Charting the Future: How Digital, Intelligent & Green Tech are Reshaping Chinese Banking

Chen Sichong
School of Finance, Zhongnan University of Economics and Law
July 8th, 2025

Instructor's CV

- **Chen Sichong**, Professor, School of Finance, Zhongnan University of Economics and Law; Director of the Finance Department; Executive Head, Virtual Teaching and Research Section for Banking Management Courses of Ministry of Education of China; Executive Director, ESG Research Institute.

- Ph.D. in Finance; Assistant Professor, Graduate School of Commerce and Management, Hitotsubashi University; Visiting Professor, Warrington College of Business, University of Florida; Deputy General Manager of the Personal Credit and Housing Finance Department, China Construction Bank (Hubei).

- Current Research Focus: Banking and financial markets, emerging risk management in International Finance.

陈 思翀（Chen Sichong）

· Email: sichongchen@zuel.edu.cn
· Homepage: https://finance.zuel.edu.cn/2020/0804/c2003a248224/page.htm

数字技术与
现代银行业导论

AN INTRODUCTION TO
DIGITAL TECHNOLOGY
AND MODERN BANKING

本书具有以下特点：

◎ **全面系统**。对现代银行业经营中数字技术的底层逻辑及其应用场景进行了系统梳理。不仅阐述了数字技术的原理、特性及其应用，还从经济学理论角度揭示出数字技术如何重塑银行业的规模经济和范围经济。此外，书中探讨了数字技术在银行业务的多个关键领域—包括营销、授信和风控等—的全过程应用，并提供了丰富的银行数字化转型实践案例。

◎ **紧跟实践变革**。银行数字化转型中，“人”尤为重要。本书紧跟大数据＋人工智能等数字技术给现代银行业带来的深刻变革，聚焦商业银行数字化经营中复合型人才的培育，旨在培养学生根据银行数字化经营的业务场景，匹配和应用“数字素养”。

◎ **理论与实践并重**。几位作者深耕相关学术领域多年，其深厚的研究功底为分析提供了坚实的理论支撑。同时，他们都具有国有大行的挂职工作经历，并多次开展银行内部培训，对现代银行业数字化经营场景进行了深入的观察和思考，确保本书内容与银行业实践紧密结合。

上架建议：数字金融

定价：　.00 元

数字技术与现代银行业导论

陈思翀　白小滢　董志华　主编

北京大学出版社
PEKING UNIVERSITY PRESS

数字中国 · 数字经济创新规划教材

AN INTRODUCTION TO
DIGITAL TECHNOLOGY
AND MODERN BANKING

数字技术与现代银行业导论

陈思翀　白小滢　董志华　主编

北京大学出版社
PEKING UNIVERSITY PRESS

作者简介

陈思翀，男，中南财经政法大学金融学院教授、博士生导师、文澜青年学者，日本一桥大学商学金融博士；曾任日本一桥大学商学院讲师、美国佛罗里达大学惠灵顿商学院访问教授，挂职中国建设银行湖北省分行住房金融与个人信贷部副总经理；主持多项国家自然科学基金、教育部及国际合作研究项目；研究成果发表于国内外权威期刊；出版两部专著、一部译著；获湖北省社会科学优秀成果奖等荣誉。

白小滢，女，经济学博士，中南财经政法大学金融学院副教授，曾任美国圣路易斯华盛顿大学访问学者。曾挂职中国建设银行湖北省分行公司业务部副总经理，兼任国家电网、中交集团、中铁建集团等多家央企国企的财务咨询顾问，主持国家自然科学基金、国家社会科学基金、教育部人文社科基金等。出版专著２部，研究成果发表于国内权威期刊，获得财政部一等奖、国企创新二等奖等荣誉。

董志华，男，中南财经政法大学金融学院副教授，硕士生导师，路易斯安那大学拉斐特分校数学专业博士；曾就职于美国知名咨询公司任商业数据分析师，挂职于中国建设银行湖北省分行任金融科技部副总经理；主持或参与多项国家级与省部级研究项目，发表多篇论文；曾获全国青教赛二等奖、湖北省青教赛一等奖，湖北省青年教学能手等荣誉。

An Introduction to Digital Technology and Mordern Banking

1. Comprehensive and Systematic Analysis

It systematically examines the underlying logic, technical principles and application scenarios of digital technologies in modern banking.

It reveals how digitalization reshapes banking economies of scale and scope from an economic theory perspective.

2. Multi-Domain Coverage

Covers digital applications in core banking functions (marketing, credit granting, risk control) with real-world cases.

Explores innovative practices in rural revitalization, ESG, green/low-carbon development, and modernizing social governance.

3. Focus on Human-Centric Transformation

Addresses profound impacts of digital technologies (e.g., big data + AI) on banking.

Emphasizing cultivation of interdisciplinary talent to trains students to apply digital literacy within business contexts of bank digitalization.

4. High Practical Utility

Serves as both an accessible textbook for university economics and finance programs and an essential training reference resource for banking professionals navigating digital transformation.

ESP

气候变化
与可持续发展银行
CLIMATE CHANGE AND
SUSTAINABLE BANKING

气候变化与可持续发展银行

Scan it to buy
in JD.COM

京东

长按或扫描查看

封面设计：陈宇琼

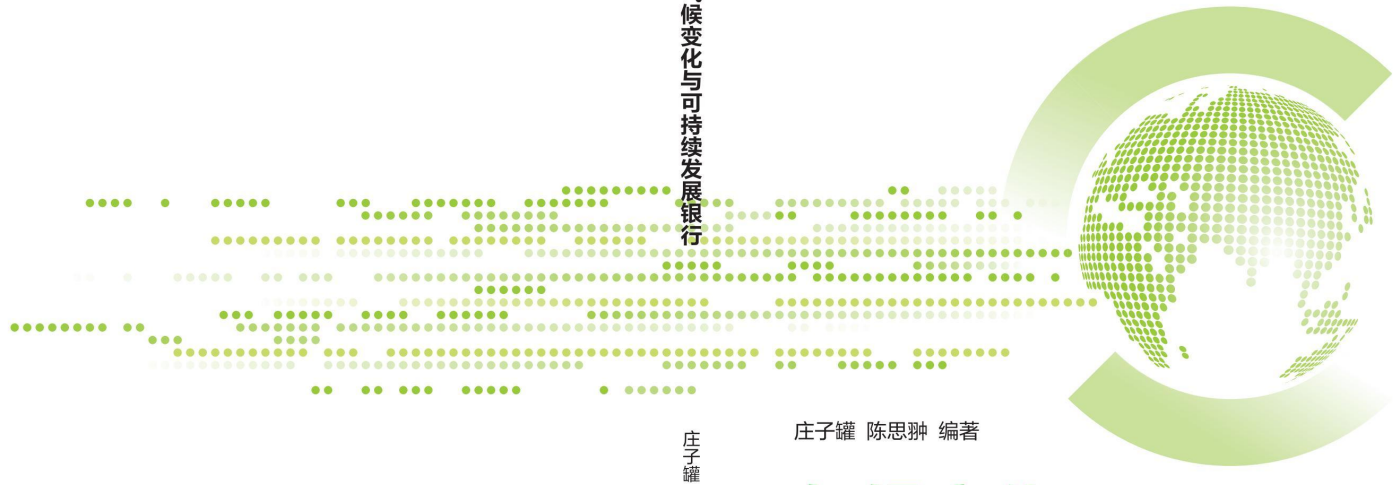
ISBN 978-7-5218-4154-1
定价：52.00元

气候变化与可持续发展银行

庄子罐 陈思翀 编著

ISBN 978-7-5218-4154-1

碳金融和碳交易系列丛书



庄子罐 陈思翀 编著

气候变化
与可持续发展银行

CLIMATE CHANGE AND
SUSTAINABLE BANKING

中国财经出版传媒集团
经济科学出版社
Economic Science Press

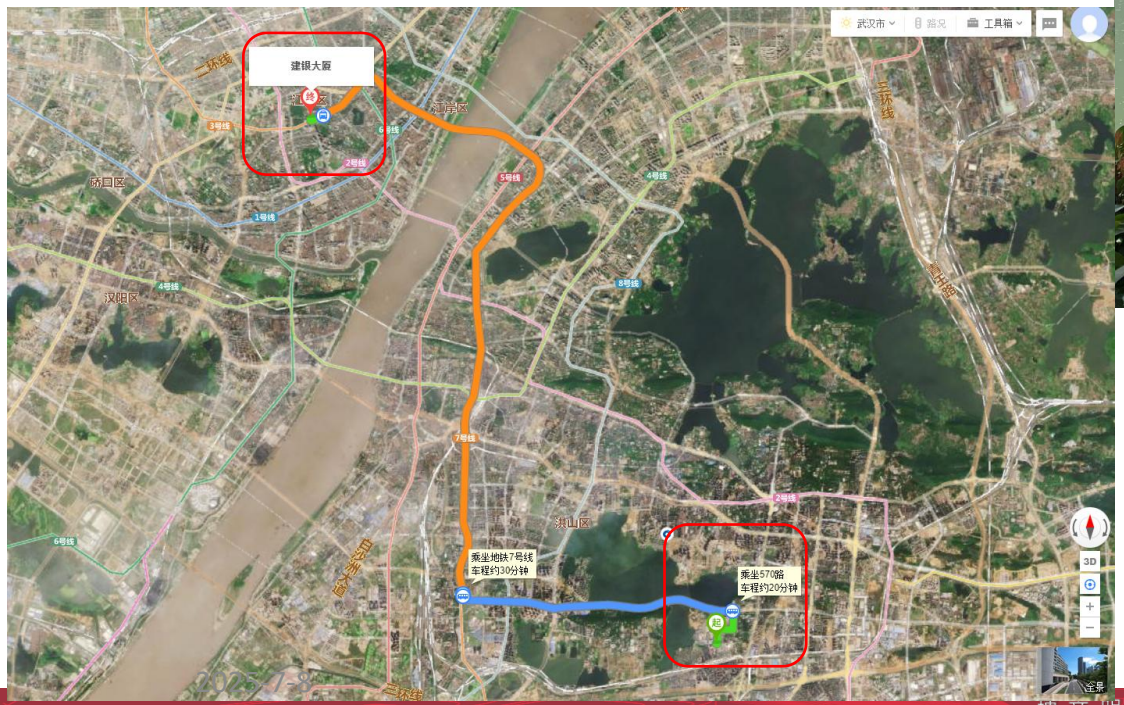
庄子罐

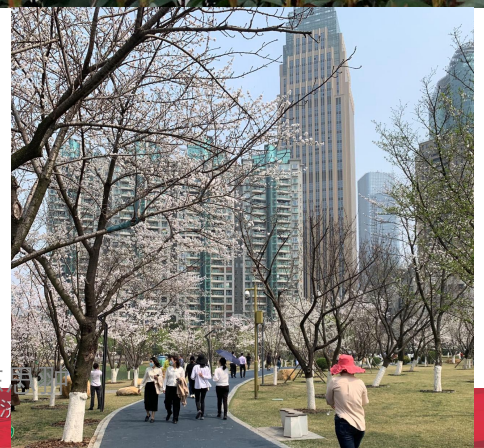
中南财经政法大学金融学院教授、博士生导师，中南财经政法大学碳交易与碳金融研究中心主任；武汉大学金融学博士、北京大学博士后；主持国家社科基金、国家自然科学基金、教育部人文社科基金等项目，参与国家社会科学基金重大项目和教育部哲学社会科学研究重大课题攻关项目。在宏观经济政策、碳市场与碳金融、低碳转型与绿色发展等领域积累了丰富的学术研究、政策咨询和项目研究经验。

陈思翀

中南财经政法大学金融学院教授，博士生导师，中南财经政法大学碳交易与碳金融研究中心副主任；日本一桥大学商学金融博士；曾任日本一桥大学商学院讲师、美国佛罗里达大学惠灵顿商学院访问教授；挂职中国建设银行湖北省分行住房金融与个人信贷部副总经理；主要研究领域为国际金融、资产定价、金融机构、金融领域的政治经济学以及碳金融。主持国家自然科学基金、国际合作科研基金、教育部留学回国基金等项目；主要成果发表于中英文权威期刊以及《财经》、《经济日报》、《证券日报》等大众传媒

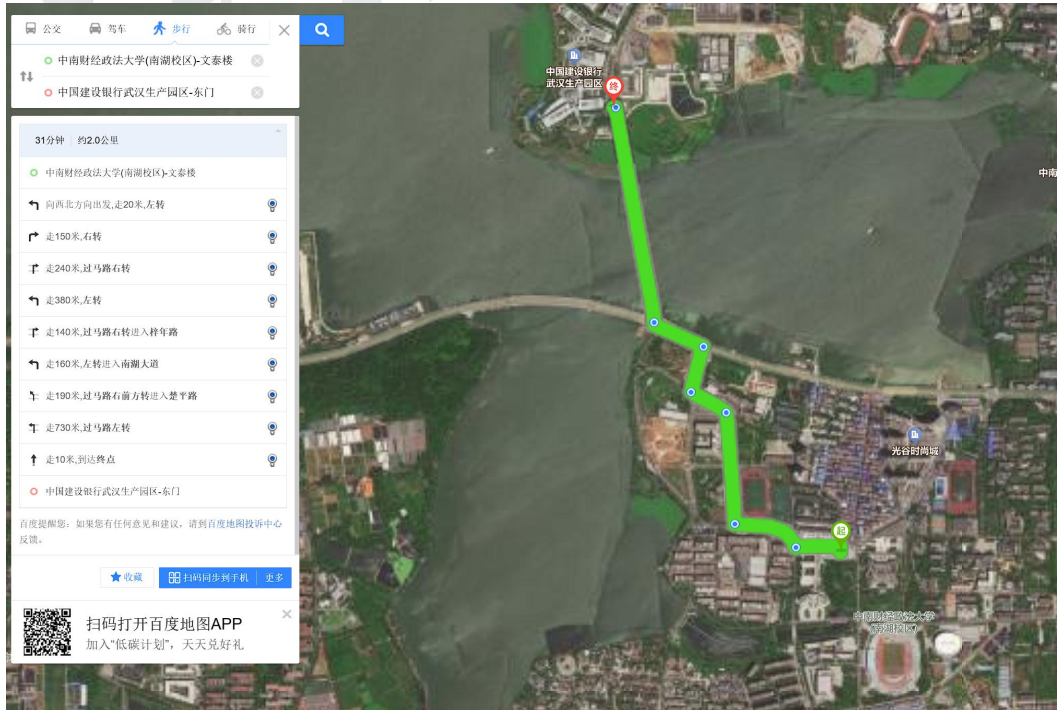
My working experience in CCB





CCB's Production Park near ZUEL across the south lake

(Direction from Wentai Building to the Park)



Contents：

1. Understanding the Era’s Characteristics and the Wealth Code

Digital, Intelligent, and Green Transformation

2. New Paradigm, New Tools, and New Framework

I. New Paradigm: Digital Technologies & Unstructured Data

II. New Tool: Fine-Tuned Large Financial Models & AI Agents

III. New Framework: Green Finance and Sustainabable Development

Part 0

Understanding the Era's Characteristics and the Wealth Code

***"Changes on a scale unseen in a century are accelerating across the world. A new round of technological revolution and industrial transformation is unfolding at an increasing pace."* (Source: Full text of the 20th CPC National Congress Report)**

"G·T·C": Three Major Forces Shaping Economic and Financial Systems in the Evolving Landscape

1.**Globalization**: Globalization recedes amid major-power rivalry, ushering in a new phase of globalization with distinct characteristics.

Dual Circulation and Unified National Market; RCEP & IPEF; National Security, Economic Sanctions, Technology Sanctions, Tariff Wars, etc.

2. **Technology**: The Power of Technology (From Electronization and Networking to **Digitalization and Intelligentization**)

Digital Technology and Artificial Intelligence: Blockchain, Big Data, Machine Learning and AI, Mobile Payment, Cybersecurity, etc.

3. **Climate/Carbon**: Dual Carbon Goals and **Green Transformation**

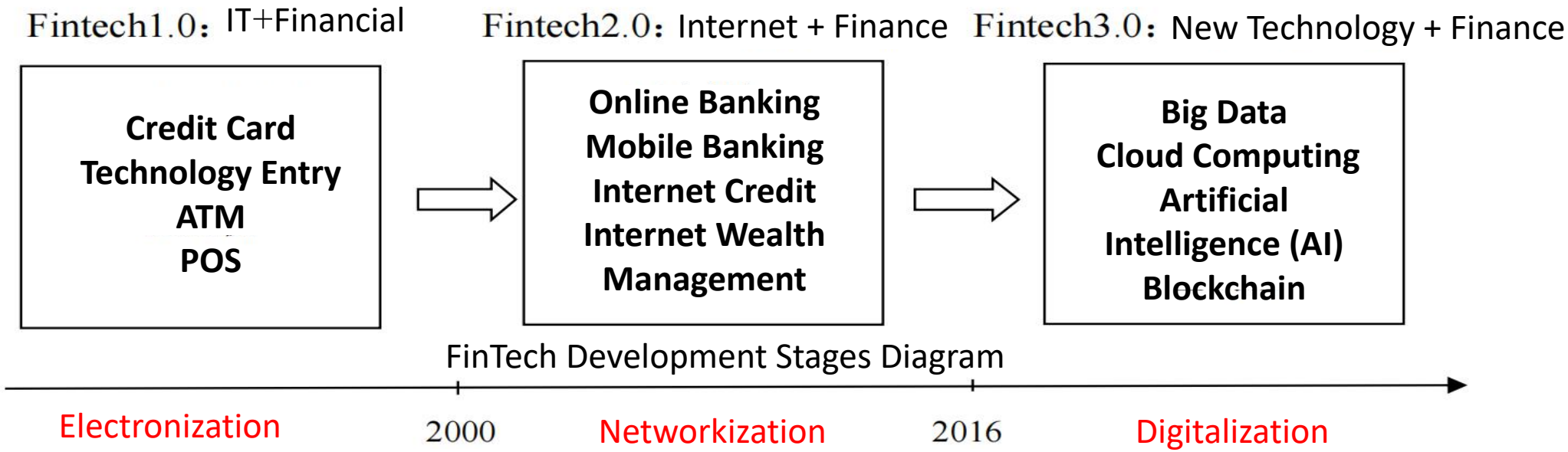
China's Green Vision: "Building a Clean, Beautiful World Through Low-Carbon Development"—Manifesto for a Shared Future for Mankind

The Trifecta of FinTech 3.0
Digitalization, Intelligence, and Sustainability as Core Pillars

Stage 1: FinTech 1.0 - Electrification
- Focus: Hardware-driven process digitization
- Objective: Operational efficiency through electronic systems

Stage 2: FinTech 2.0 - Network
- Mechanism: Client-institution interaction portals
- Methods: User data collection via digital channels; Targeted services through big data analytics

Stage 3: FinTech 3.0 - Digitalization
- Enabling Technologies: Big Data, Cloud Computing, Blockchain
- Impact Pathways :Data-driven client profiling; Algorithmically enhanced investment decisions



It is a world-wide phenomenon.
Top 10 most valuable U.S. companies by Fortune 500

金融学院 School of Finance

Electronization → Networking → Digitalization

	1980	1990	2000	2010	2020
1	IBM	Exxon	General Electric	Exxon Mobil	Microsoft
2	AT&T	IBM	Microsoft	Apple	Apple
3	Exxon	General Electric	Exxon	Microsoft	Amazon
4	Amoco	Wal-Mart Stores	Pfizer	Wal-Mart Stores	Google
5	Schlumberger	Merck & Co.	Citigroup	Berkshire Hathaway	Meta
6	Mobil	Bristol-Myers	Wal-Mart Stores	General Electric	Wal-Mart Stores
7	Chevron	Coca-cola	AIG	Procter & Gamble	Johnson & Johnson
8	Atlantic Richfield	Procter & Gamble	Intel	Bank of America	J.P. Morgan Chase
9	General Electric	Chevron	IBM	Google	Visa
10	Procter & Gamble	Pepsi	Cisco	J.P. Morgan Chase	Procter & Gamble

Current Trends:Digital, Intelligent, and Green

Data compiled based on closing prices as of June 3, 2025

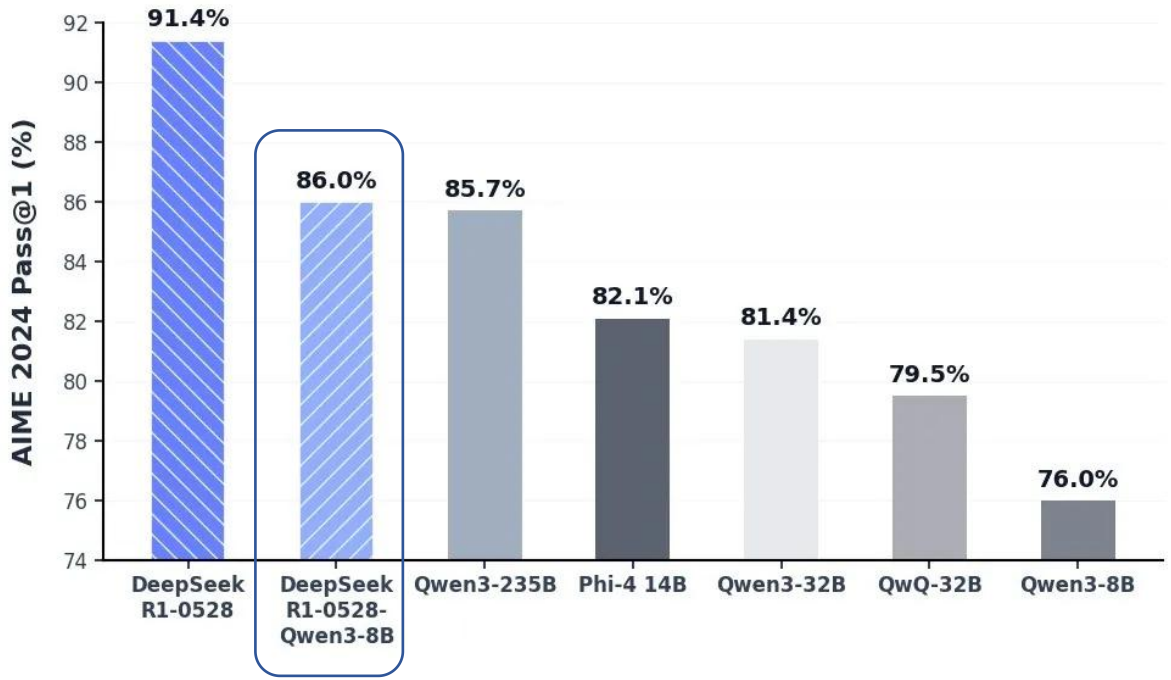
	Firm	Stock Symbol	Market Cap ($)	Closing Price ($)
1	Nvidia	NVDA	3.45	141.40
2	Microsoft	MSFT	3.44	462.97
3	Apple Inc	AAPL	3.04	203.27
4	Amazon	AMZN	2.18	205.71
5	Alphabet Inc	GOOGL	2.02	166.18
6	Meta	META	1.68	666.85
7	Tesla	TSLA	1.11	344.27
8	Broadcom	AVGO	1.21	256.85
9	TSMC	TSMC	1.02	197.61
10	Eli Lilly	LLY	0.67	750.78

DeepSeek Shock: Open Platform, Rapid Evolution

DeepSeek-R1-0528:
Deeper understanding and sharper reasoning.

DeepSeek-R1-0528-Qwen3-8B:
The chain-of-thought reasoning hold significant implications for both academic research and industrial development of small-scale models.

Benchmarks	DeepSeek-R1-0528	OpenAI-o3	Gemini-2.5-Pro-0506	Qwen3-235B	DeepSeek-R1
AIME 2024 数学竞赛 *pass@1*	91.4	91.6	90.8	85.7	79.8
AIME 2025 数学竞赛 *pass@1*	87.5	88.9	83.0	81.5	70.0
GPQA Diamond 科学测试 *pass@1*	81.0	83.3	83.0	71.1	71.5
LiveCodeBench 代码生成 *pass@1*	73.3	77.3	71.8	66.5	63.5
Aider 代码编辑 *pass@1*	71.6	79.6	76.9	65.0	57.0
Humanity's Last Exam 推理与百科知识 *pass@1*	17.7	20.6	18.4	11.75	8.5



Not only in Financial industry

--- “Digital, Intelligent, and Green” are everywhere. ---

Aircraft C919

Chip-enabled smart device

Self-driving electric vehicle

But, nobody embraces change willingly. Resistance to change is a universal constant.

Low margin

New customer

Strong drive

Pressures Driving Commercial Bank Transformation

1. Interest Rate Liberalization Compresses Profit Margins

2. Paradigm Shift in Client Behavior & Demand

3. Policy-Technology Resonance Accelerating Transformation

1 Interest Rate Liberalization Squeezes Profit Margins

Phenomenon

- **Narrowing Spreads**
  Falling Deposit-Loan Margins Squeeze Traditional Interest Income
- **Weak pricing capability**
  lack of risk-based differential pricing
- **Rising liability costs**
  Deposit competition drives up funding costs

Cause

- **Full policy liberalization**
  Lifting deposit-loan rate controls fuels full market competition
- **Homogenized competition**
  Highly similar products/services make price the key competitive tool
- **Monetary policy transmission**
  More efficient transmission narrows arbitrage space

A Comparative Analysis of LPR and Annual Interest Spread Data in the Banking Sector

2020年-2025年（上半年）

年份	1年期LPR(%)	5年期LPR(%)	银行业平均净息差(%)	息差变化	趋势分析
2020	3.85	4.65	2.10	-	初期稳定
2021	3.80	4.65	2.00	-0.10	开始收窄
2022	3.65	4.30	1.90	-0.10	明显压力
2023	3.45	4.20	1.80	-0.10	持续收窄
2024	3.10	3.60	1.70	-0.10	压力加剧
2025（5.20）	3.00	3.50	1.60	-0.10	逐步企稳

2 Paradigm shift in customer behavior and needs

Phenomenon

- **Channel preference shift**
  Offline transactions down, mobile over 80%
- **Rising experience demands**
  customers expect convenience and user experience
- **Diversified demands**
  From simple deposit-loan needs to comprehensive ones like wealth management and scenario-based finance

Cause

- **Rise of digital natives**
  80s/90s as key clients, digital lifestyle habitual
- **Tech giants' demonstration effect**
  Internet giants set new financial service experience standards
- **Greater information transparency**
  Easy product/service comparison tests loyalty

3 Policy-tech resonance drives transformation

Phenomenon

- **Strong supervisory drive**
  Financial power building raises regulatory compliance costs
- **Open banking advances**
  Data elements and new productive forces drive deep bank-third party links
- **Rapid tech iteration**
  AI, blockchain, cloud reshape financial service models

Cause

- **Policy-guided transformation**
  Regulation encourages digital, intelligent, green shifts to boost real economy services
- **Lower tech costs**
  Cheaper fintech infrastructure enables wider adoption by small banks
- **Intensified cross-sector competition**
  Internet giants enter finance, pushing traditional banks to speed up reforms

Challenges in digital, intelligent, green transformation

1. Digital Technology & Unstructured Data Governance

Data integration challenges: Multiple heterogeneous internal systems; unstructured data (e.g., user logs, regulatory info) hard to standardize.

Data security risks: Heavy reliance on sensitive data in digital transformation; need to prevent cyberattacks and leaks.

2. Application & Adaptation of Intelligent Tools

Insufficient technical maturity: Vertical domain large models require high-quality financial data; need to address interpretability and compliance.

Talent gap: Scarcity of interdisciplinary talent with finance expertise and AI skills hinders tool implementation.

3. Sustainability & Information Disclosure

Implementation of sustainability standards: Green finance needs unified carbon footprint measurement and environmental risk frameworks (current standards incomplete).

Complexity of disclosure: Integrating financial and non-financial data (e.g., carbon emissions, social impact) requires report system restructuring, increasing compliance costs.

Three “New"s Empower

I. New Paradigm

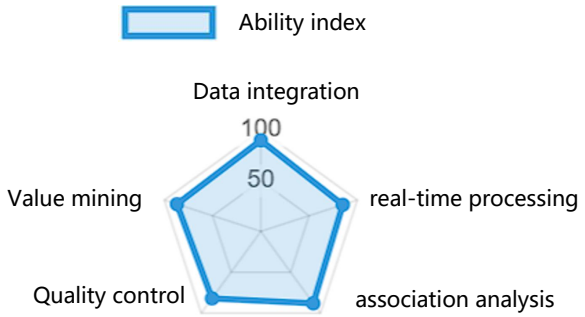
Digital Tech & Unstructured Data Governance

Core Competence Building

- Multimodal Data Fusion (Text, Image, Speech)
- Real-time Data Stream Processing Platform
- Knowledge Graph-based Intelligent Correlation Analysis

Application Value

- Improve User View Accuracy
- Improve Unstructured Data Processing Efficiency
- Reduce Data Governance Costs



II. New Tools

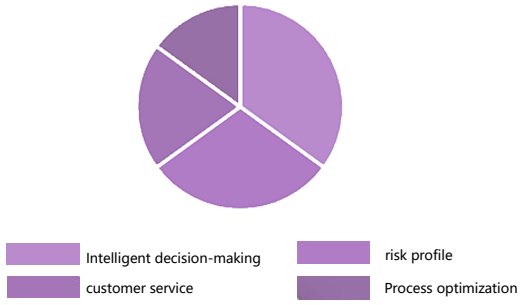
RAG, Fine-tuned Vertical LLMs & AI Agents

Technical Architecture

- Financial Domain-specific Large Model (100B+ Parameters)
- Intelligent Agent Collaboration Network (Agent Swarm)
- Federated Learning for Data Privacy Protection

Business Impact

- Improve Financial Decision-making Efficiency
- Improve Risk Prediction Accuracy
- Improve User Service Satisfaction



III. New Framework

Sustainable Development and Disclosure Standards System Constr

Core Framework

- Dual-Carbon Target Financial Impact Assessment Model
- Sustainable Risk Quantitative Assessment System
- Green Financial Products Innovation Platform

Transformation Efficiency

- Reduce Green Financing Costs
- Financing Advantages Brought by ESG Rating Improvement
- Improve Regulatory Compliance Efficiency