

# Quantitative Analysis of Investment Funds

30 August 2024



Commission de Surveillance  
du Secteur Financier

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# Outline

1. Introduction
2. Overview of the CSSF
3. Objectives of the internship
4. Analysis of SFTR data
5. Conclusion

# Introduction

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# 1. Introduction

- Luxembourg is one of the largest financial centers in the world
- 2nd largest hub for investment funds in the world after the United States
- Investment fund: pool of capital collected from multiple investors with the purpose of investing in securities.
- Primary goal is to maximize returns for its investors
- Security: tradable financial instrument that holds some type of monetary value (stocks, bonds, derivatives, ...)

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# Overview of the CSSF

## 2. Overview of the CSSF

- CSSF = Commission de Surveillance du Secteur Financier
- Financial supervisory authority in Luxembourg, i.e. supervises professionals and products of the Luxembourg financial sector and protects its consumers
- Missions:
  - Ensures that companies and issuers comply with legal provisions
  - Supervision of: banks, investment funds, pensions funds, other financial service providers
  - Monitors compliance with the rules on the prevention of money laundering and terrorist financing

## 2. Overview of the CSSF

- Department I joined: Prudential supervision and risk management of investment funds (OPC PRUD)
- Responsible for supervision and monitoring of risk management for all types of investment funds
- Division I joined: Macroprudential supervision (RISK MACRO)
- Responsible for risk analysis based on reports by various data sources
- Entities presented during the presentation are anonymous

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# Objectives of the internship

### 3. Objectives of the internship

- Assess the possibility of integrating Machine Learning techniques in prudential supervision tools
- 2 subjects:
  - SFTR: - database for a specific type of transaction
    - analyse the dataset
    - analysis of 2 financial crises
    - template to get the possibility of showing statistics of an investment fund
  - ESG data: analysis with a focus on the environmental aspect to detect cases of Greenwashing

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# Analysis of SFTR data

## 4. Analysis of SFTR data

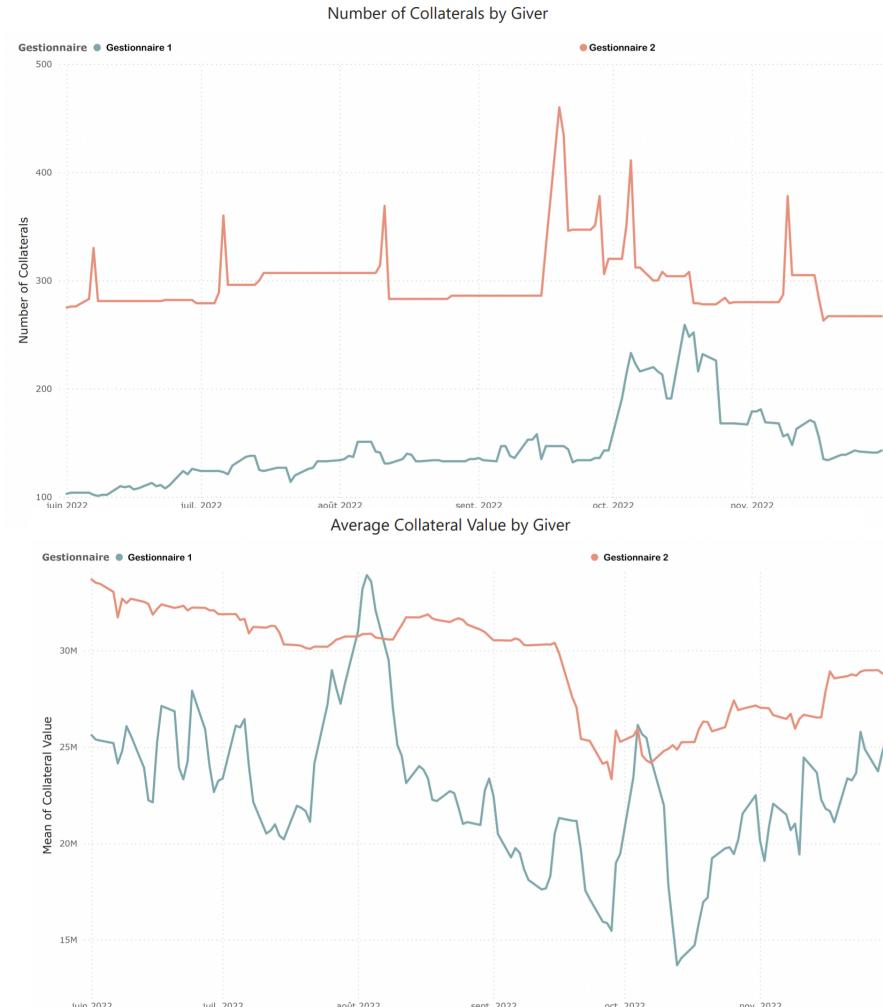
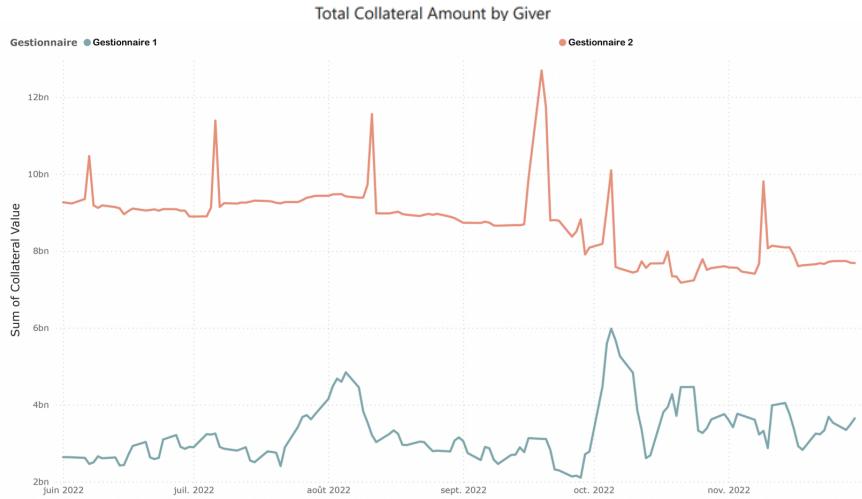
- SFT = Securities Financing Transaction : operation between 2 parties in which securities are lent to one of the parties
- SFTR = Securities Financing Transaction Regulation : regulation by the ESMA that requires entities conducting SFTs to report these transactions
- ESMA transmits reports for entities based in Luxembourg to the CSSF
- 136 fields
- In some cases collateral has to be posted for an SFT
- Collateral : valuable asset that a borrower puts up as security for a loan

# LDI funds crisis

- LDI = Liability Driven Investment : investment in assets that generate cash to pay for financial obligations
- LDI crisis was an event in UK financial markets in September 2022, where many pension funds made significant losses
- Objective: identify indicators that could have been used to predict the crisis
- Period: June 2022 - November 2022
- 95 investment funds, managed by 2 managers
- Analysis focuses on collateral

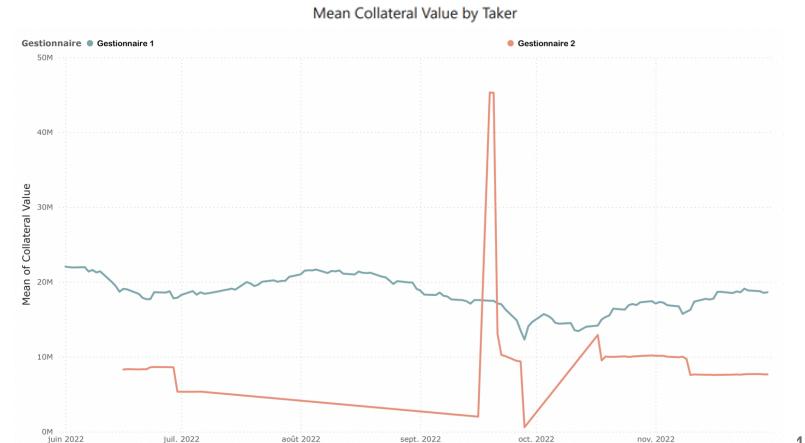
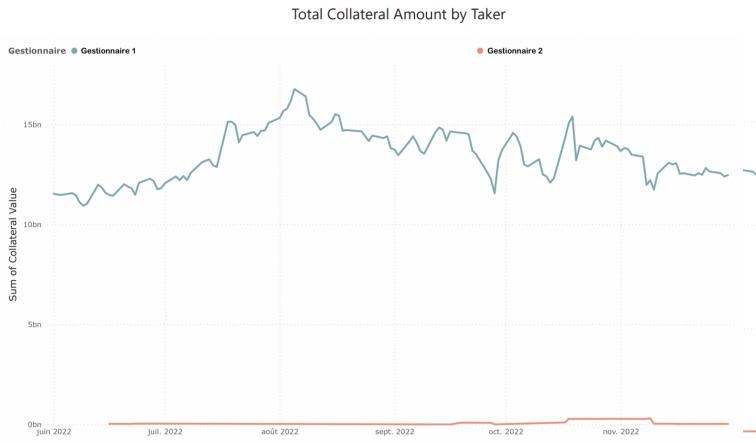
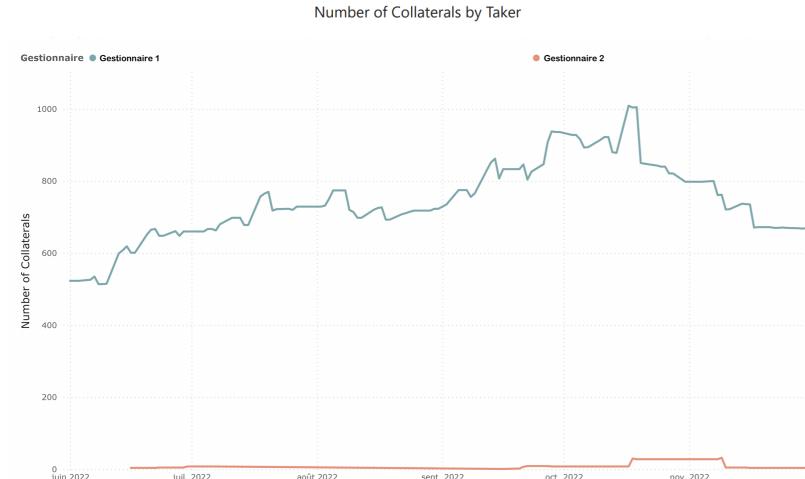
# Perspective: Collateral Giver

- Number of Collaterals peaking regularly for Gestionnaire 2
- Higher collateral activity after UK mini-budget crisis but during a limited time frame
- Mean collateral value goes down until October 2022 by a combining effect of slight increase in number of trades and decreasing amount of collateral value



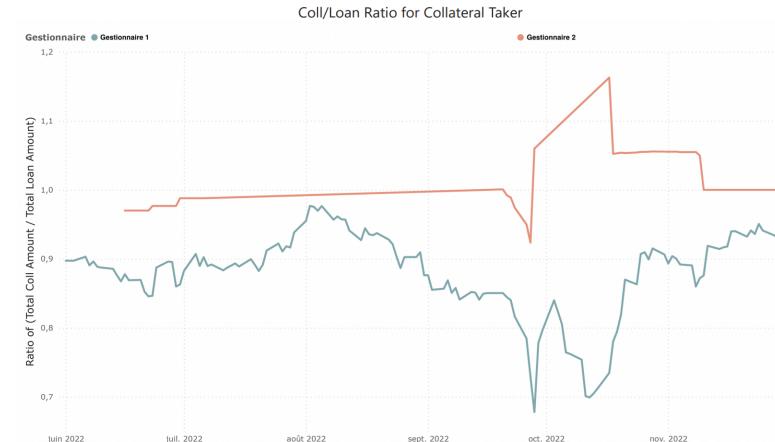
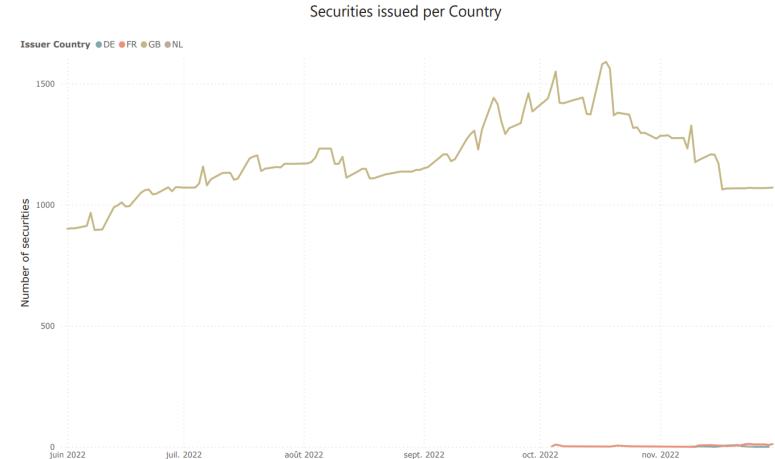
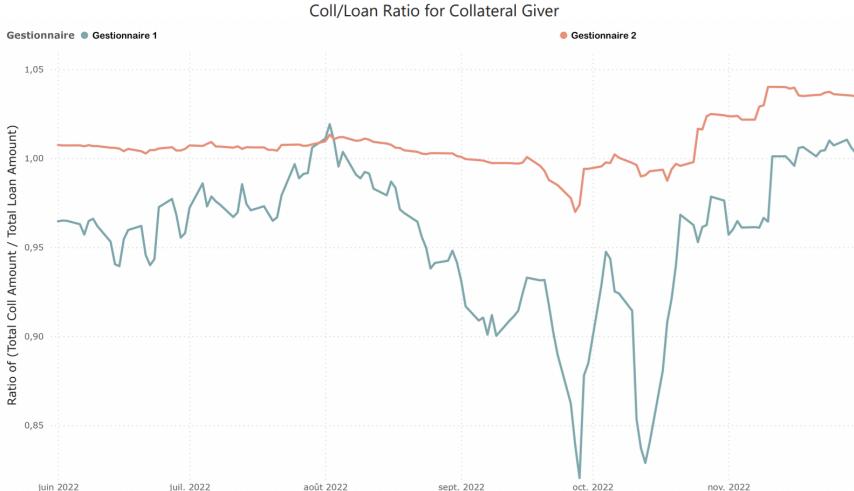
# Perspective: Collateral Taker

- For Gestionnaire 1, the number and amount of collateral taken is higher than the amount given
- We will ignore Gestionnaire 2, as they are barely involved in transactions where they receive collateral
- For Gestionnaire 1, the number of collaterals received is slowly progressing until end of October 2022
- The total value of the collaterals decreases between August and October, but is still higher than during June.
- The average value reaches its lowest point at the end of September



# Issuer Countries & Collateral Value / Loan Value

- Securities were primarily issued from UK.
- From October, securities issued by other countries start to be used as collateral.
- Difference in collateral to loan ratio from actors: transactions by Gestionnaire 2 are slightly over-collateralised while those by Gestionnaire 1 tend to be under-collateralised
- Sharp fall of the Coll/Loan ratio during mini-budget crisis likely reflecting the large decrease of the value of the gilt used as collateral



# US Banks crisis

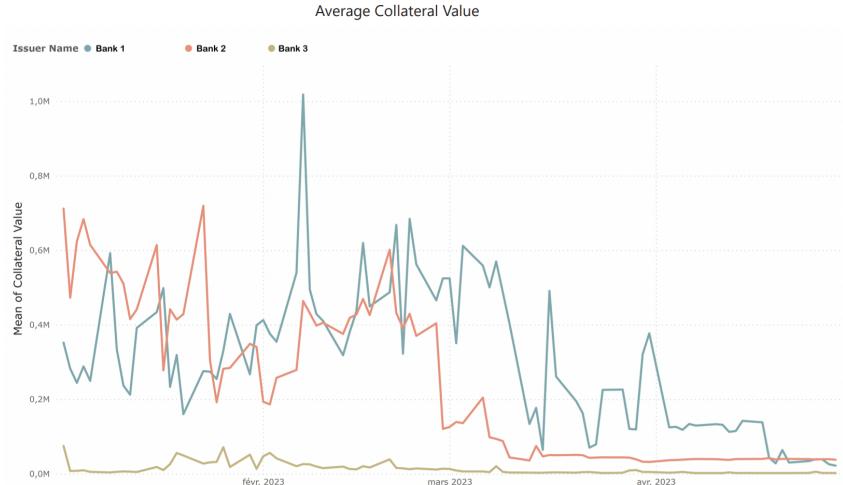
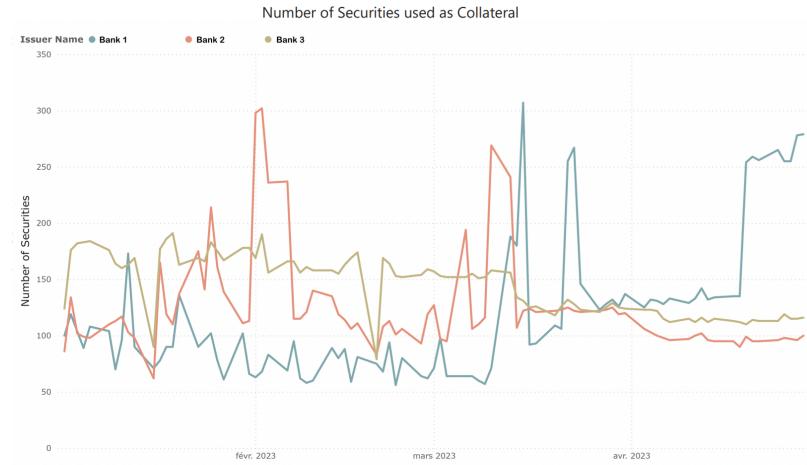
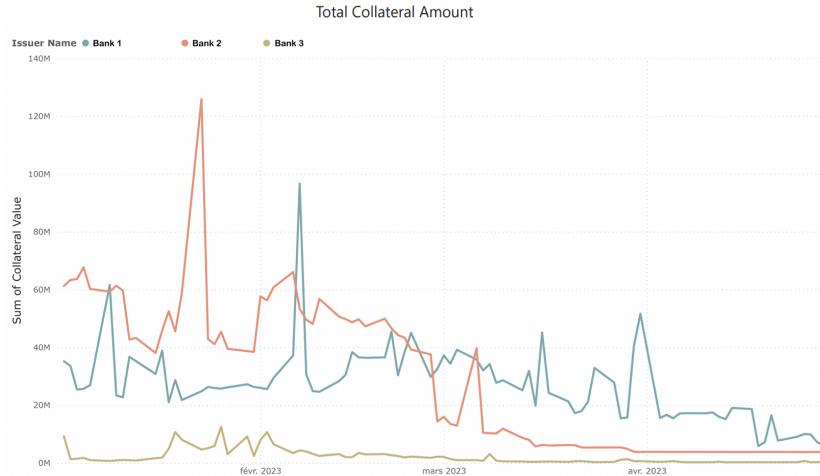
- US banking crisis was a series of bank failures and bankruptcies that occurred in early 2023
- As for the LDI funds crisis, primary objective was to determine indicators that could be used to predict the crisis
- Period: January 2023 - April 2023
- 14 entities under the control of 3 banks
- None of the banks are directly involved in SFTs (available to the CSSF)
- We can only analyse transactions with securities issued by the banks used as collateral

# US Banks crisis

During March, the number of securities used as collateral issued by :

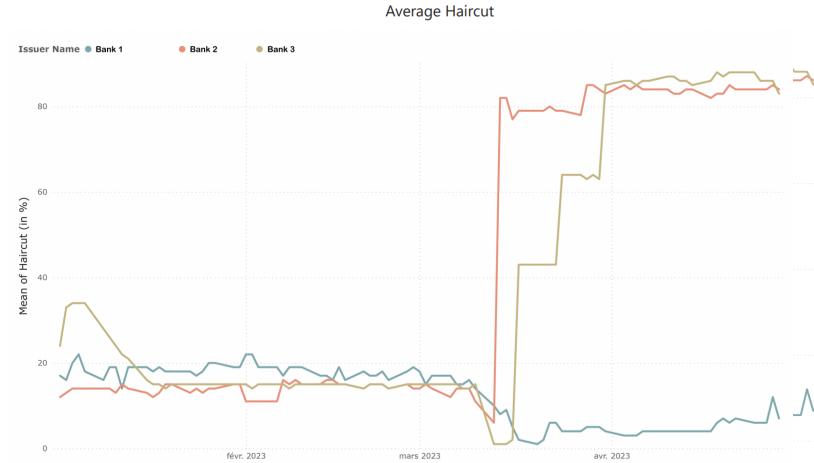
- Bank 1 increases
- Bank 3 decreases
- Bank 2 stabilises

The decrease of the collateral amount rather reflect the decline of the securities price



# Haircut

- Definition: in finance, haircut is used to assess a percentage difference between the market value of an asset and the amount that can be used as collateral
- For Banks 2 and 3, the haircut rises from 20% to over 80% to reflect higher risk of insolvency
- For First Republic Bank, the haircut unexpectedly drops from around 20% to less than 10%



# Conclusion of crisis analysis

- Data quality is sometimes a concern, particularly regarding values denoted as percentages
- Number of indicators falls short of expectations
- Uncertainty if Machine Learning could be applied in this context
- Collateral to loan value ratio and haircut show to be the most relevant indicators of market stress in SFTR data

# Conclusion

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## 5. Conclusion

- The main point at the beginning of the internship - integrating Machine Learning to analyse SFTR data - was dropped due to the lack of indicators
- Data quality issue: empty fields, values denoted as percentage entered the wrong way, negative values that should be positive
- Biggest issue for SFTR data: no way to know the direction of a trade if « GiveOrTake » field for collateral data is empty
- For ESG: still a lot of work possible using SFDR data
- Also minor data quality issues (percentage of revenue over 100%)

# Thank you!



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