

# SupTech Platform for Bills Finance Companies

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Fixed Income Services Department

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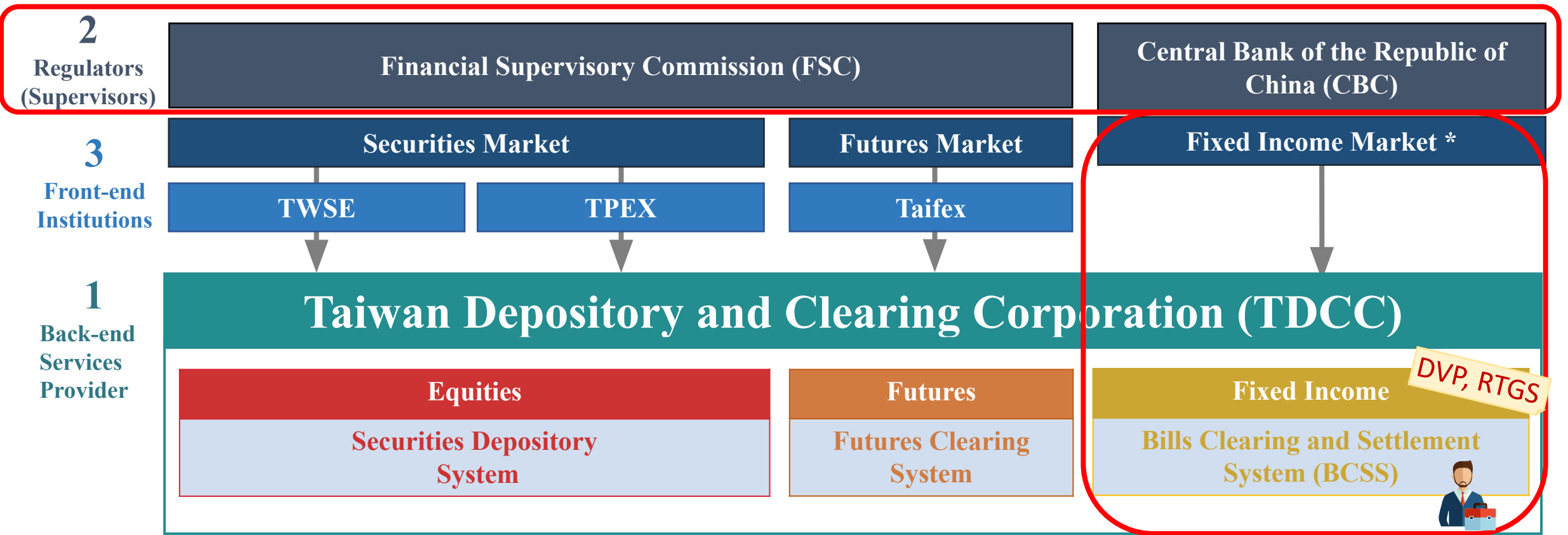
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- **TDCC's Roles in Taiwan's Market**
- **Problems of Past Supervision**
- **SupTech Platform Development Timeline**
- **SupTech Platform Structure**
- **Conclusion**



# TDCC's Roles in Taiwan's Market

TDCC processes DVP and RTGS on Fixed Income Market, thus having abundant data



\* Fixed income includes long-term bonds and short-term bills, with a reminder that long-term bonds must be issued through TPEX and can also be traded Bills Finance Companies on the Securities Depository System.

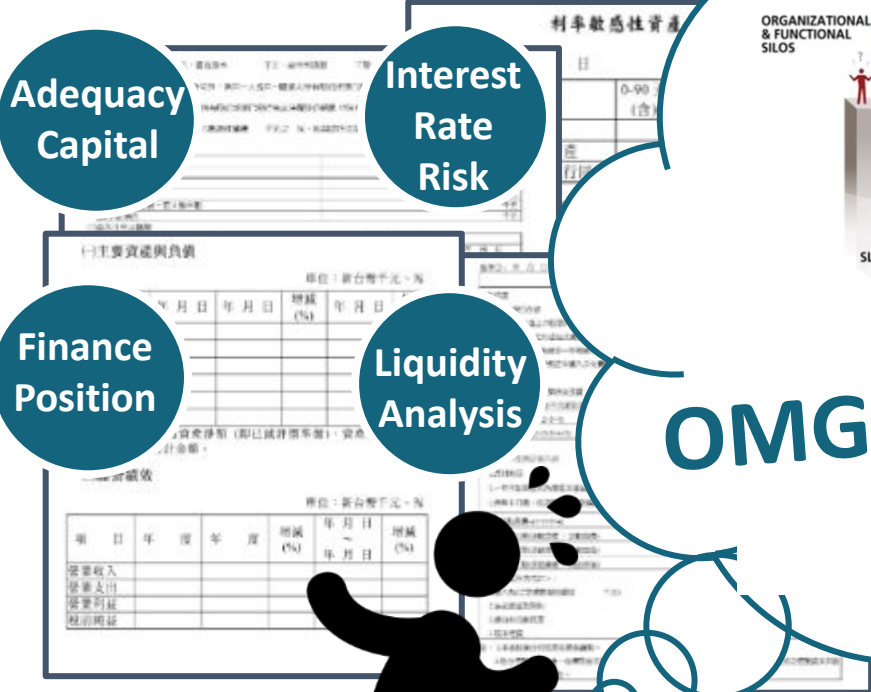
TWSE: Taiwan Stock Exchange, TPEX: Taipei Exchange, Taifex: Taiwan Futures. Exchange

DVP: Delivery versus payment, RTGS: Real-Time Gross Settlement

# Problems of Past Supervision

- 1 Multiple Reporting Channels
- 2 Duplicate Reporting
- 3 Passive Notification
- 4 Post-review
- 5 Static Reports

## Regulated Entities

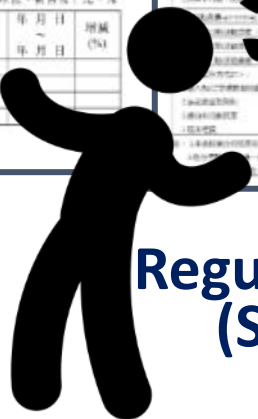


Adequacy Capital

Interest Rate Risk

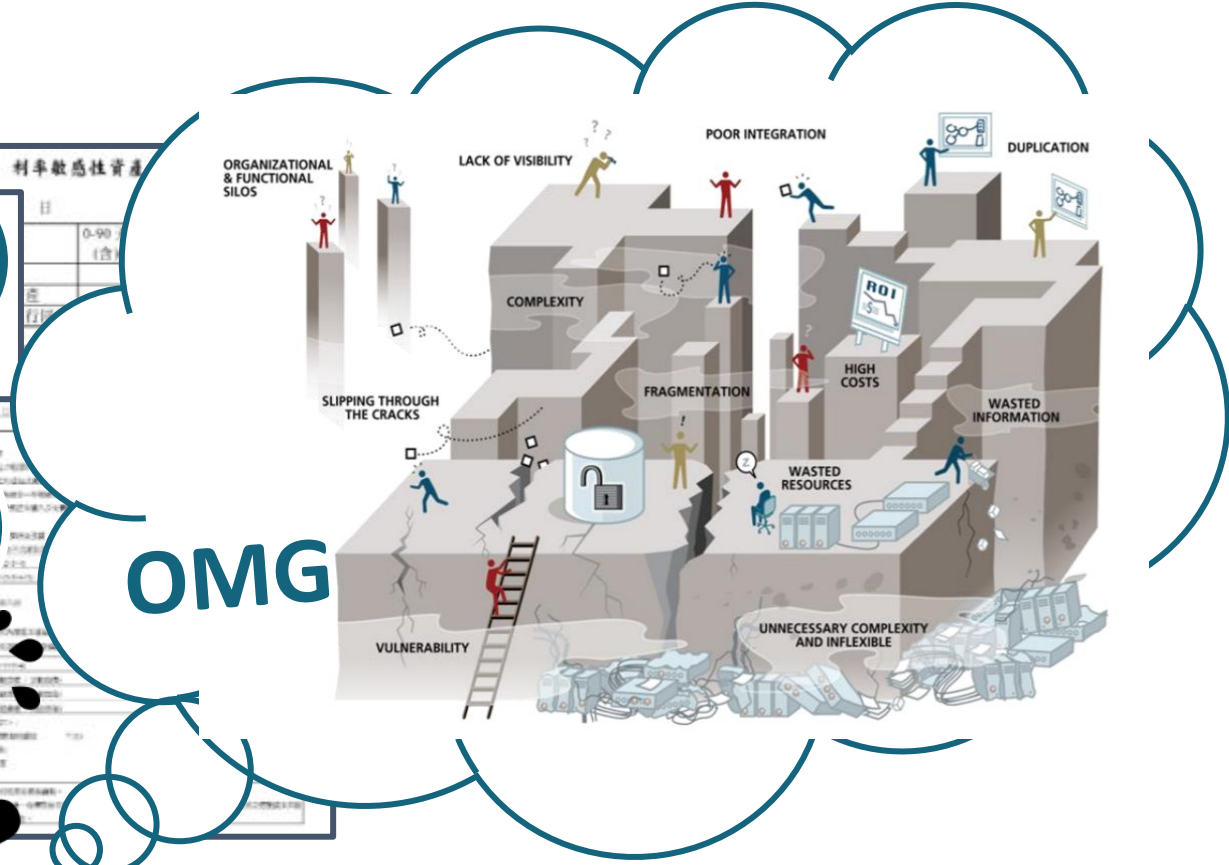
Finance Position

Liquidity Analysis



Regulators (Supervisors)

OMG



# SupTech Platform Development Timeline

2021.06.29



## API DELIVERY & INTEGRATION WITH OTHER DATA SOURCES

TDCC assisted regulators (supervisors) in developing an **API\*-based automatic reporting** approach to collect data from Bills Finance Companies and **integrate** it with **external granular data\*\***.

2021.12



## VISUALIZATION OF DATA ANALYSIS

In addition to providing template-based reports, TDCC also presents the data analysis in **visualized dashboards**.

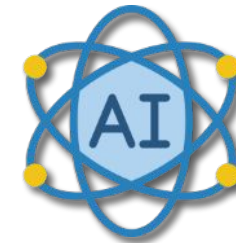
2022.07



## SINGLE-TRACK REPORTING

After one year of **parallelization with the original Reporting System run by FSC**, the original Reporting System has been discontinued and **replaced** by the SupTech Platform.

2022.03 ~ 2023.03



## APPLICATION OF AI TECHNOLOGY

TDCC has implemented AI to assist regulators (supervisors) in more **precise monitoring** of **abnormal situations**.

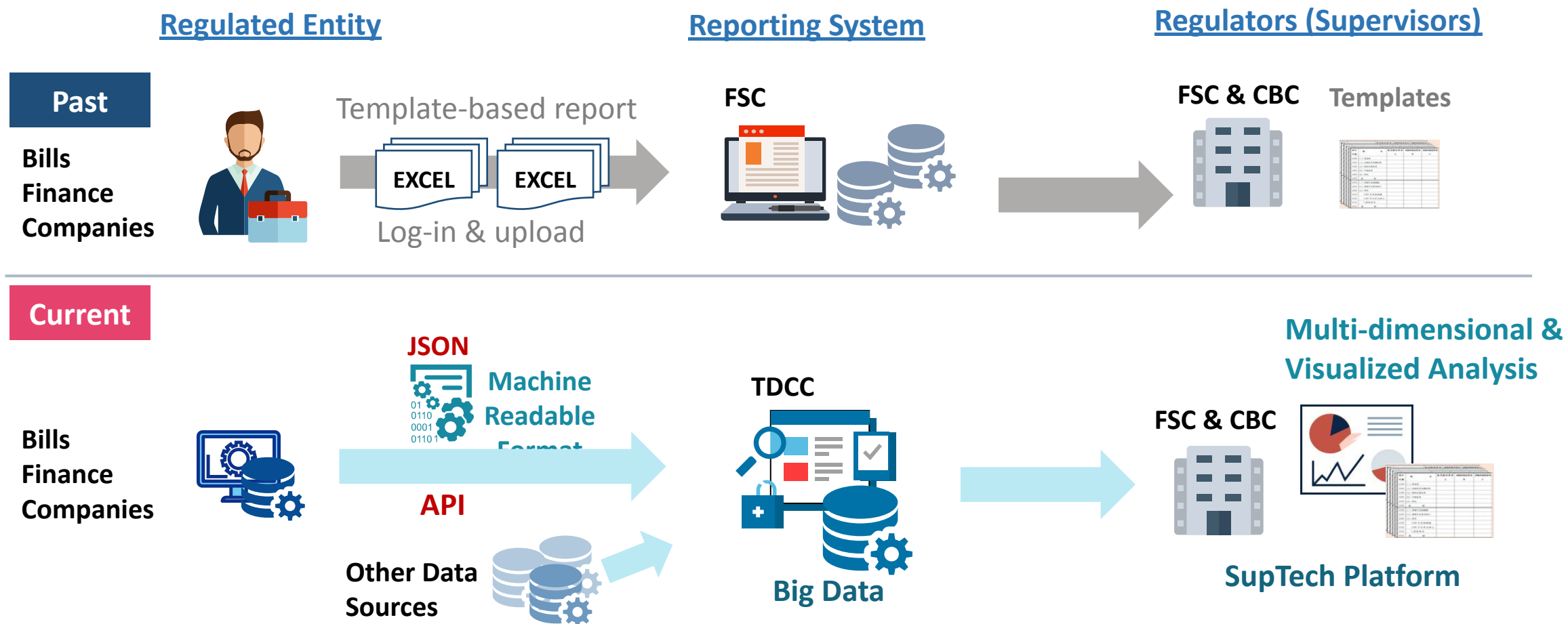
\*API is application programming interface, which means a computing interface that defines the interaction between multiple software intermediaries.

\*\*Granular data is detailed data, or the lowest level that data can be in a target set.

# SupTech Platform Structure

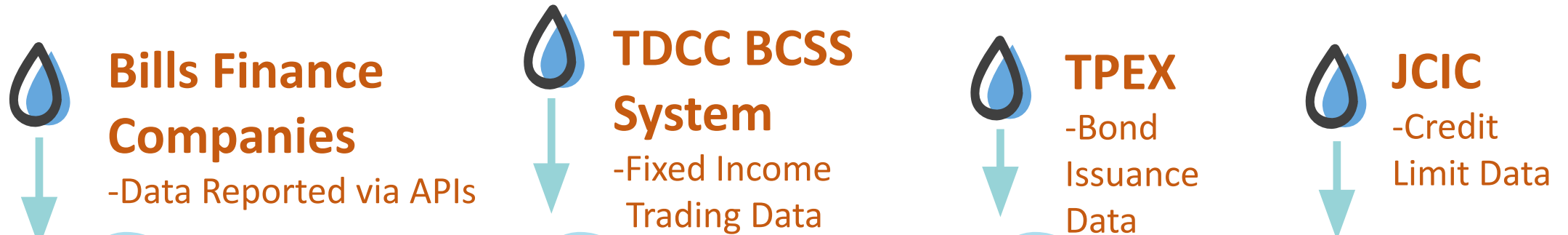
## 1. Reporting Transformation

Granularity, Standardization and Visualization



# SupTech Platform Structure

## 2. Granular Data from Multiple Sources



### TDCC SupTech Platform

Comprehensive Analysis

Targeted Supervision



**I-Reports**



**Dynamic Dashboards**



**Theme-based Models**



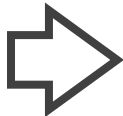
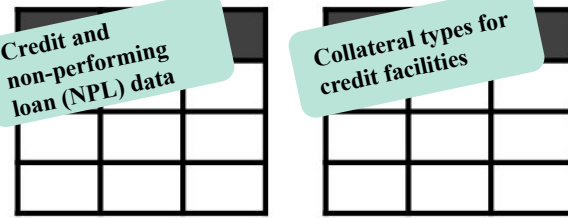
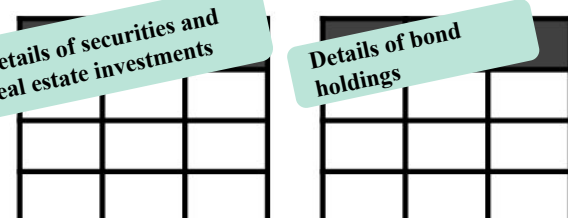
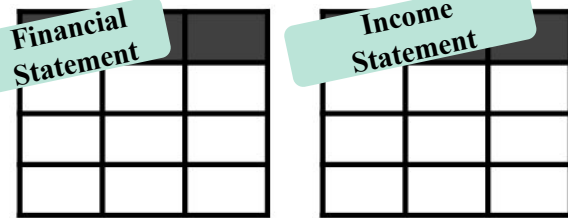
**AI Alerts**



# SupTech Platform Structure

## 3. Data Application - I-Reports, Dynamic Dashboards and Theme-based Models

Data collected from Bills Financial Companies

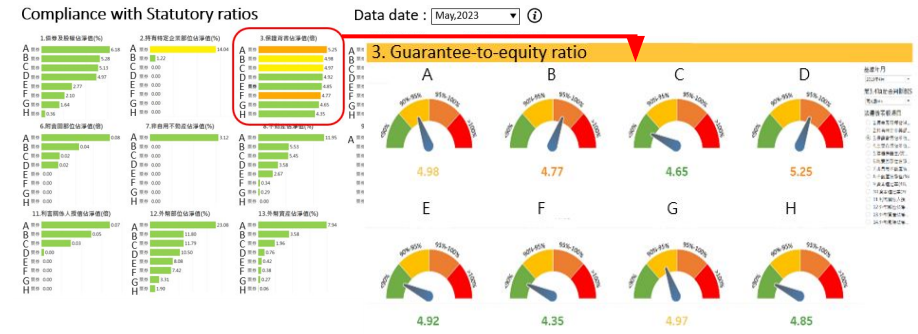


### I-Reports

Allow the regulators (supervisors) to filter fields from different reports and provide flexible selection for generating reports from various perspectives.

### Dynamic Dashboards

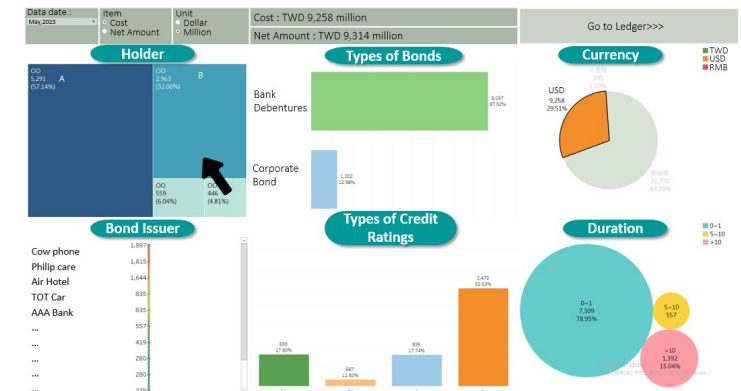
Assist the regulators (supervisors) in identifying potential violations of various statutory ratios through a colorful and visualized dashboard.



### Theme-based Models

Integrate the data collected from Bills Financial Companies with external granular data and provide multi-dimensional theme-based analysis, such as bond risk analysis and credit risk analysis, to assist regulators (supervisors) in examining the status of Bills Financial Companies in bond investments and guarantee services.

#### Bond Risk Analysis

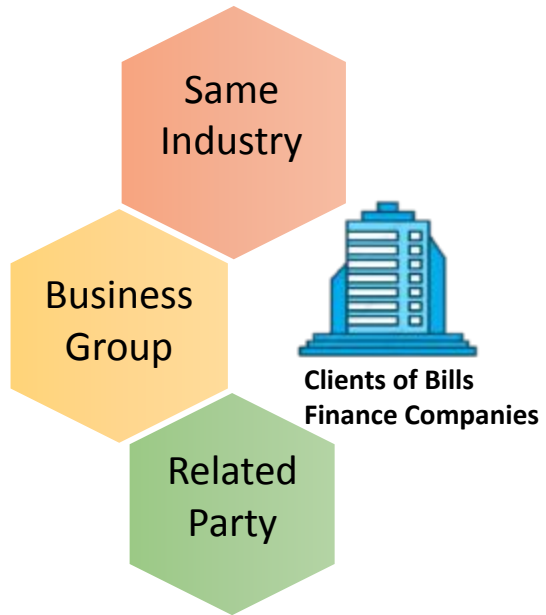




# SupTech Platform Structure

## 3. Data Application - AI Alerts

For example:



A Bills Finance company

AB Finance Group  
A Bank  
B Lease Co.

B Bills Finance company

ABC Group  
A Bank  
B Lease Co.  
C Securities

C Bills Finance company

BC Group  
B Lease Co.  
BB Securities  
C Securities

D Bills Finance company

B Group  
B Lease Co.

Market

ABC Group  
A Bank  
B Lease Co.  
BB Securities  
C Securities

Consolidation of the names of the Business Group and its members

Smart Categorization

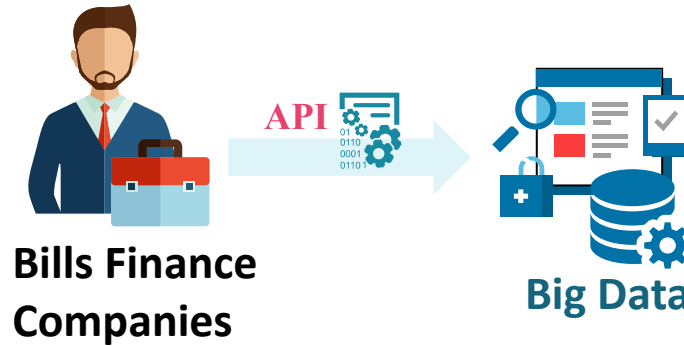
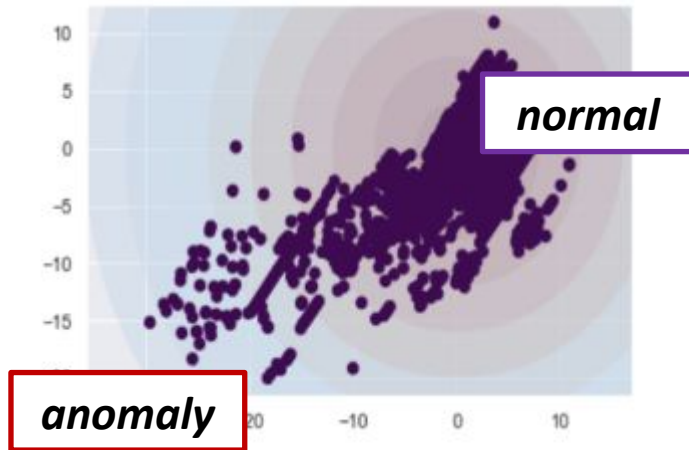
Unsupervised Learning —  
Hierarchical Clustering

Due to the **different classifications** used by Bills Financial Companies for industries, business groups, and related parties of their clients, regulators (supervisors) encountered **challenges** in achieving **market-wide consolidation**.

To address this, the SupTech Platform utilizes hierarchical clustering analysis with decision tree concept to consolidate market data based on the information reported by Bills Finance Companies.

# SupTech Platform Structure

## 3. Data Application - AI Alerts



32,000↑ Items

As of December 2022 (covering a total of four years), including historical data from original system run by FSC.

Report Anomaly Detection

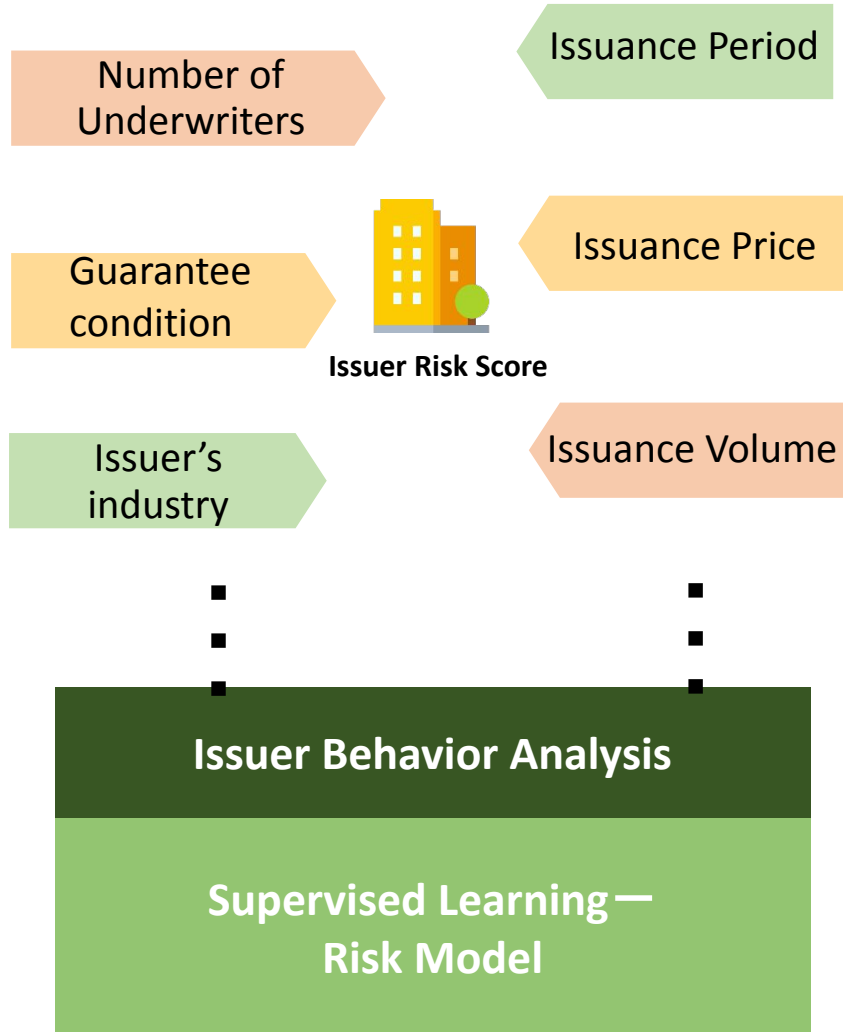
Unsupervised Learning —  
Anomaly Model

The API reporting of Bills Finance Companies was mainly checked and judged by the basic system check and manual intervention.

However, TDCC has developed an **anomaly detection model** for regulators (supervisors) to accurately and comprehensively **identify reporting anomalies**.

# SupTech Platform Structure

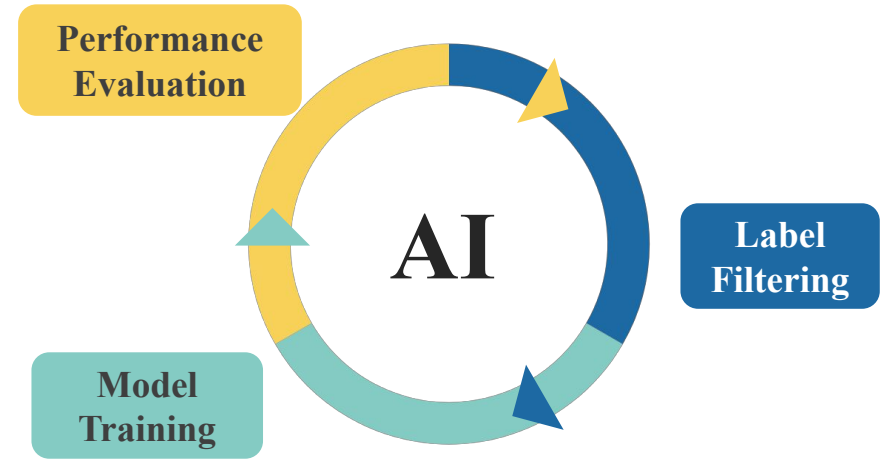
## 3. Data Application - AI Alerts



### 14 Labels

1. Increase in end-of-month balances for two consecutive months
2. In the past three years, there have been evaluations indicating poor liquidity.
3. Is the industry classified as leasing or real estate?

⋮

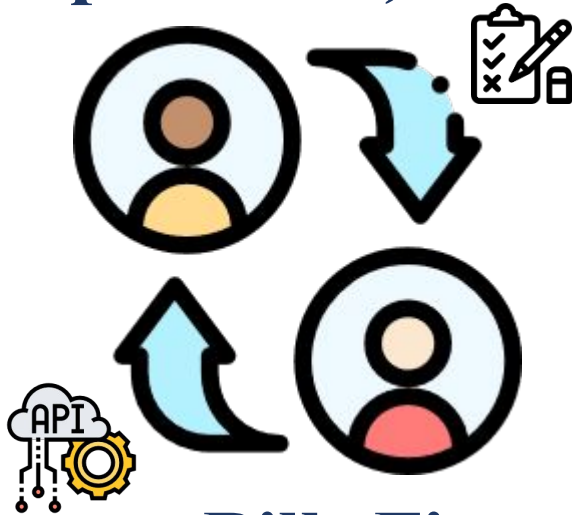


Based on market changes, there may be additions or removals of labels or optimization of the model.

By leveraging **domain knowhow and experiences** to identify **correlations** between variables and issuer risk, supervised learning techniques can be utilized to perform issuer scoring and clustering for similar issuers. This approach aids regulators (supervisors) in **identifying potential underwriting risks** of Bills Finance Companies .

# Conclusion

## Regulators (Supervisors)



**Bills Finance  
Companies**

- 50% of report fields are changed to Granular data combination
  - Reduce duplication of reports and improve data consistency
  - Facilitate data reorganization, exploration and analysis
- AI enables better monitoring of market changes and risks.





**TDCC**

**Innovation. Resilience. Sustainability. Inclusive Financing**

Thank you for listening !

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