

# Appendix

English Only (英語のみ)

# Political Schedule

## Key political events

|      | Japan | US   | Europe/China and Others                                       |
|------|-------|--|---|
| 2016 | May   |  | <u>G7 summit</u>  |
|      | June  |  | <u>"Brexit" referendum</u>                                    |
|      | Jul   | <u>Upper house election</u>                              |   |
|      | Nov   | <u>Presidential election</u>                             |   |
|      | Dec   | Congress to ratify TPP?                                  |   |
| 2017 | Dec   |  | <u>Xi Jinping administration established for second term?</u> |
| 2018 | Feb   | <u>End of term for FRB Chair Janet Yellen</u>            |   |
|      | Apr   | <u>End of term for BOJ governor Haruhiko Kuroda</u>      |   |
|      | Sep   | <u>Election of LDP president (Shinzo Abe steps down)</u> |   |
|      | Nov   | Mid-term elections                                       |   |
|      | Dec   | End of term for upper house representatives              |   |
| 2019 | Oct   | <u>Sales tax to be hiked again?</u>                      | End of term for ECB president Mario Draghi                    |

Source: Various materials; compiled by DIR.

# Trends in major economic indicators

|   |  | Before inauguration of Abe Administration |   | Current indicators                  | Note   |
|---|--|---|---|-------------------------------------|--|
| Corporate earnings (Ordinary profit)                                  |  | 12.4 trillion yen (Oct.-Dec. 2012)        | ➔ | 17.9 trillion yen (Jul.-Sep. 2015)  | Record high  |
| Wage hike<br>(announced by Rengo, Japanese Trade Union Confederation) |  | 0.82% (2012)                              | ➔ | 2.2% (2015)                         | Highest level in 17 years  |
| Employment Situation  | Number of employees                      | 62.8 million (Oct.- Dec. 2012)            | ➔ | 64.0 million (Oct.-Dec. 2015)       | Increased by more than 1.1 million   |
|   | Unemployment Rate                        | 4.1% (Nov. 2012)                          | ➔ | 3.3% (Dec. 2015)                    | Lower 3% range, lowest in 18 years   |
|   | Active Job Openings-to-Application Ratio | 0.82 (Nov. 2012)                          | ➔ | 1.27 (Dec. 2015)                    | Highest level in 24 years  |
| Nominal GDP   |  | 472.7 trillion yen (Oct.-Dec. 2012)       | ➔ | 499.4 trillion yen (Oct.-Dec. 2015) | Recovering to the level before the global financial crisis in 2008.        |
| Nikkei Stock Average  |  | 8,665 yen (Nov. 14, 2012)                 | ➔ | 16,052 yen (Feb. 23, 2016)          | Highest level in 19 years<br>(Average between Jan.- Dec. 2015: 19,213 yen) |

# The new three arrows of Abenomics

(1) A robust economy that gives rise to hope



Growth strategy

(2) Dream-weaving childcare support

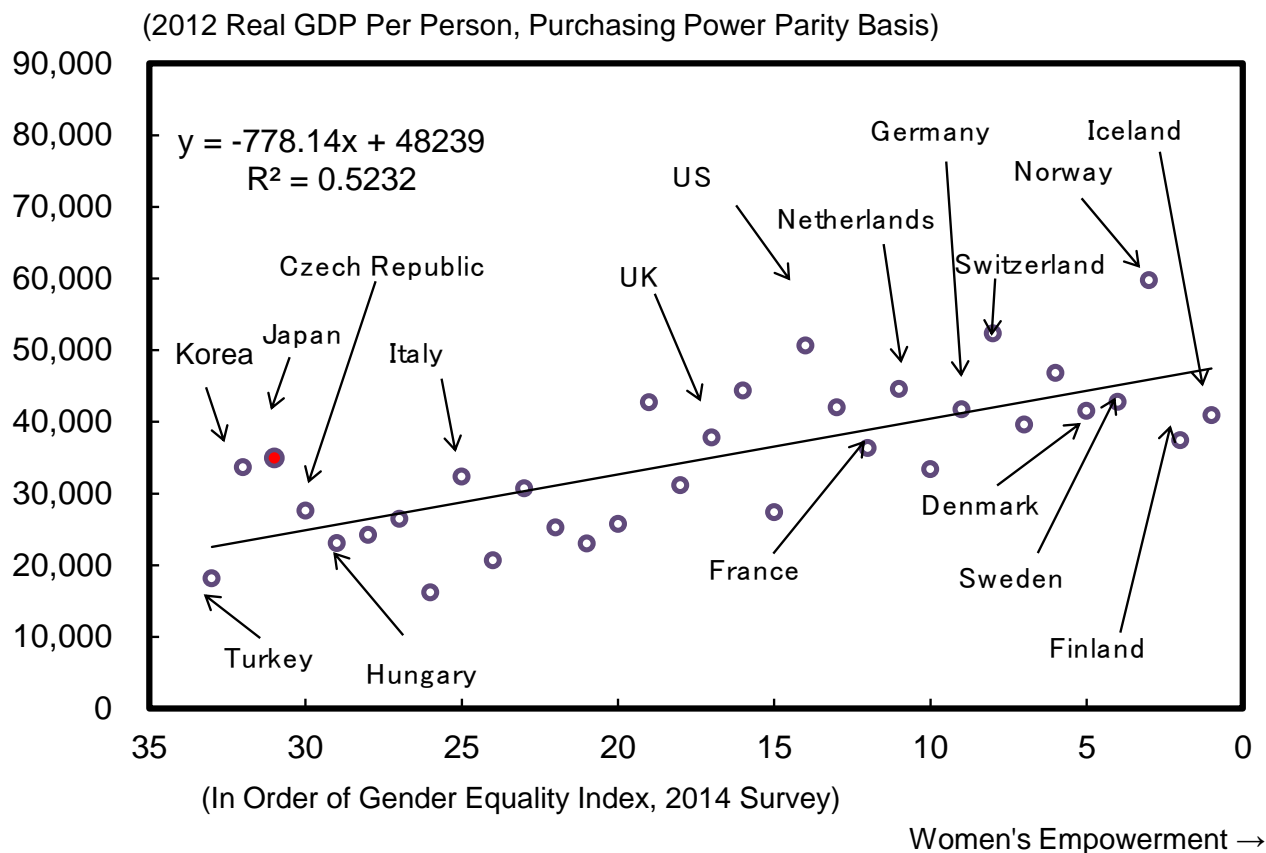


Redistribution policy

(3) Social security that provides reassurance

# “Active involvement of women” is the key to reviving Japan’s economy

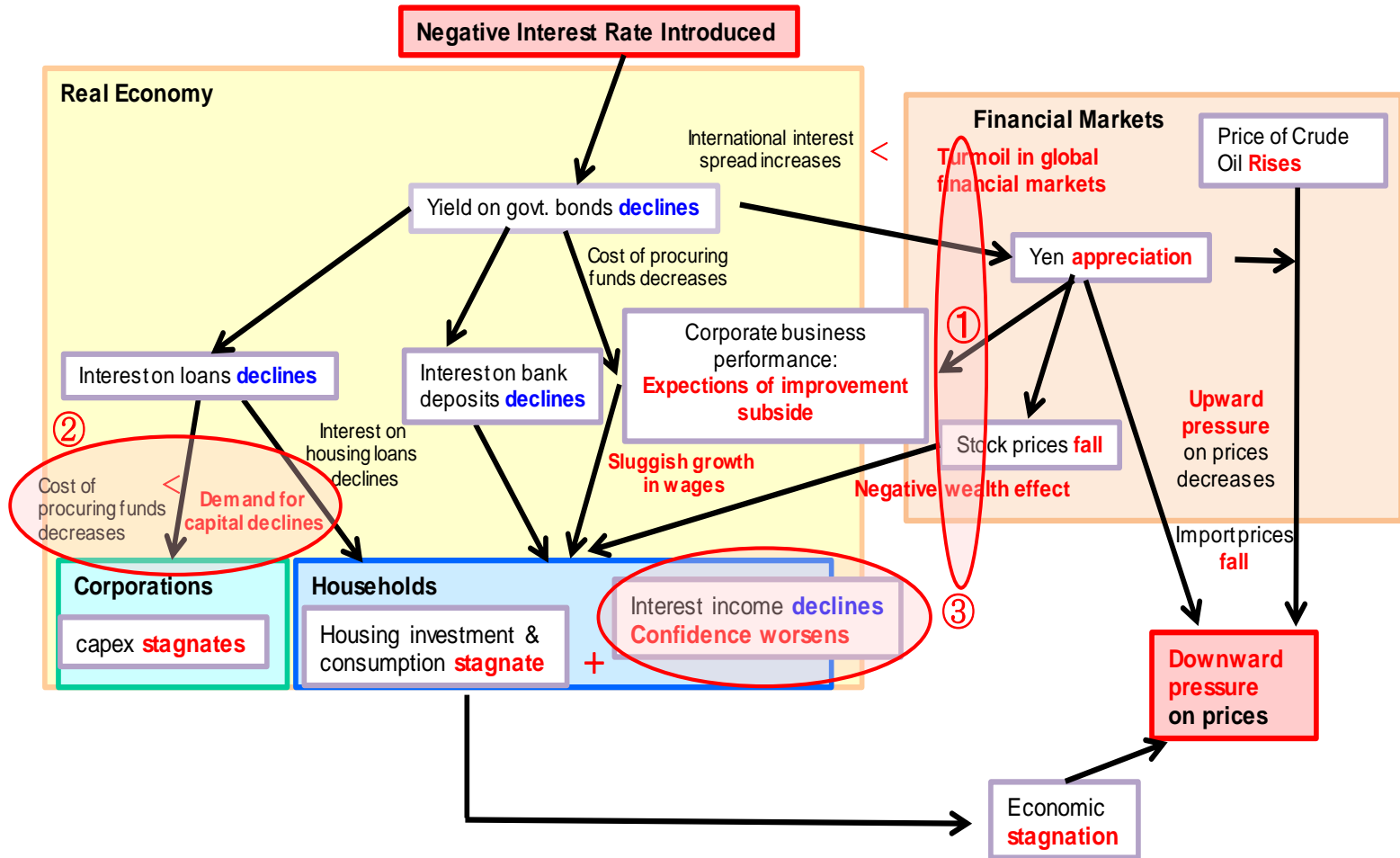
## Gender Equality and Real GDP Per Person in OECD Member Nations (Purchasing Power Parity Basis)



Source: World Economic Forum and OECD; compiled by DIR.

# Japan: Effects of Negative Interest

Possible Negative Effects on Economy & Prices due to Negative Interest Rate

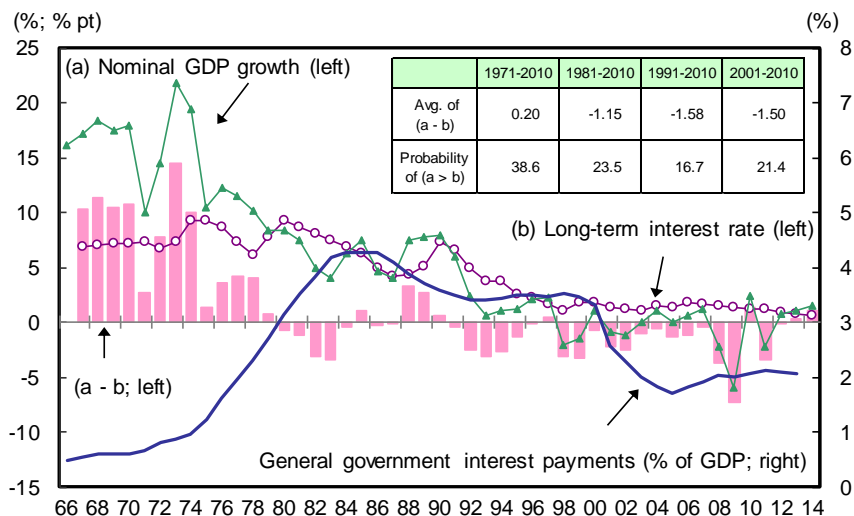


Source: Compiled by DIR.

# Is fiscal adjustment possible if there is economic growth?

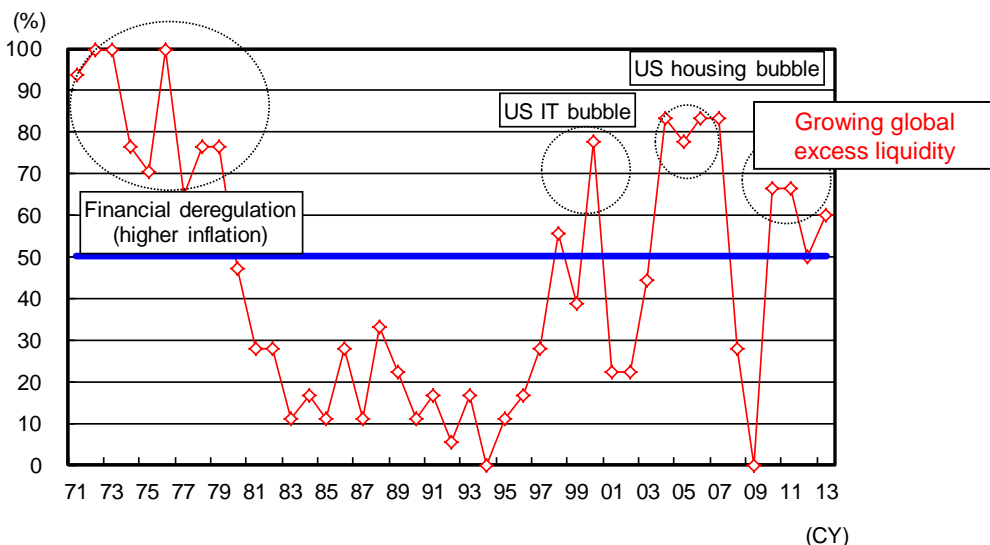
Domar's condition: Nominal GDP growth rate > long-term interest rate

Japan: Nominal GDP, Long-term Interest Rate, Interest Payments



Source: Cabinet Office, IMF; compiled by DIR.  
 Note: General government interest payments: FY basis; other: CY basis.

Ratio of Major OECD Nations That Meet Domar's Condition

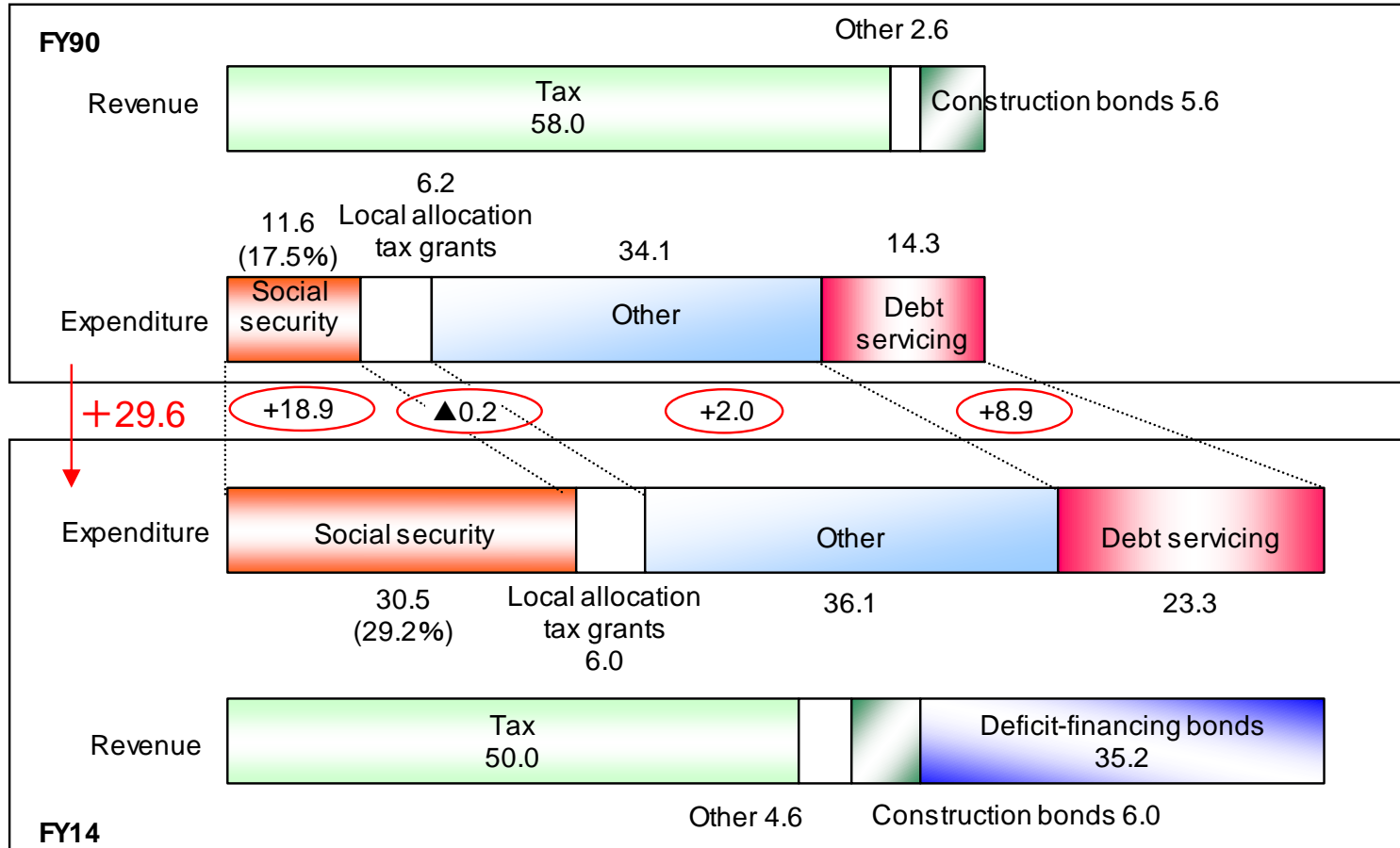


Note: OECD, IMF; compiled by DIR.  
 Note: Major OECD nations are 16 nations for which interest rate (in terms of 10-yr sovereign bond yields) and nominal GDP growth rate since 1971 are available, namely, Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Luxemburg, Netherlands, Norway, Sweden, UK, and US.

# Growing Social Security Costs Main Cause of deteriorating Fiscal Balance

## Comparison of FY90 and FY14 General Government Revenue and Expenditure (Central government)

(Y tril)

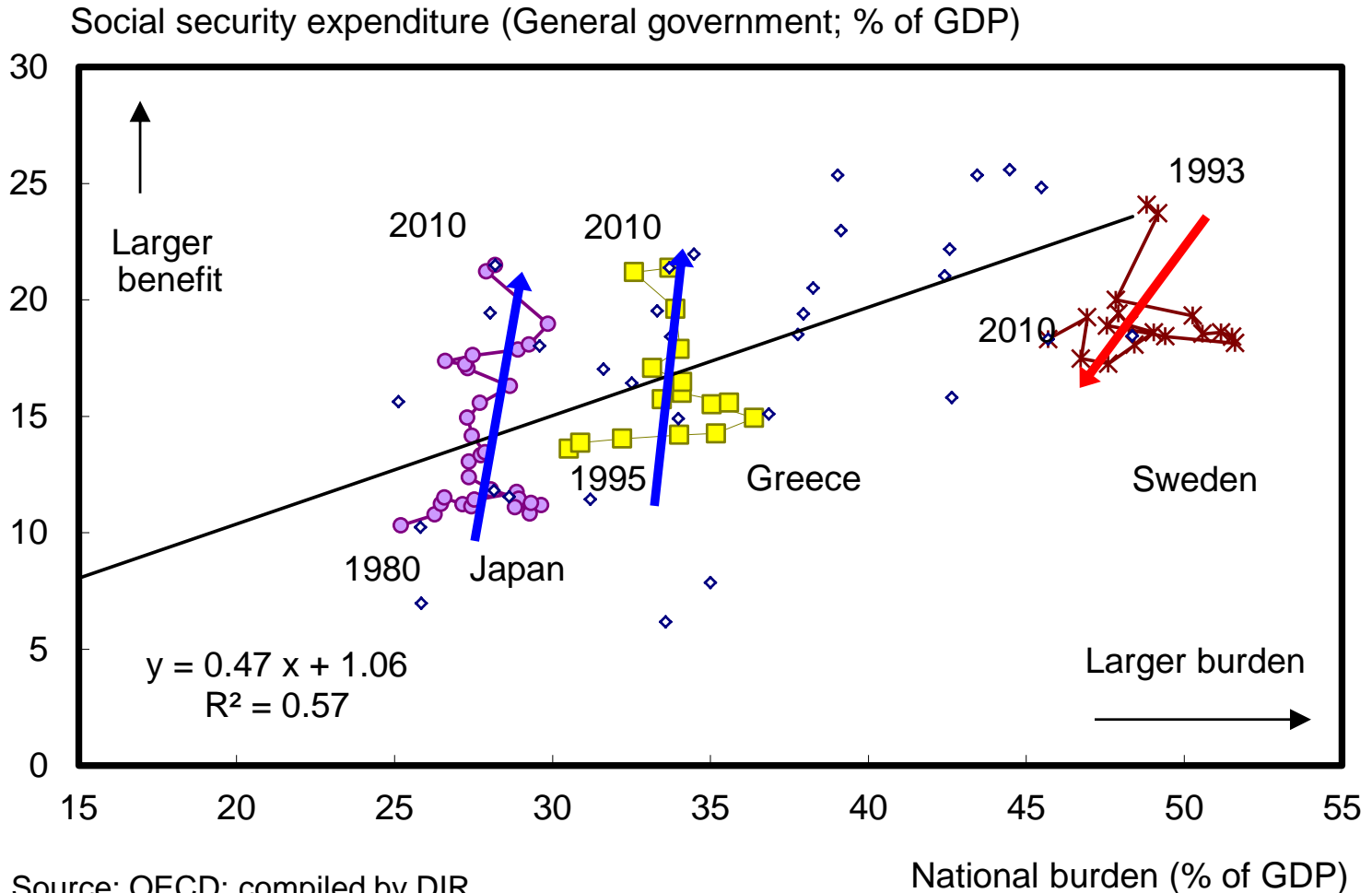


Source: Ministry of Finance; compiled by DIR.  
 Note: FY90: original budget; FY14: government draft.



# The Shift From Mid-Range Benefits for Low Burden to High Benefits for Low Burden

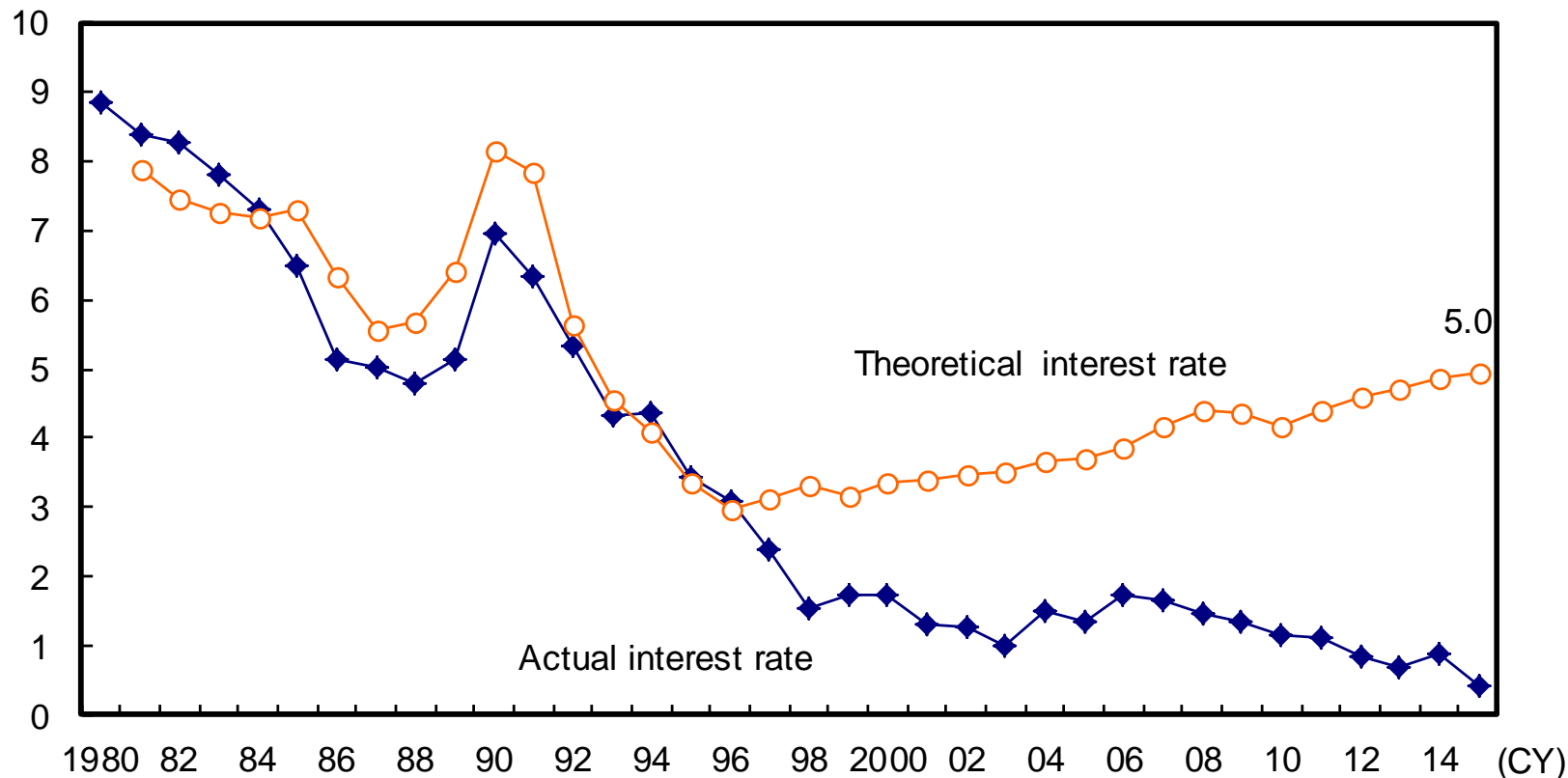
## OECD Nations: National Burden and Social Security (2010)



Source: OECD; compiled by DIR.

# Simulation of Long-Term Interest Rate

## Japan's Theoretical Long-term Interest Rate Implied by Other Nations' Interest Rate (%)



Source: OECD; compiled by DIR.

Estimating equation for theoretical interest rate:

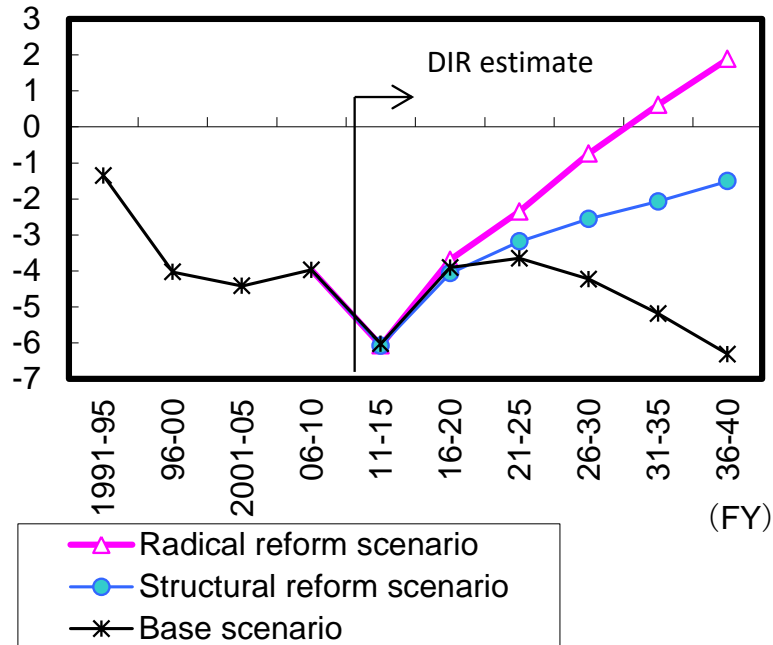
Long-term interest rate =  $1.07 + 0.76 \times \text{short-term interest rate} + 0.02 \times \text{outstanding balance of general government debt (\% of nominal GDP)} + 0.06 \times \text{GDP deflator (y/y)}$ .

Estimation period 1981-2013; Significance of coefficients: 5%; Adjusted R2: 0.87; Coefficients derived from estimation results of long-term interest rates of OECD 21 nations (excl. Japan).

# Consumption Tax(1)

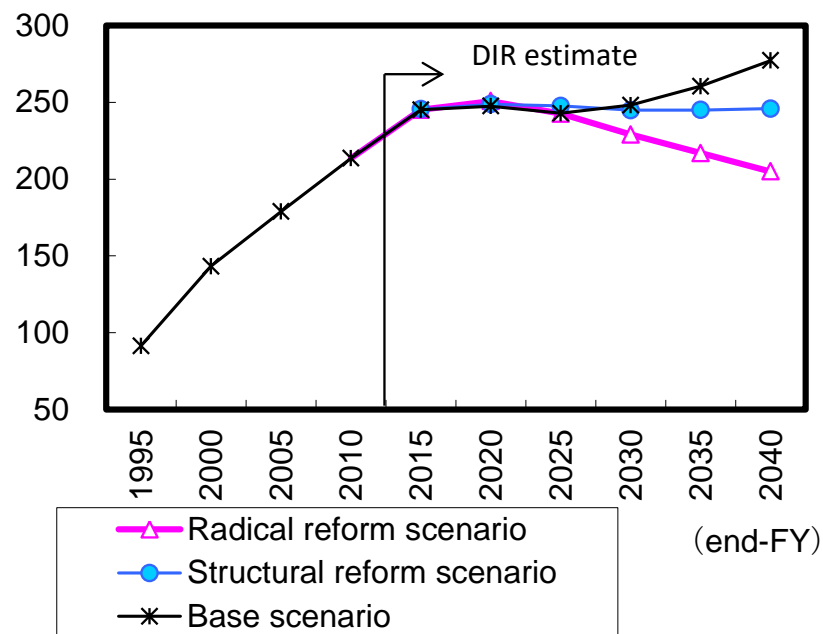
Central/local Government Primary Balance

(% of GDP)



Outstanding Balance of Central/local Government Debt

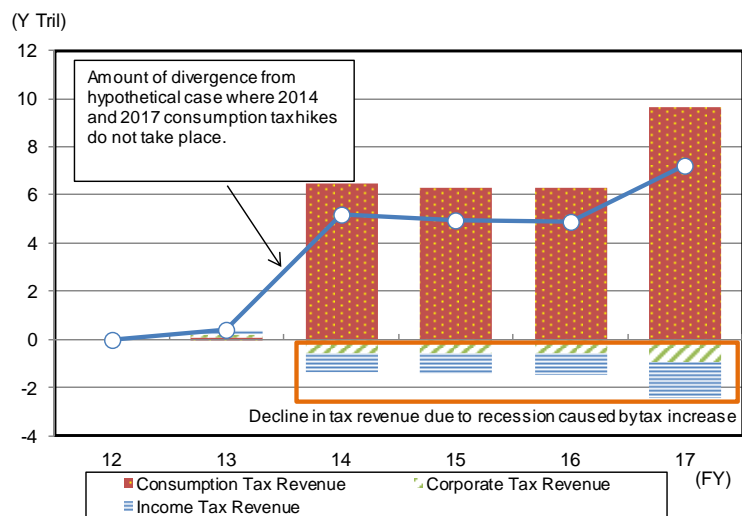
(% of GDP)



Source: Compiled by DIR based on various statistics.

# Consumption Tax(2)

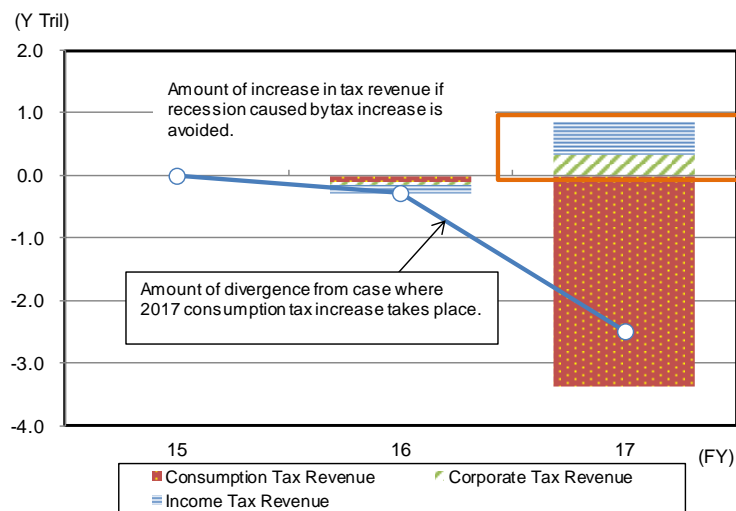
## Tax Revenue Simulation



Source: Produced by DIR

Notes: 1) Simulation results using DIR short-term macro model.

2) FY2017 revenue from consumption tax takes into consideration the amount of decline in tax revenue due to the reduced tax rate.



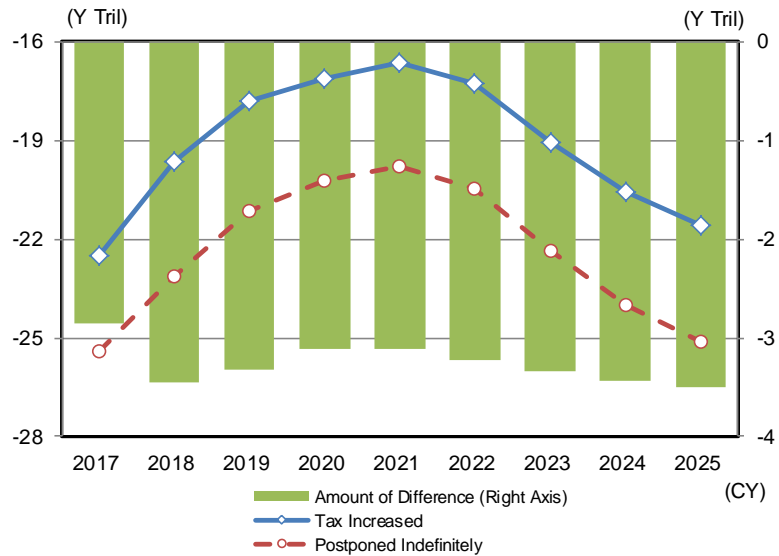
Source: Produced by DIR

Notes: 1) Simulation results using DIR short-term macro model.

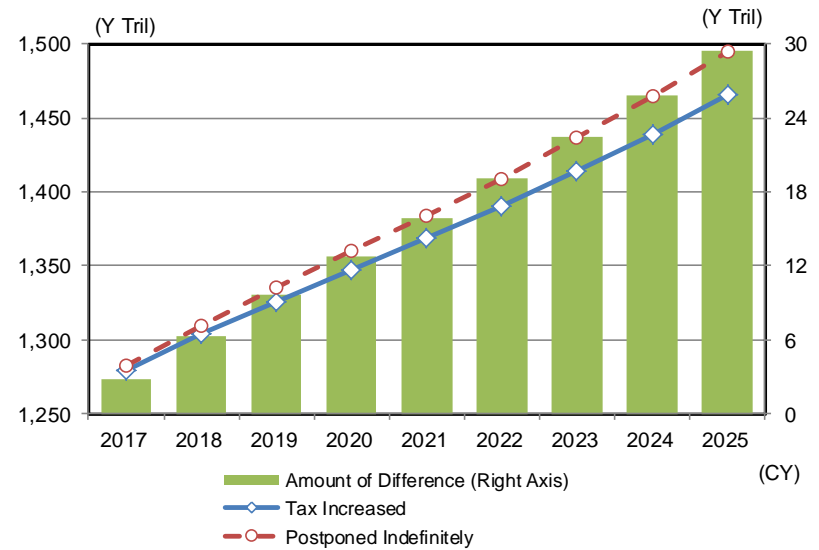
2) FY2017 revenue from consumption tax takes into consideration the amount of decline in tax revenue due to the reduced tax rate.

# Consumption Tax(3)

Simulation of Fiscal Balance (Left: General Government Fiscal Balance, Right: General Government Debt)



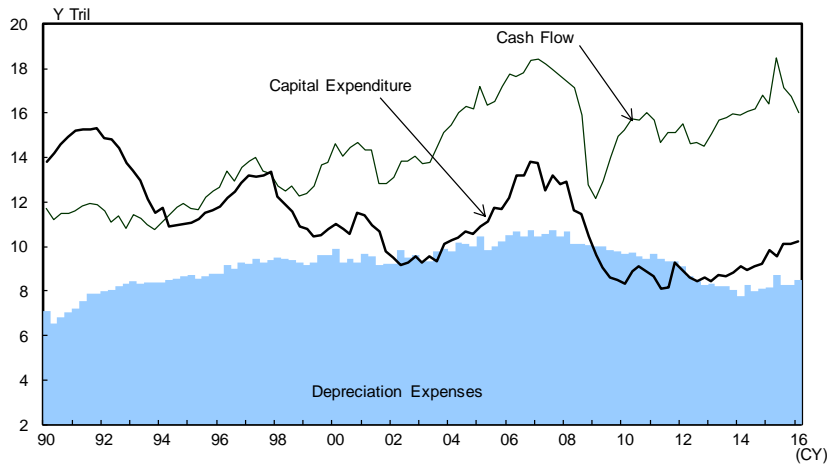
Source: Estimates using DIR Midterm Macro Model.



Source: Estimates using DIR Midterm Macro Model.

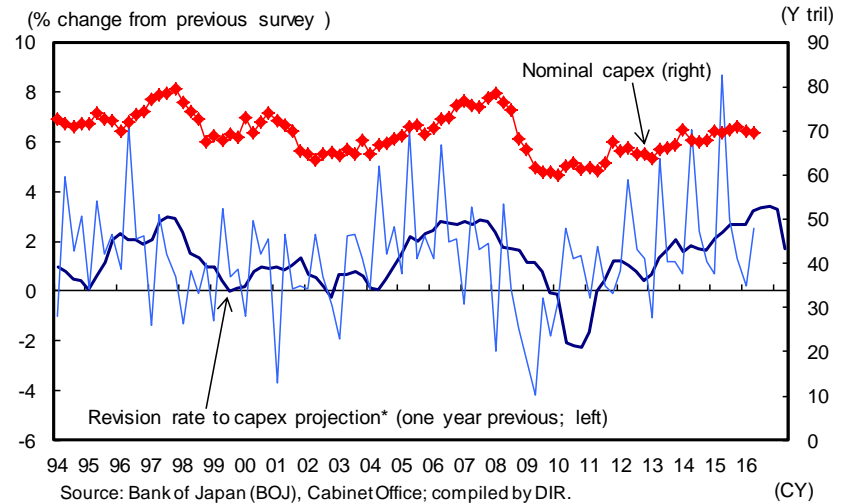
# Capex(1)

Capital Investment and Cash Flow



Source: Ministry of Finance; compiled by DIR  
 Notes: 1) Seasonally adjusted figures for depreciation expenses calculated by DIR.  
 2) Cash flow = recurring profits / 2 + depreciation expenses.

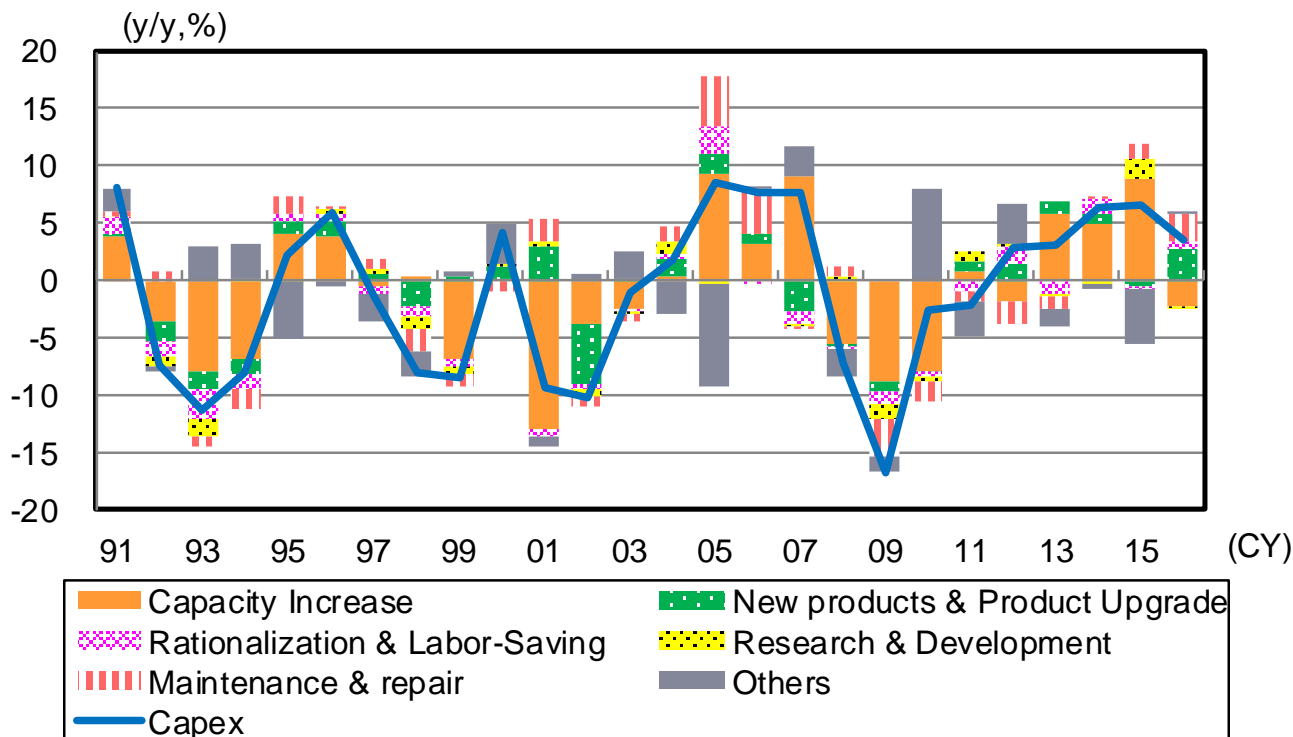
Capex: Actual and Projection



Source: Bank of Japan (BOJ), Cabinet Office; compiled by DIR.  
 \*BOJ Tankan survey of corporate sentiment; bold line=4Q MA.

# Capex(2)

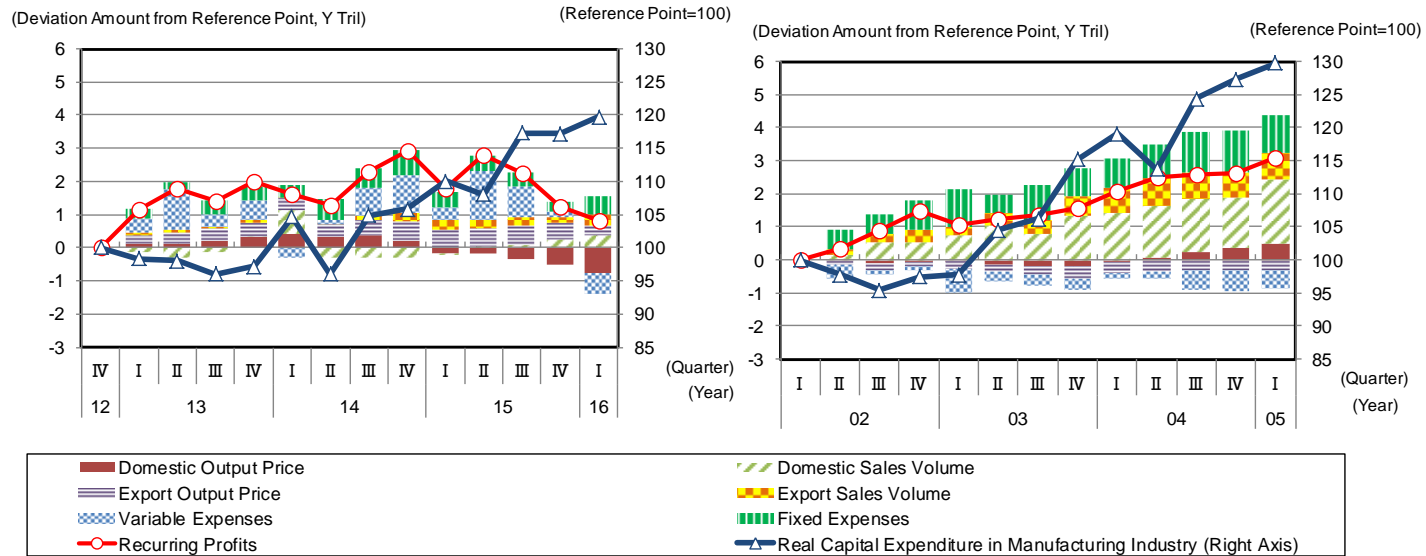
Capex Breakdown by Motive of Investment (All Industry)



Source: Development Bank of Japan, compiled by DIR.

# Capex(3)

## Factor Analysis of Corporate Earnings

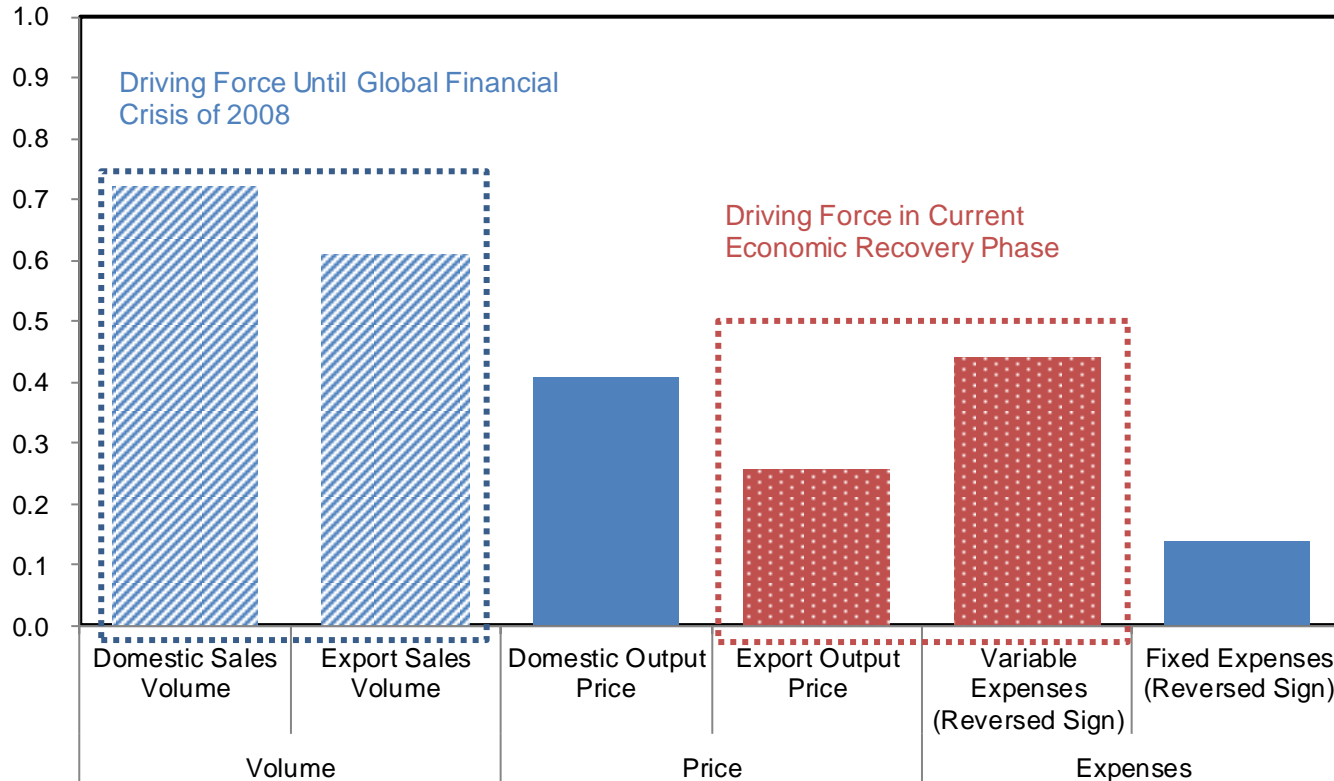


Source: Ministry of Finance, Bank of Japan; compiled by DIR.



# Capex(4)

## Correlation Coefficient of Capital Investment and Corporate Earnings Components

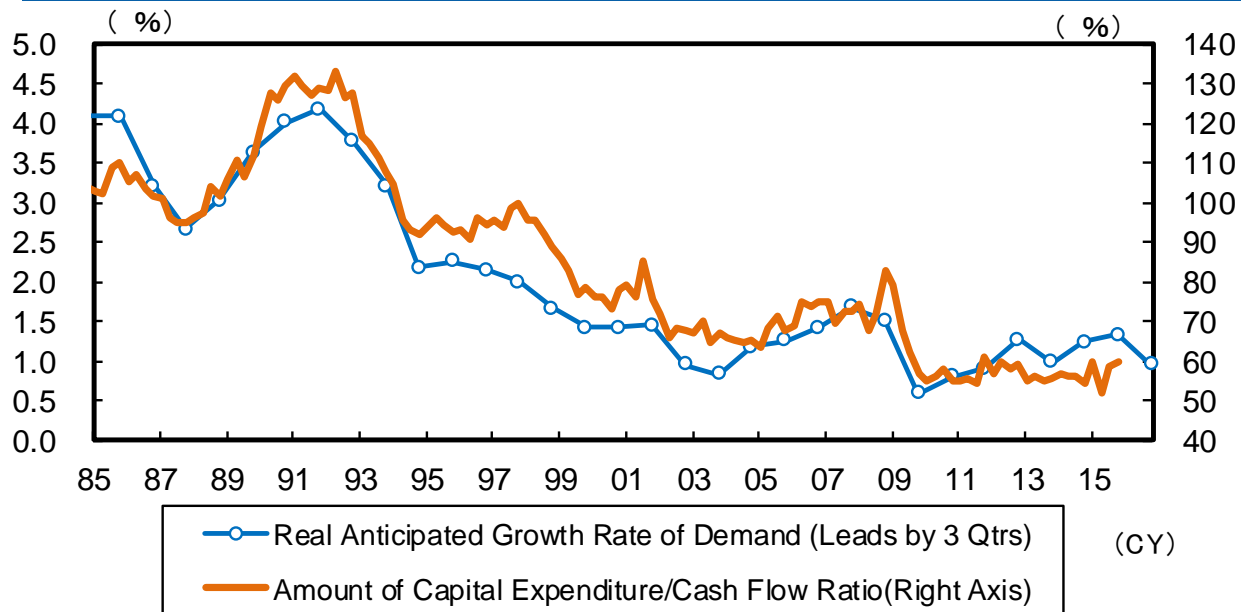


Source: Ministry of Finance, Ministry of Economy, Trade and Industry; compiled by DIR.

Note: Coefficient with the greatest absolute value out of 4-quarter time-difference correlation is displayed.

# Capex(5)

Real Anticipated Growth Rate of Demand, and Amount of Capital Expenditure/Cash Flow Ratio



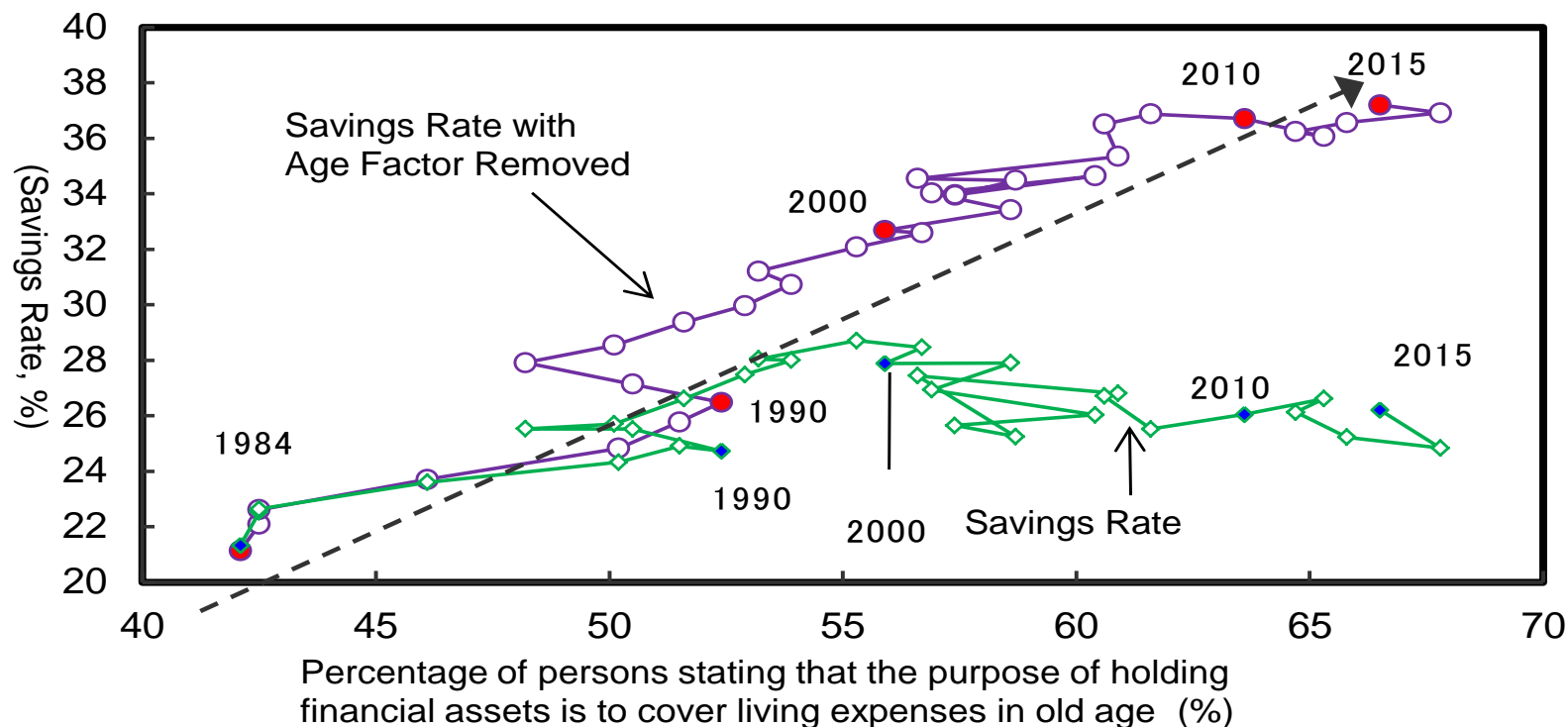
Source: Ministry of Finance, Cabinet Office; compiled by DIR.

Note: Real anticipated growth rate of demand is an all-industry figure.

Indicates outlook five-years into the future.

# Consumption(1)

## Financial Planning for Old Age and Savings Rate

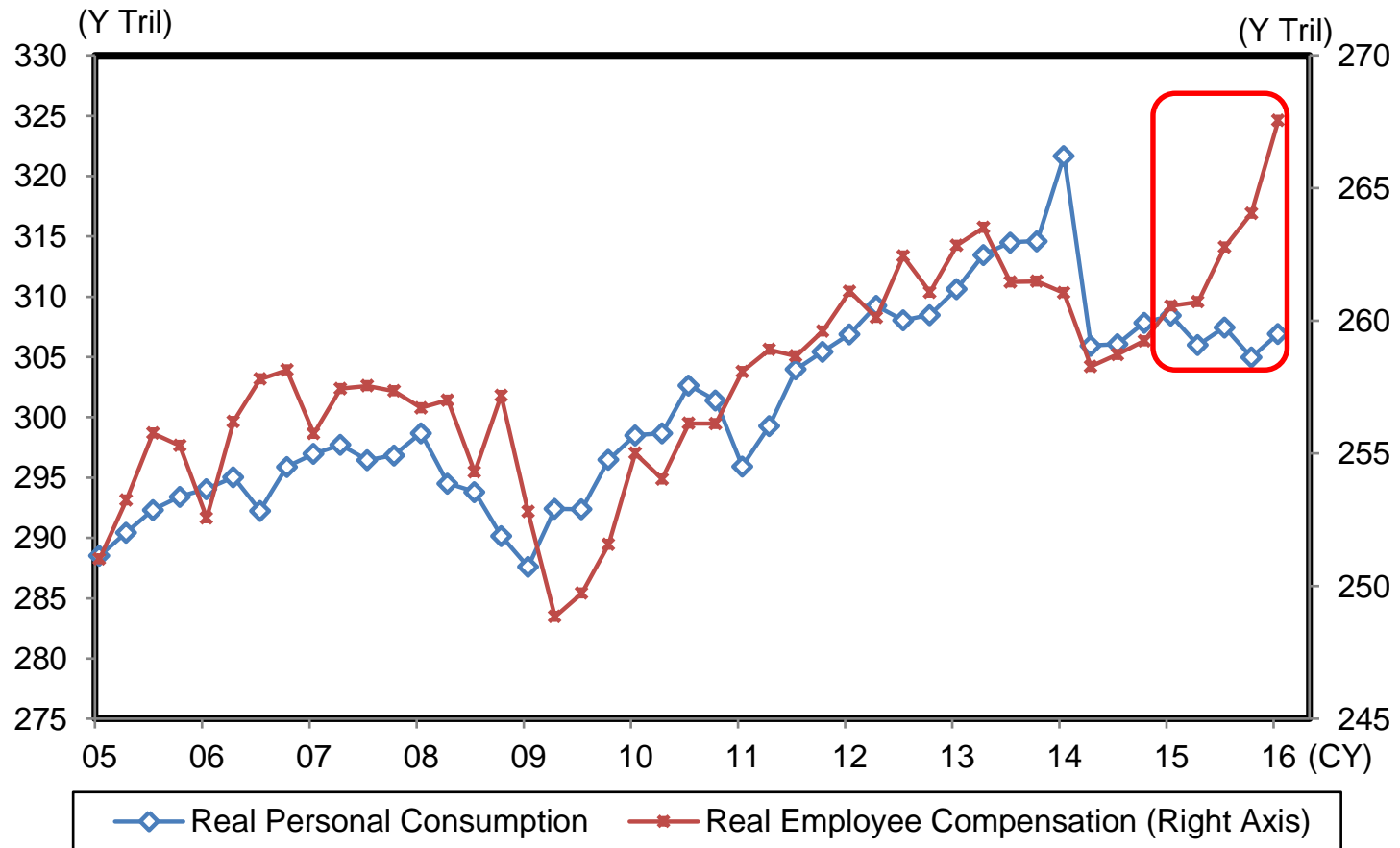


Source: Ministry of Internal Affairs and Communications, and Bank of Japan; compiled by DIR.  
 Note: Savings rate from household survey "Rate of Surplus". Aging factor found by estimating savings rate. The forecast formula is as follows: Savings rate = 18.01 - 0.75 x aging rate + 0.16 x anxiety regarding the future + 0.01 x household assets (-2). Aging rate and household asset factors have a significance of 1%. Anxiety regarding the future has a significance of 5%. Anxiety regarding the future is the percentage of persons stating that the purpose of holding financial assets is to cover living expenses in old age in reply to surveys regarding the purpose of holding financial assets.

# Consumption(2)

## Employee Compensation Growing, while Personal Consumption Stagnates

### Real Personal Consumption and Real Employee Compensation



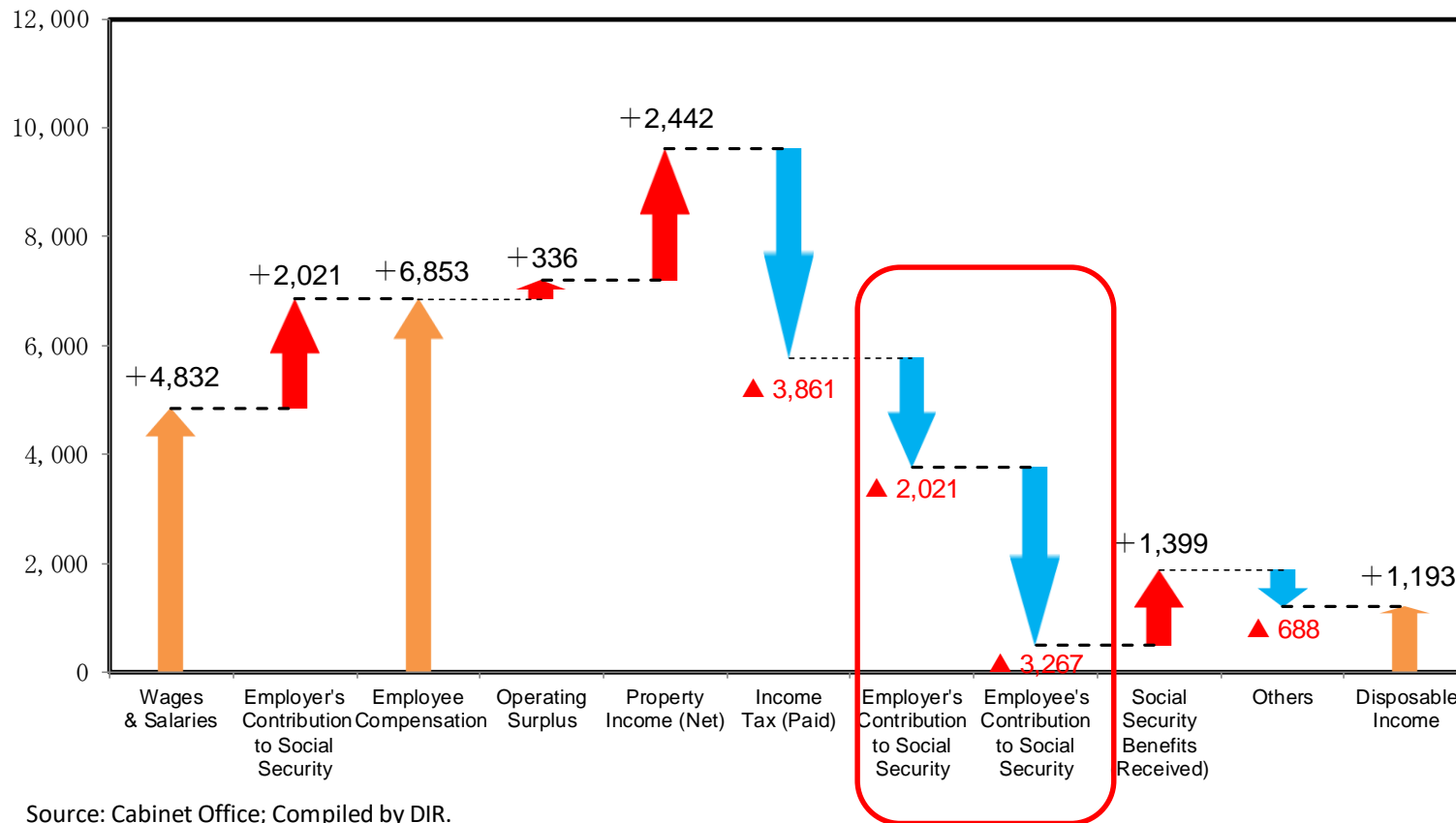
Source: Cabinet Office; Compiled by DIR.

# Consumption(3)

## Increase in Social Security Contributions Puts Squeeze on Growth in Disposable Income

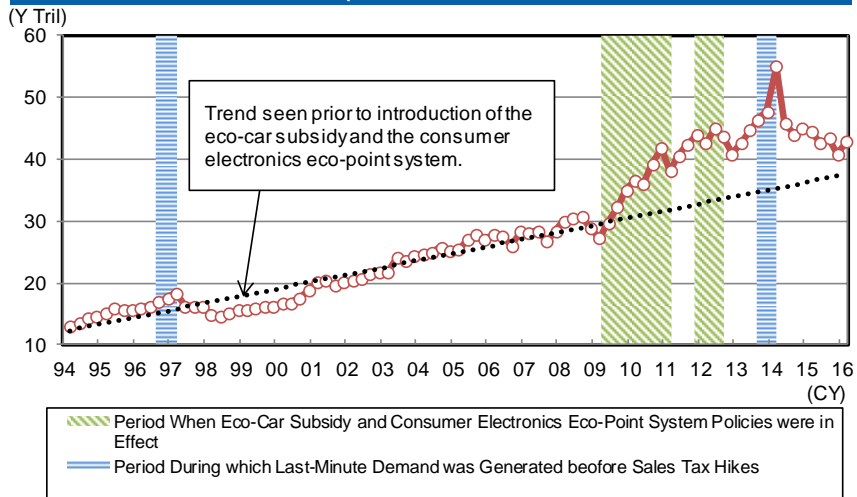
### Factor Analysis of Change in Wages & Salaries, Employee Compensation, and Disposable Income (FY2012→FY2014)

(Change Between FY2012 and FY2014, Yen Bil)

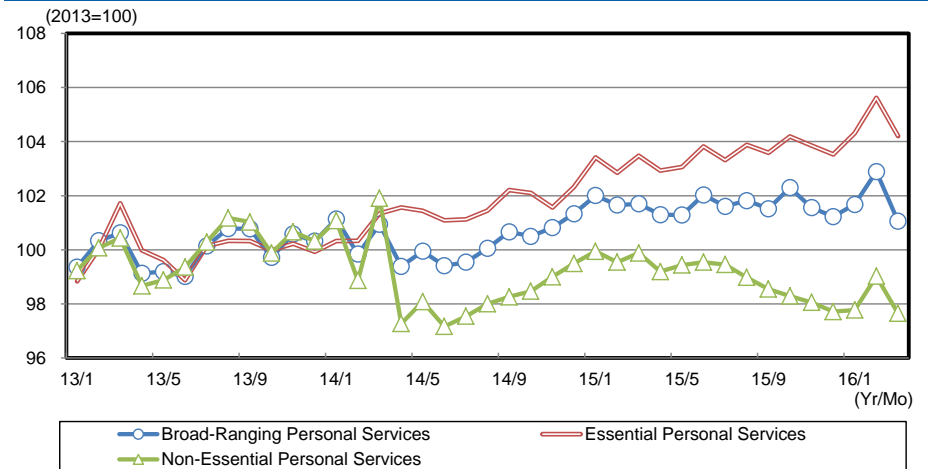


# Consumption(4)

## Real Durables Consumption and its Trend



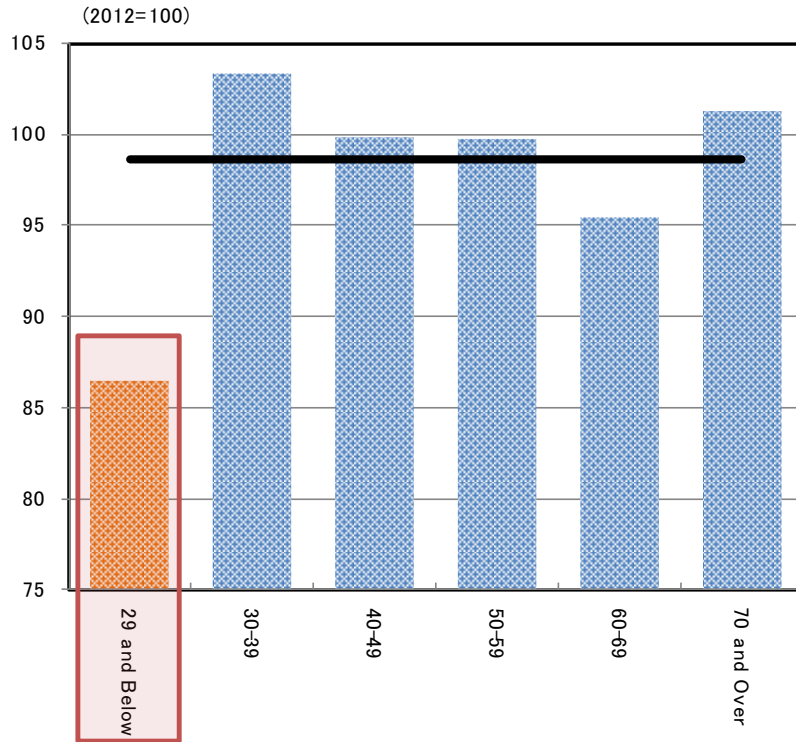
## Trends in Personal Services



Source: Ministry of Economy, Trade and Industry; compiled by DIR.  
Note: Less retailing.

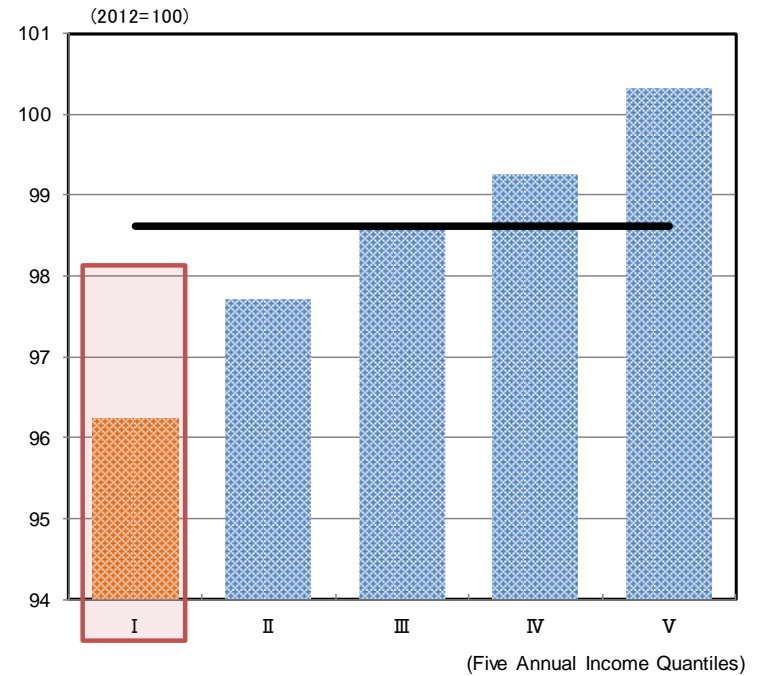
# Consumption(5)

Personal Consumption by Age Group



Source: Ministry of General Affairs and Communications; compiled by DIR  
 Note: Seasonal Adjustment by DIR. Thick bold line indicates average of all households.

Personal Consumption by Annual Income



Source: Ministry of General Affairs and Communications; compiled by DIR  
 Note: Seasonal Adjustment by DIR. Thick bold line indicates average of all households.

# Consumption(6)

## Consumption Function Estimation Results by Age Group and Income Bracket

|                              | Estimation of Consumption Functions by Age Group      |          |               |             |         |                 |
|------------------------------|---|----------|---------------|-------------|---------|-----------------|
|                              | Age 29 and Below                                      | 30-39    | 40-49         | 50-59       | 60-69   | Age 70 and Over |
| Disposable Income            | 0.91***   | 0.97***  | 0.67***       | 0.79***     | 0.49*** | 0.46***         |
| Financial Assets             | 0.08  | -0.04    | -0.05         | 0.16***     | 0.11    | 0.54***         |
| Anxiety Regarding the Future | -0.32***  | -0.11*** | -0.15***      | -0.06*      | 0.00    | 0.11            |
| Trend Term                   | 0.00  | 0.00**   | 0.00          | 0.00*       | 0.00*** | 0.00**          |
|                              | Estimation of Consumption Functions by Income Bracket |          |               |             |         |                 |
|                              | Low Income  |          | Middle Income | High Income |         |                 |
| Disposable Income            | 0.85***   |          | 0.84***       | 0.75***     |         |                 |
| Financial Assets             | 0.15***   |          | 0.17***       | 0.26***     |         |                 |
| Anxiety Regarding the Future | -0.01   |          | -0.02**       | -0.07***    |         |                 |

Source: Produced by DIR.

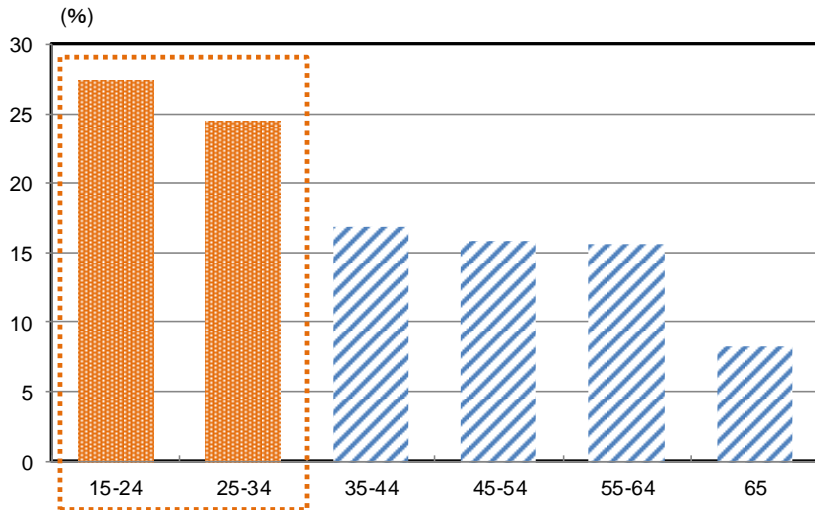
Notes: 1) The asterisks \*, \*\*, \*\*\* indicate that the coefficients are statistically different from zero at the 1%, 5%, and 10% levels.

2) The factor of anxiety regarding the future is Japan's outstanding obligations as a percentage of GDP.



# Consumption(7)

Involuntary Irregular Employee Ratio (2015)

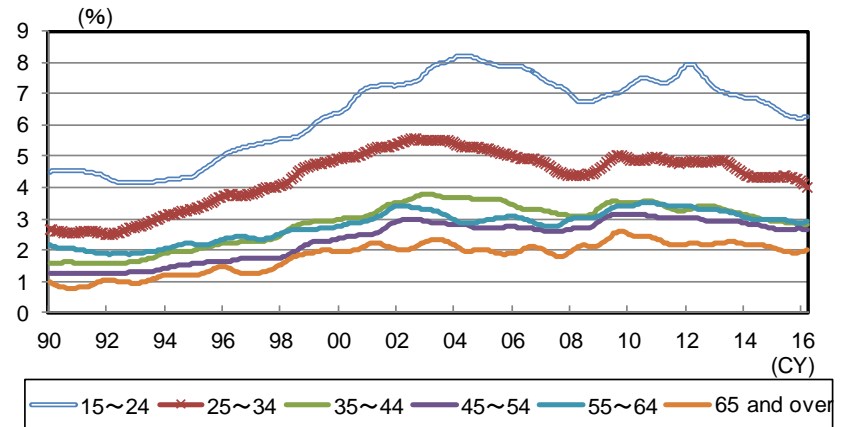


Source: Ministry of Internal Affairs and Communication; compiled by DIR

Notes: 1) Number of irregular employees accounted for by individuals who became an irregular employee because there were no regular employee positions open.

2) Number of irregular employees in the 15-24 age group does not include individuals still going to school.

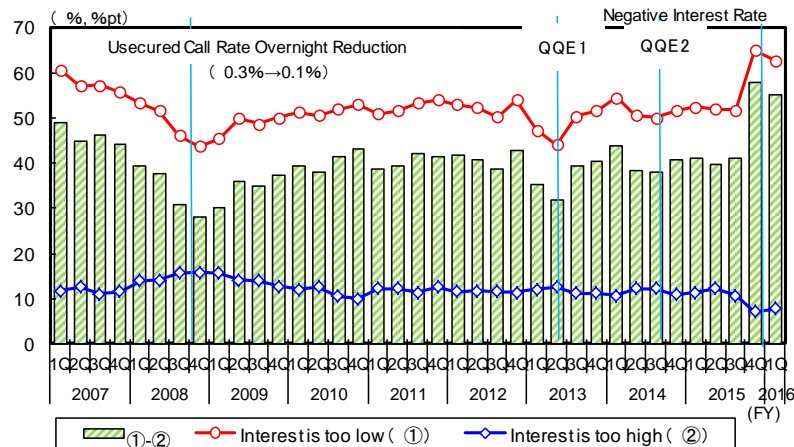
Structural and Frictional Unemployment Rates by Age Group



Source: Ministry of Internal Affairs and Communication, Ministry of Health, Labour and Welfare; compiled by DIR

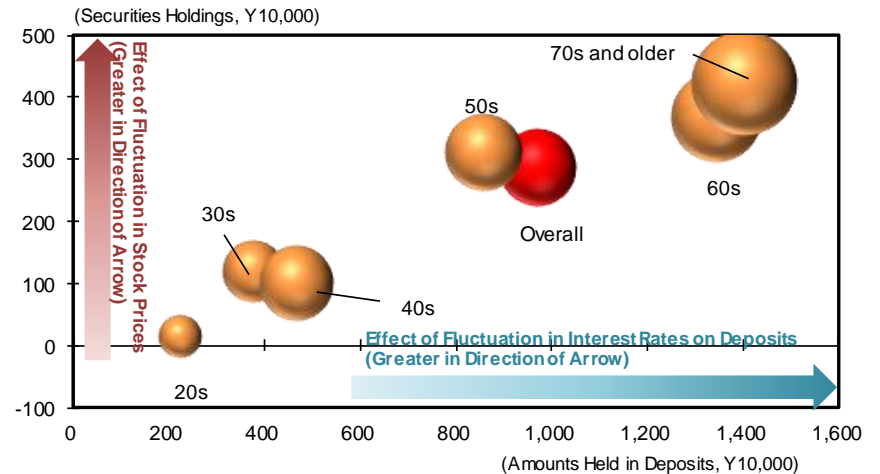
# Consumption(8)

Individual Opinions Regarding Level of Interest Rate



Note: Ratio of responses to survey regarding level of interest rate (too low : too high).  
Source: Bank of Japan; compiled by DIR.

Deposits and Securities Holdings by Age of Head of Household ( Households holding financial assets, 2015)

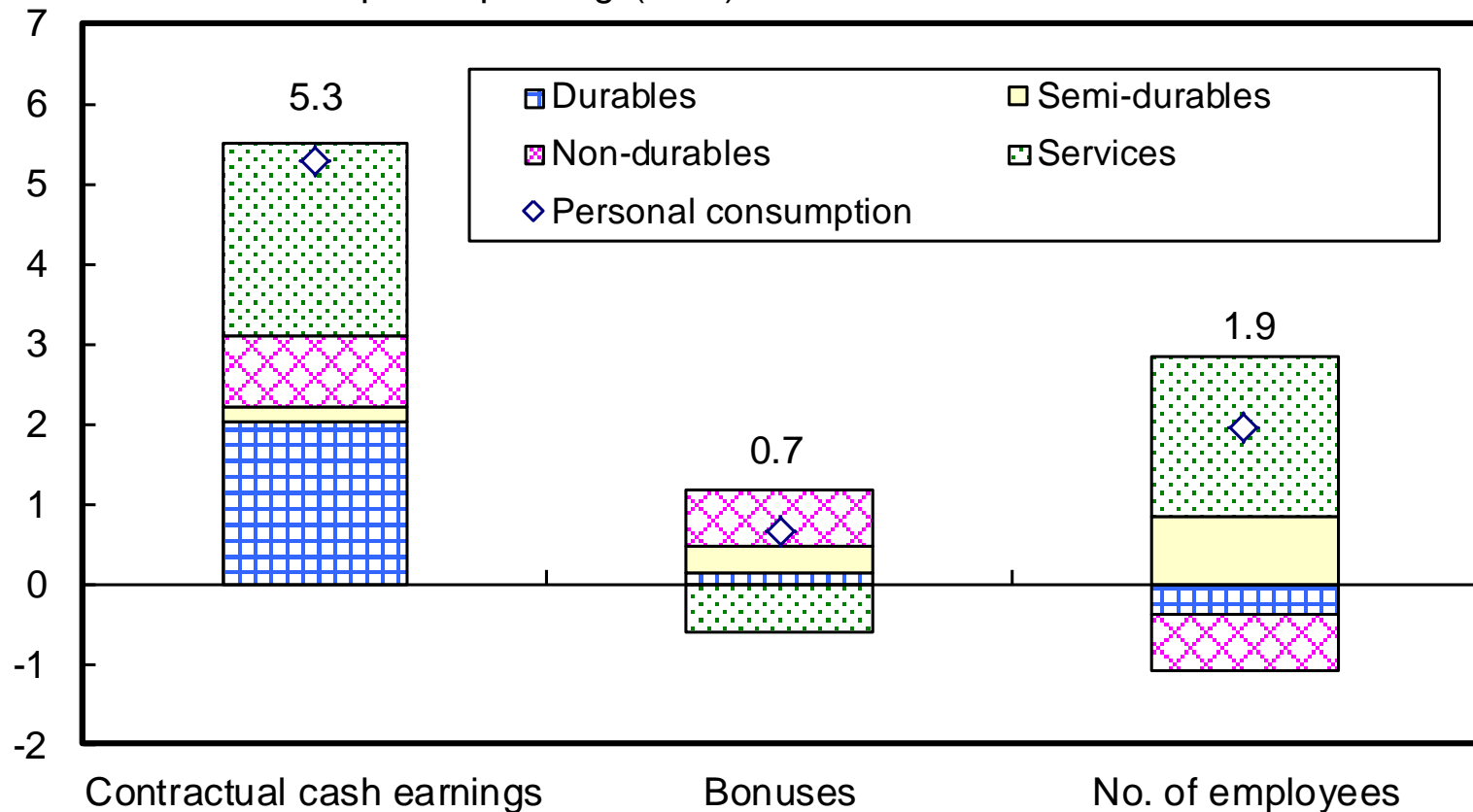


Source: Central Council for Financial Services Information, Ministry of General Affairs and Communication; compiled by DIR.  
Note: Size of circles represents number of households as of 2015. Overall category is a simple average of number of households.

# Impacts on Consumption Vary by Types of Labor Market Improvement

## Impact of 2% Rise in Employee Compensation on Personal Consumption

Increase in consumption spending (Y tril)

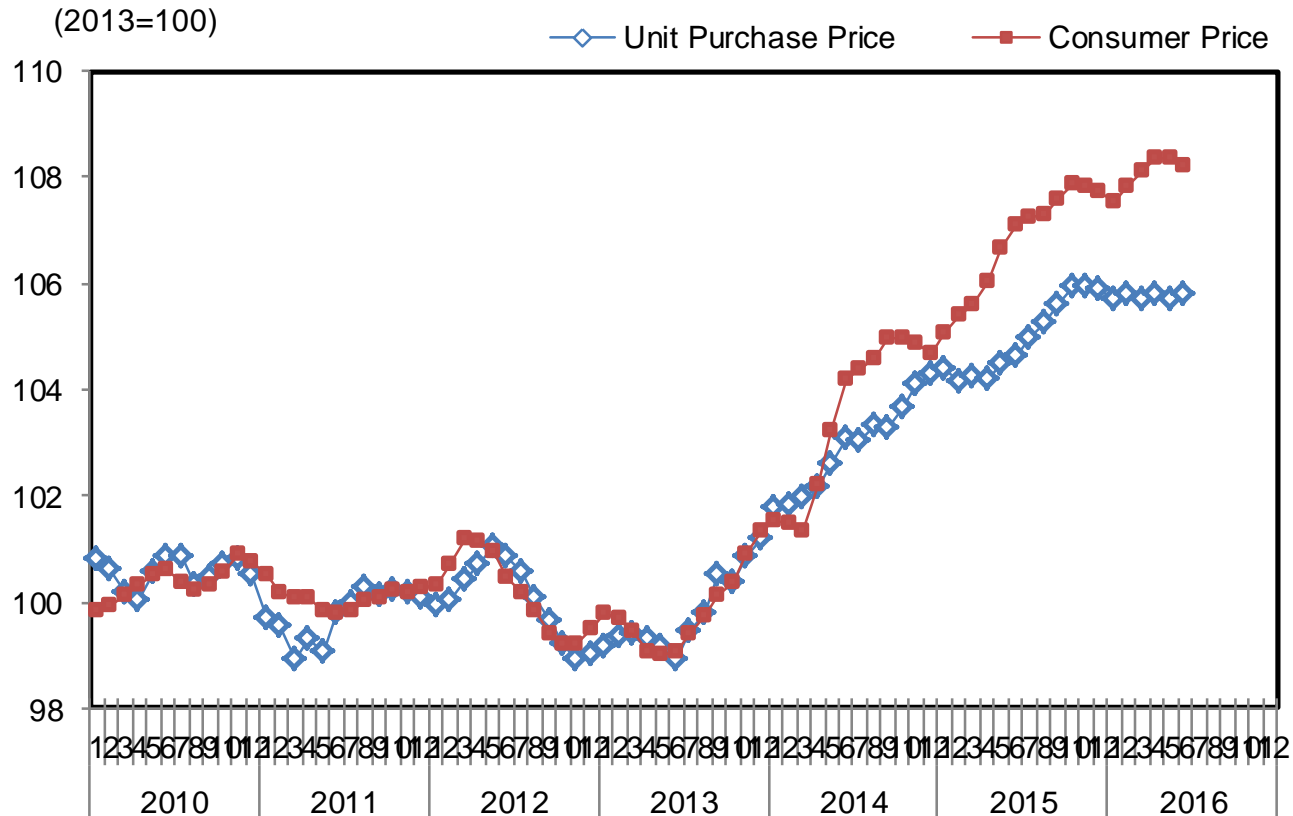


Source: Cabinet Office, Ministry of Health, Labour and Welfare, Ministry of Internal Affairs and Communications; compiled by DIR.

Note: Employee compensation expressed as "total cash payments multiplied by no. of employees". If employee compensation rises 2%, contractual cash earnings would be up 2.4%, bonuses up 12.0%, and no. of employees up 2.0%. If this is the case, personal consumption would increase as shown in the chart. Estimation period: Jan-Mar 1994 to Apr-Jun 2013.

# Unit Purchase Price of Foodstuffs in Downward Trend

Changes in Unit Purchase Price Index and Consumer Price Index (Foodstuffs)

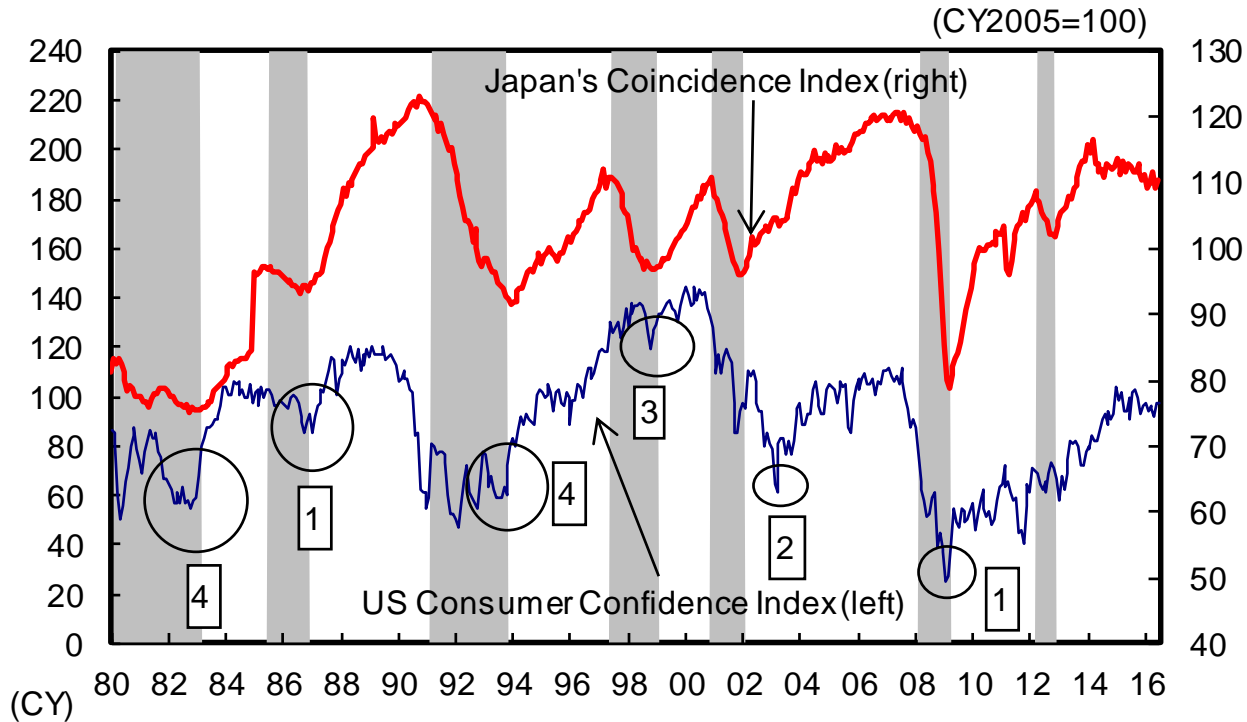


Source: Ministry of Internal Affairs and Communications; Compiled by DIR.  
 Note: Figures are seasonally adjusted and use the 3-month moving average.

(Mo)  
(Yr)

# US Consumer Confidence Is Favorable

## US Consumer Confidence and Japan's Economy



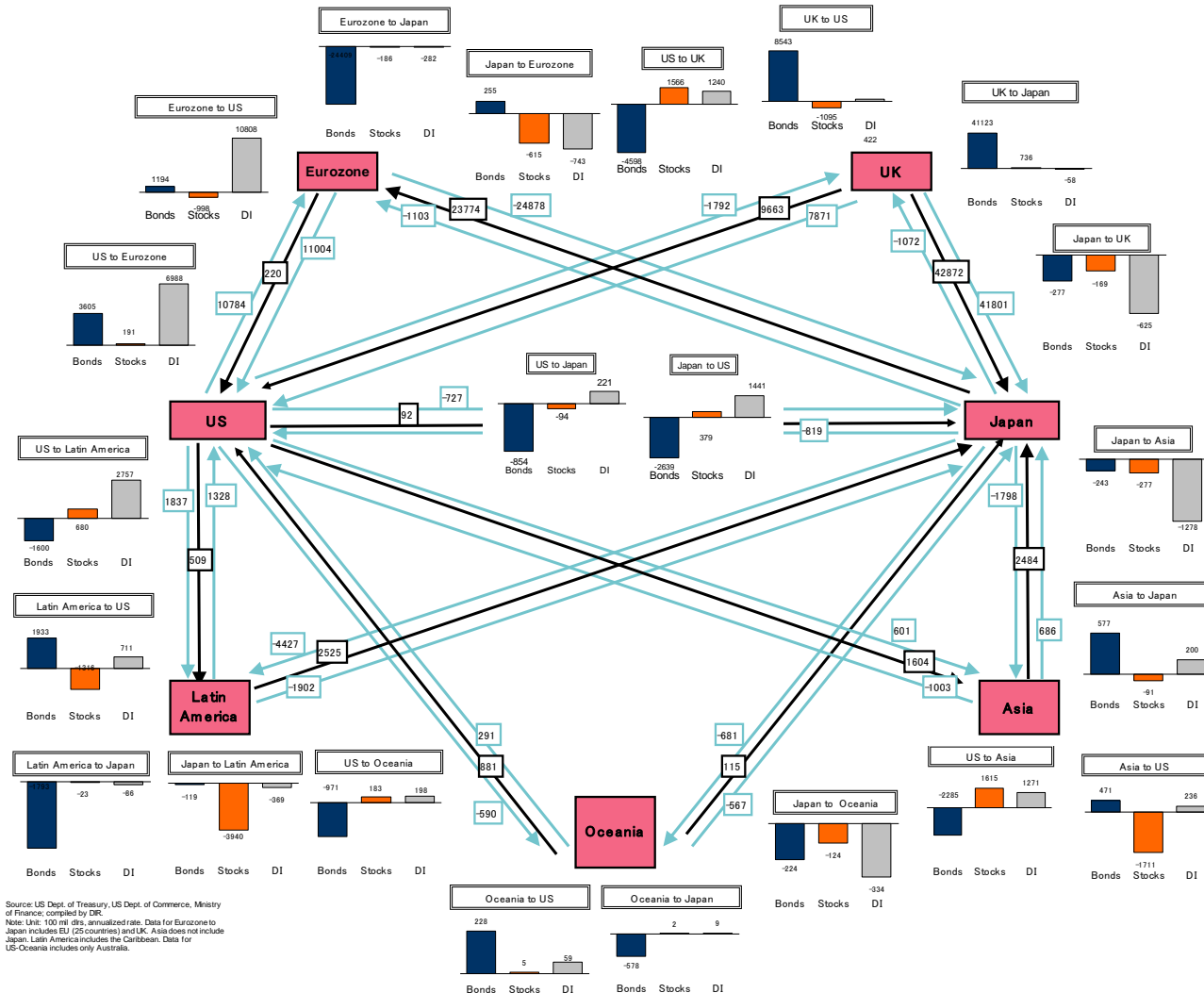
Source: Cabinet office, Conference Board; compiled by DIR.

Notes: 1) Shaded areas denote economic downturns in Japan.

2) Figures in boxes: Months preceding Japan's economic trough.

# US Role as World's Banker

G bba IM oney F low s 2015



# Influence of US and European Monetary Policy on World Economy

|                  |      | US Interest Rate Hikes + EU Quantitative Easing |                        |                        | US Interest Rate Hikes at Neutral Pace + EU Quantitative Easing |
|------------------|------|---|------------------------|------------------------|---|
|                  |      |   | US Interest Rate Hikes | EU Quantitative Easing |   |
| US               | 2015 | 0.01%   | 0.00%                  | 0.02%                  | 0.00%   |
|                  | 2016 | -0.09%  | -0.14%                 | 0.09%                  | 0.00%   |
|                  | 2017 | -0.27%  | -0.34%                 | 0.13%                  | 0.00%   |
| EU               | 2015 | 0.02%   | 0.00%                  | 0.04%                  | 0.01%   |
|                  | 2016 | -0.06%  | -0.15%                 | 0.14%                  | 0.02%   |
|                  | 2017 | -0.25%  | -0.39%                 | 0.20%                  | -0.01%  |
| Emerging Nations | 2015 | 0.01%   | 0.00%                  | 0.02%                  | 0.00%   |
|                  | 2016 | -0.08%  | -0.12%                 | 0.09%                  | -0.01%  |
|                  | 2017 | -0.24%  | -0.31%                 | 0.12%                  | -0.05%  |
| World            | 2015 | 0.01%   | 0.00%                  | 0.03%                  | 0.00%   |
|                  | 2016 | ① -0.08%  | -0.13%                 | 0.10%                  | ② 0.00%   |
|                  | 2017 | -0.25%  | -0.34%                 | 0.14%                  | -0.02%  |

Source: Compiled by DIR

Notes: 1) Cumulative rate of deviation from baseline.

2) Figures for the world are a total of the values of the US, EU, and the emerging nations (covers about 82% of world GDP).

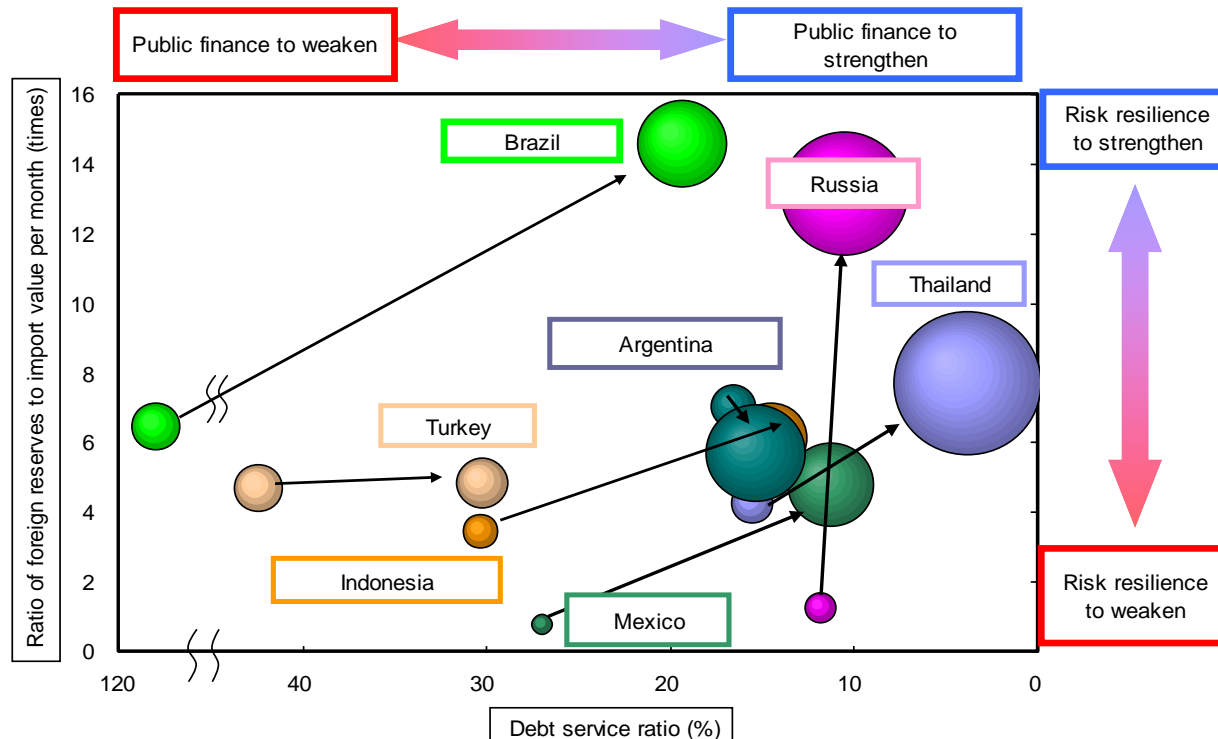
3) The US interest rate hike case starts in the Oct-Dec period of 2015, and assumes increases in the 10-yr bond yield of 25bp at a time for 8 consecutive quarters.

4) The EU quantitative easing case starts in the Jan-Mar period of 2015 and assumes an expansion of the ECB balance sheet of 180bil Euros at a time for 8 consecutive quarters.

5) Simulation run using the DIR world economic model.

# Fundamentals of Emerging Nations Improve

## Risk Resilience of Emerging Market Economies



Source: Haver Analytics; compiled by DIR.

Notes: 1) Arrows denote shift of positions at critical moments to 2012.

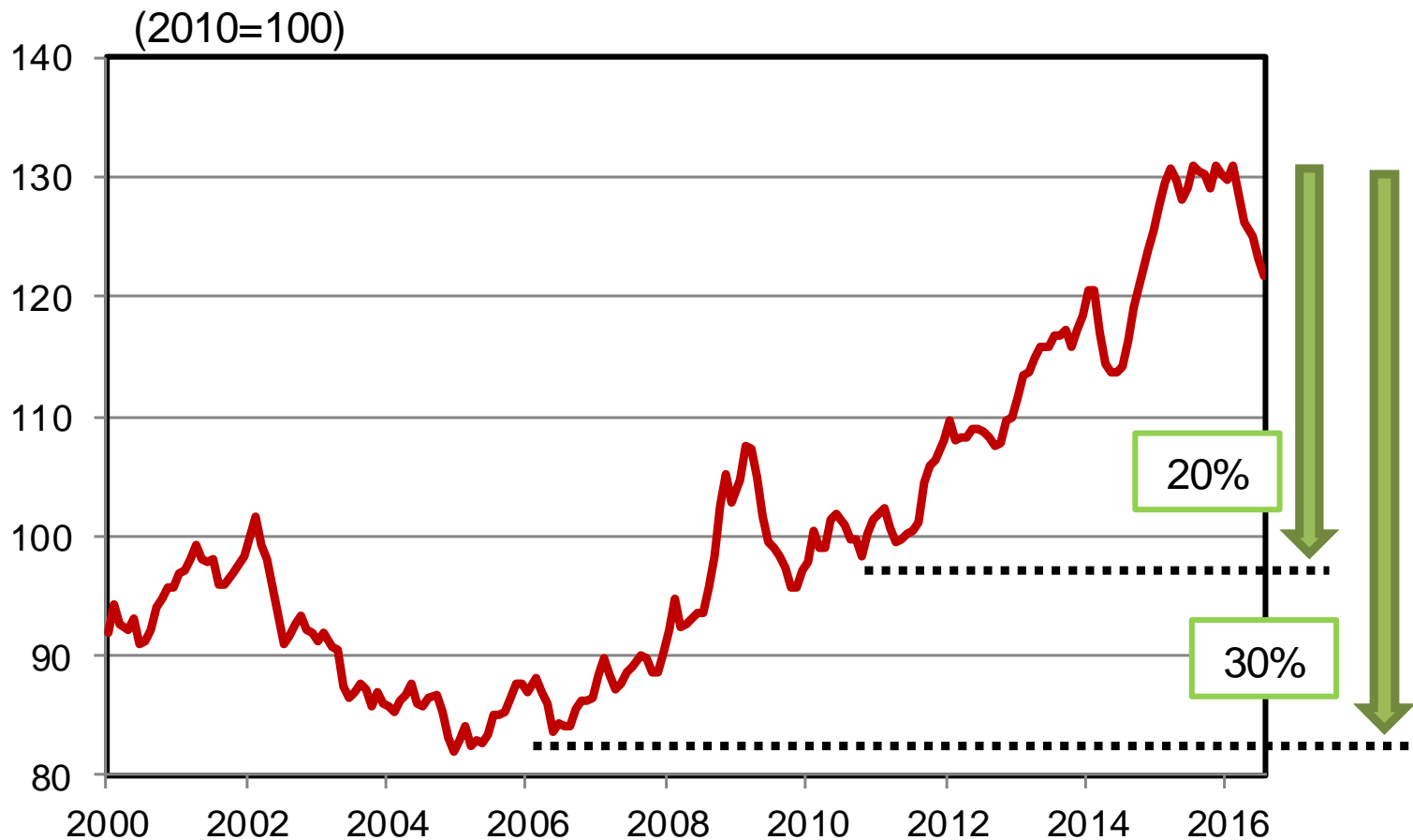
2) Year of crises defined as 1994 for Mexico, 1997 for Thailand and Indonesia, 1998 for Russia, 1999 for Brazil, 2001 for Turkey, and 2002 for Argentina.

3) Size of circles shows ratio of foreign reserves to foreign debt with less than one-year maturity. The larger the circle, the greater the resilience.



# How Far will Yuan Depreciate?

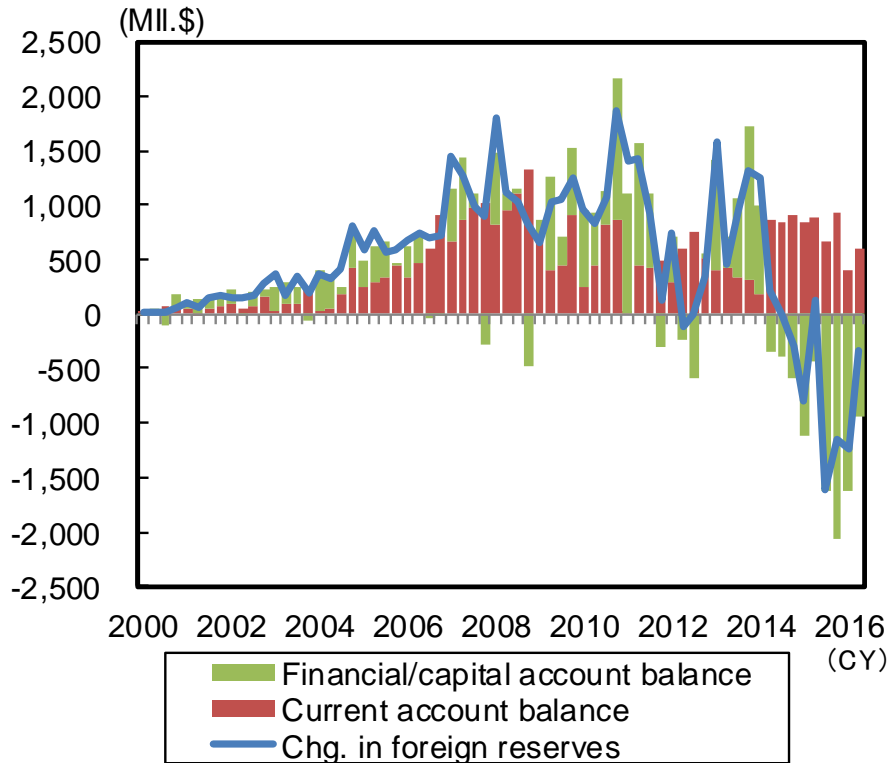
## The yuans' real effective exchange rate



Source: Haver Analytics; compiled by DIR.

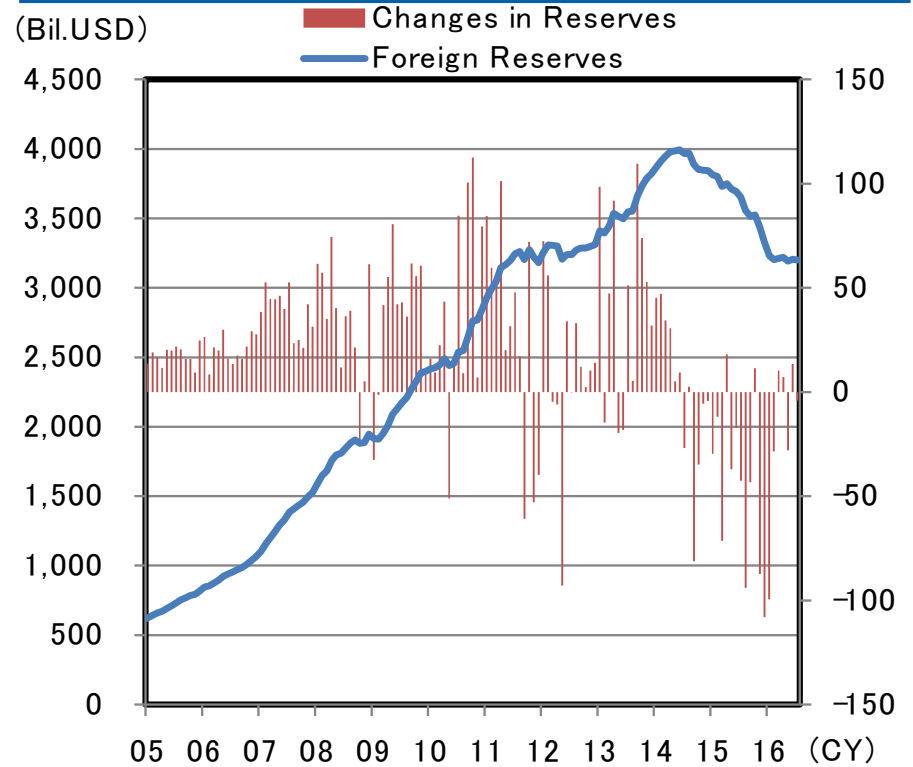
# Capital Flight from China

## China's balance of international payments



Source: Haver Analytics; compiled by DIR.

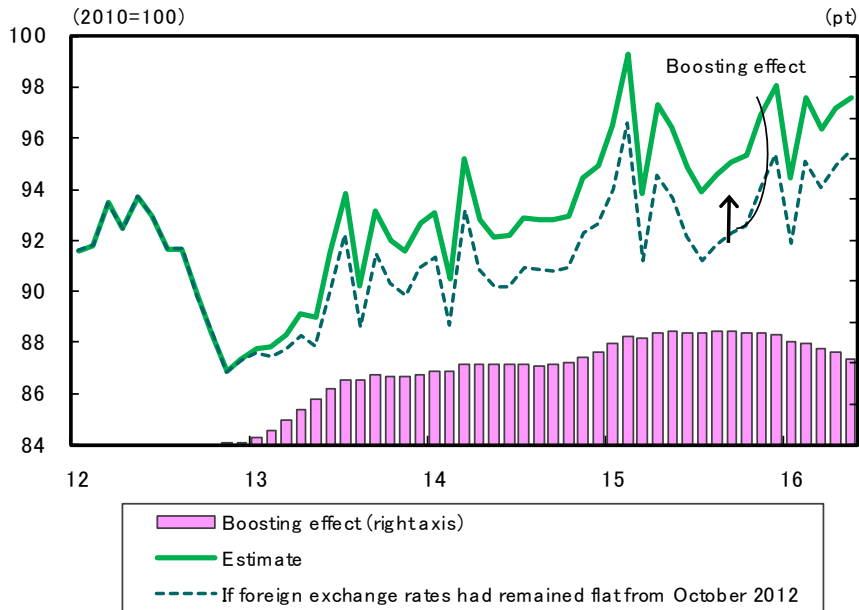
## China's Foreign Reserves



Source: PBOC

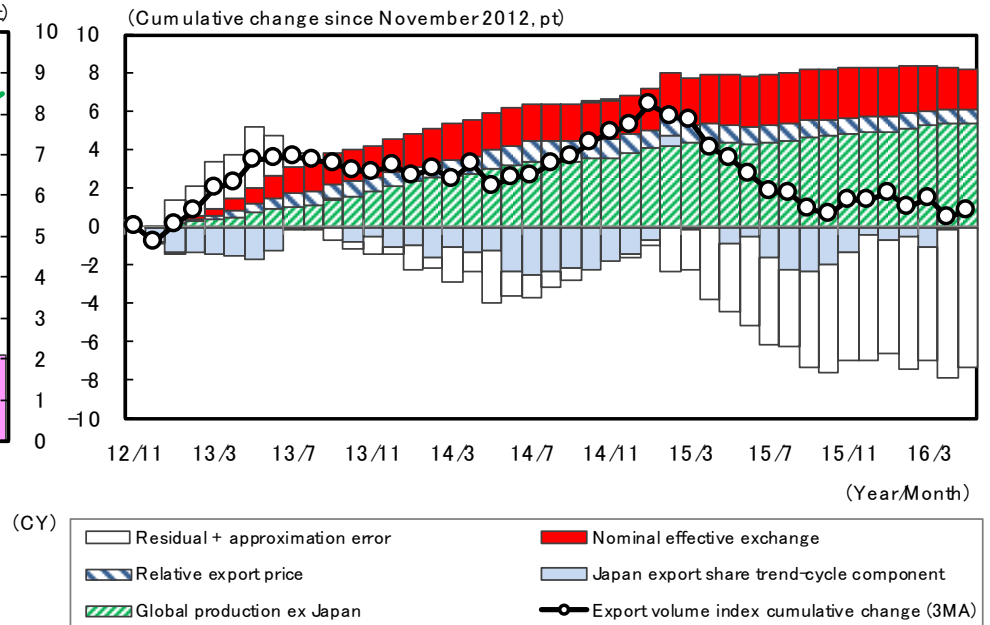
# Export-boosting effect of weak yen

Estimated export-boosting effect of weak yen



Source: Ministry of Finance, Bank of Japan, and Netherlands Bureau for Economic Policy Analysis statistics; Compiled by DIR

Export volume index cumulative change factor analysis



Note: Relative export price = Japan export price / world export price ex Japan (in US dollars).

Source: Ministry of Finance, Bank of Japan, and Netherlands Bureau for Economic Policy Analysis statistics; Compiled by DIR

# How should we think about immigration?

## Emmanuel Todd Family Types

|                     |         | Parent-child relationship      |                          |
|---------------------|---------|--------------------------------|--------------------------|
|                     |         | Equal<br>(separate residences) | Unequal (same residence) |
| Filial relationship | Equal   | France                         | China<br>Russia          |
|                     | Unequal | UK<br>US                       | Japan<br>Germany         |

Source: Compiled by DIR.

## **IMPORTANT**

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