

Offleaks

This project for Social and Economic Networks course uses Offshore Leaks Database found here <https://offshoreleaks.icij.org/>.

Yearly counts development

One would like to know how many accounts have been opened throughout years.

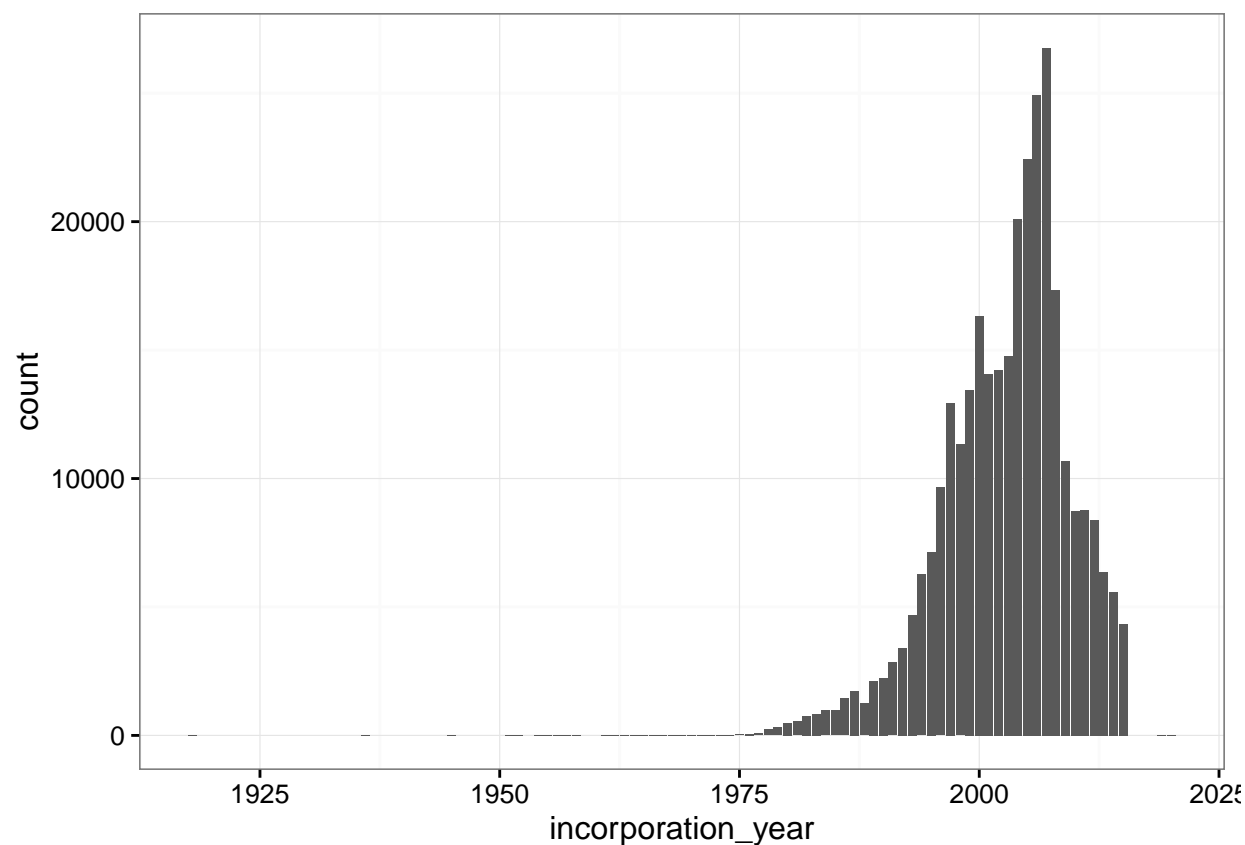
The sample size for answering this question is 309736.

The earliest opened account belongs to 1918 and the latest comes from the future 2020.

The most fruitful years for the offshore accounts are the following:

```
## Source: local data frame [6 x 2]
##
##   incorporation_year      n
##   (dbl) (int)
## 1      2007 26774
## 2      2006 24924
## 3      2005 22454
## 4      2004 20109
## 5      2008 17342
## 6      2000 16327
```

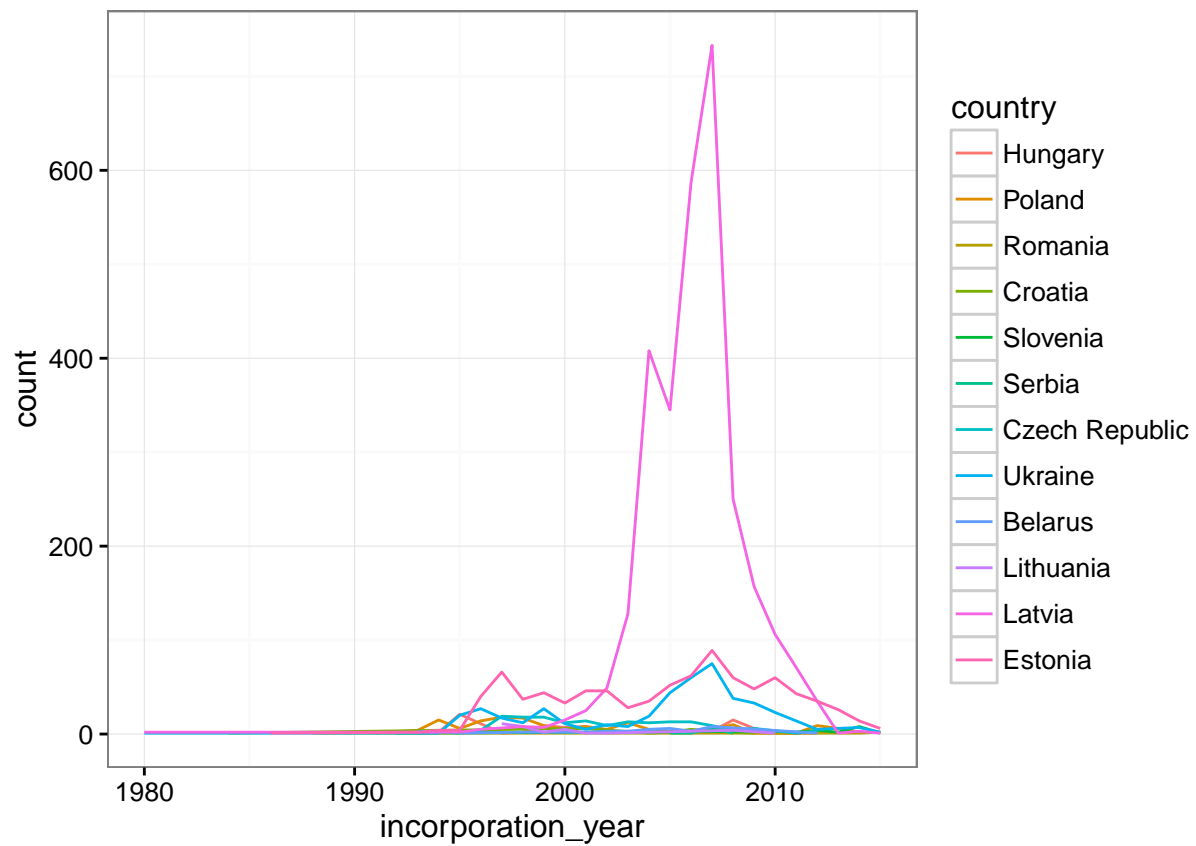
Overall, that is how the process looks like:



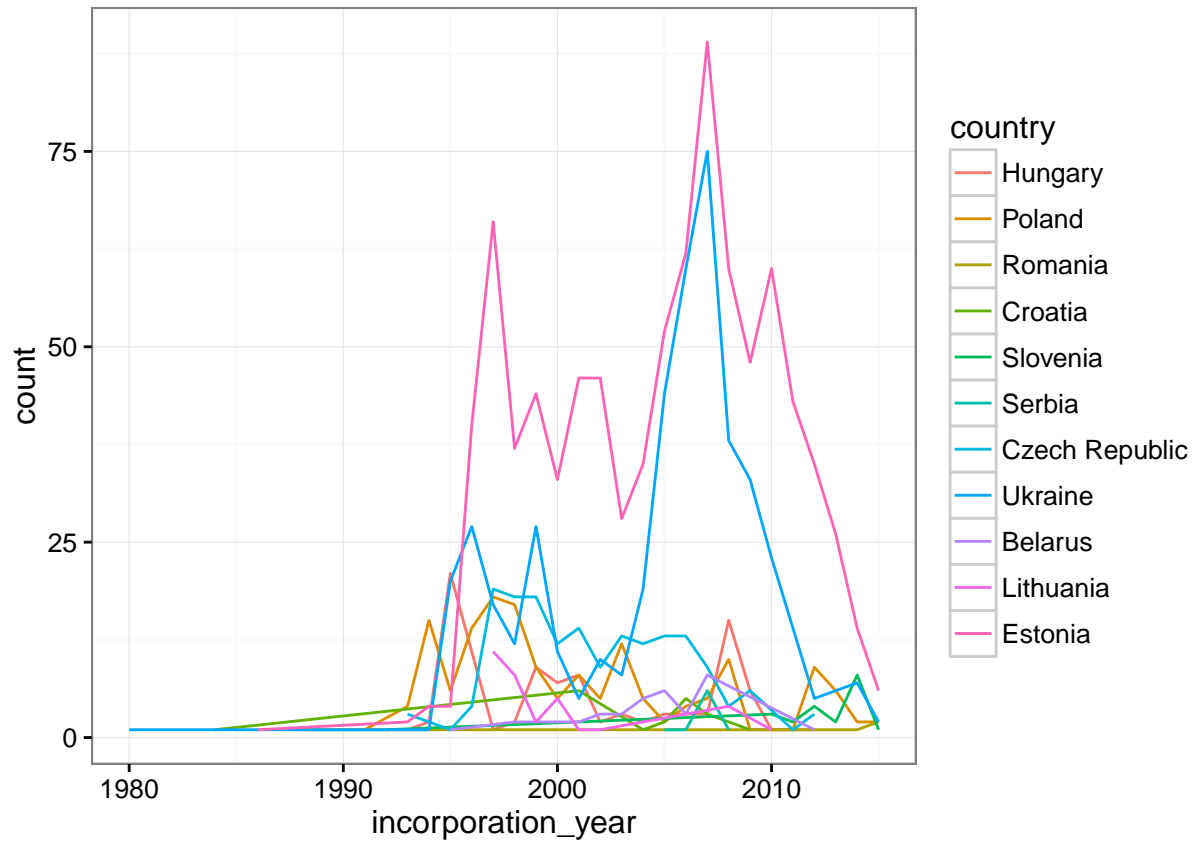
CEE countries counts

Number of firms related to different Central-Eastern European countries.

```
##
##      Hungary      Poland      Romania      Croatia      Slovenia
##      90          161          8          19          21
##      Serbia Czech Republic  Ukraine      Belarus      Lithuania
##      9          172          465          34          33
##      Latvia      Estonia
##      2938         881
```



Without Latvia:



CEE countries relationships

It is interesting to see how are the relationships built around the entities from these countries.

There are 13188 known links related to CEE countries entities.

The count allocation of the nodes from origin to end is the following:

##	origin	end		
##	origin	address	cee-entity	non-cee-entity
##	cee-entity	1948	2	7
##	intermediary	0	4831	0
##	non-cee-entity	0	6	0
##	officer	0	6394	0

“registered address” relationship type

When the origin node is a cee-entity, it points to either addresses or other entities.

When it is a cee-entity connecting to an address, the relationship type of the nodes are registered address. Do the countries of the cee-entity correspond to the address specified?

The mean of matches of the cee-entity and the address countries is:

```
## [1] 1
```

Then these links of type "cee-entity"->"registered address"->"address" present no interest for the further study.

“same name and registration date as” relationship type

Now the amount of links is reduced to 11240.

There are some entites linked to other entites through same name and registration date as.

```
##              origin  node_1                      rel_type
## 1264595 non-cee-entity 10013420 same name and registration date as
## 1265366 non-cee-entity 10051831 same name and registration date as
## 1265407   cee-entity 10052709 same name and registration date as
## 1266042 non-cee-entity 10129355 same name and registration date as
## 1267412   cee-entity 189353 same name and registration date as
## 1267413   cee-entity 189354 same name and registration date as
## 1267466   cee-entity 197215 same name and registration date as
## 1267472 non-cee-entity 194227 same name and registration date as
## 1267508   cee-entity 208045 same name and registration date as
## 1267509 non-cee-entity 208083 same name and registration date as
## 1267521 non-cee-entity 232413 same name and registration date as
## 1267536   cee-entity 232019 same name and registration date as
## 1267571   cee-entity 193494 same name and registration date as
## 1267573   cee-entity 194308 same name and registration date as
## 1267580   cee-entity 197218 same name and registration date as
##              end  node_2
## 1264595   cee-entity 10013465
## 1265366   cee-entity 10057348
## 1265407 non-cee-entity 10102185
## 1266042   cee-entity 10135767
## 1267412 non-cee-entity 10138826
## 1267413 non-cee-entity 10138825
## 1267466   cee-entity 10141622
## 1267472   cee-entity 10150939
## 1267508 non-cee-entity 10132669
## 1267509   cee-entity 10206797
## 1267521   cee-entity 10136446
## 1267536 non-cee-entity 232020
## 1267571   cee-entity 193539
## 1267573 non-cee-entity 10131652
## 1267580 non-cee-entity 10138821
```

The assumed way to deal with duplicates in this case is to bring in the edges connected to the found non-cee-entites and replace all instances of `node_2` as `node_1`.

The treatment leads to 11272 distinct link observations.

Now the relationships between the nodes related to CEE countries are as follows:

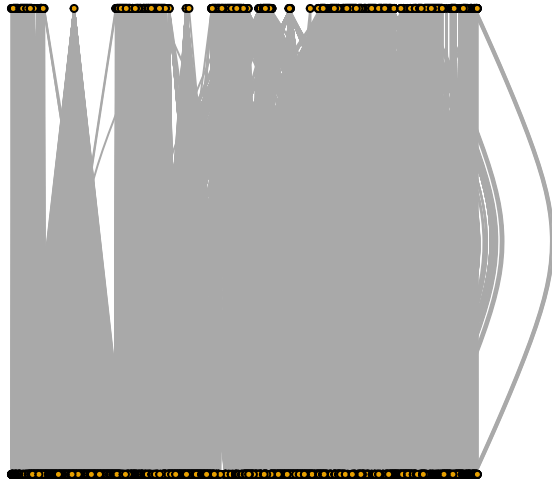
```
##              origin
## relationship intermediary officer
## beneficial owner of          0      7
## beneficiary of              0     200
## director of                 0    2505
## intermediary of          4843      0
## secretary of              0      19
## shareholder of           0    3698
```

Constructing the network

It is possible now to construct the network.

So far by construction the network is bipartite: TRUE.

Below is the first attempt to plot the resulting network.



Nodes decomposed

The main connections file provides 1269796 links/edges. At both ends one can find different players.

Origin nodes

There are 462468 unique origin nodes/vertices.

They are distributed among the types in the following manner:

Entities	Addresses	Intermediaries	Officers
93572	960	23600	345475
20.1834744%	0.2070719%	5.0905185%	74.5189352%

A note. The decomposition does not sum up to the number of unique entries. $463607 = 462468$ is FALSE.

Receiving nodes

Looking at the unique receiving nodes/vertices, one can find that there are 492143 of them.

They are distributed among the types in the following manner:

Entities	Addresses	Intermediaries	Officers
319122	151043	355	21664
64.8379468%	30.6883198%	0.0721275%	4.4016059%

In the same manner $492184 = 492143$ is FALSE.

Origins and ends overall

The cross tabulated origins and ends from all the edges available are presented in the table below.

##		address	entity	intermediary	officer
##	address	960	0	0	0
##	entity	93623	3768	0	0
##	intermediary	9358	362425	21	56
##	officer	213491	538166	349	47579

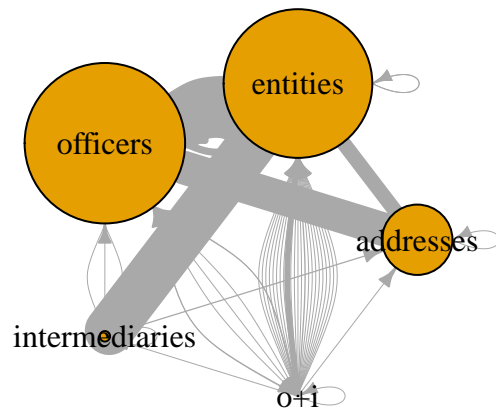
Visualizing

At the very first place, the nodes are very intertwined.

For example, there are 1139 officers listed as intermediaries and vice versa. They are separated into a new group labeled “o+i”.

It is possible to identify, through which relationship the types of nodes are related.

It is performed through network formation of the initial information on the edges. The node size is proportional to the amount of registered nodes of the type. The links' width represents the amount of connections between the nodes.



There is some coherent merging of the information required.

##	from	to	type	quantity
## 1	a	a	same address as	960
## 2	e	e	related entity	622
## 3	e	e	same name and registration date as	3146
## 4	e	a	registered address	93623
## 5	o	a	registered address	213491
## 6	o	e	alternate director of	409
## 7	o	e	appointor of	32
## 8	o	e	assistant secretary of	574
## 9	o	e	auditor of	202
## 10	o	e	authorised person / signatory of	1176
## 11	o	e	authorized signatory of	1
## 12	o	e	auth. representative of	32
## 13	o	e	bank signatory of	123
## 14	o	e	beneficial owner of	1797
## 15	o	e	beneficiary of	19125

## 16	o	e	beneficiary, shareholder and director of	6
## 17	o	e	board representative of	2
## 18	o	e	chairman of	4
## 19	o	e	connected of	3
## 20	o	e	correspondent addr. of	144
## 21	o	e	co-trustee of trust of	313
## 22	o	e	custodian of	7
## 23	o	e	director and shareholder of	1
## 24	o	e	director / beneficial owner of	4
## 25	o	e	director of	117261
## 26	o	e	director (rami makhoul) of	2
## 27	o	e	director / shareholder / beneficial owner of	2
## 28	o	e	director / shareholder of	6
## 29	o	e	first beneficiary of	1
## 30	o	e	general accountant of	120
## 31	o	e	investment advisor of	62
## 32	o	e	joint settlor of	41
## 33	o	e	legal advisor of	89
## 34	o	e	member of foundation council of	3
## 35	o	e	member / shareholder of	1
## 36	o	e	nominated person of	98
## 37	o	e	nominee name of	1
## 38	o	e	officer of	277
## 39	o	e	owner, director and shareholder of	28
## 40	o	e	owner of	16
## 41	o	e	partner of	7
## 42	o	e	personal directorship of	9
## 43	o	e	power of attorney of	29
## 44	o	e	power of attorney / shareholder of	1
## 45	o	e	president and director of	1
## 46	o	e	president - director of	1
## 47	o	e	president of	40
## 48	o	e	principal beneficiary of	3
## 49	o	e	protector of	1157
## 50	o	e	records & registers of	77
## 51	o	e	register of director of	21
## 52	o	e	register of shareholder of	23
## 53	o	e	reserve director of	72
## 54	o	e	resident director of	272
## 55	o	e	safekeeping of	6
## 56	o	e	secretary of	13304
## 57	o	e	shareholder of	378520
## 58	o	e	shareholder (through julex foundation) of	1
## 59	o	e	signatory of	2
## 60	o	e	sole shareholder of	4
## 61	o	e	sole signatory / beneficial owner of	1
## 62	o	e	sole signatory of	2
## 63	o	e	stockbroker of	11
## 64	o	e	successor protector of	13
## 65	o	e	tax advisor of	14
## 66	o	e	treasurer of	18
## 67	o	e	trustee of trust of	1413
## 68	o	e	trust settlor of	1156
## 69	o	e	unit trust register of	18

## 70	o	e	vice president of	7
## 71	o	i	grantee of a mortgage of	1
## 72	o	i	similar name and address as	300
## 73	o	o	director of	5
## 74	o	o	nominee beneficial owner of	4
## 75	o	o	nominee beneficiary of	2
## 76	o	o	nominee director of	60
## 77	o	o	nominee investment advisor of	1
## 78	o	o	nominee protector of	8
## 79	o	o	nominee secretary of	4
## 80	o	o	nominee shareholder of	1085
## 81	o	o	nominee trust settlor of	23
## 82	o	o	similar name and address as	46387
## 83	o	o+i	nominee director of	4
## 84	o	o+i	nominee shareholder of	41
## 85	o	o+i	nominee trust settlor of	1
## 86	o	o+i	similar name and address as	2
## 87	i	a	registered address	8165
## 88	i	e	intermediary of	310671
## 89	i	i	similar name and address as	16
## 90	i	o	similar name and address as	43
## 91	o+i	a	registered address	1193
## 92	o+i	e	assistant secretary of	9
## 93	o+i	e	auditor of	5
## 94	o+i	e	authorised person / signatory of	53
## 95	o+i	e	beneficial owner of	75
## 96	o+i	e	beneficiary of	57
## 97	o+i	e	correspondent addr. of	29
## 98	o+i	e	co-trustee of trust of	7
## 99	o+i	e	custodian of	7
## 100	o+i	e	director of	1323
## 101	o+i	e	intermediary of	8450
## 102	o+i	e	investment advisor of	3
## 103	o+i	e	nominated person of	3
## 104	o+i	e	officer of	4
## 105	o+i	e	protector of	41
## 106	o+i	e	records & registers of	36241
## 107	o+i	e	register of director of	27
## 108	o+i	e	register of shareholder of	18
## 109	o+i	e	reserve director of	2
## 110	o+i	e	safekeeping of	2
## 111	o+i	e	secretary of	1047
## 112	o+i	e	shareholder of	4268
## 113	o+i	e	trustee of trust of	5
## 114	o+i	e	trust settlor of	78
## 115	o+i	i	similar name and address as	4
## 116	o+i	o	nominee secretary of	1
## 117	o+i	o	nominee shareholder of	4
## 118	o+i	o	similar name and address as	8
## 119	o+i	o+i	similar name and address as	1