SupTech application in regulatory statistics and risk monitoring

China Banking and Insurance Regulatory Commission
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Part I

General introduction of SupTech practices in CBIRC
I. General introduction of SupTech practices in CBIRC

Growing Chinese banking industry

Total Asset of Banking Industry (2003-2018)

Total Legal Entities of Banking Industry

- Commercial banks, 1657
- Policy banks & CDB, 3
- Other rural financial institutions, 2486
- Other banking institutions, 463

Trillion

I. General introduction of SupTech practices in CBIRC

'SupTech' is not something new...

Rapid growing applications in recent years
  ➢ enhance efficiency and effectiveness
  ➢ increase modelling options and capability
  ➢ moving to forward-looking risk analysis
  ➢ highly embedded into supervisory process
  ➢ ......
I. General introduction of SupTech practices in CBIRC

Main risk monitoring systems

- Examination and Analysis System Technology
- Credit Exposure Analysis System
- Risk Early Analysis Supporting System
- Off-site Surveillance System

Example
I. General introduction of SupTech practices in CBIRC

CBIRC supervision procedures

- Making supervisory plan
- Daily supervision analysis
- Periodic risk evaluation
- On-site Examination
- Following-up supervision
- Regulatory rating

Risk Monitoring Systems

- Policy research
- Regulatory rule making
- Information disclosure
Part II

Main risk monitoring systems
II. Main risk monitoring systems

Off-site Surveillance System

Core financial data
- asset and liability
- profit and loss
- capital adequacy
- credit risk
- liquidity risk
- .......

Business operation data
- wealth management
- security investments
- credit cards
- loan transfer
- off balance sheet businesses
- .......

Development data
- inclusive finance
- SME loans
- affordable housing loans
- key industries
- agriculture loans
- .......

Institution specific data
- policy banks
- trust companies
- asset management companies
- TLACs
- .......

Fundamental financial data and core risk indicators
Key business types and products
Economy development supporting
Specific data for typical FI types
II. Main risk monitoring systems

Off-site Surveillance System

Data collection
- Financial Institutions
- Upload reporting templates to data collection front

Data validation
- Chief supervisors
- Automatic and manual validation

OSS
- Statistics department
- Data aggregation and analysis

Department data platforms
- Statistics department
- Policy bank department
- Large bank department
- City commercial bank department
- Rural bank department
- Non-bank FI department
- ......
II. Main risk monitoring systems

Off-site surveillance system

Traffic lights display
II. Main risk monitoring systems

Risk Early Analysis Supporting System

- **Indicator analysis**
  - time series
  - cross sectional
  - peer group analysis

- **Institution vulnerability**
  - short term risk warning
  - medium-to-long term risk warning

- **Systematic risk**
  - specific risk type warning
  - regional risk warning
II. Main risk monitoring systems

Risk Early Analysis Supporting System

- Individual bank risk
- Overall risk analysis
- Short term warning
- Medium-to-long term warning
- Specific risk analysis
- Regional risk analysis
- Systemic risk
- Composite index
- Risk dimension
- Indicator selection
- Warning threshold
- Risk dimension
- Short term warning
- Medium-to-long term warning
II. Main risk monitoring systems

Risk Early Analysis Supporting System

Indicator selection

- **Fragility indicators**
  - capital adequacy
  - asset quality
  - profitability
  - liquidity risk
  - market risk

- **Leading indicators**
  - business expansion risk
  - credit risk
  - liquidity risk
  - Profitability
  - market risk
  - consolidation risk
II. Main risk monitoring systems

Risk Early Analysis Supporting System

Distribution analysis for major indicators

<table>
<thead>
<tr>
<th>Indicator 1</th>
<th>Indicator 2</th>
<th>Indicator 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
<td><img src="image3.png" alt="Graph" /></td>
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</table>

<table>
<thead>
<tr>
<th>Indicator 4</th>
<th>Indicator 5</th>
<th>Indicator 6</th>
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<td><img src="image4.png" alt="Graph" /></td>
<td><img src="image5.png" alt="Graph" /></td>
<td><img src="image6.png" alt="Graph" /></td>
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## II. Main risk monitoring systems

### Risk Early Analysis Supporting System

#### Composite index

<table>
<thead>
<tr>
<th></th>
<th>Short term</th>
<th>Medium-to-long term</th>
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</thead>
<tbody>
<tr>
<td>Percentile ranking</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Diffusion index</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Composite index</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Distance to downgrading index</td>
<td>√</td>
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II. Main risk monitoring systems

Risk Early Analysis Supporting System

Specific risk analysis

Scan the whole database and identify institutions with certain risk feature, e.g. institutions with fast growing business and a funding structure highly dependent on non-core liabilities.

<table>
<thead>
<tr>
<th>Fragile growth indicators</th>
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<tbody>
<tr>
<td>Risk dimension</td>
</tr>
<tr>
<td>Expansion speed</td>
</tr>
<tr>
<td>Asset growth rate</td>
</tr>
<tr>
<td>Deposit growth rate</td>
</tr>
<tr>
<td>Degree of dependency on interbank market liability</td>
</tr>
<tr>
<td>Equity capital growth rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific risk analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive growth</td>
</tr>
<tr>
<td>Credit concentration</td>
</tr>
<tr>
<td>Real estate exposure</td>
</tr>
<tr>
<td>Liquidity risk</td>
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<td>Solvency risk</td>
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<tr>
<td>......</td>
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</tbody>
</table>
II. Main risk monitoring systems

Risk Early Analysis Supporting System

Chief Supervisor

Email notice

Necessary amendments

Other information

Risk warning list

Extended analysis

Feedback report

Supervision action

Off-site surveillance system

Information flow supported by REASS
II. Main risk monitoring systems

Credit Exposure Analysis System

- Wholesale customers
  - counterparty level information: corporates, FIs
    - registration information, financial data, shareholder, senior management, related entities, beneficial controlling owner etc
    - warning signals and special events
  - Transactional level data: On- and off-balance sheet
    - credit limits, loan trasaction data, investment details, off balance sheet transactions, transactions with other financial institutions etc
    - gurantee data, collateral data

- Retail customers
  - default information
II. Main risk monitoring systems

Credit Exposure Analysis System

- Borrowers with credit exposures in multiple banks
- Corporate group structure and Guarantee net
II. Main risk monitoring systems

Examination and Analysis System Technology

Data standardization process

Bank A

Model 1

Result

Bank B

Model 2

Result

Bank C

Model 3

Result

Bank A

Bank B

Bank C

Standardization protocol

General model

Result

Result

Result
II. Main risk monitoring systems

Examination and Analysis System Technology

- Transaction info
- Accounting info
- Management info
  - public info
  - customer info
  - counterparty info
  - credit card info
  - loan management info etc

Business

Diagram illustrating the integration of various information systems for risk monitoring.
II. Main risk monitoring systems

Examination and Analysis System Technology

- Trend analysis to detect suspicious cases
- Examiners design their own models for specific purposes

Accounting item analysis
Model analysis
Part III

Challenges and next step consideration
III. Challenges and next step consideration

Challenges
- Computational and storage capacity constraints
- Finding the right talents
- Buy-in and used by supervision units

Next step consideration
- Cross-system validation and interconnection
- Merge systems for both banking and insurance industry
- High frequency market information
Thank you!

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