SupTech Platform for Bills Finance Companies

Anna Lin
Fixed Income Services Department

21 June, 2023
CONTENTS

• 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.

1. Back-end Services Provider
   - Taiwan Depository and Clearing Corporation (TDCC)
     - Equities: Securities Depository System
     - Futures: Futures Clearing System
     - Fixed Income: Bills Clearing and Settlement System (BCSS)

2. Regulators (Supervisors)
   - Financial Supervisory Commission (FSC)
   - Central Bank of the Republic of China (CBC)

3. Front-end Institutions
   - Securities Market: TWSE, TPEX, Taifex
   - Futures Market: Taifex

* 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 by 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

Source: RegTech Sprint Technology Roundtable
SupTech Platform Development Timeline

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**.

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

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.

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

<table>
<thead>
<tr>
<th>Regulated Entity</th>
<th>Reporting System</th>
<th>Regulators (Supervisors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td>Template-based report</td>
<td>FSC &amp; CBC Templates</td>
</tr>
<tr>
<td>Bills</td>
<td>EXCEL Log-in &amp; upload</td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>JSON Machine Readable Format</td>
<td></td>
</tr>
<tr>
<td>Companies</td>
<td>API Other Data Sources</td>
<td></td>
</tr>
<tr>
<td>SupTech Platform</td>
<td>Big Data</td>
<td>Multi-dimensional &amp; Visualized Analysis</td>
</tr>
</tbody>
</table>

1. Reporting Transformation
Granularity, Standardization and Visualization

Regulated Entity

- Bills
- Finance
- Companies

Reporting System

- Template-based report
- Log-in & upload
- JSON Machine Readable Format
- API Other Data Sources
- Big Data

Regulators (Supervisors)

- FSC & CBC Templates
- Multi-dimensional & Visualized Analysis
- SupTech Platform
SupTech Platform Structure

2. Granular Data from Multiple Sources

- Bills Finance Companies
  - Data Reported via APIs
- TDCC BCSS System
  - Fixed Income Trading Data
- TPEX
  - Bond Issuance Data
- JCIC
  - Credit Limit Data

TDCC SupTech Platform

Comprehensive Analysis

I-Reports
Dynamic Dashboards
Theme-based Models

Targeted Supervision

AI Alerts

TPEX: Taipei Exchange, JCIC: Joint Credit Information Center
3. Data Application - I-Reports, Dynamic Dashboards and Theme-based Models

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.
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.
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.
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)

- 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.

Bills Finance Companies

Source: Deloitte Taiwan
Thank you for listening!

Email: annalin@tdcc.com.tw