2012-2017

- The table shows crimes happened in different activities and relationships. The darker color represents more crimes records.

Suspicious & Relationship

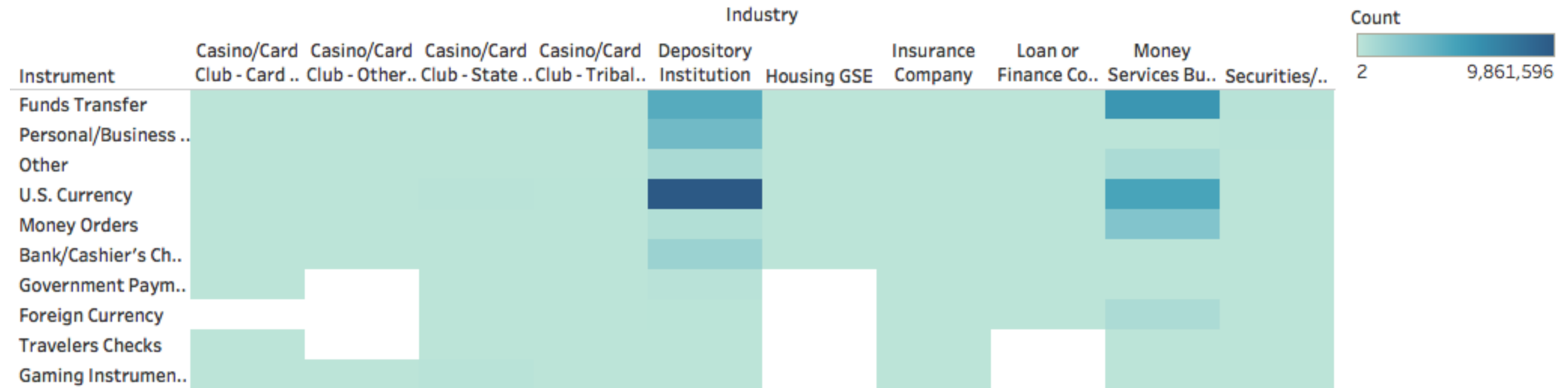


Financial crimes in suspicious activities and relationships during 2012-2017

Suspicious.Activity	Relationship								
	rney	Borrower	Customer	Director	Employee	No Relation..	Officer	Other	Owner/Cont..
Multiple Transactions Below Bsa Recordkeepin..									
Multiple Transactions Below Ctr Threshold									
Other Fraud (Type)									
Other Identification Documentation									
Other Insurance									
Other Money Laundering									
Other Mortgage Fraud									
Other Other Suspicious Activities									
Other Structuring									
Other Terrorist									
Provided Questionable or False Documentation									
Refused or Avoided Request for Documentation									
Single Individual with Multiple Identities									
Suspected Public/Private Corruption (Domestic)									
Suspected Public/Private Corruption (Foreign)									
Suspicion Concerning the Physical Condition of ..									
Suspicion Concerning the Source of Funds									
Suspicious Designation of Beneficiaries, Assign..									
Suspicious EFT/Wire Transfers									
Suspicious Exchange of Currencies									

- As the table shows, crimes in 'customer' relationship are very common, especially in 'multiple transactions below control threshold' and 'suspicion concerning the source of funds';

Financial crimes in industry and instrument during 2012-2017



Sum of Count (color) broken down by Industry vs. Instrument. The view is filtered on Industry, which excludes Casino/Card Club and Other.

- The table shows crimes happened in different industry and instrument. The darker color represents more crimes records.
- The combination of U.S. Currency and depository institution has highest financial crime number during 2012-2017.

Fluctuation of total financial crime in industry during 2012-2017



- Line chart for total financial crime during 2012-2017
- ‘Depository Institution’ and ‘Loan or Finance company’ industry both have high growth rate during 2012-2017.
- Other industries almost remain constant.

Conclusion

- In terms of industry, depository institution and money service business are most vulnerable industries for financial crime;
- In terms of instrument, U.S. Currency and funds transfer are more possible to be implemented the crimes;
- In terms of product, debit card and credit card have the highest risk on suspicious financial crimes;
- In terms of activity, once someone uses the same product, like debit card, to consume in multiple locations, there is highly possible that crimes of suspicious use happen.
- In terms of location, California is the place that financial crimes happened most.

Implication

- In terms of industry, government should develop more regulations regarding depository institution and money service business;
- In terms of instrument, banks should improve their security awareness on transactions related to U.S. Currency and funds transfer ;
- In terms of product, banks and government should supervise more on debit card and credit card transactions and train their employees on fraud compliance;
- In terms of activity, government should pay more attention on crime activities with high growth rate like 'suspicious concerns the source of funds'.
- The government should allocate more fund to prevent financial crimes in California compared to other areas.