



FINANCIAL SUPERVISORY SERVICE



Financial Innovation and Banking Regulations: Korea's Experience

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July 13, 2017

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I . Recent market Development and potential risks

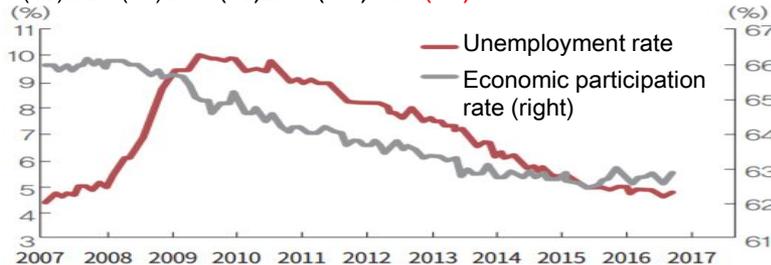
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Global economy showing modest recovery (2017: 3.4%); but the growth trends becoming more **divergent**



▪ Growing political uncertainty with the Trump administration

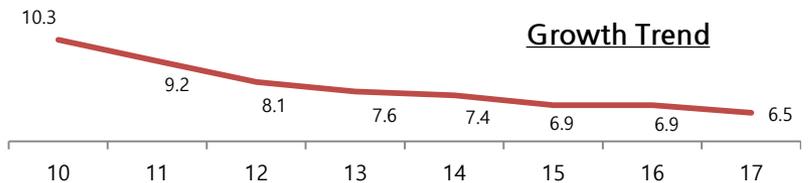
▪ (13)2.2→(14)2.4→(15)2.6→(16^e)1.6→(17^f)2.3%



▪ Continued economic slowdown with the rebalancing of economy

(investment → consumption, export → domestic demand)

* (13)7.8→(14)7.3→(15)6.9→(16^e)6.5→(17^f)6.5%



▪ Uncertainty from Brexit, upcoming elections, and potential Greek crisis

* (13)Δ0.5→(14)0.9→(15)2.0→(16^e)1.7→(17^f)1.6%



▪ Growth expected to remain sluggish due to strong yen

* (13)1.6→(14)0.0→(15)1.2→(16^e)0.9→(17^f)0.8



* Growth rate of '16 & '17 from IMF forecast

I . Recent market Development and potential risks

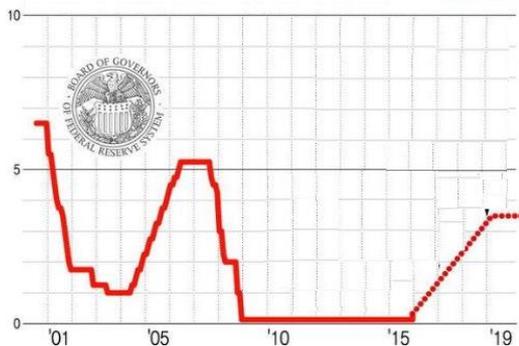
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Major risk: rising US interest rates, trade protectionism, market volatility in emerging countries

Rising Interest Rates

- Timing and pace of interest rate hike
- Monetary policy direction of U.S. and ECB

Forecast of US interest rate



Trade Protectionism

- Policy direction of the Trump administration
- Increasing trade disputes between U.S. and China
- Hard Brexit



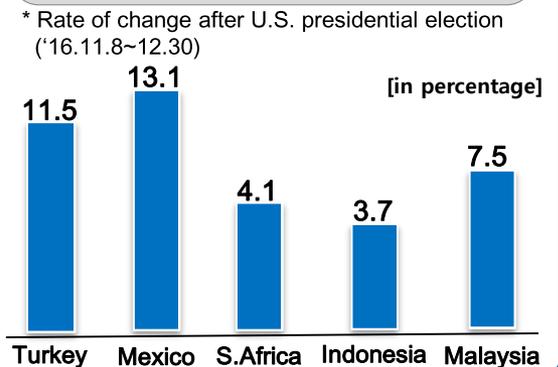
'America First'



Market Volatility in Emerging Markets

- Excessive external debt
- Capital outflow and currency depreciation
- Increasing volatility in financial markets

Currency volatility against USD



*Source: Bloomberg

I . Recent market Development and potential risks

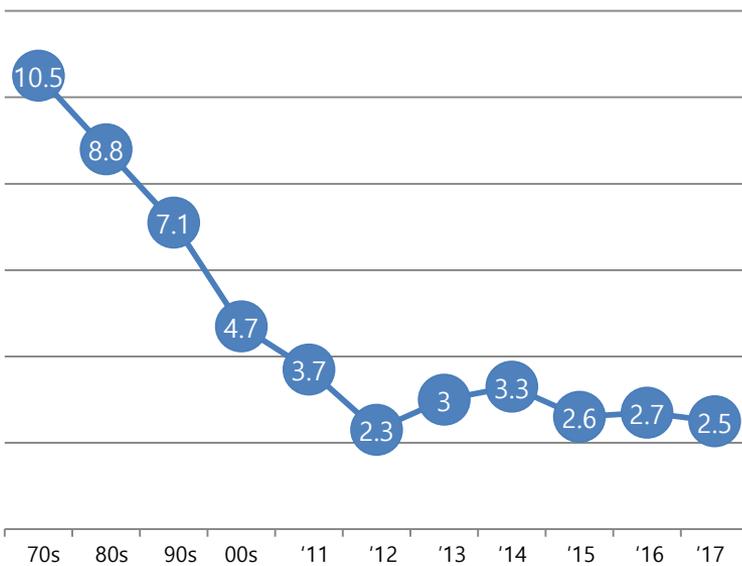
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Korea's growth rate slowly picking up [Q1,16: 0.5% → Q1,17: 1.1%]

Economic Slowdown

Growth Trajectory & Forecast of the Korean Economy

[in percentage]



*Source: Bank of Korea

Uncertainties at Home & from Aboard

Index on Internal & External Uncertainties for the Korean Economy



*Source: Hyundai Economic Research Institute

I . Recent market Development and potential risks

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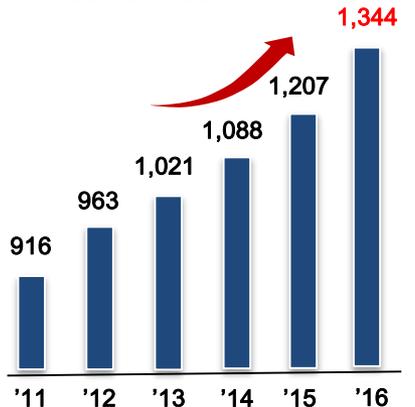
Amid North Korean risk, rising household debt, more marginal companies, and withdrawal of foreign investment

Household Debt

- Upward trend since '13
- Improving structural soundness

Size of Household Debt

* based on BOK household credit [in KRW trillions]

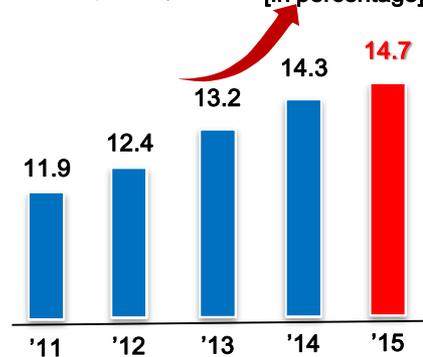


Marginal Companies

- Growing need for preemptive restructuring of distressed companies
- Deteriorating business conditions for SMEs

Proportion of Marginal Companies

* TIE ratio < 1 for 3 consecutive years (externally audited companies) [in percentage]

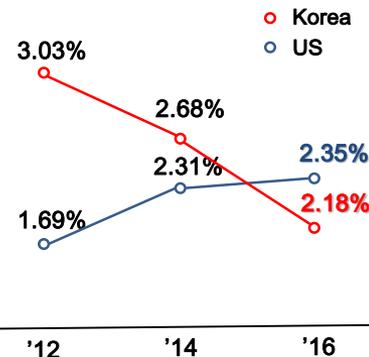


Withdrawal of Foreign Investment

- Rising U.S. interest rate
- Divergent interest rate policy between Korea and U.S.

Interest Rate Direction

[Interest rate of national bond(10Y)]



N. Korean Risk

- Missile launch
- Trump administration's N. Korean policy



N. Korea's Submarine Launched Ballistic Missile

Outlook for the Banking Industry

With the recent licensing of K-Bank, a total of **seven bank holding companies**, **19 domestic banks**, and **40 foreign bank branches** operating in Korea (June 2017)

Domestic Banks

Commercial Banks (8)



Local Banks (6)



Specialized Banks (5)



Financials of Bank Holding Companies

[in KRW trillions]

	EOY '14	EOY '15	End of Mar. '16	End of Jun. '16	EOY '16
Total assets	1,438	1,548	1,590	1,612	1,679
Total liabilities	1,327	1,431	1,473	1,494	1,588
Total capital	111.2	116.8	116.9	118.4	120.8

Based on financials of 7 bank holding companies excluding Woori, Citi and KDB holdings that dissolved in '14 and SC holdings dissolved in '15

Financials of Domestic Banks

[in KRW trillions, in 10 thousand people]

	EOY '11	EOY '12	EOY '13	EOY '14	EOY '15	EOY '16
Total assets	1,969	2,031	2,101	2,288	2,449	2,625
Deposits	1,171	1,226	1,275	1,363	1,487	1,587
Total capital	147.9	153.7	156.9	168.8	175.8	180.8
Net income*	11.8	8.7	3.9	6.0	3.4	3.0*
Employee	11.1	11.3	11.8	11.9	11.7	11.5
No. of branch	7,710	7,835	7,797	7,554	7,445	7,280

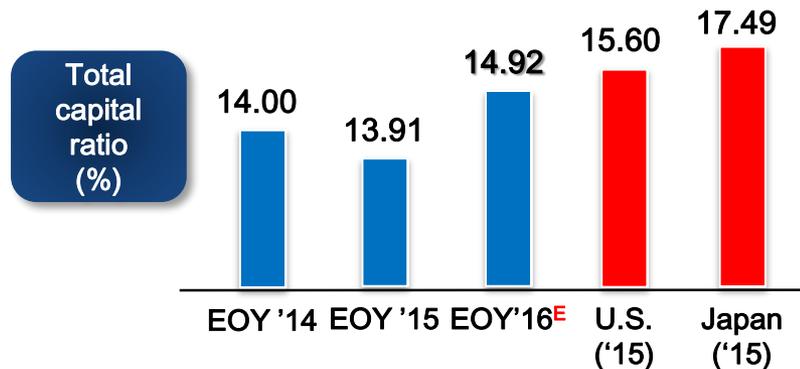
* Net income before including bad debt reserves

Domestic Banks' Soundness

Capital Adequacy



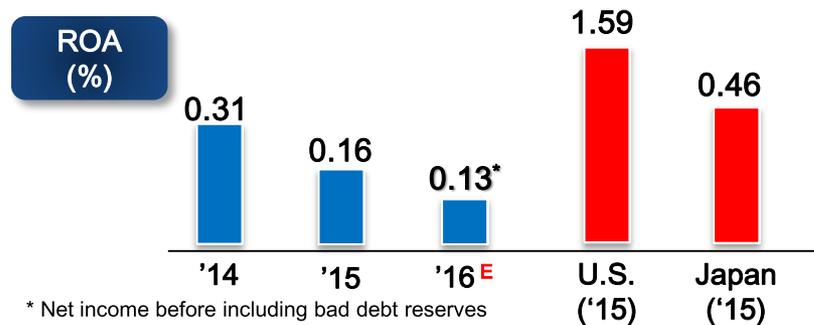
- High BIS ratio



Profitability



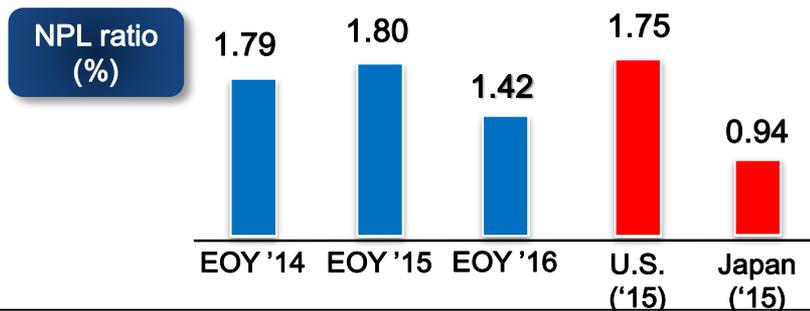
- Domestic banks' ROA lower than major global banks' ROA



Asset Soundness



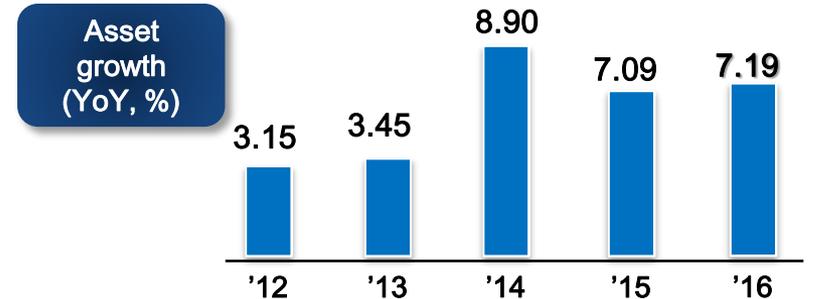
- Low NPL ratio



Asset Growth



- Rapid asset growth



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II. Korea's Financial Innovation

1

Overview

- Fintech innovation (4th Industrial Revolution) may fundamentally change the financial landscape.
- Korea is actively promoting P2P, robo-advisor, block chain, and other technologies, and consumer demand for these services is growing.
 - * Korea's first Internet bank reached half of its annual deposit target within the first three weeks of its operation.
- In the future, there will be a need to support fintech ecosystem for the vitality of the financial industry, and reorient the supervisory regime to minimize risks from rapid technological changes.
 - *Risks : cyber risks and financial exclusion for the disadvantaged (in particular, the elderly)

II. Korea's Financial Innovation

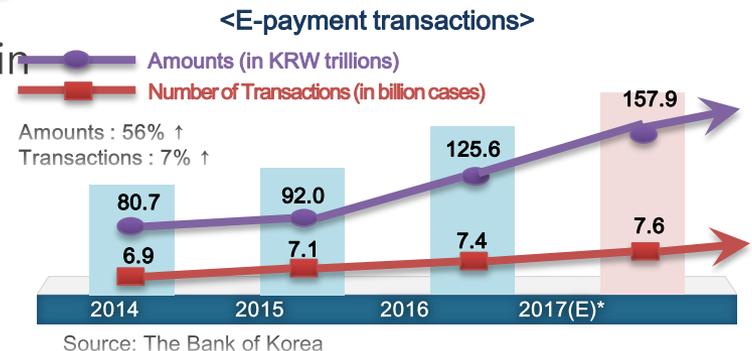
2 Korea's Fintech market

Trends in Fintech & financial companies

- Fintech companies rapidly expanding their specialty into payment, platform, and financial data analysis
- Financial companies integrating Fintech into their services
(Banks) Block chain, online transactions, and Internet bank; (Non-banks) Payment services; (Securities companies) Robo-advisor

Expansion of electronic financial industry

- 164 electronic financial companies operating in Korea as of Q1 of 2017
- Number and transaction amount of electronic payments increasing by 7% and 56%, respectively, over the past two years



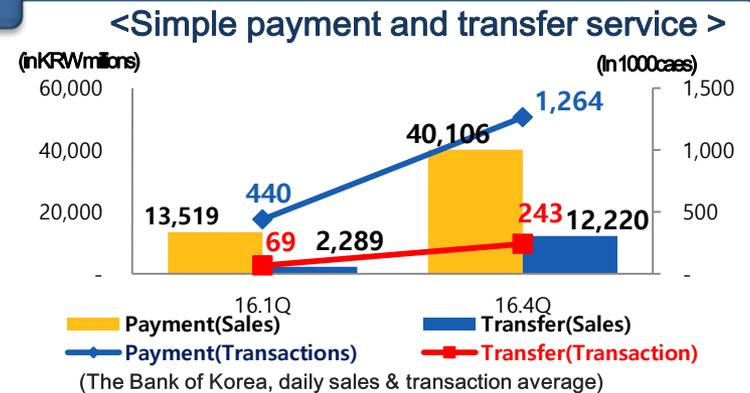
II. Korea's Financial Innovation

3 Korean financial companies and Fintech (1)

① Growing payment and fund transfer services

- Easy, consumer-friendly payment and fund transfer services with quick password or fingerprint log-in rapidly increasing over the past year

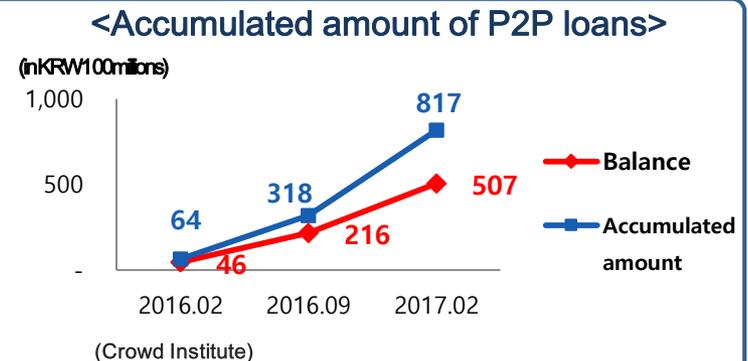
* Payment amount increased about three times, and transfer amount about five times over the past year.



② Growing P2P mid-interest rate loans

- Rapidly increasing P2P mid-interest rate loan balance (based on credit assessment using big data)

* KRW817 trillion as of February 2017, 13 times more than the same period last year



II. Korea's Financial Innovation

3 Korean financial companies and Fintech (2)

③ Popularity of Robo-advisor

- Robo-advisor gaining popularity among both retail and high-net-worth investors

④ Growing demand for crowdfunding

- Start-ups and SMEs increasingly turning to crowdfunding
- Steadily increasing investor demand for crowdfunding

⑤ New Authentication Services

- New authentication methods such as smart OTP and fingerprints being introduced in tandem with technological advances and relaxed regulations

II. Korea's Financial Innovation

4

Internet bank(1)

Authorization

- K-Bank applying for business authorization on September 20, 2016; launched as Korea's first Internet bank on December 15, 2016

* Kakao bank, which obtained authorization for Internet banking business in April 2017, is currently preparing to launch Internet banking services.

Business status

- K-Bank offering: 1) mid-range interest rate loans to borrowers who are young or have a mid-range credit score; and 2) lower commission fees for transactions
- Deposit amount: KRW284.8 billion (achieving over 50% of its annual deposit target amount); Lending amount: KRW186.5 billion (as of April 26, 2017)
 - (Deposit) Higher interest rates and fast growing new depositors
 - (Loan) Mid-range interest rate loans



II. Korea's Financial Innovation

4 Internet bank(2)

Impact on financial industry

- Increasing competition not only among banks, but also among savings banks, securities firms, and P2P services providers
 - (Banks) Price competition, business reorganization, strengthening Fintech services
 - (Savings banks, P2P) Lower interest rates, enhanced convenience for customers
 - (Securities firms) Fee waiver for non face-to-face transactions

Policy Direction

- Growing need for relaxed regulations on stock ownership to facilitate capital expansion
 - On-going discussion with the National Assembly to pass special legislation on Internet bank to enable IT firms to participate in bank management

II. Korea's Financial Innovation

5

Prospect and potential risk

Prospect

- Falling number of branches and employees; growing need for new regulations to respond to newly emerging risks

*Total employees (in thousands) : 125 (FY15)→ 122 (FY16)→ 120 (Q1,FY17)

Total number of branches : 7,329 (FY15)→ 7,150 (FY16)→ 6,861 (est.) (FY17)

Potential risk

- ① Falling profit margins as a result of intensifying competition in the financial sector
→ Leveling the playing field and close risk monitoring for enhanced risk management
- ② Financial exclusion
→ Encouraging banks to promote financial inclusion for all financial consumers
- ③ Cyber risk posed by hackers
→ Introducing preemptive measures to curb cyber risk;





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III. Systemic Risk in Korea

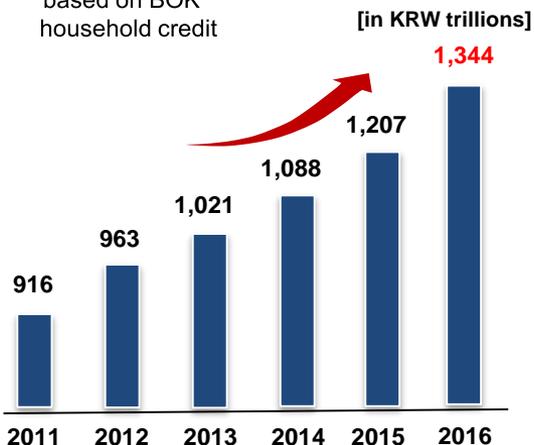
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Rising Household Debt

- Household debt on the rise since '13
- Improving structural soundness

Size of Household Debt

* based on BOK household credit



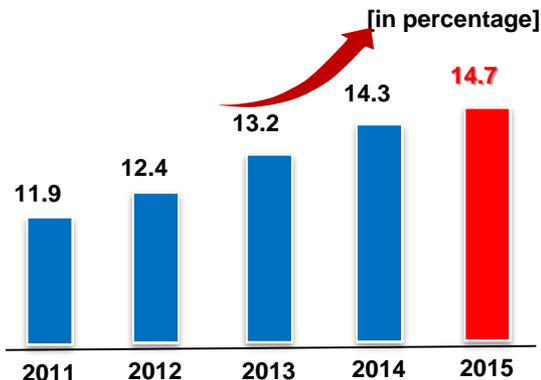
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Corporate Restructuring

- Growing need for preemptive restructuring of distressed companies
- Deteriorating business conditions for SMEs

Proportion of Distressed Companies

* TIE ratio < 1 for 3 consecutive years (externally audited companies)



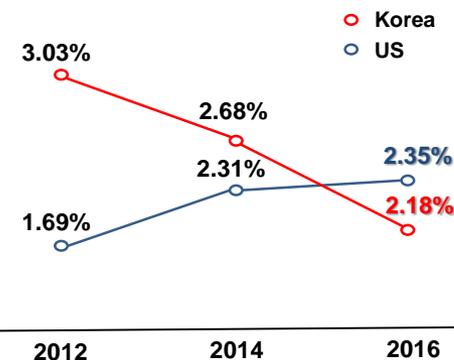
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Withdrawal of Foreign Investment

- Rising US interest rates
- Divergent interest rate policy between Korea and U.S.
- Slowing foreign investment

Interest Rate Direction

* Interest rate of 10-year national bond



III. Systemic Risk in Korea

1 Rising household debt

- **Current status: Rising household debt since 2013**

- Slowing bank lending, increasing non-bank lending;

* Size of household debt [in KRW trillions]:

1,021 (2013) → 1,088 (2014) → 1,207 (2015) → 1,344 (2016) → 1,359 (Q1, 2017)

- **Risk factors: Drag on the economy and household debt repayment**

- Increasing household debt leading to decrease in household consumption;
- U.S. interest rate hikes imposing greater debt-servicing burden on low-income borrowers;

- **Supervision policy: Preserve financial stability by strengthening risk management of household debt**

- Early detection of risk factors through close surveillance;
- Strengthening preemptive measures on vulnerable areas such as group loans;
- Risk management on loans for the self-employed;
- Introduction of macroprudential measures on housing loans (loan-to-value (LTV) & debt-to-income (DTI) limits, plans for the introduction of debt-service-ratio (DSR)

III. Systemic Risk in Korea

2 Corporate restructuring

- **Current status: Companies in certain industries (in shipping, shipbuilding, steel, and petrochemical industries) underperforming;**
 - Distressed shipping and shipbuilding companies undergoing downsizing and restructuring with government support;
 - * Government and main creditors financing (KRW6.7 trillion) for the restructuring of DSME (March 2017)
- **Risk factors: Growing uncertainties at home and from abroad**
 - Trade protectionism and U.S. interest rate hikes
 - Slow economic recovery in Korea making it difficult to expect improved structural soundness of the vulnerable industries
- **Supervision policy: Close monitoring of vulnerable industries & distressed companies and preemptive restructuring on an on-going basis**
 - Management of vulnerable industries and businesses
 - Stricter credit risk evaluation and reinforced follow-up measures

III. Systemic Risk in Korea

3 Withdrawal of Foreign Investment

- **Current status: Net purchase of KRW22.1 trillion in 2017**
 - Net stock purchase since 2016
 - Net selling of bonds (KRW12.3 trillion) for the first time in 2016 but net buying resuming in January 2017
- **Risk factors: Potential outflow of foreign investment caused by U.S. interest rate hikes and wider Korea-U.S. interest rate spreads**
 - Foreign investors likely to invest in safer assets due to reversal of Korea-U.S. interest rates
 - Greater volatility in bond and foreign exchange markets
- **Supervision policy: Monitoring of changes in interest rates and exchange rates and fund flows**
 - More active foreign exchange-related information sharing with related authorities (MOSF, BOK) and swift response to any changes in the markets in accordance with contingency plan

※ Three key macroprudential measures put in place to reduce volatility in capital flows after global financial crisis



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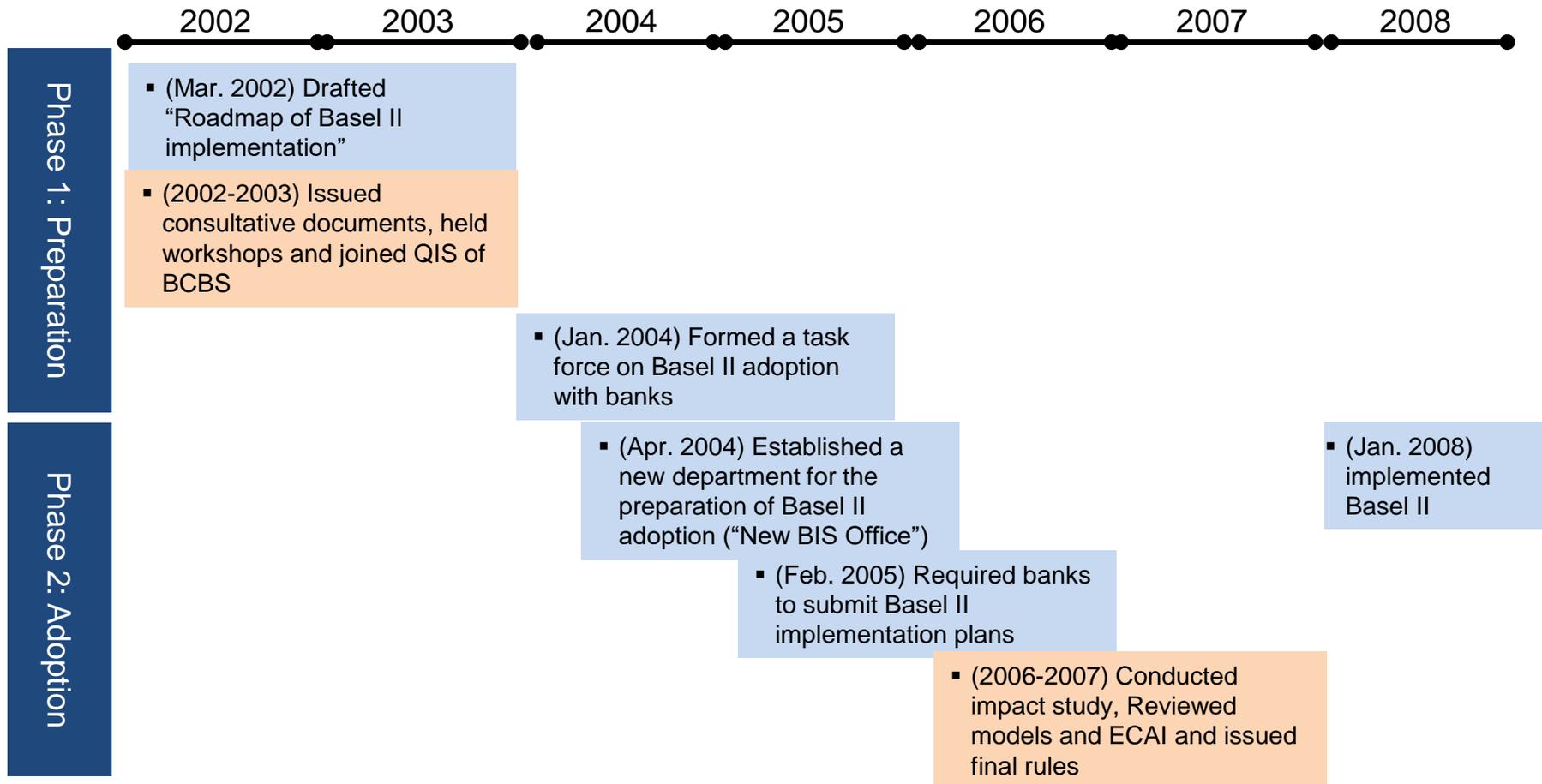
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IV. Korea's Systemic Risk Management

1 Implementation of Basel II and III (1)



Overview of Basel III Standards

Financial Stability & Sound Banking Supervision

Minimum Capital Requirement

- Calculation of risk measures with options for credit, market, and operational risks

Total Capital

Tier 1
Capital

Tier 2
Capital

> 8%

Risk Weighted Asset

Credit RWA

Market RWA

Operational RWA

Pillar I

Supervisory Review

- Bridging the gap between minimum capital requirement and actual risks (economic capital)
- Enhancing risk management methods for supervision and control of banking risks
- Assessing the quality of banks' risk estimation and capital planning by regulators

Pillar II

Market Discipline

- Using regulating market forces to enhance soundness and stability of the financial system
- Improving transparency and risk structures via better disclosure
- Increasing incentives to strengthen risk management and internal control systems

Pillar III

IV. Korea's Systemic Risk Management

1 Implementation of Basel II and III (2)

Capital Requirements

- Total capital ratio in 2017: 9.75% for D-SIBs, 9.25% for non D-SIBs

Capital Ratio	2016	2017	2018	2019~
CET1 capital ratio(A)	4.5%	4.5%	4.5%	4.5%
Tier1 capital ratio(B)	6.0%	6.0%	6.0%	6.0%
Total capital ratio (C=B+Tier2)	8.0%	8.0%	8.0%	8.0%
Capital Conservation Buffer (D)	0.625%	1.25%	1.875%	2.5%
Total capital ratio including conservation buffer (E=C+D)	8.625%	9.25%	9.875%	10.5%
If D-SIBs capital is imposed	0.25%	0.5%	0.75%	1.0%
If CCyB is imposed	0.625%	1.25%	1.875%	2.5%

IV. Korea's Systemic Risk Management

1 Implementation of Basel II and III (3)

Liquidity

▪ LCR

$$\text{LCR} = \frac{\text{Stock of high quality liquid assets}}{\text{Net cash outflows over 30-days}}$$

- Implemented for domestic banks and foreign bank branches in January 2015
- Different LCR applied in consideration of the size and characteristics of banks (phased-in increase up to 100% for domestic banks and 60% for foreign bank branches)

$$\text{LCR (Foreign Currency)} = \frac{\text{Stock of high quality liquid assets (Foreign Currency)}}{\text{Net cash outflows over 30-days (Foreign Currency)}}$$

▪ FX LCR

- For banks with FX liabilities above 5% of the total or USD500 million
- Phased-in increase until 2019 (60% (2017) → 70% (2018) → 80% (2019))

▪ NSFR

$$\text{NSFR} = \frac{\text{Available Stable Funding}}{\text{Required Stable Funding}}$$

- Scheduled to be implemented in January 2018
(Details to be finalized in Q3-Q4, 2017)

IV. Korea's Systemic Risk Management

2 Managing systemic risk through macroprudential regulation

D-SIBs (1)

- **(Background)** Concept of G-SIBs extended to D-SIBs in an effort to minimize potentially negative impact from systemically important banks on the economy
- **(Implementation)** Concept finalized by Basel Committee in December 2012 and implemented in Korea in January 2016
- **(D-SIBs in Korea)** Four financial holding companies and one bank (Shinhan Financial Group, Hana Financial Group, KB Financial Group, NH Financial Group and Woori Bank) designated as D-SIBs for 2018

IV. Korea's Systemic Risk Management

2 Managing systemic risk through macroprudential regulation

D-SIBs (2)

- Systemic importance assessed by 11 indicators in 5 criteria

Criteria	Indicator	Weighting
Size (20%)	Total exposure	20%
Interconnectedness (20%)	Intra-financial system assets	6.7%
	Intra-financial system liabilities	6.7%
	Securities outstanding	6.7%
Substitutability (20%)	Payments activity in KRW	6.7%
	Payments activity in foreign currencies	6.7%
	Assets under custody	6.7%
Complexity (20%)	Notional amount of OTC derivatives	10%
	Trading and available-for-sale securities	10%
Country-specific factors (20%)	Foreign currency-denominated debt	10%
	Household loans	10%
Total		100%



IV. Korea's Systemic Risk Management

Increasing Interconnectedness among D-SIBs

- (Total) The proportion of systemic importance of D-SIBs in terms of interconnectedness gradually increasing in the entire banking system since end-2014
* 38.4% (end-2014) → 48.4% (end-2015) → 52.5% (end-2016)
- (Individual) Bank holding companies (Bank 2 and Bank 3) showing increases compared to the end of 2015

(in basis point)

		Dec. 2014	Dec. 2015	Dec. 2016
D-SIBs	Bank1	1,110	1,227	1,229
	Bank2	709	854	1,092
	Bank3	677	910	1,070
	Bank4	597	937	966
	Bank5	752	907	889
	Total	3,845	4,836	5,246
Aggregate proportion		38.4%	48.4%	52.5%

IV. Korea's Systemic Risk Management

2 Managing systemic risk through macroprudential regulation

CCyB (1)

- **(Background)** Countercyclical capital buffer (CCyB) introduced to protect the banking sector during a period of excessive aggregate credit growth, often associated with system-wide risk
- **(Implementation)** Final rules on CCyB announced in December 2012; applied to Korea's D-SIBs since January 2016
- **(The level of CCyB)** Currently 0% (since 2016)

IV. Korea's Systemic Risk Management

2 Managing systemic risk through macroprudential regulation

CCyB [2]

- For determination of the level of CCyB, **one main indicator (total credit-to-GDP gap) and five secondary indicators** used to help analyze market conditions and systemic stability of the financial sector

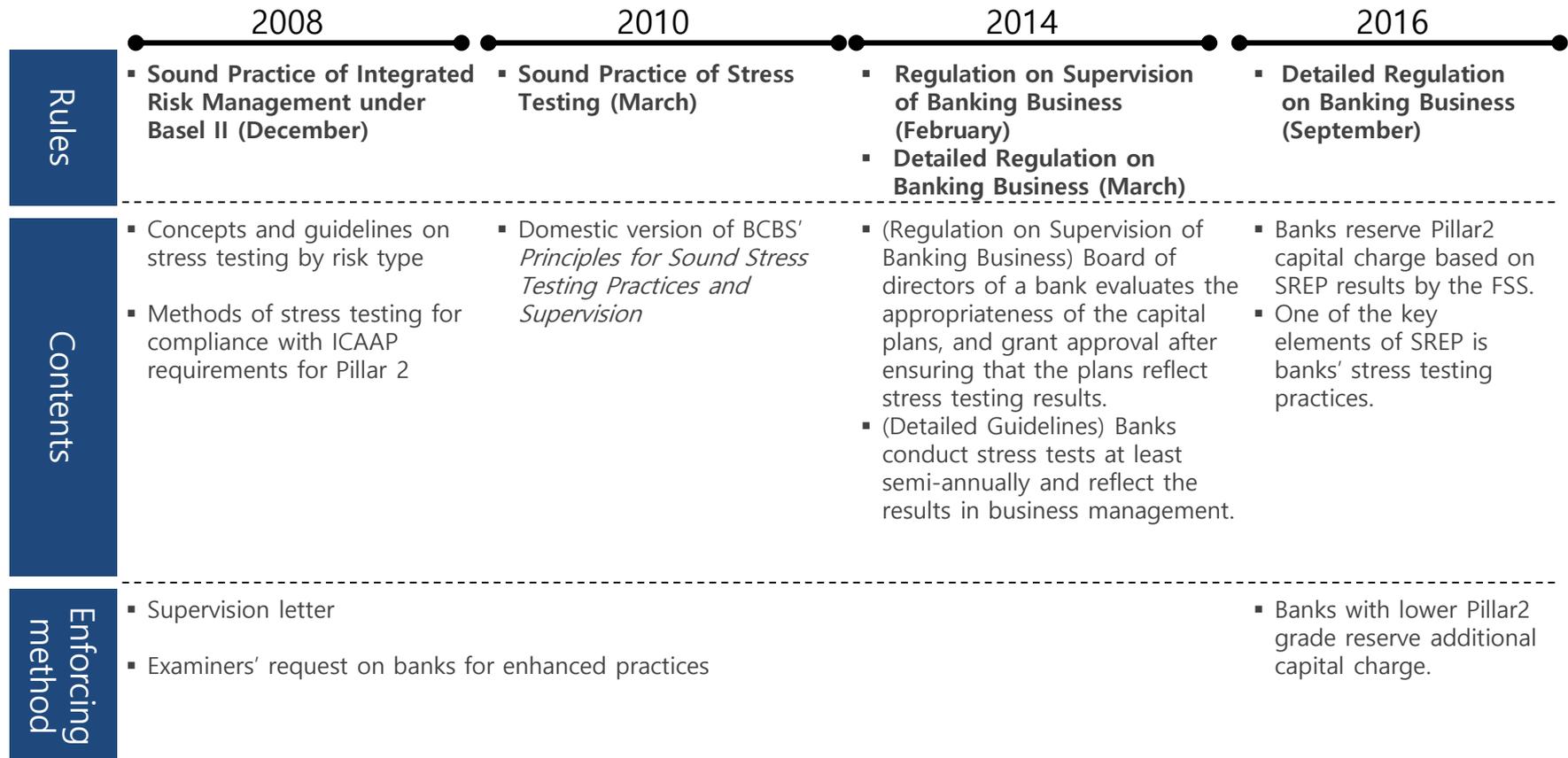
Main Indicator	Total credit-to-GDP gap
Secondary Indicators	Total Credit Gap
	Household debt-to-disposable income gap
	Housing price-to-GDP gap
	Marketable borrowing-to-M2 gap
	Short-term foreign debt-to-foreign exchange holding gap

- **The level of CCyB** set at **0%** and applied to all domestic banks and bank holding companies since March 2016

IV. Korea's Systemic Risk Management

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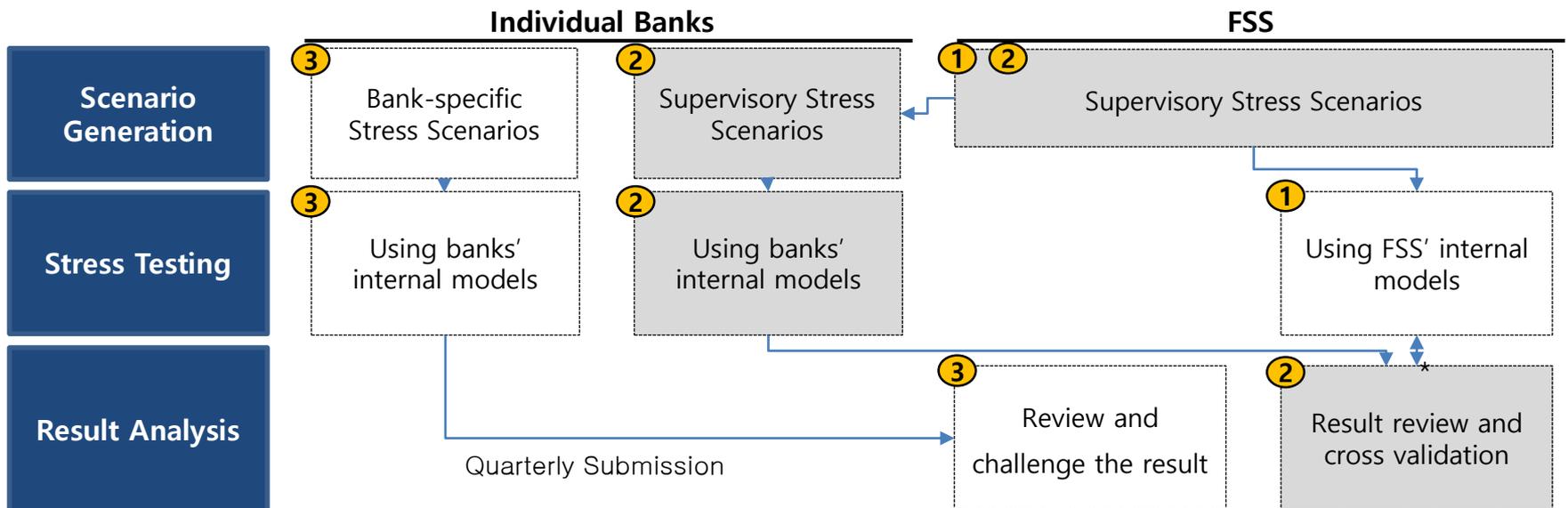
Stress test framework (1)



IV. Korea's Systemic Risk Management

3 Stress test framework (2)

	Scenario	Model
① FSS Top-down ST:	FSS	FSS
② FSS Bottom-up ST:	FSS	Individual banks
③ Bank specific Bottom-up ST:	Individual banks	Individual banks



IV. Korea's Systemic Risk Management

4

Systemic management of potential risks

- Risk analysis through early warning system and stress tests for macroprudential supervision; off-site monitoring of risks and signs of distress from both individual financial firms and the overall financial system
- Detection of risk factors such as contagion risks arising from interconnectedness and “herd behaviors” caused by changes in the financial markets; identification and stricter monitoring of risk transmission channels

IV. Korea's Systemic Risk Management

5

Cooperation with related authorities

Cooperation Framework for Prudent Finance Supervision

MOSF

FSC/FSS

BOK

- Close policy discussion and coordination among government agencies, the central bank, and regulators also taking place on a regular basis to ensure effective, coordinated macroprudential measures in the event of a crisis
- Meeting of the heads and other senior officials of MOSF, BOK, and FSC/FSS each month to assess new developments and conditions in the market and the economy





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V. Conclusion

- In relation to the Fourth Industrial Revolution characterized by emergence of Internet banks and Fintech in financial industry,
 - new systemic risk factors may appear due to greater threats of cyber attack and changes in banks' business models
- These changing forces inevitably call for working closely together among financial supervisors/regulators within the global regulatory framework
- So far Korea has generally complied with the agreed timetable in implementing many global regulatory reform measures successfully



V. Conclusion

- As Korea is re-establishing a new framework for financial order and regulatory environment that is well-suited to support Fintech as well as the newly authorized internet banks
- We are looking closely into potential systemic risk factors that may emerge in the due process
- We recognize that household debt and some weakness in corporate sector as imminent issues for Korean supervisory authority, and we are ensuring that these issues do not turn into a systemic risk with pre-emptive measures.

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소비자는 **행복**하게”

금융감독원의 약속입니다

Q & A

“금융은 튼튼하게
소비자는 행복하게”

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Thank you