A Data Scientist's Journey in a Real-World Environment

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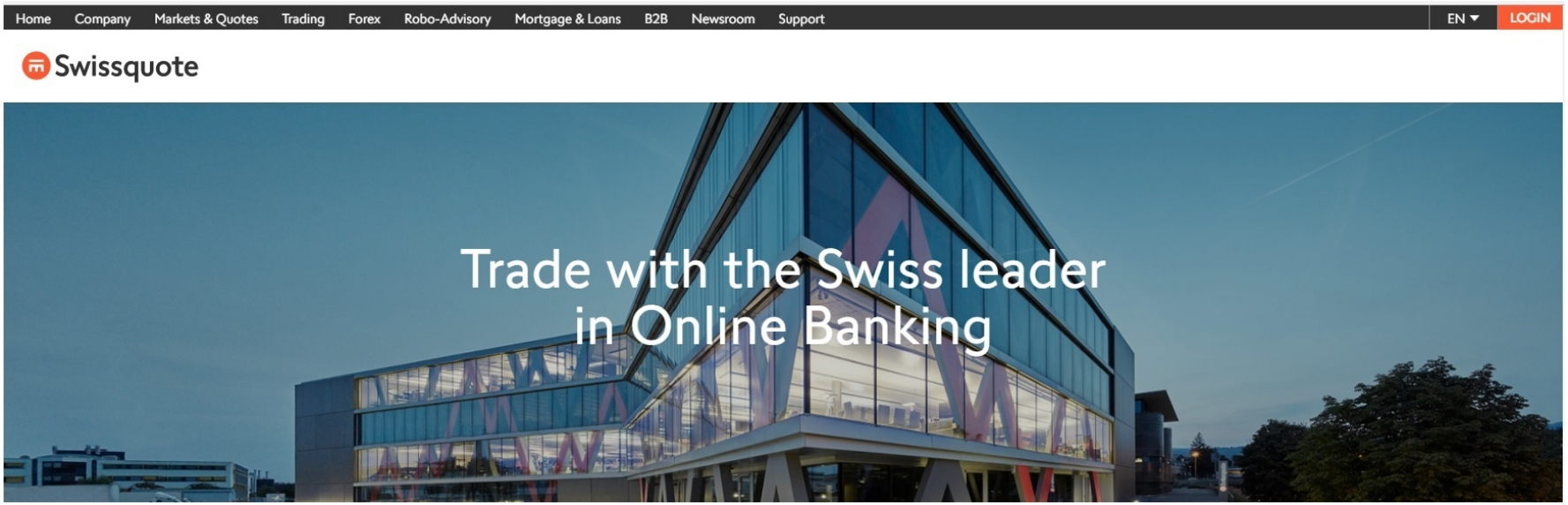
ROADMAP

1. Swissquote and its Business at a Glance
2. A Data Scientist's Workflow
3. Use-case: Trading Cost Simulator
4. *Q&A*

SQ and its business at a glance

SWISSQUOTE AND ITS BUSINESS AT A GLANCE

- Online Broker, largest in Switzerland
- Has a banking license but differs from typical banks
- Main mission: "democratize finance", by making financial services easily accessible to private investors



Forex

130 financial instruments to trade the global markets with Advanced Trader, MetaTrader 4 and MetaTrader 5.

Find out more

Trading

Access to more than 2.5 million products and trade them on our quick and secure platform.

Find out more

Robo-Advisory

Manage and optimise your investments with the Robo-Advisor developed by Swissquote

Find out more

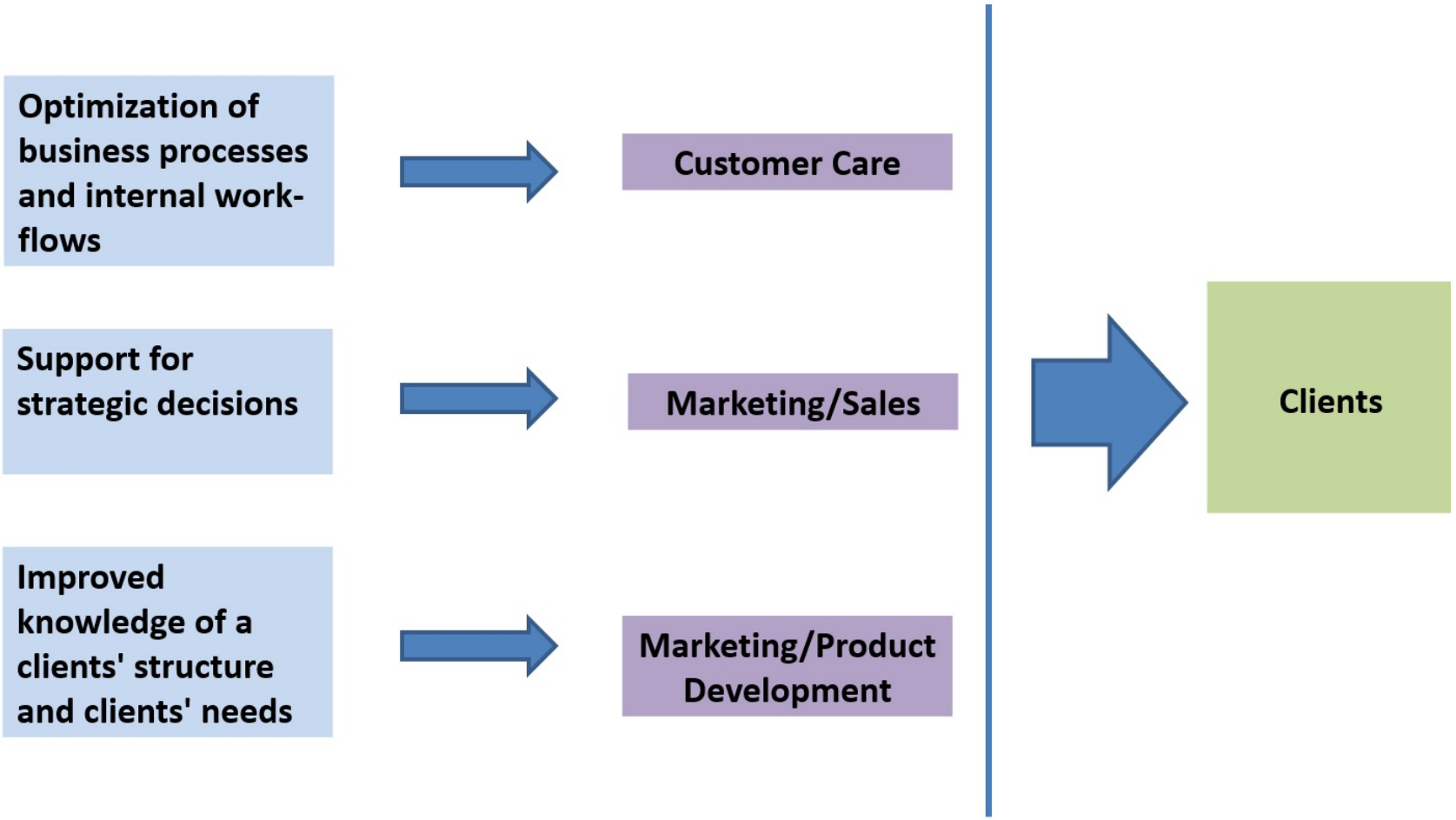
Data Scope

- Market data (quotes, stock prices etc.)
- **Client accounts' data**
- **Transactional data**

THE RIGHT USE OF DATA ADDS VALUE TO A BUSINESS

- Optimization of business processes and internal work-flows (e.g., clients' on-boarding)
- Support for strategic decisions (e.g. changes in the pricing conditions)
- Improved knowledge of a clients' structure and clients' needs (e.g. personalized content of digital accounts, new investment products and services)

WHO BENEFITS FROM DATA ANALYSIS?



Data Scientist' Workflow

Data Scientist's Workflow: Step 1

Formalizing a question/a problem to solve (interaction with the project's owner) :

- What a project's owner ultimately wants to achieve?
- What are the constraints?

DATA SCIENTIST'S WORKFLOW: STEP 2

Understanding the business context (interaction with Business Analysts)

- Identifying relevant business processes
- Setting assumptions (behavioral patterns, market conditions etc.)

DATA SCIENTIST'S WORKFLOW: STEP 3

Building the dataset (interaction with a Data Architecture team)

- Which kind of information will be useful for the analysis?
- How the data resulting from business processes are mapped into the company's databases?

Data Scientist's Workflow: Step 4

Selecting and validating a method

- understand the nature of the problem: classification? predictions? optimization?
- understand the main statistical properties of the data
- try several alternative methods/explore different scenarios
- privilege simplicity over complexity

Data Scientist's Workflow: Step 5

Implementing the retained method

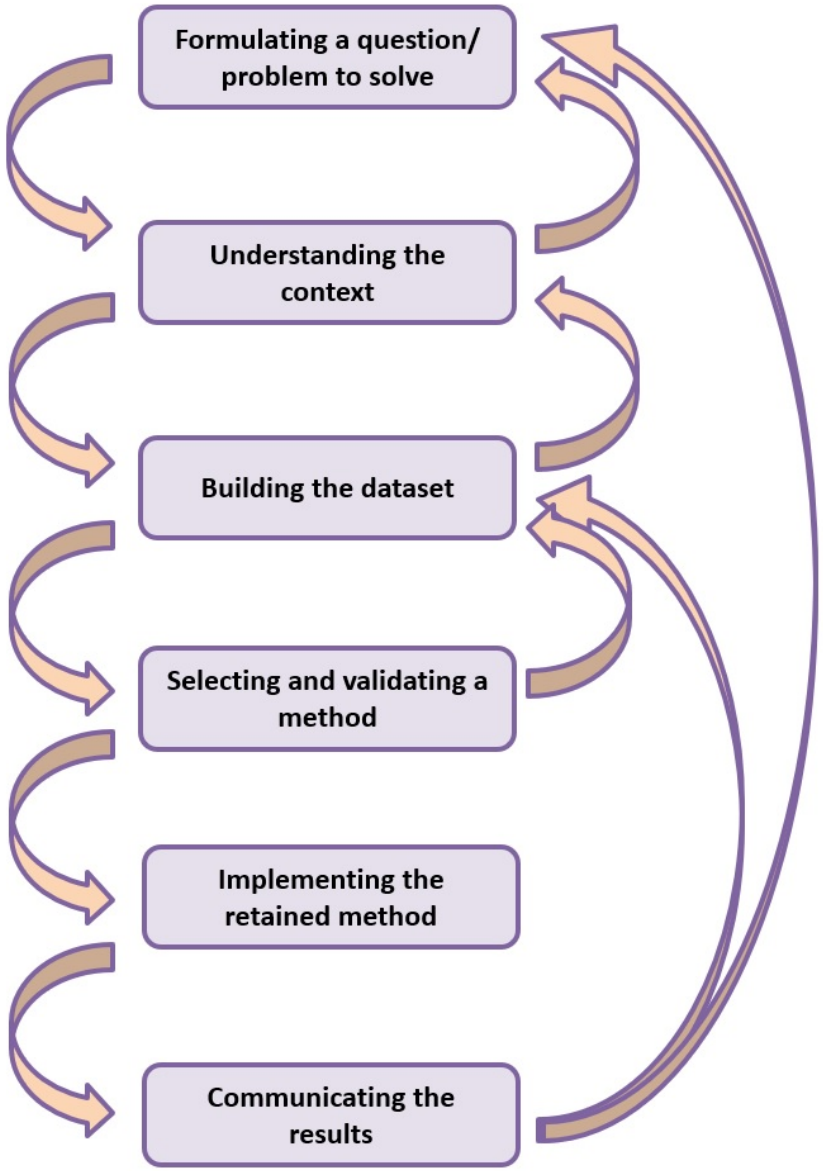
- parametrization (bottom line: anticipate potential questions and needs of a project owner -'what if...')
- generalization (i.e., can your codes be reused to address similar problems?)
- computational efficiency (e.g. alternatives to loops, parallelized computations)
- replicability of the results

DATA SCIENTIST'S WORKFLOW: STEP 6

Communicating the results

- privilege visual representation
- provide intuition behind each result/method (people do not like 'black boxes'!)

DATA SCIENTIST'S WORKFLOW: SUMMARY



Use Case

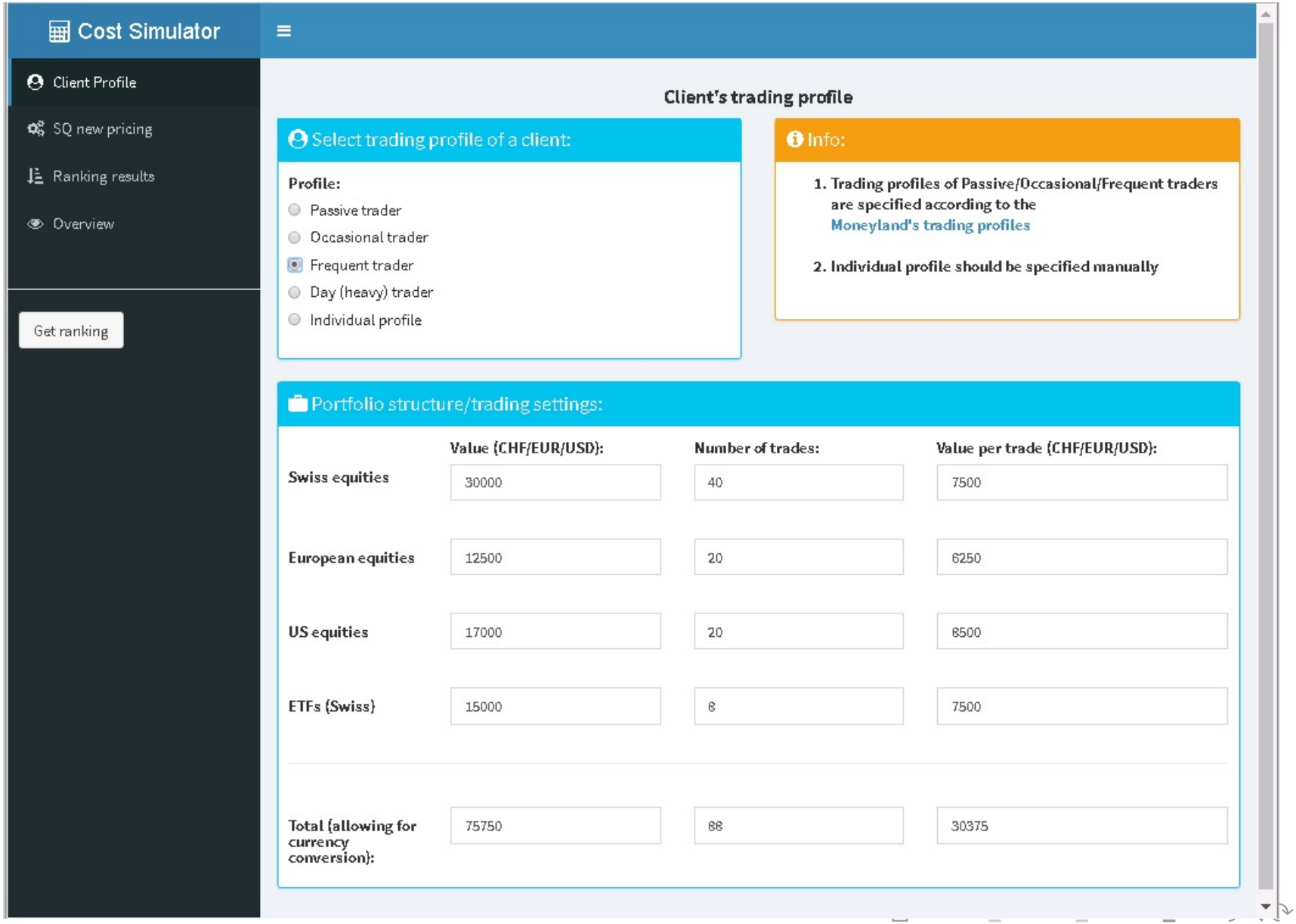
USE CASE: TRADING COST SIMULATOR

- **Context:** Marketing Department wanted to modify pricing condition for retail clients involved in eTrading (stocks, bonds, structured products)
- **Objective:** simplify pricing conditions while staying **competitive**
- **Challenge:** a benchmark to measure 'competitiveness'?

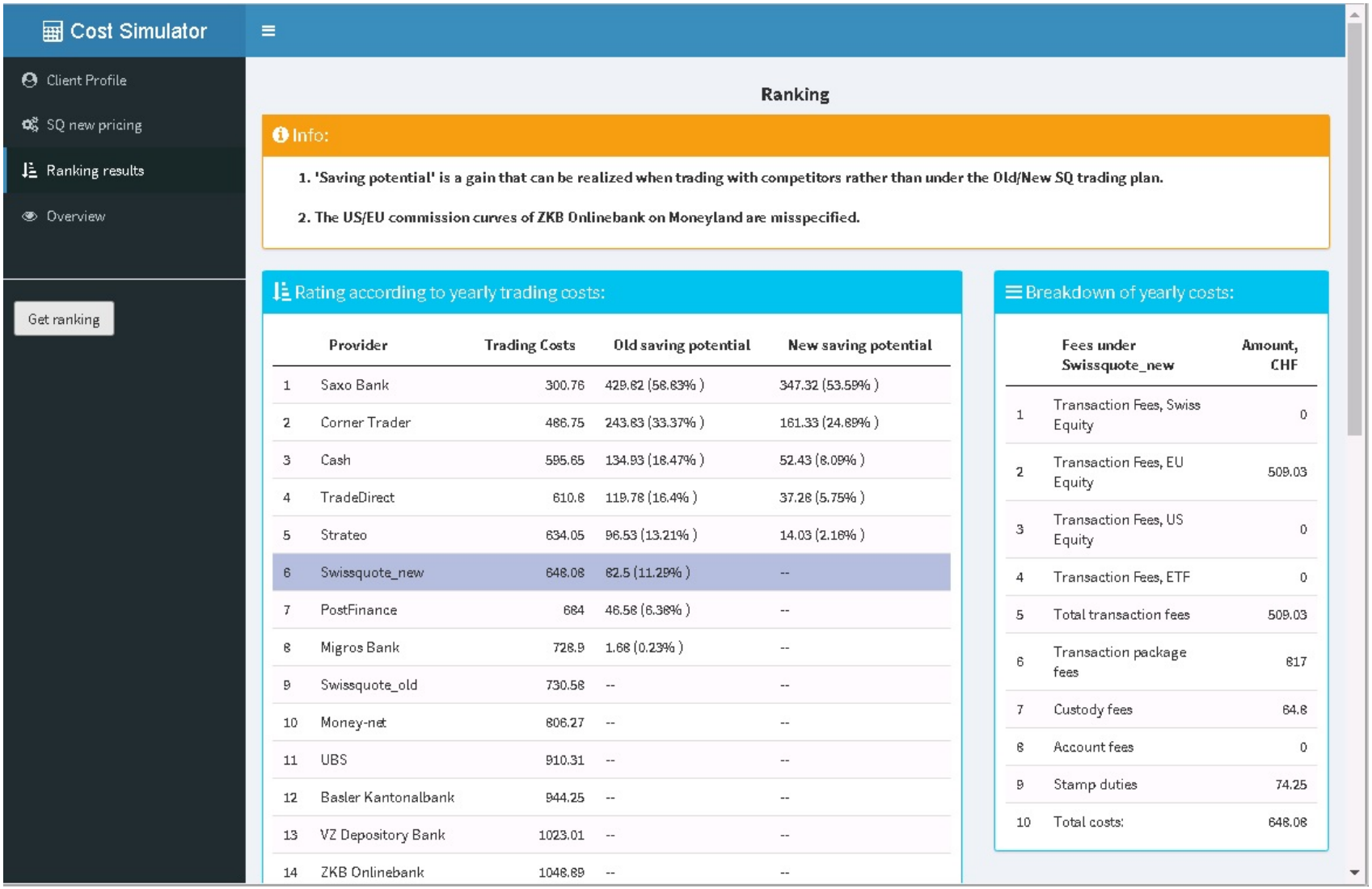
DEMO: Trading Cost Simulator

Thank you!

TRADING COST SIMULATOR 1



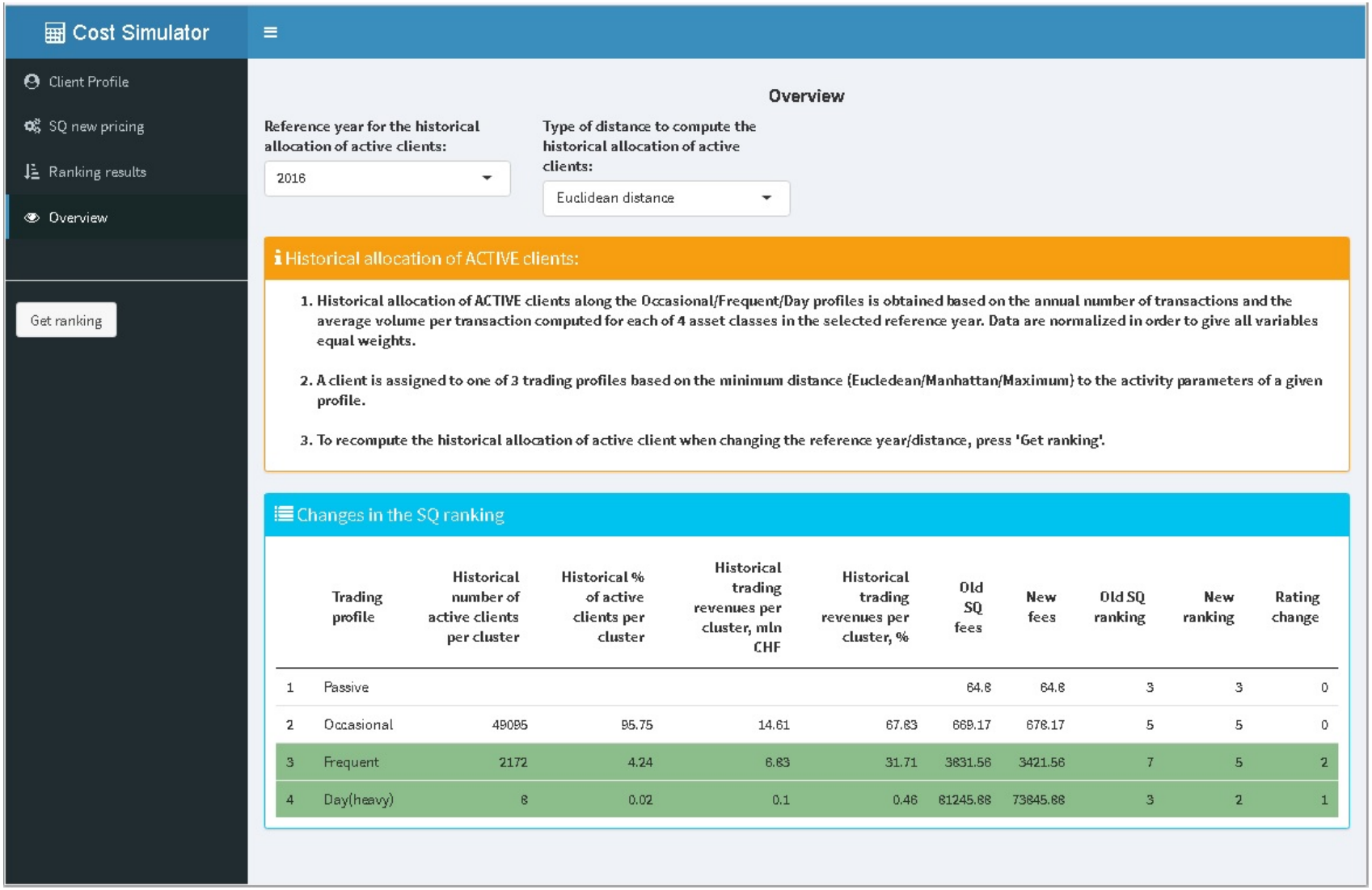
TRADING COST SIMULATOR 2



	Provider	Trading Costs	Old saving potential	New saving potential
1	Saxo Bank	300.76	429.82 (58.83%)	347.32 (53.59%)
2	Corner Trader	486.75	243.83 (33.37%)	161.33 (24.89%)
3	Cash	595.65	134.93 (18.47%)	52.43 (8.09%)
4	TradeDirect	610.8	119.78 (16.4%)	37.28 (5.75%)
5	Strateo	634.05	96.53 (13.21%)	14.03 (2.16%)
6	Swissquote_new	648.08	82.5 (11.29%)	--
7	PostFinance	684	46.58 (6.38%)	--
8	Migros Bank	728.9	1.68 (0.23%)	--
9	Swissquote_old	730.58	--	--
10	Money-net	806.27	--	--
11	UBS	910.31	--	--
12	Basler Kantonalbank	944.25	--	--
13	VZ Depository Bank	1023.01	--	--
14	ZKB Onlinebank	1048.89	--	--

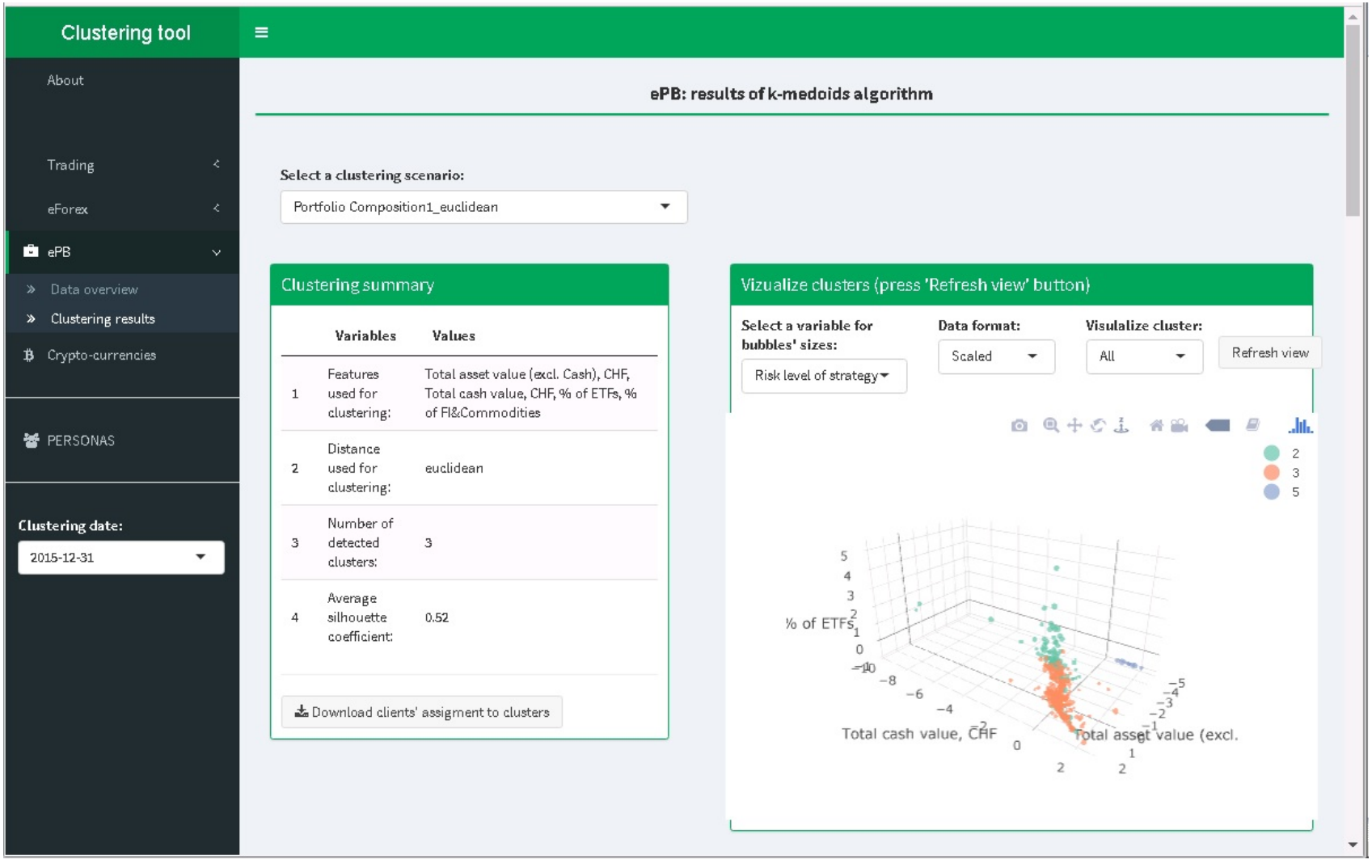
	Fees under Swissquote_new	Amount, CHF
1	Transaction Fees, Swiss Equity	0
2	Transaction Fees, EU Equity	509.03
3	Transaction Fees, US Equity	0
4	Transaction Fees, ETF	0
5	Total transaction fees	509.03
6	Transaction package fees	617
7	Custody fees	64.8
8	Account fees	0
9	Stamp duties	74.25
10	Total costs:	648.08

TRADING COST SIMULATOR 3

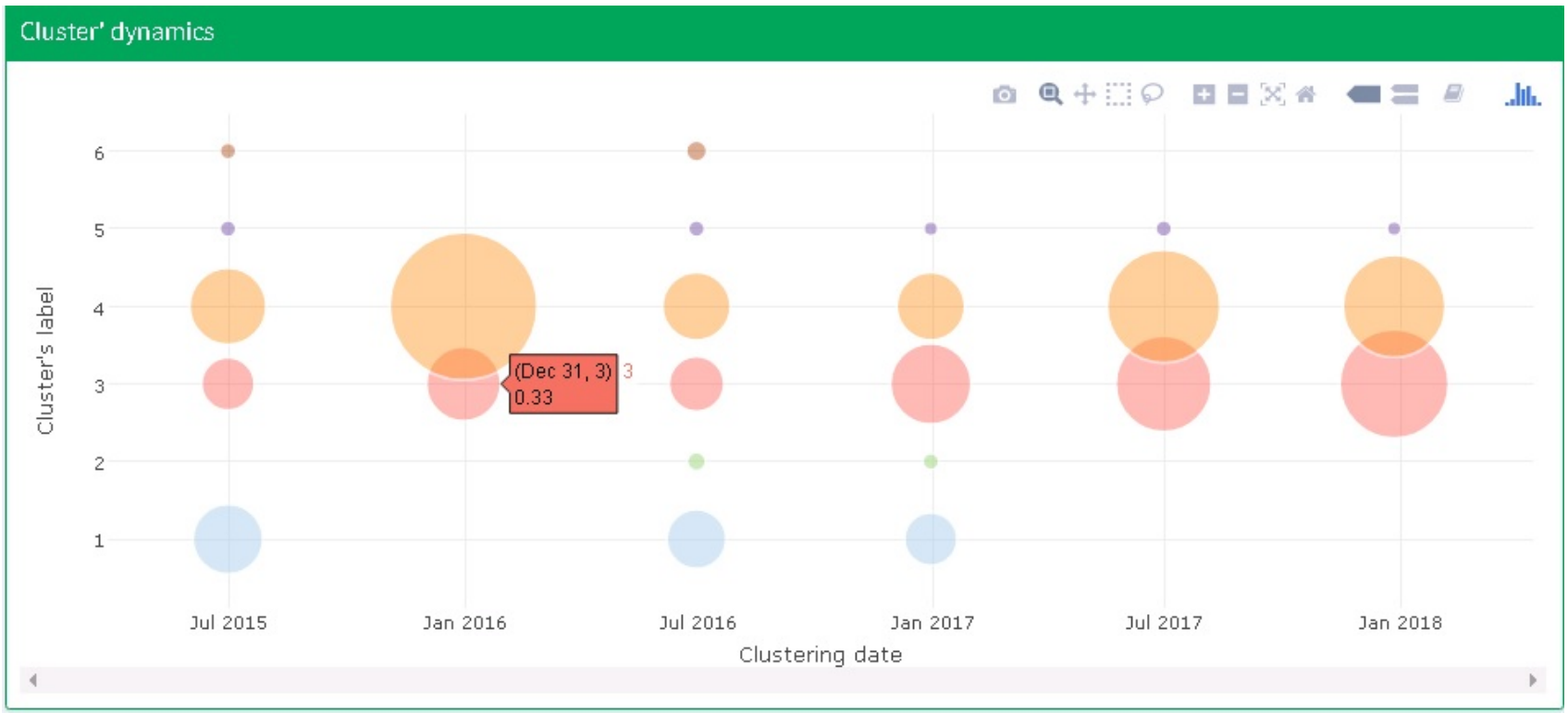


	Trading profile	Historical number of active clients per cluster	Historical % of active clients per cluster	Historical trading revenues per cluster, mln CHF	Historical trading revenues per cluster, %	Old SQ fees	New fees	Old SQ ranking	New ranking	Rating change
1	Passive					64.8	64.8	3	3	0
2	Occasional	49095	95.75	14.61	67.83	669.17	678.17	5	5	0
3	Frequent	2172	4.24	6.83	31.71	3831.56	3421.56	7	5	2
4	Day(heavy)	8	0.02	0.1	0.46	81245.88	73845.88	3	2	1

CLUSTERING TOOL 1



CLUSTERING TOOL 2



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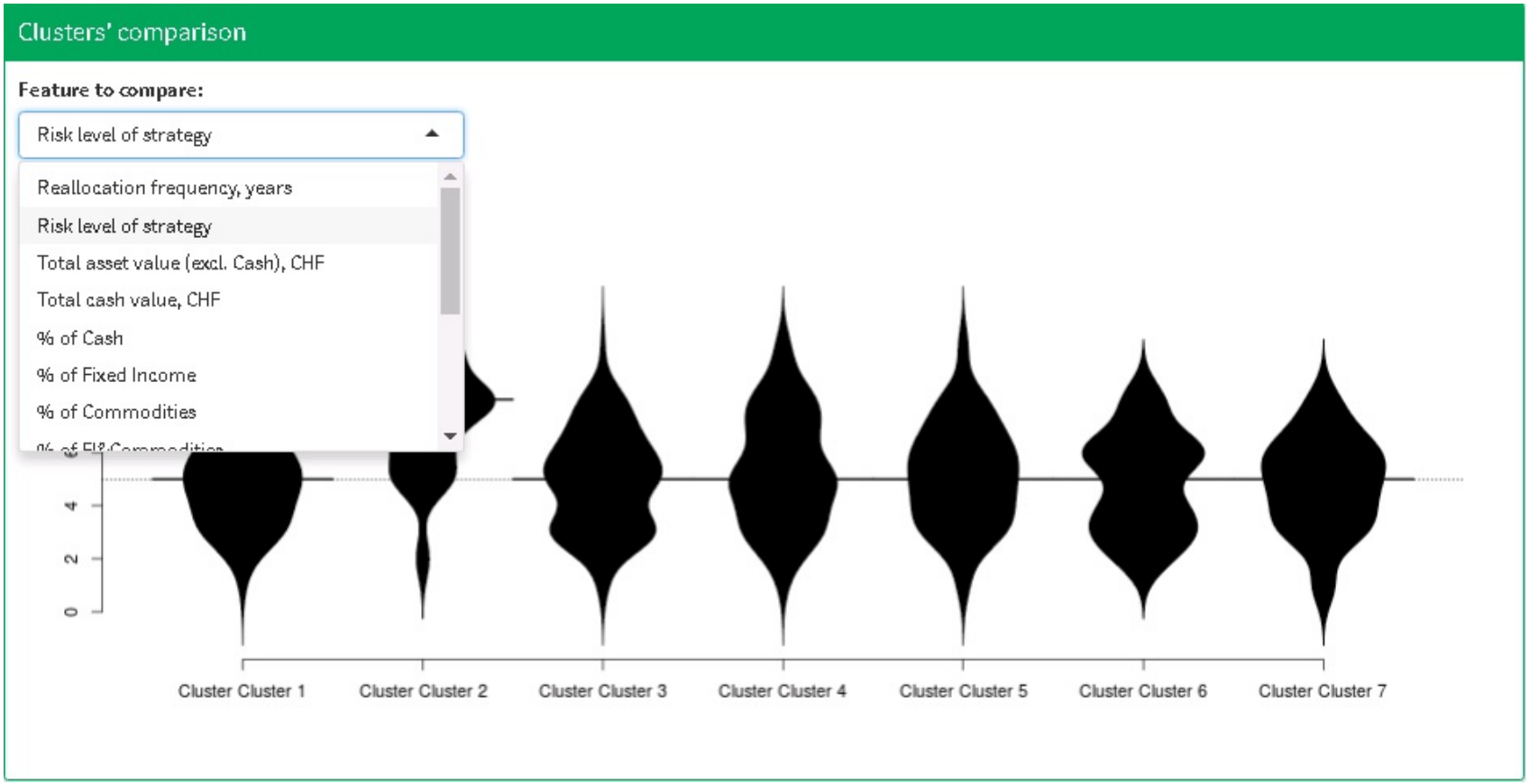
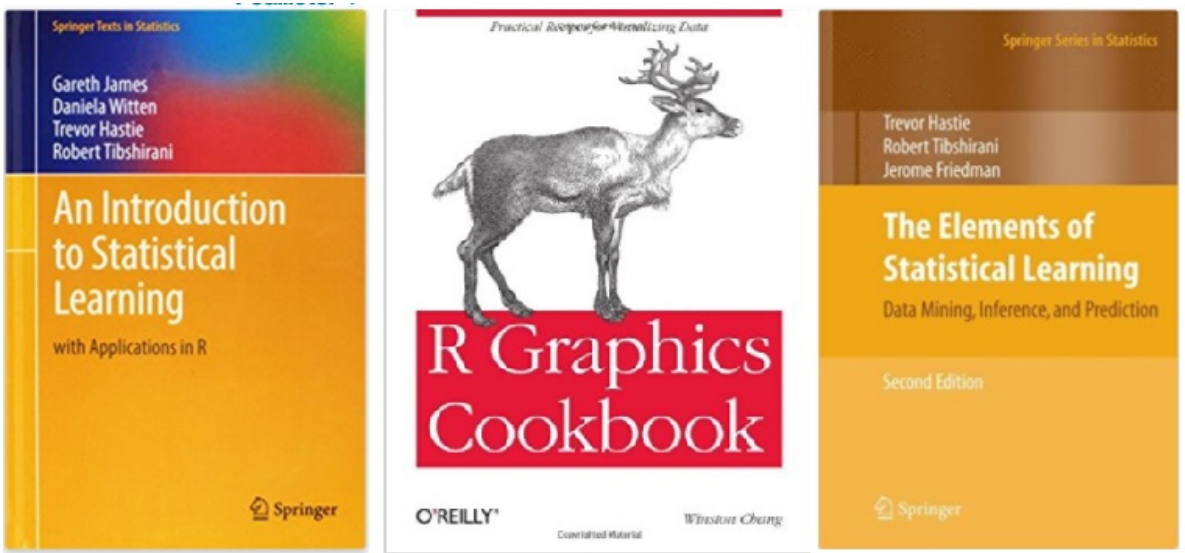


USEFUL BOOKS AND WEB-RESOURCES



- http://r-statistics.co/Top50-Ggplot2-Visualizations-MasterList-R-Code.html
- https://cran.r-project.org/web/views/
- https://cran.r-project.org/bin/windows/contrib/checkSummaryWin.html