

Investigating Related Parties with FNA

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Compliance Related Fines are High

Source: Quinlan & Associates 2017, covering 50 largest banks

"Criminals disguise the original ownership and control of the proceeds of criminal conduct by making such proceeds appear to have derived from a legitimate source." Money laundering occurs in three steps (Jensen 1997, Bolton and Hand 2002)

- **1.** *Placement*: introduction of cash into the banking system or legitimate business. This can be done, e.g., by paying vastly inflated amounts for goods imported across international frontiers.
- **1.** *Layering*: carrying out multiple transactions through multiple accounts with different owners at different financial institutions in the legitimate financial system
- **1.** *Integration*: aggregating the funds with legitimately obtained money or providing a plausible explanation for its ownership

Famous Cases

Scheme	Year	Magnitude
Wachovia and Sinaloa Cartel	2004-2007	\$ 378 billions
Standard Chartered	2012	£ 191.8 billions
Russian Laundromat	2010-2014	\$ 20-80 billions
Nauru	1998	£ 53.7 billions
Bank of Credit and Commerce International (BCCI)	Mid 1980s	£ 17.6 billions
Danske Bank	2007 - 2015	\$ 8.3 billions
Benex Scandal	1996-1999	\$ 6 billions
MtGox and Always Efficient	2014	£ 4.5 billions
Petróleos de Venezuela (PDVSA)	2014-2015	\$ 1.2 billions
HSBC & Sinaloa Cartel	2006-2009	\$ 881 millions
Commonwealth Bank of Australia (CBA)	2012-2015	\$ 625 millions

AML Business Operations Overview

Common Challenges

High proportion (>95%) of false positives

Manual time-consuming process of case investigation

Hard to find actual money laundering

Inability to see macro-structures / catching just small fry

New issues with Faster Payment Systems High proportion (>95%) of false positives

Manual time-consuming process of case investigation

Hard to find actual money laundering

Inability to see macro-structures / catching just small fry

New issues with Faster Payment Systems Improve accuracy of algorithms Automate generation of networks

Identify anomalies in financial networks

Link cases and other data together to see the full picture

Automate "Following the Money" with algorithms

Automated Generation of Related Parties Networks

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Data Set: Customer Related Parties

Attributes:

- Company Name
- Directors
- \circ Officers
- Date of Birth
- Start / End Date of Appointment

Approach: Ego Distance

An "Ego" is an individual "focal" node. For related parties investigation, it is a person or company of interest. We are interested in relationships to their "neighborhood", which is the collection of ego and all nodes to whom ego has a connection at some path length. Data Sources: Public (private) datasets available, e.g.:

UK Companies House SEC Edgar Bloomberg opencorporates.com Panama Papers etc. (<u>https://www.icij.org/</u>)

Companies House in UK provides an API

BETA This is a new service.					Forum	Sign in / Register	
Companies House API	Searc	h					
etting started werview stroduction uthorisation teveloper guidelines	Search Companies House						
ate limiting earch Search all	Method	Method HTTP Request		Descri	Description		
Search company Search disqualified officer Search officer Resources	Search all	GET /	GET /search Sea		arch Companies House		
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OfficerSearch resource Search resource ompany profile	Search com	ipany					
OfficerSearch resource Search resource company profile gojstered office address ompany Officers	Search com	ipany	HTTP Request	t	Descrip	tion	
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OfficerSearch resource Search resource many profile gelstered office address ompany Officers ling history isolvency harges fifteer disgualifications K establishment companies ersons with significant control ompany registers ompany registers ompany exemptions	Search comp Search comp Search for o	any.	HTTP Request	t mpanies	Descrip Search	tion companies	
OfficerSearch resource Search resource Search resource ornpany.tprofile exjistered office address ompany.Officers ling history isolvency harges fifteer disjonitment Liss iffeer disjonitment companies ersons with significant control ompany officers ompany exemptions ocument API	Search comp Search comp Search for o	any. officer	HTTP Request GET /search/cod r information	t mpanies	Description	tion companies	

Method	HTTP Request	Description
Search disqualified officer	GET /search/disqualified- officers	Search disqualified officers

The API allows searching eg.

- directors of a given company
- companies that a director is affiliated with

The FNA Platform has an algorithm to build the network around a particular company (or director) automatically through a series of API calls.

The same logic can be used also for any database, csv file or other data source

Automating the Generation of Related Party Networks

Automating the Generation of Related Party Networks

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Chart: Emerdata Limited—the new Cambridge Analytica/SCL Group?

Note: chart may be updated periodically, please share page link, not a screenshot.

Automate "Following the Money" with algorithms

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Faster Payment Systems are being rapidly adopted in the world.

Problem: As Faster Payment systems allow movements of funds rapidly between account, this enables criminals to rapidly hide source of funds by multiple account movements using mule accounts.

In addition, **police requests** are time consuming and cumbersome to comply manually with. Fast payment systems in selected countries Table 1 Country Year Year System Country System 2001 Electronic Banking System 2013 Turkey **BKM Express** Korea 2003 Chinese Taipei ATM, FXML and FEDI systems 2014 Denmark Nets Real-time 24x7 Iceland CBI Retail Netting System (JK) Italy Jiffy – Cash in a flash Singapore Fast And Secure Transfer 2006 Malaysia Instant Transfer 2015 Mexico SPEI South Africa **Real-Time Clearing** Switzerland Twint 2007 Korea CD/ATM System 2017p Australia New Payments Platform 2008 Chile Transferencias en línea 2017/18p Saudi Arabia Future Ready ACH United Kingdom Faster Payments Service 2018p Hong Kong SAR To be determined 2010 China Internet Banking Payment Zengin System Japan System India Immediate Payment Service 2019p Hungary **Instant Payments** 2011 Costa Rica Transferencias de Fondos Netherlands **Instant Payments** a Terceros del Sinpe 2012 Pago Directo Ecuador Poland Express ELIXIR Sweden **BiR/Swish**

Solution

Cyber Risks

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First Financial Networks

Fedwire Interbank Payment Network (Fall 2001) was one of the first network views into any financial system.

Of a total of around 8000 banks, the 66 banks shown comprise 75% of total value. Of these, 25 banks completely connected

The research was subsequently used e.g. in congressional hearings to showcase the type of information that should be collected by financial institutions after the financial crisis.

Soramaki, K. M Bech, J. Arnold, R.J. Glass and W.E. Beyeler, The Topology of Interbank Payment Flows, Physica A, Vol. 379, pp 317-333, 2007.

Impact of 9/11 Terrorist Attacks on the Network

Note: 100 = September 10th, 2001.

"The next crisis might not come from a financial shock at all. The more likely culprit: a cyber attack that causes disruptions to financial services capabilities, especially payments systems, around the world."

- "How a Cyber Attack Could Cause the Next Financial Crisis" by Paul Mee & Til Schuermann, <u>HBR 2018</u>

Detect -> Prevent -> Recover

Detect Anomalies in Cyber Networks in Real-time

Identify Patterns of DDoS attacks

Mapping Interconnectedness

30 MAY 2018, 12:

Measuring Technological Interdependence

8, 12:

How might cyber risks and financial risks interact to cause systemic crises?

Is there anything fundamentally new or different about cyber risks?

How should economists, regulators, policymakers, and central bankers focused on financial stability incorporate cyber risks into their models and thinking?

- "The Future of Financial Stability and Cyber Risk" by Jason Healey, Patricia Mosser, Katheryn Rosen, and Adriana Tache, <u>Brookings Institute 2018</u>

Related Parties - Scripting Example

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• <u>Links</u>

company_number	officer_id	officer_role	officer_appointed_on	officer_resigned_on
09375920	YEplkqBMfc6Rp3dbPs57pN3aqO4	Director	2015-01-06	
05514098	YEplkqBMfc6Rp3dbPs57pN3aqO4	Director	2016-01-28	
05514098	mrwiNFdKsooGz_8JW2M22xzXyHY	Director	2005-10-03	
05514098	hvyCzVBNN2CA8PSiOQFLbwm8BGo	Director	2007-12-20	
05514098	_jEDYwaT6JuGo-crc0_MicvZfws	Secretary	2005-07-20	2014-03-31
05514098	Pm5VUNghomm3HpJLwQrB0umIXr8	Secretary	2014-03-31	2016-01-28
05514098	tek7o48HC1FqAOYDbcI5BeWcMFM	Nominee Secretary	2005-07-20	2005-07-20

• <u>Nodes</u>

vertex_id	name	type	date	active	root
09375920	CAMBRIDGE ANALYTICA(UK) LIMITED	Company	2015-01	True	True
YEplkqBMfc6Rp3dbPs57pN3aqO4	Alexander James Ashburner NIX	Officer	1975-05	True	False
05514098	SCL GROUP LIMITED	Company	2005-07	True	False
mrwiNFdKsooGz_8JW2M22xzXyHY	Nigel John OAKES	Officer	1962-07	True	False
hvyCzVBNN2CA8PSiOQFLbwm8BGo	Julian David WHEATLAND	Officer	1961-07	True	False

Create Network

reset database

system.reset_db

import links

arc.import {

- -table ca_links.csv
- -source_column company_number
- -target_column officer_id
- -columns company_number, officer_id

Import node properties

```
# define node properties and import them
vertex.property.define {
```

```
-property name, type
```

```
-type String
```

```
vertex.property.import {
    -table ca_nodes.csv
    -columns name,type
```

Quick visualization

create dashboard

dashboard.new

dashboard.save -file cambridge_analytics

```
# calculate distance from ego (Cambridge Analytica) node
vertex.stats.ego_distance {
    -ego_vertex 09375920
    -direction undirected
}
```

calculate degree = number of links for each node

vertex.centrality.degree

set shape of nodes

vertex.property.set {

-property shape

-value 'square'

-filter type=='Company'

-type Shape

Set companies as green, others as red

- # set node colors
- vertex.property.set {
 - -property color
 - -value 'red'
 - -type Color
- vertex.property.set {
 - -property color
 - -value 'green'
 - -filter type=='Company'
 - -type Color

Create Dashboard

create dashboard

```
dashboard.new
```

```
dashboard.mappings.vertex.label {
```

```
-text name
```

```
-size degree:8-20
```

```
}
```

```
dashboard.mappings.vertex {
```

```
-size degree
```

```
-color color
```

```
-shape shape
```

dashboard.save

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