



Finance, Innovation, Technology

Hiromi Yamaoka

**Director-General, Payment and Settlement Systems Department
Bank of Japan**

April 14, 2017

Information Technology

IT Giants

Satoshi Nakamoto

Robo-advisor

Android Pay

Big-data Analysis

M-Pesa

DAO

Ripple

Lending Club

GoogleWallet

Bitcoin

1. Why “FinTech” now?

— Finance + Technology —

ApplePay

Smart Contract

PayPal

Distributed ledger technology

WeChatPay

P2P Lending

Smartphones

Blockchain



New Elements of FinTech

Blockchain and Distributed Ledger Technology

- Born as basic technologies of “bitcoin”
- By technologies, every participants can share the same ledger in an internet environment.

Artificial Intelligence(AI) and Big-data analytics

- facilitating tailor-made financial services
(e.g., protecting elderly people from financial fraud)
- potential for various applications (eg., AML/CFT, cost-reducton)

Smartphones

- Smartphones and mobile phones are spreading rapidly worldwide, also in emerging and developing countries where financial infrastructure has been underdeveloped.
- Smartphones, which are inherently “personalized” tools, has become new access tools for various financial services.

Historic “Coincidence” behind FinTech

Satoshi Nakamoto paper (2008) and Bitcoin(2009–)

- With bitcoin, blockchain and DLT also appeared.

AI and Deep Learning

- Wide-ranging applications (e.g.. medical science)
- Interactions between financial services and other industries

iPhone(2007-)

- Smartphones have become new access points for financial services, instead of brick and mortar branches and ATMs.

Global Financial Crisis(2008)

- After public capital injection, public opinions in US, UK and Europe welcomed new entrants to financial services. Moreover, regulatory framework for traditional financial institutions has broadly been tightened.

Various FinTech Services

✓ Payments and Settlements

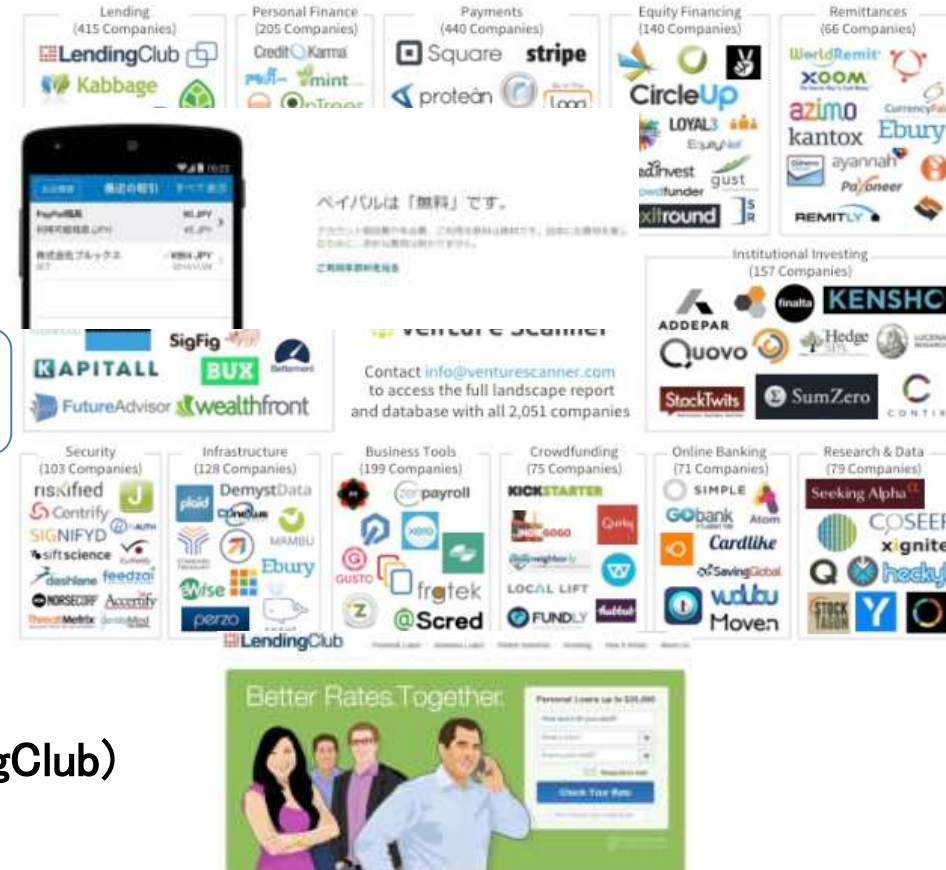
- Payment services fitted to e-commerce, }
sharing economies and smartphones
(e.g. PayPal, ApplePay, AliPay, WeChat, GoogleWallet, M-Pesa)
- Cheap Cross-border Funds transfers (e.g., TransferWise)

✓ Financial intermediation

- P2P lending, Crowdfunding (e.g., LendingClub)
- Investment support utilizing AI and big-data analytics (e.g., Robo-advisor)

✓ Other services

- Asset Management and Accounting services (customized services vis smartphone APPs)
- “Smart Contracts” (e.g. adjusting car insurance fees in accordance with driving attitudes)





2. Why is the World focusing on FinTech?



New Frontiers of Financial Services!

Financial Inclusion

- Smartphones and mobile phones are spreading worldwide, also in emerging and developing countries where financial infrastructure (e.g., bank branches and ATMs) has been underdeveloped.
- FinTech enables emerging and developing countries to facilitate people's access to financial services through smartphones and mobile phones, and to catch up developed countries. G20, IMF, World Bank and other international forums now have great interest in FinTech.

Interactions among various businesses

- Financial transactions accompany attractive data. (⇒ Global giant companies (e.g., Apple, Google, Alibaba) also enter financial services.)
- FinTech creates new linkages between financial services and various businesses (e.g., Internet of Things, sharing economy businesses).

Financial Services for Globalization and Diverse Life-style

- E-commerce and mp3 downloads ⇒ People need payment instruments usable also in weekend and around midnight, and even for small amount, without disclosing their credit card #.
- In-bound tourism, foreign employees, population aging ⇒ cheap cross-border payments, bio-authentication

FinTech extends the frontiers of financial services!

New information technologies

Globalize

▪ ▪ *to people all over the world*

Personalize

▪ ▪ *customized services for each user*

Virtualize

▪ ▪ *without branches, ATMS, or computer centers*

Financial services!

FinTech and People's Daily Life

— Examples of Use Cases —

✓ Payment Instruments fitted to daily transactions (Convenient FinTech)

- Automatic payment (without cashiers) through bio-authentication
- APPs ordering hired-cars with automatic payment at the destination

✓ Bio-authentication, protecting elderly people from fraud (Safe FinTech)

- AI is used to reject transaction made by elderly people for very unusual shopping

✓ DLT can be used for keeping the records of wide-ranging assets and transactions (Developing FinTech)

- Registering paintings and jewels, Ensuring traceability of agricultural products
- Keeping medical records of patients and academic records of students

✓ FinTech and Asset Management

- Human beings and AI (e.g. Robo-advisor) can live together and support each other.
- FinTech can facilitate people's understanding of their portfolio, and enhance financial literacy, which are important for sound development of asset management.



3. FinTech Tokyo!



Power of Tokyo!

— Freedom, Transparency, Diversity —



Metropolis with long-lasting diversity

- A Global city with democracy, rule of law, safety and openness
- Tokyo has big financial markets, diversified customers, advanced academia, and various networks.

Technopolis with reliable infrastructure

- Internet, smartphones and mobile phones, dense transportation networks, good educational environments
- Various payment instruments (cash smartphone payments, pre-paid cards, credit cards) can be used.

GFC did not affect people's trust to financial infrastructure

- Traditional FIs and FinTech firms are ready to cooperate.
- High-level customer services

Challenges to Tokyo (and, Japan)



Existing “heavy” infrastructure might turn into “legacy”.

- Brick and mortar branches, ATMs, computer centers (Development of traditional financial services and heavy infrastructure are “both sides of the same coin”.)
- FinTech enables us to offer financial services through internet, smartphones and cloud computing without any physical, heavy infrastructure. Under such environments, existing heavy infrastructure could be obstacles.

“Japan Standard” often differs from “Global Standard”.

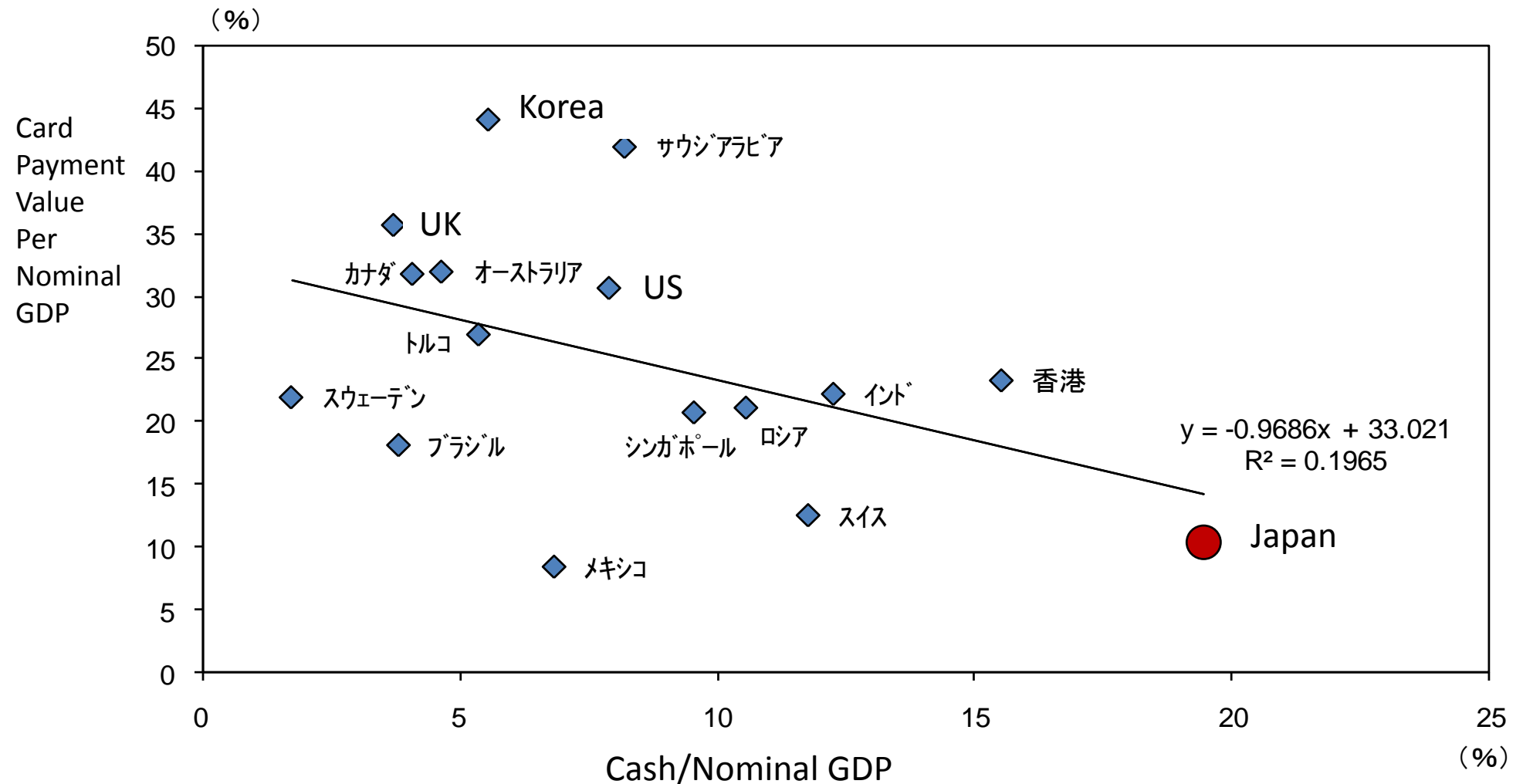
- The technological level of Japan’s infrastructure is usually high, but it is difficult to find Japan-born technologies that are also used as global platforms.

Upside potential of Japan’s domestic market

- Popularization of basic financial services and upside potential are also “both sides of the same coin”. It is important to establish business models suitable both to Japan and overseas (in particular, Asian countries), in order to obtain the “economies of scale”

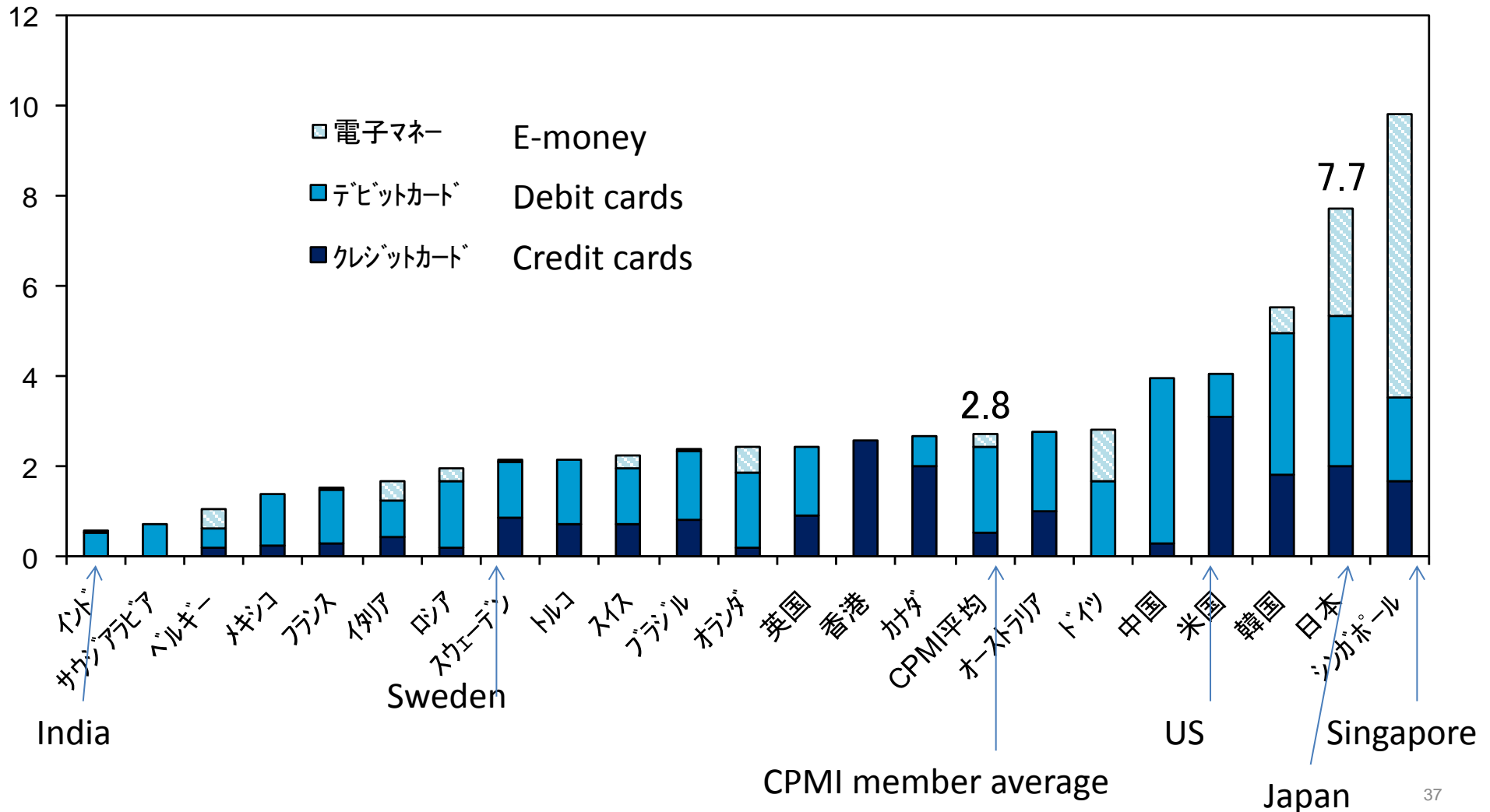
Language issues, Humble and modest characters...

Japanese people tend to use cash, instead of cards, for daily payments



Nonetheless, Japanese people carry many cards in their wallets

(The Number of Cards per person)



Needed Initiatives

Promoting “open innovation”

- In Particular, it is important to promote **open API**, which facilitate cooperation among various entities such as banks and FinTech Startups, and **Financial EDI**, which facilitate efficient processing of financial and commercial information.

Promoting FinTech R&D Investments

- Blockchain, Distributed Ledger Technology (DLT), AI, Robotics, etc.
- It is important to facilitate cooperation among various entities (including academia), experiments for business applications, and fundraising.

Promoting cyber security, data security and privacy

- Through AI and big data analytics, we can make more effective use of various data. At the same time, we need to pay more attention to information security, cyber security and privacy.
- In order to create “trust” to Japan’s FinTech, it is important for Japanese FinTech industries to take effective measures (e.g. bio-authentication for elderly people).

Business Continuity Planning

- Foreign firms also have strong interests in business continuity planning in Japan.

FinTech Initiatives Taken by Foreign Countries

➤ FinTech Events, Festivals and Forums

- Inviting various entities (e.g. IT companies, startups and financial institutions) from home and abroad
- Offering the opportunities of business presentation and networking
- Competitions, speeches and relevant conferences

➤ FinTech Competitions and Awards

- Inviting opinions and ideas from general public on the issues to be resolved and desirable financial services
- In general, the following awards are offered to the winners and the participants
 - ✓ Opportunities for presentation and demo
 - ✓ Networking with various entities (e.g. FIs, IT firms and experts)
 - ✓ Facilities for experiments and business trials
 - ✓ Monetary awards, access to funds

➤ Institutional Initiatives for Promoting FinTech

Singapore Cases (1)

—Global FinTech Hackcelerator —

- Held in Singapore FinTech Festival(Nov. 2011)
- Held by MAS (Monetary Authority of Singapore)
 - partnership with Singapore Bankers Association, sponsored by PwC

(Schedule of the Hackcelerator)

Mar. 2016: Inviting public opinions on the “problems” to be resolved

May 2016: Posting 100 problems to be resolved and asking solutions

End of Jul. 2016: Deadline for solution proposals

- 655 proposals from 50 countries (around 70 percent came from Asia-Pacific)

Aug. 2016: Announcing 19 teams to be proceeded to final round

Nov. 2016: 19 teams made demonstration (each 5 minutes each)
at Singapore FinTech Festival. Three teams became winners.

Singapore (2)

—Global FinTech Hackcelerator —

【Winners (3)】

- **FitSense : Insurance-related FinTech (InsTech)**
- **AIDA Technologies : Fraud detection services through AI**
- **Beacon Interface : Smartphone services to handicapped people**

【Awards】

- **Monetary Awards : 20 thousand S\$ to each of 19 participants at final round
50 thousand S\$ to each of 3 winners**
- **“Mentorship” (guidance and support from experts)**
- **“Network” (with relevant FIs and companies)**
- **“Infrastructure” (technical support for monetizing innovative ideas)**
- **“API Catalogues” (access to the data necessary for monetizing ideas)**

100 Problems to be resolved

“100 problems” consist of wide-ranging issues such as ①KYC, ②RegTech, ③trade finance, ④insurance, ⑤financial literacy, ⑥financial inclusion and SME financing, ⑦customer services, ⑧payments and settlements, ⑨portfolio management, and ⑩capital markets.

【Examples】

- Cashless and comprehensive payment schemes in schools in Singapore, such as the payments for lunch, textbooks and school buses.
- Payment schemes that the parents can check their children's behavior (e.g., “What kinds of foods do they eat at lunch?”)
- Cashless payments schemes used for most parking lots in Singapore
- Cheap and convenient authentication scheme without relying on passwords or tokens
- Free game APPs for enhancing financial literacy

Examples of Institutional Initiatives to Promote FinTech

—For stimulating investment and fostering human resources relevant to FinTech—

(Singapore)

■ Startup SG (from May 2017) "Startup SG Equity"

- Government co-investment funding to stimulate investments in deep--technology.
- For ICT, co-investment ratio is 7:3 up to \$250,000, 1:1 thereafter up to \$2 million
- For Non-ICT, co-investment ratio is 7:3 up to \$500,000, 1:1 thereafter up to \$4 million

■ FSTI Proof of Concept Scheme

- MAS provides funding support of up to 50-70% of qualifying costs, up to a maximum of S\$200,000
- In addition, One-stop office for startups, LATTICE80 as “innovation village”, FinTech Innovation Lab, and API Catalogues for facilitating access to the necessary data, have been arranged.

(Hong Kong)

■ Fintech Career Accelerator Scheme, (FCAS, from Dec. 2016)

- 11 banks and 9 university participate in this scheme and offered 70 internship posts (from 6 months to 1 year) to the students interested in FinTech.
- Business areas consist of cyber-security, DLT, big-data analytics, AI, bio-authentication, mobile APPs, etc.

FinTech Tokyo

Combining wide-ranging assets in Tokyo!

- Various life-styles in metropolis, wide-ranging industries
- Transportation, communication, education (schools, universities), research facilities, consumers, businesses, places for sightseeing, etc.

Open and Global Tokyo!

- Important roles in financial Intermediation in Asia

Tourist-friendly Tokyo!

- Grasping the needs of in-bound tourists

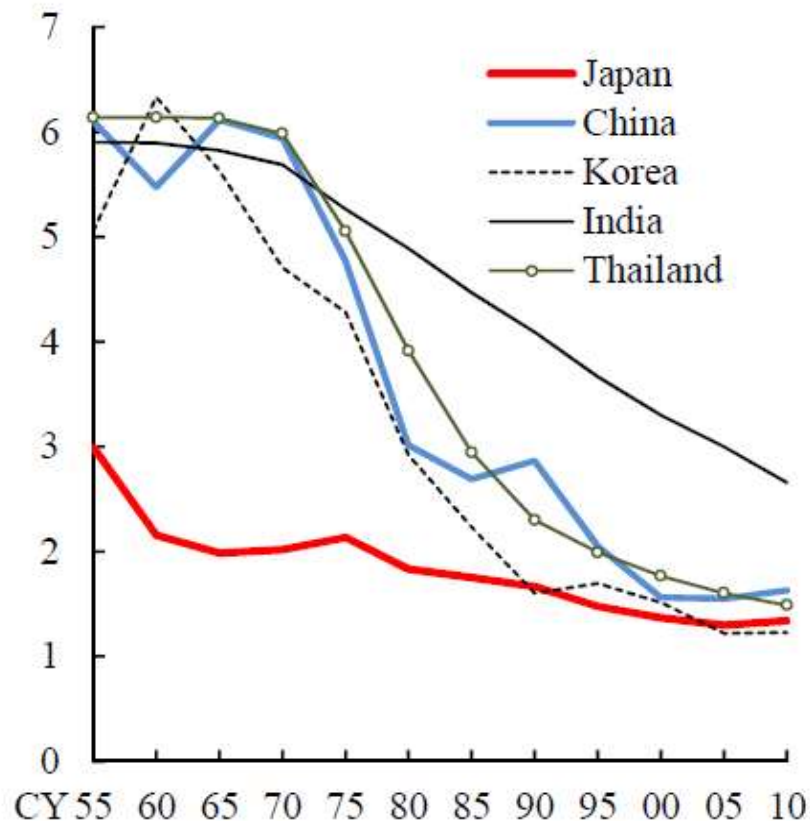
Tokyo 2020 Olympic and Paralympic Games

- Gathering opinions from and sending messages to the world

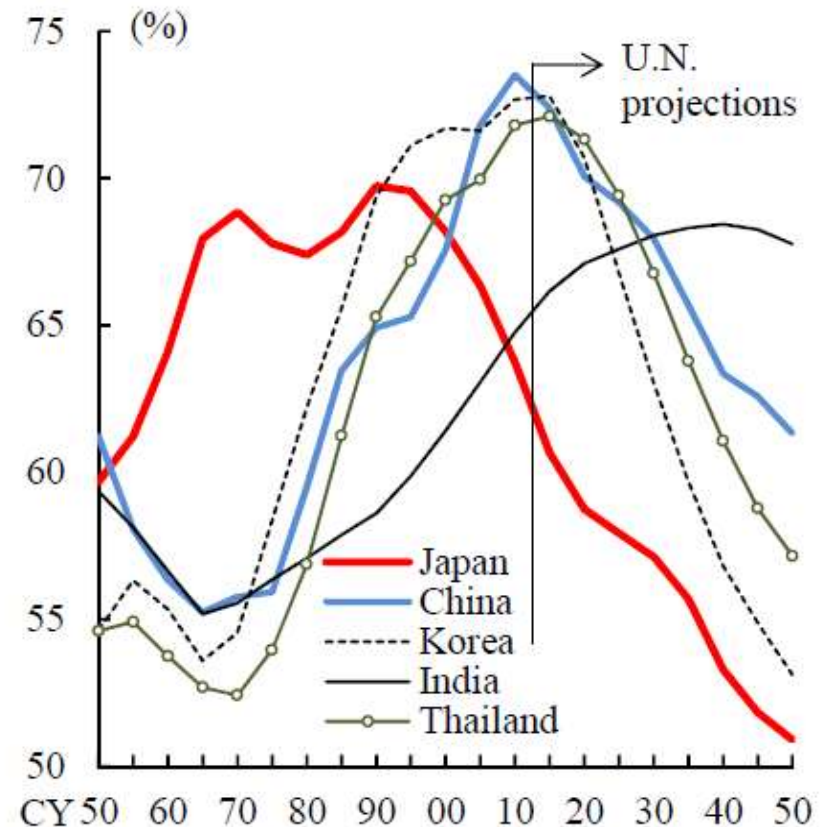


Asian countries will face aging population and become matured economies in the near future.

Fertility Rate



Working-Age Population Ratio



Note: Fertility rate refers to total fertility rate.

Sources: United Nations, HAVAR.

***Finance, Innovation, and Technology
for people's daily life!***

Smart City Tokyo

The Bank of Japan supports FinTech!



The Bank of Japan's Initiatives

■ Establishment of BOJ FinTech Center (Apr. 2016)

■ Establishment of FinTech Network within BOJ

■ FinTech Forums

- First Forum (Aug. 23, 2016) "FinTech and Information Security"
- Second Forum (Nov. 8, 2016) "Open Innovation in Financial Services"
- Third Forum (Feb. 28, 2017) "Utilization of DLT in financial businesses"

■ Collaboration with Academia

- Joint Conference held by University of Tokyo and BOJ (Nov.18, 2016) "FinTech and the Future of Money"

■ Speeches by BOJ Governor Kuroda

- "Innovations in Payments and FinTech" (Mar. 17, 2016)
- "Information technology and Financial Services" (Aug.23, 2016)
- "Digital Innovation and FinTech" (Dec. 5, 2016)
- Other BOJ officials also made many speeches on FinTech.



Establishment of the "FinTech Center"

April 1, 2016
Bank of Japan

The Bank of Japan today established the "FinTech Center" within its Payment and Settlement Systems Department. This is in line with the recent environment in which FinTech is gaining considerable attention as it applies new technologies -- including those of information and communications -- to innovative financial services.

The Bank aims to reinforce its efforts in which the developments of FinTech will contribute to enhancing financial services and achieving sustainable growth of Japan's economy.