

## **Exploration of the Latest Trends in SupTech and RegTech**

### **Abstract**

#### **I. Research Content**

##### **1. Background of SupTech and RegTech**

In the aftermath of the pandemic, the financial markets find themselves in a VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) world—a dynamic environment characterized by volatility, uncertainty, complexity, and ambiguity. In this scenario, financial operations and regulatory oversight face heightened uncertainty, with risk patterns and data becoming more intricate. This dynamic propels the agile development of financial technology (FinTech), necessitating both the financial industry and regulatory authorities to adeptly harness technology. The imperative is to accelerate digital transformation, enhancing operational resilience in the financial sector and facilitating the prudent management of emerging risks by regulatory bodies.

FinTech refers to the integration of traditional financial services by leveraging electronic functionalities and new platform environments. It aims to provide customers with more real-time, convenient, and efficient financial services. The application of technology in the regulatory domain of supervisory authorities is termed Supervisory Technology (SupTech). Simultaneously, the use of technology in the areas of risk management and regulatory compliance in financial institutions is termed Regulatory Technology (RegTech).

##### **2. Application Areas of Supervisory Technology (SupTech) and Regulatory Technology (RegTech)**

As financial technology (FinTech) rapidly evolves, new modes of operation emerge, complicating the control operations of financial supervision and regulatory compliance. Major economies, including those in Europe and the United States, are gradually shifting towards a "risk-oriented" regulatory

approach. They are introducing Supervisory Technology (SupTech) and Regulatory Technology (RegTech), encouraging businesses to use emerging technologies to verify the legality of operations, monitor business activities, ensure compliance with regulations in real-time, and manage and prevent risks associated with new forms of financial technology.

The development of SupTech can be divided into four phases: information technology, information architecture, big data architecture, and big data architecture + AI solutions. It encompasses five application dimensions: data collection, data processing, data storage, data analysis, and visualization.

RegTech focuses on four major development areas: regulatory and supervisory reporting, transaction monitoring, identity recognition and management, and risk management.

### **3. International Financial Regulatory Principles**

Internationally adopted financial regulatory principles include:

- (1) Functional Approach: Regulating similar services provided by entities with similar regulations to balance opportunities and risks.
- (2) Proportionality Principle: Implementing proportionate regulation, allowing new entrants to obtain limited or restricted licenses to promote innovation.
- (3) Technology Neutrality: Applying the same standards to similar services regardless of the technology used, encouraging technological neutrality and flexibility in financial innovation.
- (4) Creating a Fair Competitive Environment: Ensuring all types of entities have equal opportunities, contributing to efficient markets and the provision of better products and services.

(5) Enhancing Cybersecurity and Data Protection: Taking appropriate measures to identify, mitigate, and overcome cyber threats and ensure the protection of personal data.

(6) Coordination and Cooperation Among Regulatory Authorities: Coordinating efforts on consumer protection, anti-money laundering, counter-terrorism financing, cybersecurity, data protection, taxation, and fair competition.

(7) Strengthening International Regulatory Cooperation: Enhancing coordination and cooperation in cross-border regulation, sharing experiences, addressing risks, preventing regulatory arbitrage, and reaching agreements on specific issues related to financial technology.

(8) Innovation-Friendly Mechanisms: Establishing collaboration and research between regulatory authorities and the private sector, promoting financial technology innovation through measures such as regulatory sandboxes and innovation centers.

#### **4. Domestic and International Trends in Regulatory Technology and Compliance Technology**

This study extensively collects and organizes relevant literature on domestic and international regulatory technology (RegTech) and compliance technology (Compliance Tech). It introduces the development processes of important regulatory and compliance technologies in the United Kingdom, Hong Kong, Singapore, mainland China, the United States, the European Union, and Taiwan. Observing the experiences of domestic and international developments in regulatory technology and compliance technology, three main directions emerge:

(1) Transition from "Data Collection" to "Data Analysis" Domain:

- The focus has shifted from merely collecting data to delving into the realm of data analysis.

(2) Shift from "Passive Management" to "Proactive Prevention":

- There is a move from passive management approaches to actively preventing potential issues.

(3) Change from "Reducing Compliance Costs" to "Mitigating Business Risk Losses":

- The emphasis has moved from solely reducing compliance costs to mitigating losses associated with business risks.

In addition, new entrants in the digital financial industry are expected to serve as demonstration areas for emerging applications of regulatory technology and compliance technology.

As technology advances, both domestically and internationally, there are now technologies that meet regulatory compliance standards. These technologies allow financial institutions to establish highly flexible and agile service structures. Concepts such as API ecosystems, hybrid clouds, Hybrid AI, and others provide options for businesses to choose different technology services, combining "cloud + on-premises + innovation + compliance" to accelerate their transformation.

Furthermore, the new directions in international regulatory technology include automation, digitization, and intelligence in regulation. This involves real-time support for regulatory needs through data analysis and warning systems in various scenarios. Future financial demands in different scenarios are expected to break free from current financial service content, presenting more opportunities for customization and ultimately achieving the transfer of value across scenarios. The goal of regulatory technology is to assist regulatory authorities in creating a comprehensive regulatory technology ecosystem where "where the customer is, financial services are, and financial regulation is" seamlessly coexist.

## **5. Overview of Taiwan Depository and Clearing Corporation's Application of Regulatory Technology and Compliance Technology**

Taiwan Depository and Clearing Corporation (TDCC) plays a significant backend role in securities, futures, short-term securities, and other financial markets, handling transaction settlement, delivery, and custody. In the past, it also served as a supporting role in supervision, retrieving core business data as instructed by regulatory authorities for supervisory purposes.

The supportive supervision model of TDCC has gradually evolved into providing a platform for regulatory reporting and inquiries. This allows enterprises to directly submit reports on the platform, which can then be accessed by regulatory authorities. This includes platforms for reporting information on company executives and major shareholders commissioned by the Ministry of Economic Affairs, platforms for anti-money laundering and counter-terrorism financing inquiries, platforms for the declaration of overseas structured products, and platforms for the declaration of domestic and overseas funds.

As these platforms accumulate more data, coupled with TDCC's own services in equity securities, futures, bonds, cross-border custody, funds, and rich market data generated, TDCC initiated the construction of a big data platform in 2017. It actively transformed into a financial big data center, delving into regulatory technology, assuming the role of a data backend, and providing regulatory information to regulatory authorities. This includes supplying the Insurance Bureau and Inspection Bureau with information on foreign investment supervision in the insurance industry and offering regulatory information on the bond market to the Banking Bureau, Inspection Bureau, and the Central Bank.

## **II. Conclusion and Recommendations**

### **1. Development Direction of Regulatory Technology and Compliance Technology in Taiwan**

## **(1) FSC's Fintech Development Roadmap**

According to the Financial Supervisory Commission's (FSC) "Fintech Development Roadmap," the promotion plan is structured into three-year phases, emphasizing collaborative efforts between the public and private sectors. The focus lies on three main aspects: strengthening foundational work, expanding applications, and coordinating cooperation. The roadmap advances through eight key directions, including a single-window communication platform, data sharing, regulatory adaptation, ethical standards, capacity building, digital infrastructure, ecosystem development, international linkages, and regulatory technology.

The future development of regulatory technology and compliance technology is particularly oriented toward "promoting digital supervisory mechanisms" and "organizing regulatory technology hackathons" as two major focal points. This strategic approach aligns with the collaborative and phased vision outlined in the Fintech Development Roadmap, indicating a commitment to advancing regulatory and compliance capabilities in the digital era.

### **a. Advancement of Digital Supervisory Mechanisms**

After the 2008 financial crisis, global financial regulatory authorities, aiming to promote financial stability and mitigate risks, recognized the need for substantial and real-time data for supervisory purposes. Therefore, effective mechanisms for data collection, analysis, and the automation, digitization, and smartification of supervisory operations became imperative for prudent oversight, behavior management, and policy formulation. The Financial Supervisory Commission (FSC) in Taiwan is gradually promoting digital supervisory reporting for online banks (short term), securities firms (medium term), and traditional banks (long term).

In September 2019, the FSC conducted a trial of API automatic reporting with multiple financial institutions, shifting from the current manual login system to an automatic reporting system through a single window connected to the FSC Inspection Bureau. This enhancement streamlines the reporting process, ensures accuracy, and boosts efficiency. Anticipating the opening of online banks, the FSC seized the opportunity to reassess the

current supervisory information reporting system. It plans to introduce regulatory technology, establish a digital supervisory reporting mechanism, and integrate resources from financial peripheral units to create an automated, real-time, and intelligent workflow, thereby enhancing supervisory effectiveness.

In August 2020, the FSC announced the commissioning of Taiwan Depository and Clearing Corporation to establish a "Digital Supervisory Reporting Mechanism for Securities Financial Companies," officially launching the digital supervisory project. This platform aims to facilitate rapid information exchange between securities companies and regulatory authorities, incorporating API-based automatic reporting mechanisms and complementary measures.

#### **b. Organization of Regulatory Technology Hackathon**

The Financial Supervisory Commission, in collaboration with Taiwan Financial Services Roundtable (TFSR) and Taiwan Depository and Clearing Corporation, co-hosted the inaugural "2020 Regulatory Technology Hackathon." Executed in partnership with the FinTech Innovation Base and the Institute for Information Industry, this initiative sought to generate solutions for regulatory technology through a hacker culture. The event invited innovative solutions from technologically mature start-ups, which were then evaluated by experts. The objective was to assist in the adoption of relevant applications by regulatory authorities and financial institutions, showcasing Taiwan's prowess in financial technology innovation.

#### **c. Establishment of a FinTech Collaboration Platform**

To address rapidly evolving domestic and international business models and technologies and to advance regulatory technology, the FSC plans to establish a FinTech collaboration platform. This platform will leverage the expertise and resources of surrounding units to assist the Innovation Center in promoting various aspects of FinTech development, including regulatory technology, capacity building, organizing FinTech awards, selecting international FinTech teams, recruiting FinTech ambassadors, and promoting achievements in FinTech.

#### **d. Evaluation of Proportional Supervision for Digital Financial Services**

In response to the diverse practices in financial supervision by regulatory

authorities, particularly in the European Union, which adopt proportional supervision and differentiated licenses for digital financial service providers, the FSC will assess the feasibility of applying proportional supervision, tiered management, or issuing restrictive licenses based on the intensity of innovation demands. The evaluation will include setting different financial qualifications, business scopes, personnel qualification conditions, information security, and system requirements for digital financial service providers with varying impacts on the market.

**e. Enhancing the Efficiency of Regulatory Sandboxes**

Having operated for over two years, regulatory sandboxes have accumulated valuable experience. The FSC plans to create guidelines or a quick guide for regulatory sandboxes, disseminating this guidance to related non-financial institutions to reduce their exploration or communication time. Through outreach and coordination with relevant units, the FSC aims to expedite the application process for sandbox cases.

**f. Development of a Learning Map for Regulatory Personnel in FinTech**

To help regulatory personnel understand FinTech, the trends in the development of new business models, potential risks arising from transformations, consumer protection, and the impact on overall market prudential supervision, the FSC will consider developing a learning map for regulatory personnel in FinTech. The map will cover FinTech activities, empowering technologies, and supervisory measures. Additionally, the FSC will organize training courses on FinTech capabilities, encouraging regulatory personnel to complete the learning map. This initiative aims to align supervision with market practices and ensure a comprehensive approach to stable and sustainable market development.

**(2) Financial Supervisory Commission's Capital Market Roadmap Implementation**

The Financial Supervisory Commission (FSC) has outlined a three-year blueprint with five major strategies and 25 key initiatives. After collaborative discussions with entities such as the Taiwan Stock Exchange and Taiwan Depository and Clearing Corporation, the FSC officially initiated the implementation of 82 concrete measures and a schedule for the Capital

Market Blueprint on December 8, 2020. The section related to the promotion of regulatory technology and compliance technology is outlined below:

**a. Enhancing Supervisory Efficiency of Listed Companies using Regulatory Technology**

The Taiwan Stock Exchange and the TPEX plan to utilize new technologies such as process automation and big data in supervisory operations for listed companies. This aims to reduce manual tasks, improve the efficiency of routine management, collect cases related to illegal or abnormal transactions, and employ big data analysis to understand patterns and indicators of abnormal transactions. The findings will be used to review and amend relevant supervisory and monitoring measures for listed companies. Additionally, the plan involves exploring the adoption of technologies like Natural Language Processing (NLP) to collect and analyze information from non-structured sources like social media, enhancing real-time supervision and transaction-related monitoring of listed companies.

**b. Strengthening Oversight of Investment Trust and Advisory Businesses through Technology**

The Taiwan Depository and Clearing Corporation will establish a monitoring information platform for investment trust funds investing in bonds. This platform aims to capture the distribution of investment in domestic and foreign bonds by all investment trust funds. The Investment Trust & Consulting Association will use data analysis to study fund expenses, performance, sales behavior through channels, and propose policy recommendations to enhance the protection of investor rights.

**c. Enhancing Real-Time Monitoring Mechanisms for Securities Firms Issuing Financial Products**

The Taiwan Stock Exchange and the TPEX Securities Market plan to promote the enhancement of the overall risk management mechanisms of securities firms. This includes strengthening risk control measures, monitoring profit and loss limits, and conducting stress testing for risks associated with the issuance of financial products by securities firms. The plan also involves conducting ongoing risk management evaluations of securities firms to enhance the effectiveness of risk management assessments.

#### **d. Establishing a Futures Market Supervisory Information Collection Platform using Regulatory Technology**

The Taiwan Futures Exchange plans to use regulatory technology to collect data on changes in the trading and settlement systems of major futures exchanges (such as CME). This includes incorporating sentiment analysis technology based on business needs to establish mechanisms for collecting information from domestic and international futures markets, regulatory reports, and information sharing.

#### **e. Supervising Taiwan Depository and Clearing Corporation's Implementation of Digital Supervision Mechanisms for Securities and Futures Markets**

Taiwan Depository and Clearing Corporation will study the requirements for automating, digitizing, and smartifying the supervision of the securities and futures markets. Following a review of international practices and assessing technological feasibility, a phased approach will be devised for the implementation of digital supervisory mechanisms.

### **2. Recommendations for Regulatory Technology and Compliance Technology in Taiwan**

In response to the regulatory technology planning of the supervisory authority, the Taiwan Depository and Clearing Corporation (TDCC) has proposed several suggestions to assist in regulatory supervision. These suggestions are outlined as follows:

#### **(1) Integration of Granular Data from Securities and Futures Peripheral Units**

As financial institutions evolve their business models in response to fintech developments, regulatory and compliance control operations face increasing complexity. Current periodic reporting, such as monthly, quarterly, and annual statistical reports, is gradually becoming inadequate in keeping up with the pace of fintech advancement. Regulatory authorities worldwide are actively considering how to incorporate regulatory technology into daily supervision operations. This involves using more granular and high-frequency data and new data analysis methods to enhance supervisory efficiency. Effective integration of resources from securities and futures peripheral units, coupled with the use of regulatory

technology, can provide real-time responses to the supervisory authority's reporting needs. This approach involves collecting granular data on a transaction-by-transaction basis and employing consistent calculation formulas. It allows for real-time exploration and analysis of supervisory data across the entire market or specific entities, providing more accurate, comprehensive, and real-time data. Additionally, the introduction of Business Intelligence (BI) tools for visual analytics can enhance supervisory efficiency and reduce reporting costs for financial institutions.

### **(2) Application of Machine-Readable Formats for Regulatory Compliance**

The realization of regulatory technology not only impacts financial regulatory rules but also regulations related to personal data or privacy protection. Given the unpredictable impact of new financial products on the market, regulations for financial consumers may also be affected. Therefore, regulatory authorities need to reconsider what data can be captured by supervisory and financial institutions, whether there should be permission distinctions for different data, the scope of use for such data, and the responsibilities in case of privacy or business confidentiality infringements. The Financial Conduct Authority (FCA) in the UK is currently considering the creation of Machine-Readable Rules (MRR) and Machine-Executable Rules (MER). These rules use natural language processing to convert rule content into machine-readable formats, improving consistency in the use of legal terms, facilitating regulatory compliance, and helping narrow the gap between regulatory content and legal interpretation. However, due to the complexity and variability of Chinese, especially in legal contexts, achieving consistency in terminology across various regulations requires careful consideration before structuring.

### **(3) Application of AI Deep Learning**

Some financial institutions are exploring the use of AI deep learning for intelligent compliance requirement recognition and risk analysis. This involves creating dedicated compliance databases and knowledge graphs. When new external regulations emerge, AI models can automatically infer corresponding internal regulations and responsible units, providing recommendations to compliance personnel and continuously updating the

models. This approach aims to shorten the operational time for interpreting and analyzing regulations. Regulatory technology can also be applied to cross-industry risk comparisons, such as financial holding companies collaborating with asset management companies to build asset-liability risk management systems. Algorithms can simulate economic value scenarios and predict future account values, avoiding potential risks and optimizing strategies. Financial institutions can utilize AI technologies to automate customer reviews and identification for various customer types, account types, customer backgrounds, industry types, nationalities, etc. This can include automated identification of potential money laundering and terrorism financing risks, enhancing customer review and identification processes. AI can comprehensively analyze dynamic data such as people flow, cash flow, customer movement, location, and spending habits to identify and immediately detect suspicious transaction patterns and modes, improving the accuracy of identifying suspicious transactions. AI is also valuable in compliance and anti-money laundering scenarios, such as managing changes in regulations and penalties. It can automatically collect information from various websites through automated techniques, integrate, compare, and analyze internal operations, regulations, or processes within the company, and propose corrective suggestions. It can also monitor the daily operational data of various units, issue alerts, or make predictions, allowing compliance personnel to save time and related costs.

#### **(4) Application of Robotic Process Automation (RPA) for Automated Audits**

Financial institutions can leverage Robotic Process Automation (RPA) for process automation, integrating data from different systems and automating repetitive operational processes. For example, in anti-money laundering, the introduction of RPA can confirm whether a customer is a sanctioned entity, whether their nationality or primary place of business is in a high-risk money laundering country, whether they are a significant foreign political figure, and whether there is negative news about them. This can save manpower and enhance the ability to prevent money laundering. In terms of automated audits, auditing tasks with high repetition and customizable automated checking rules can be handed over to RPA for real-time and continuous

monitoring, allowing more resources to be allocated to internal control analysis, assessment, and recommendations for high-risk areas.