

# Big Data in Finance Project 2022

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## 1. Topic

SFC-licensed Professionals in Hong Kong Financial Market.

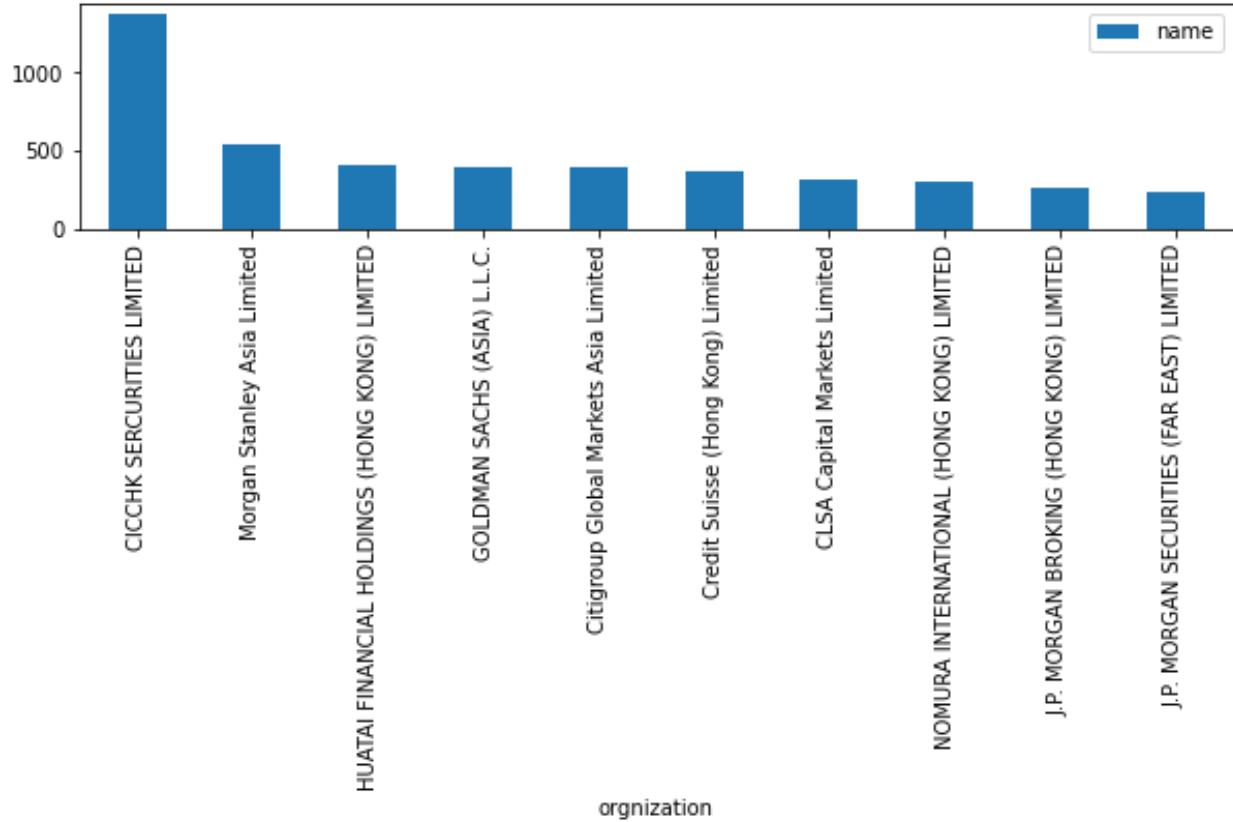
## 2. Data source

From webb-site, entire registration set of firms in SFC can be found and in each of them, all the employee with licenses in the firm history can be scrapped. Firstly, links for firms details (here details mean information of employee in the history) were scrapped from League tables of SFC licensees (<https://webb-site.com/dbpub/SFClicount.asp>) and then scrapped links of person whose have ever appeared in the database. Finally, in each of person's link, here are their name, what company they worked for and when, also there is their role and types of licenses.

The database directly stores the information of professionals in this industry is not found in wedd-site. So the alternative approach as described above is applied. I believe that some data may be lost during the web-scraping via selenium or blank data in original website, but missing data can be ignored since the data set contains 459308 rows, a large amount compared with the missing data.

## 3. Statistics in 2022

For adviser industry, people with licenses of Advising on corporate finance, Advising on futures contracts and Advising on securities are considered as those who in the adviser industry. First of all, fundamental statistics in 2022 are present below, firms with most employees in adviser industry. Obviously, big title financial institutions are dominating the in industry if we consider the employee number as the business scale. CICC and HUATAI are top Chinese financial service firms and CLSA is partially a Chinese firm. Others are foreign investment banks' subsidiaries (almost from USA, Credit Suisse from Switzerland and Nomura from Japan).



## 4. Number of new licenses

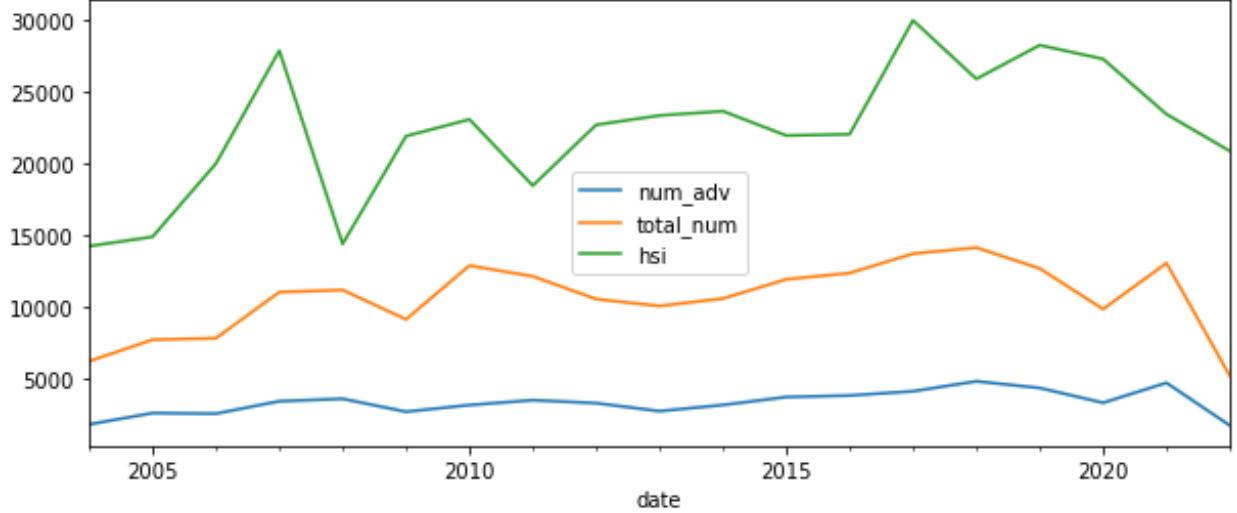
### 4.1 Advisering licenses vs.total licenses

Data set provides information of different types of licenses:

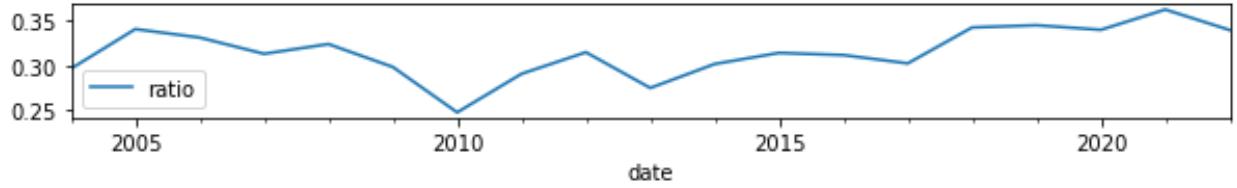
- Advising on corporate finance
- Advising on futures contracts
- Advising on securities
- Asset management
- Automated trading services
- Credit rating services
- Dealing in futures contracts
- Dealing in securities
- Leveraged foreign exchange trading
- Securities margin financing

The licenses whose name does start with Advising is treated as licenses in adviser industry and the those who renewed their licence are recognized as new joiner of firms. The reason of renewing licenses is mainly for two reasons, job-hopping or transferring division inside firm. So here I assume renewing number is partially reflect the dynamic of economics (Heng Seng Index (HSI) is added to the plot to show if the assumption is reasonable since the stock market is a index to show how the economics goes). To optimize the plot to be more reasonable, the number of people who have licenses in that year can be used (a little complex in data pre-processing, and I just choose a easy approach to alternate, new joiners).

The plot has the changing of renewed licence of these two groups and HSI. It indicates the total number of licenses renewed decreased around 2009, 2013 and 2020, while number of renewed advising licenses tracing the trend of total number but not so strong as that. By contrast, HSI dropped in 2008, 2011 and 2018 correspondingly. It seems like number of renewing licenses follows the economics and become more and more lagged.



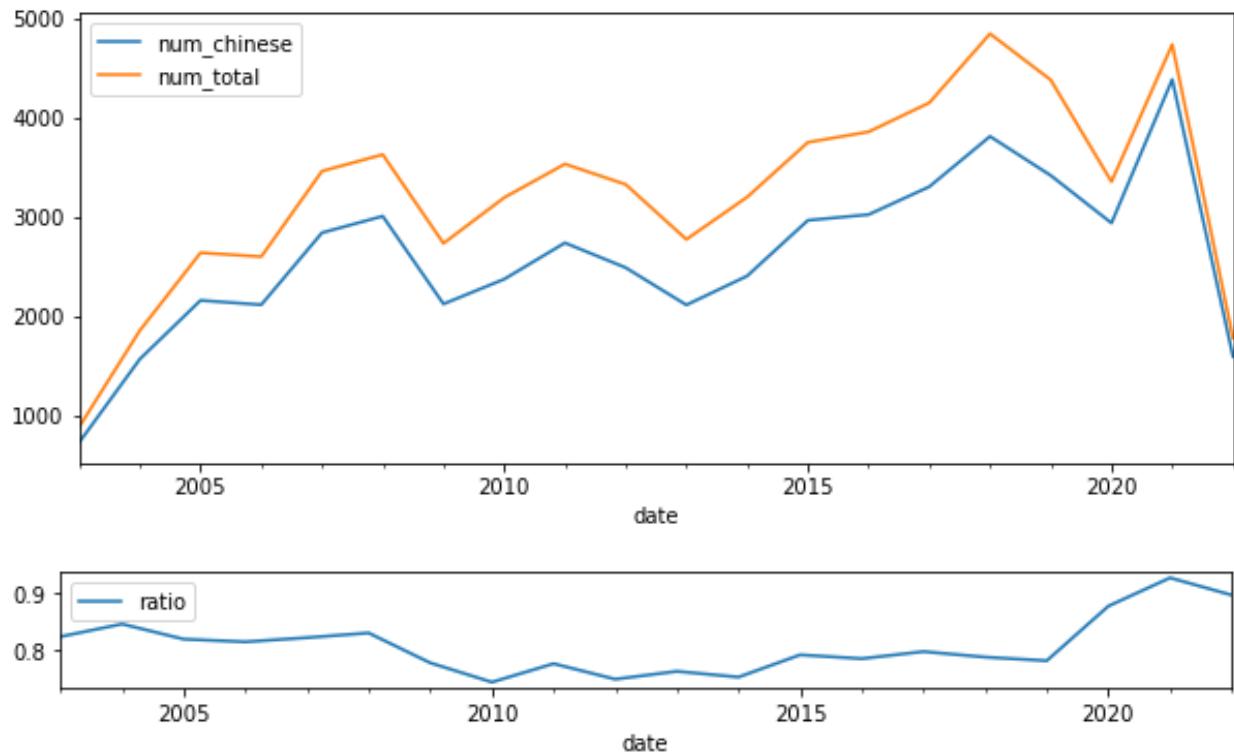
Besides, the percentage of advising licenses in total licenses is presented below. It increased, then dropped considerably around 2010 and kept recovering after it periodically. Generally, it moved in a 3-year/4-year period.



In summary, statistics mentioned above perform good after economics booming and bad after recession, for example, financial crisis in 2008 and political crisis in Hong Kong in 2019 followed by epidemic starting from 2020. As for the ratio, adviser industry is relatively stable compared with other areas since the variance of adviser statistics is much smaller and generally increasing before recent three or four years. So the changing of the ratio is mainly lead by the changing of the total industry. The ratio (or percentage) decay in 2010 because other industries booming in the recovering after financial crisis. If do not consider the time period from 2009 to 2010, the percentage generally kept increasing.

## 4.2 Chinese vs. foreigners

In database, there are Chinese characters after English name for some data points, I treated them as Chinese people. In fact, this group contains some Japanese, South Korean but almost of them are Chinese. The following plot is number of Chinese and total number per year and the other one is ratio between them. It can be proven that from 2009 to 2019, the ratio stayed in a lower level (under 80%), which means lots of foreign professionals working in Hong Kong at that time period. When the political movement started in 2019, approving of national security law in 2020 and border lock down during epidemic period, it seems that there is a friction for Hong Kong to be more international and the reason may be that the confidence of business and investment harmed after those events, which lead adjustment on business or investment. As a result, Chinese percentage increasing to above 90%.

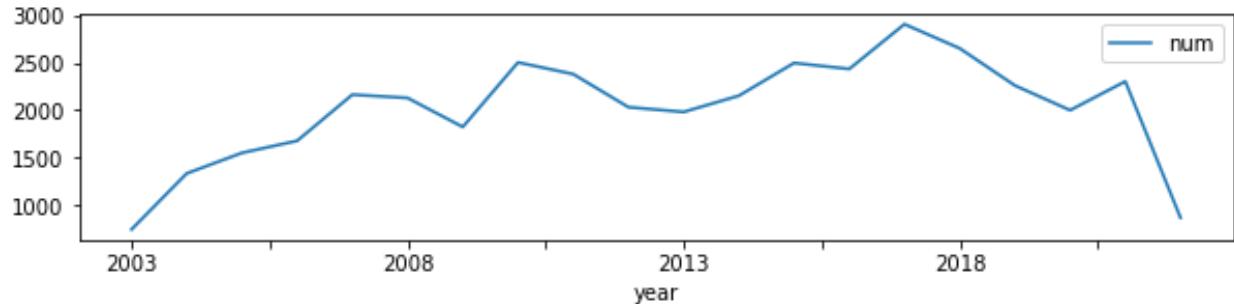


## 5. Job-hopping

In this part, there is filter to find those who renewed their licence, mean while changing the firm they work for. This part of people I consider this variation as job-hopping. The plot below shows times of job-hopping per year.

### 5.1 Number of job-hopping

One point is a Great decay recently, which is lead by same events in last part, politics and epidemic.

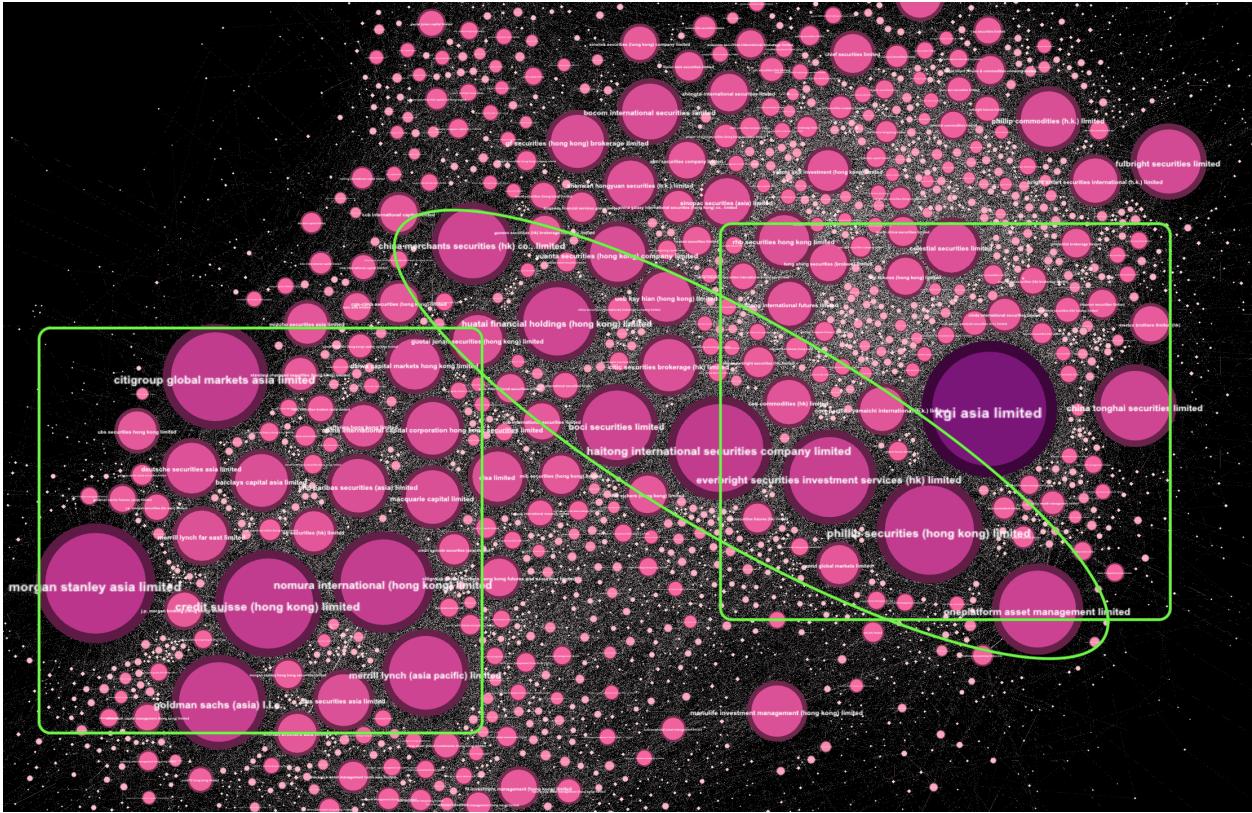


\*One strange thing is what happens in 2021. In 2021, HSI kept dropping, more Chinese joined this industry while foreigners left and high turnover.

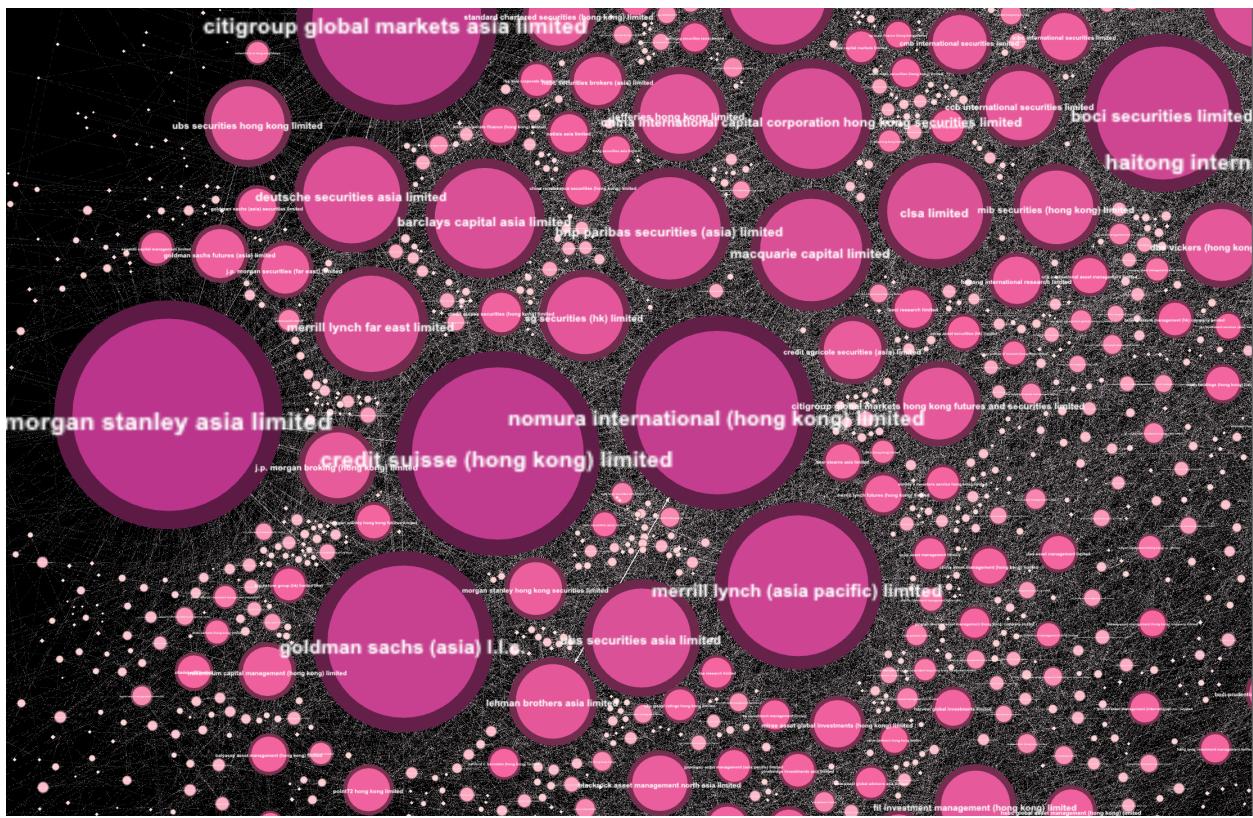
### 5.2 Job-hopping relationship between firms

Import the job-hopping data into Gephi to visualize their relationship via force atlas 2 algorithm. The position stands for how closed relationship is, in this case, how many professionals turnover happened between firms.

The size and color of the ball implies how many people left other company and join that company. Here we can see two big groups which in the green blocks (will discuss later). Also, there is a green circle area which is between those two blocks, which contains HUATAI, BOCI, HAITONG, GUOTAI JUNAN, CMSHK, EVERBRIGHT and CITIC, which are all popular Chinese financial service firms.



If I zoom in the left block, there is a group of big name investment banks, the amount of transfer between these banks are huge. And if some one works in these banks, they are more likely to transfer to other big name investment bank.



If I zoom the right block, there is company named kgi asia limited. It more like to absorb the professionals from small firms.



In summary, big investment banks have border of professionals transforming between each other. Small firms are rarely join big name banks. Chinese top firms are lying between this two parts, can join both of them and absorb from both of them.