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Japan's Medium-term Economic Outlook
—*January 2012*—

Japan overcomes strong yen, electricity supply shortages, and higher taxes in a synchronized world economy

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Summary

- We have revised our June 2011 medium-term outlook for Japan's economy. After downgrading the growth rate of the world economy and factoring in the government's reconstruction policies and draft proposal for the integrated reform of the social security and tax systems, we now forecast that Japan's economy will grow 2.4% (nominal) and 1.8% (real) over the next 10 years (annualized average trend rates).

- Rather than actual level, what has become problematic with respect to currency rates is the fluctuation that far exceeds changes in economic fundamentals. Excessive fluctuation in market exchange rates not only directly worsens Japan's economy but also has the indirect but still major adverse effect of restraining the growth of nominal wages as companies seek to maintain export competitiveness. To roll back the overly strong yen, measures that take a long-term view are needed. Specific steps that could be taken are rules to control excessive fluctuation accompanying a floating exchange rate system and Japan's manufacturers endeavoring to make products whose selling prices do not fall and developing sales methods where price reductions are not necessary.

- Electricity shortages resulting from the halt of nuclear power plants have mainly been met by curbing the demand of large-volume electricity users and by increasing the operating rate of thermal power plants. Such measures, however, have been accompanied by subdued corporate activity and upward pressure on electricity prices. To mitigate these effects, it will be necessary to implement comprehensive measures, including restarting nuclear power plants that have met high safety standards, further reducing household demand for electricity through market mechanisms and smart grids, and establishing reasonable and highly transparent purchase prices for electricity generated through renewable energy sources.

- As the fiscal problems of governments deepen worldwide, it is very significant that a proposal has been drafted for the integrated reform of the social security and tax systems, which includes a specific plan for increasing the consumption tax. While we can agree with the philosophy behind the draft proposal, cuts to existing benefits are inadequate, and the examination of many issues has simply been postponed to the future. Whether conditions for raising the consumption tax rate will actually fall into place is a prospect that will bear watching.

Contents

Forecast Tables

Medium-term Outlook for Japan's Economy (as of Jan 2012)

	Actual		DIR estimates		
	FY2002-06	FY2007-11	FY2012-21	FY2012-16	FY2017-21
Real GDP (Y/y %)	1.7	-0.2	1.8	1.7	1.9
Private final consumption	1.1	0.3	1.2	1.1	1.3
Private capital investment	3.5	-3.1	4.1	4.8	3.3
Private housing investment	-0.3	-5.6	-1.4	-2.8	0.1
Public fixed capital formation	-7.5	-0.8	-1.6	-2.2	-1.0
Government final consumption	1.2	1.9	2.3	1.7	2.9
Exports of goods and services	10.1	0.4	4.3	4.9	3.6
Imports of goods and services	4.7	0.7	4.0	4.1	4.0
Nominal GDP (Y/y %)	0.3	-1.4	2.4	2.2	2.5
GDP deflator (Y/y %)	-1.4	-1.2	0.6	0.5	0.7
Corporate Goods Price Index (Y/y %)	0.6	-0.1	1.3	1.3	1.3
Consumer Price Index (Y/y %)	-0.2	-0.2	1.3	1.2	1.3
O/N call rate (%)	0.0	0.2	1.2	0.1	2.3
Yields on 10-yr JGBs (%)	1.4	1.3	2.9	2.0	3.7
Exchange rate(Y/$)	114.5	94.3	76.9	79.4	74.4
Current balance (% of nominal GDP)	3.5	3.2	2.0	2.1	1.9
Nominal employee compensation (Y/y %)	-1.1	-0.8	1.8	0.2	2.3
Unemployment (%)	4.7	4.6	4.0	4.4	3.6
Labor's share (ratio of employee compensation to national income)	68.6	69.8	65.9	66.6	65.1
Central & local government (% of nominal GDP)					
Fiscal balance	-5.7	-6.4	-5.8	-6.3	-5.3
Primary balance	-3.9	-4.8	-3.9	-4.6	-3.2
Central & local government debt (% of nominal GDP)	174.2	207.9	249.8	243.0	255.9

Source: Compiled by DIR.
Notes: 1) Period avg.
2) Some FY10 and all FY11 figures: DIR estimates.
3) Fiscal balance: excl. ad-hoc factors.

Main Economic Indicators

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nominal GDP (Y tril)	509.1	513.0	489.5	473.9	479.2	473.9	480.7	489.0	503.7	515.4	528.0	539.6	553.6	568.5	583.6	597.9
(Y/y %)	0.7	0.8	-4.6	-3.2	1.1	-1.1	1.4	1.7	3.0	2.3	2.4	2.2	2.6	2.7	2.7	2.5
Nominal GNI (Y tril)	524.1	530.6	504.5	486.4	491.9	483.8	489.5	499.4	516.4	530.0	543.7	555.7	570.2	585.1	599.6	613.4
(Y/y %)	1.1	1.2	-4.9	-3.6	1.1	-1.7	1.2	2.0	3.4	2.6	2.6	2.2	2.6	2.6	2.5	2.3
Real GDP (Chained [2005]; Y tril)	516.0	525.5	505.8	495.4	511.0	511.1	523.7	535.6	540.4	548.4	556.4	566.8	578.5	589.8	600.1	609.9
(Y/y %)	1.8	1.8	-3.7	-2.1	3.1	0.0	2.5	2.3	0.9	1.5	1.5	1.9	2.1	1.9	1.8	1.6
Domestic demand (contribution to real GDP growth; % pt)	1.0	0.6	-2.7	-2.2	2.4	1.2	2.8	2.2	0.4	1.3	1.2	1.8	2.0	2.0	2.0	1.9
Foreign demand (contribution to real GDP growth; % pt)	0.8	1.2	-1.1	0.2	0.8	-1.1	-0.3	0.0	0.5	0.2	0.3	0.1	0.0	-0.1	-0.2	-0.3
Per capita real GDP (Chained [2005]; Y mil)	4.0	4.1	4.0	3.9	4.0	4.0	4.1	4.2	4.3	4.3	4.4	4.5	4.6	4.7	4.8	4.9
(Y/y %)	1.7	1.8	-3.7	-1.9	2.7	0.3	2.6	2.4	1.1	1.7	1.7	2.2	2.4	2.3	2.2	2.1
Real GDI (Chained [2005]; Y tril)	510.3	514.4	491.8	488.3	498.7	498.9	510.5	520.3	523.9	529.6	535.9	544.2	553.6	562.4	570.0	576.9
(Y/y %)	1.0	0.8	-4.4	-0.7	2.1	0.0	2.3	1.9	0.7	1.1	1.2	1.5	1.7	1.6	1.4	1.2
Index of Industrial Production (2005 = 100)	105.3	108.1	94.4	86.1	93.8	92.7	96.3	99.6	100.2	102.0	103.9	106.6	109.8	112.8	115.5	118.0
(Y/y %)	4.6	2.7	-12.7	-8.8	-8.9	-1.2	3.9	3.5	0.6	1.8	1.8	2.6	3.0	2.8	2.4	2.1
Corporate Goods Price Index (2005 = 100)	102.5	104.9	108.2	102.6	103.3	102.2	102.0	102.2	105.7	107.6	109.3	110.2	111.4	112.9	114.7	116.4
(Y/y %)	2.0	2.3	3.2	-5.2	0.7	-1.0	-0.3	0.2	3.4	1.7	1.6	0.8	1.1	1.4	1.6	1.5
Consumer Price Index (2010 = 100)	100.6	101.0	102.1	100.4	99.9	99.5	99.1	99.3	102.3	103.8	105.6	106.7	108.0	109.5	111.2	112.8
(Y/y %)	0.2	0.4	1.1	-1.7	-0.4	-0.4	-0.3	0.1	3.0	1.5	1.7	1.0	1.2	1.4	1.5	1.5
O/N call rate (%)	0.2	0.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.9	2.4	2.8	2.9
Yield on 10-yr JGBs (%)	1.8	1.6	1.5	1.4	1.1	0.9	1.1	1.6	2.1	2.4	2.9	3.2	3.6	3.8	3.9	4.0
Y/$	117	114	100	93	86	78	77	77	80	82	81	79	77	74	72	70
Y/EUR	150	162	143	131	113	106	106	106	108	111	110	107	104	101	98	95
Current balance (Y tril)	21.2	24.5	12.3	15.8	16.1	9.1	6.3	7.1	11.2	12.7	14.4	14.1	13.7	11.9	8.8	5.3
(% of nominal GDP)	4.2	4.8	2.5	3.3	3.4	1.9	1.3	1.4	2.2	2.5	2.7	2.6	2.5	2.1	1.5	0.9
Labor force (0000)	6,660	6,668	6,648	6,608	6,563	6,596	6,567	6,535	6,504	6,484	6,468	6,437	6,405	6,374	6,345	6,319
(Y/y %)	0.1	0.1	-0.3	-0.6	-0.7	0.2	-0.4	-0.5	-0.5	-0.3	-0.2	-0.5	-0.5	-0.5	-0.5	-0.4
No. employed (0000)	6,389	6,414	6,373	6,265	6,236	6,269	6,257	6,244	6,223	6,212	6,205	6,184	6,165	6,147	6,128	6,110
(Y/y %)	0.4	0.4	-0.6	-1.7	-0.5	0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.3	-0.3	-0.3	-0.3	-0.3
No. of employees (0000)	5,486	5,523	5,520	5,457	5,451	5,446	5,453	5,458	5,456	5,464	5,476	5,477	5,479	5,483	5,487	5,493
(Y/y %)	1.2	0.7	-0.1	-1.1	-0.1	0.5	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.1
No. unemployed (0000)	271	255	275	343	327	327	310	291	281	271	264	253	240	227	217	209
Unemployment rate (%)	4.1	3.8	4.1	5.2	5.0	5.0	4.7	4.5	4.3	4.2	4.1	3.9	3.7	3.6	3.4	3.3
Nominal employee compensation (Y tril)	256	256	254	243	244	236	236	238	241	247	252	257	262	268	275	282
(Y/y %)	0.7	0.0	-0.5	-4.4	0.5	-3.2	-0.1	0.9	1.1	2.3	2.1	2.0	2.1	2.3	2.6	2.6
Nominal household disposable income (Y tril)	292	291	288	288	287	279	279	283	288	296	306	316	327	338	349	360
(Y/y %)	0.8	-0.4	-0.9	-0.1	-0.5	-2.6	0.0	1.1	1.9	2.9	3.2	3.2	3.5	3.4	3.4	3.1
Labor's share (%)	67.6	67.1	71.6	70.9	69.9	69.5	68.0	67.0	65.9	66.2	66.1	65.9	65.2	64.8	64.8	65.0
Household savings rate (%)	1.5	0.3	1.5	2.6	2.5	1.0	0.6	0.4	-0.2	0.3	1.2	2.4	3.7	4.7	5.5	6.0
Central & local government																
Fiscal balance (Y tril)	-15.9	-12.5	-21.8	-44.1	-40.3	-35.9	-35.9	-33.7	-29.8	-29.9	-28.3	-28.6	-29.0	-29.7	-31.1	-32.9
(% of nominal GDP)	-3.1	-2.4	-4.5	-9.3	-8.4	-7.6	-7.5	-6.9	-5.9	-5.8	-5.4	-5.3	-5.2	-5.2	-5.3	-5.5
Primary balance (% of nominal GDP)	-1.7	-1.1	-2.9	-7.6	-6.7	-5.9	-5.8	-5.3	-4.3	-4.2	-3.7	-3.5	-3.4	-3.2	-3.1	-3.0
Central & local government debt (Y tril)	944	960	962	1,009	1,036	1,084	1,133	1,180	1,223	1,267	1,311	1,356	1,403	1,452	1,505	1,562
(% of nominal GDP)	185.4	187.0	196.5	212.9	216.1	228.8	235.8	241.3	242.9	245.9	248.3	251.2	253.4	255.4	257.8	261.2

Source: Compiled by DIR.

Notes: 1) Mar 2011 figures for labor force, no. employed, no. of employees, no. unemployed, and unemployment rate estimated by DIR as government figures for the month excluded those for the disaster-affected three Tohoku prefectures.
2) Through FY10: actual; some FY10 figures: DIR estimates.
3) Fiscal balance: excl. ad-hoc factors.

Nominal Gross Domestic Expenditure (Y tril)

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nominal GDP	509.1	513.0	489.5	473.9	479.2	473.9	480.7	489.0	503.7	515.4	528.0	539.6	553.6	568.5	583.6	597.9
(Y/y %)	0.7	0.8	-4.6	-3.2	1.1	-1.1	1.4	1.7	3.0	2.3	2.4	2.2	2.6	2.7	2.7	2.5
Domestic demand	502.0	505.0	491.1	469.5	474.9	474.3	483.0	492.1	504.6	516.7	528.6	540.9	555.8	572.6	590.4	607.9
(Y/y %)	0.7	0.6	-2.7	-4.4	1.1	-0.1	1.8	1.9	2.5	2.4	2.3	2.3	2.8	3.0	3.1	3.0
Private final consumption	293.4	294.7	288.1	284.2	284.2	281.3	282.4	286.3	293.6	300.6	307.5	313.4	320.0	327.5	335.9	344.5
(Y/y %)	0.3	0.5	-2.2	-1.3	0.0	-1.0	0.4	1.4	2.6	2.4	2.3	1.9	2.1	2.3	2.6	2.6
Private housing investment	18.8	16.4	16.5	12.6	13.0	14.1	15.3	15.0	14.7	14.1	13.5	13.2	13.3	13.6	14.2	15.0
(Y/y %)	2.1	-12.9	1.1	-23.5	2.8	8.7	8.3	-1.9	-2.3	-4.0	-4.2	-2.0	0.3	2.2	4.2	5.7
Private capital investment	74.7	76.8	71.0	60.8	62.1	59.8	61.3	64.7	67.6	71.0	73.8	76.5	79.7	83.2	86.7	89.9
(Y/y %)	5.7	2.9	-7.6	-14.4	2.1	-3.6	2.5	5.5	4.5	5.1	3.9	3.7	4.2	4.4	4.2	3.7
Change in private inventories	0.5	1.7	1.3	-5.1	-1.5	-0.9	-0.2	2.1	3.6	2.7	1.8	1.6	2.5	3.7	4.3	4.2
Government final consumption	91.9	93.3	92.9	94.2	95.8	97.5	99.7	100.4	101.5	104.5	108.6	112.5	116.4	120.4	124.7	129.1
(Y/y %)	-0.5	1.4	-0.4	1.5	1.6	1.8	2.2	0.7	1.2	2.9	4.0	3.6	3.4	3.4	3.6	3.5
Public fixed capital formation	22.8	22.1	21.2	22.8	21.4	22.0	24.1	22.9	22.7	22.7	22.2	22.2	22.2	22.3	22.7	23.0
(Y/y %)	-6.0	-3.0	-4.0	7.7	-6.1	2.4	9.8	-4.9	-1.2	0.1	-2.3	0.1	0.0	0.6	1.4	1.6
Change in public inventories	0.0	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Exports of goods and services	84.1	92.4	78.6	64.5	73.8	69.5	70.2	73.9	80.0	85.4	89.5	92.1	94.7	96.6	98.4	100.2
(Y/y %)	11.9	10.0	-15.0	-17.9	14.4	-5.8	0.9	5.3	8.2	6.7	4.9	2.9	2.8	2.0	1.8	1.8
Imports of goods and services	76.9	84.4	80.2	60.2	69.5	70.0	72.5	76.9	80.8	86.5	90.1	93.3	96.8	100.6	105.1	110.0
(Y/y %)	12.3	9.7	-4.9	-25.0	15.5	0.6	3.6	6.1	5.1	7.1	4.1	3.6	3.7	3.9	4.5	4.7

Real Gross Domestic Expenditure (chained [2005]; Y tril)

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real GDP	516.0	525.5	505.8	495.4	511.0	511.1	523.7	535.6	540.4	548.4	556.4	566.8	578.5	589.8	600.1	609.9
(Y/y %)	1.8	1.8	-3.7	-2.1	3.1	0.0	2.5	2.3	0.9	1.5	1.5	1.9	2.1	1.9	1.8	1.6
Domestic demand	503.7	506.9	493.1	482.1	493.7	499.7	513.5	524.9	527.0	534.0	540.4	550.1	561.2	572.6	583.8	594.7
(Y/y %)	1.0	0.6	-2.7	-2.2	2.4	1.2	2.8	2.2	0.4	1.3	1.2	1.8	2.0	2.0	2.0	1.9
Private final consumption	295.0	297.4	291.5	295.0	299.7	299.5	303.3	308.6	308.7	312.6	315.8	319.9	324.0	328.1	332.7	337.5
(Y/y %)	0.8	0.8	-2.0	1.2	1.6	-0.1	1.3	1.7	0.0	1.3	1.0	1.3	1.3	1.3	1.4	1.5
Private housing investment	18.4	15.7	15.5	12.3	12.6	13.7	14.9	14.5	13.6	12.7	11.9	11.5	11.3	11.3	11.6	11.9
(Y/y %)	0.1	-14.5	-1.1	-21.0	2.3	9.5	8.1	-2.6	-6.1	-6.3	-6.5	-3.5	-1.4	0.2	1.9	3.4
Private capital investment	74.8	77.0	71.1	62.6	64.8	64.0	66.5	70.7	74.2	77.9	80.9	83.8	86.9	90.0	92.8	95.4
(Y/y %)	5.9	3.0	-7.7	-12.0	3.5	-1.2	4.0	6.3	4.9	5.0	3.9	3.5	3.8	3.6	3.1	2.7
Change in private inventories	0.5	1.8	1.8	-5.2	-1.3	-0.6	0.2	2.7	4.4	3.3	2.3	2.2	3.1	4.4	5.0	4.9
Government final consumption	92.7	93.8	93.4	95.9	98.2	101.9	105.0	106.1	105.5	107.5	110.7	114.3	117.7	120.9	124.2	127.5
(Y/y %)	0.4	1.2	-0.4	2.7	2.3	3.8	3.1	1.0	-0.5	1.8	3.0	3.2	3.0	2.8	2.7	2.7
Public fixed capital formation	22.4	21.3	19.8	22.1	20.6	21.5	23.7	22.4	20.8	20.2	19.2	19.0	18.7	18.5	18.4	18.3
(Y/y %)	-7.3	-4.9	-6.7	11.5	-6.8	4.1	10.2	-5.3	-7.0	-2.9	-5.0	-1.2	-1.5	-1.2	-0.7	-0.4
Change in public inventories	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Exports of goods and services	80.8	88.4	79.0	71.3	83.6	82.4	84.4	89.5	94.8	99.9	104.9	109.4	113.9	117.9	121.5	125.0
(Y/y %)	8.7	9.4	-10.6	-9.8	17.2	-1.4	2.5	6.0	5.9	5.5	5.0	4.3	4.1	3.5	3.1	2.9
Imports of goods and services	68.5	70.1	66.8	59.6	66.7	70.9	74.1	78.2	80.2	83.7	86.5	89.8	93.2	96.9	101.0	105.2
(Y/y %)	3.8	2.4	-4.7	-10.7	12.0	6.3	4.5	5.5	2.5	4.4	3.4	3.8	3.8	4.0	4.2	4.2

Deflator (chained [2005])

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP deflator	98.7	97.6	96.8	95.6	93.8	92.7	91.7	91.3	93.2	93.9	94.8	95.2	95.6	96.3	97.2	98.0
(Y/y %)	-1.0	-1.0	-0.9	-1.2	-2.0	-1.2	-1.0	-0.5	2.1	0.8	1.0	0.3	0.5	0.7	0.9	0.8
Domestic demand	99.7	99.6	99.6	97.4	96.2	94.9	94.0	93.7	95.7	96.7	97.8	98.3	99.0	100.0	101.1	102.2
(Y/y %)	-0.3	-0.1	0.0	-2.2	-1.2	-1.3	-0.9	-0.3	2.1	1.1	1.1	0.5	0.7	1.0	1.1	1.1
Private final consumption	99.4	99.1	98.8	96.3	94.8	93.9	93.1	92.8	95.1	96.2	97.4	98.0	98.8	99.8	101.0	102.1
(Y/y %)	-0.5	-0.4	-0.2	-2.5	-1.6	-0.9	-0.9	-0.3	2.5	1.1	1.3	0.6	0.8	1.0	1.2	1.1
Private housing investment	102.3	104.2	106.5	103.1	103.5	102.7	102.9	103.8	108.0	110.8	113.5	115.3	117.3	119.7	122.5	125.2
(Y/y %)	2.1	1.8	2.2	-3.2	0.5	-0.7	0.2	0.8	4.1	2.5	2.4	1.6	1.8	2.1	2.3	2.2
Private capital investment	99.8	99.8	99.9	97.1	95.8	93.6	92.2	91.5	91.1	91.2	91.2	91.4	91.7	92.4	93.4	94.3
(Y/y %)	-0.2	-0.1	0.2	-2.8	-1.3	-2.4	-1.5	-0.8	-0.4	0.1	0.0	0.2	0.4	0.8	1.0	1.0
Government final consumption	99.2	99.4	99.4	98.2	97.6	95.8	95.0	94.7	96.3	97.3	98.2	98.5	99.0	99.6	100.5	101.3
(Y/y %)	-0.9	0.2	0.0	-1.2	-0.7	-1.9	-0.9	-0.3	1.7	1.1	0.9	0.4	0.5	0.7	0.8	0.8
Public fixed capital formation	101.9	103.9	106.8	103.2	104.0	102.4	102.0	102.4	108.8	112.2	115.4	116.9	118.7	120.9	123.5	126.0
(Y/y %)	1.3	2.0	2.9	-3.4	0.8	-1.6	-0.4	0.4	6.2	3.1	2.9	1.3	1.5	1.9	2.1	2.0
Exports of goods and services	104.1	104.6	99.5	90.5	88.3	84.4	83.2	82.6	84.4	85.5	85.4	84.3	83.2	82.0	81.0	80.2
(Y/y %)	3.0	0.5	-4.9	-9.0	-2.4	-4.4	-1.5	-0.7	2.2	1.2	-0.1	-1.3	-1.3	-1.4	-1.2	-1.0
Imports of goods and services	112.4	120.4	120.2	101.0	104.1	98.6	97.8	98.3	100.7	103.4	104.1	103.9	103.8	103.7	104.0	104.5
(Y/y %)	8.3	7.1	-0.2	-16.0	3.1	-5.3	-0.8	0.6	2.5	2.6	0.7	-0.2	-0.1	-0.1	0.3	0.5

Source: Compiled by DIR.
Note: Through FY10: actual.

Assets and Labor and Capital Supply

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hourly labor productivity (Chained [2005]; yen)	5,448	5,547	5,429	5,445	5,536	5,581	5,714	5,843	5,919	6,014	6,107	6,229	6,362	6,492	6,613	6,729
(Y/y %)	1.0	1.8	-2.1	0.3	1.7	0.8	2.4	2.3	1.3	1.6	1.5	2.0	2.1	2.0	1.9	1.7
Hours worked per annum and per capita	1,813	1,804	1,768	1,739	1,752	1,742	1,742	1,741	1,734	1,730	1,726	1,723	1,722	1,719	1,716	1,713
(Y/y %)	0.1	-0.5	-2.0	-1.6	0.7	-0.6	0.0	-0.1	-0.4	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2
Labor participation rate (%)	60.4	60.4	60.2	59.8	59.7	59.5	59.2	58.9	58.6	58.5	58.4	58.2	58.0	57.9	57.8	57.7
Net corporate sector capital stock (2000 prices; Y tril)	1,034	1,043	1,047	1,041	1,026	1,026	1,024	1,026	1,031	1,039	1,049	1,061	1,074	1,089	1,104	1,120
(Y/y %)	0.9	0.9	0.4	-0.6	-1.4	0.0	-0.2	0.2	0.5	0.8	1.0	1.1	1.3	1.4	1.4	1.4
Household financial assets (Y tril)	1,554	1,462	1,410	1,453	1,468	1,470	1,522	1,544	1,571	1,575	1,587	1,613	1,645	1,687	1,730	1,776
(% of nominal GDP)	305.3	285.1	288.1	306.7	306.3	310.1	316.6	315.7	312.0	305.6	300.6	298.9	297.1	296.7	296.4	297.1
External assets (Y tril)	620	629	575	599	591	558	557	566	595	626	642	645	646	638	627	617
(% of nominal GDP)	121.8	122.6	117.5	126.5	123.3	117.7	115.8	115.7	118.1	121.4	121.5	119.6	116.7	112.2	107.5	103.2
Net external assets (Y tril)	224	244	236	276	272	257	257	261	274	289	296	297	298	294	289	284
(% of nominal GDP)	44.0	47.6	48.1	58.3	56.9	54.3	53.4	53.3	54.4	56.0	56.0	55.1	53.8	51.7	49.5	47.6
Stock prices (TOPIX)	1,644	1,556	1,057	904	885	770	922	1,022	1,128	1,052	1,040	1,124	1,211	1,318	1,375	1,427
(Y/y %)	18.1	-5.4	-32.0	-14.5	-2.2	-13.0	19.8	10.9	10.3	-6.7	-1.1	8.0	7.8	8.8	4.3	3.7
Land Price Index (nationwide; all purposes; 2000 = 100)	64.8	64.2	62.9	59.9	57.3	55.3	56.4	57.2	58.5	58.9	59.2	58.9	59.2	59.8	60.9	62.8
(Y/y %)	-3.4	-0.9	-2.0	-4.8	-4.3	-3.4	1.9	1.4	2.2	0.7	0.6	-0.5	0.5	0.9	1.9	3.1

Assumptions

(FY)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
World economic growth (PPP; y/y %)	5.3	4.8	1.9	0.8	4.7	3.7	3.8	4.3	4.7	4.7	4.7	4.7	4.8	4.8	4.8	4.8
Oil price (WTI; $/bbl)	66.1	84.1	85.3	72.3	84.9	88.8	92.6	96.5	100.1	103.6	106.9	110.1	113.0	115.8	118.4	120.9
(Y/y %)	9.0	27.1	1.5	-15.3	17.5	4.5	4.3	4.1	3.8	3.5	3.2	2.9	2.7	2.5	2.3	2.1
Population (mil)	127.8	127.8	127.7	127.5	128.1	127.7	127.6	127.4	127.1	126.8	126.5	126.1	125.6	125.1	124.7	124.1
(Y/y %)	0.0	0.0	-0.1	-0.1	0.4	-0.3	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4
Population 15-64 (mil)	83.7	83.0	82.3	81.5	82.0	81.1	80.0	78.8	77.6	76.6	75.8	75.1	74.4	73.8	73.2	72.7
Population over-65 (mil)	26.6	27.5	28.2	29.0	29.2	29.8	31.0	32.2	33.3	34.2	35.0	35.5	36.0	36.3	36.6	36.8
Ratio of those over 65 to overall population (%)	20.8	21.5	22.1	22.7	22.8	23.4	24.3	25.2	26.2	27.0	27.6	28.2	28.7	29.0	29.4	29.7
Consumption tax rate (%)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0
Effective corporation tax rate (%)	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	35.7	35.7	35.7	35.7	35.7	35.7	35.7
Employees' pension contribution rate (%)	14.5	14.8	15.2	15.6	15.9	16.3	16.6	17.0	17.3	17.7	18.0	18.3	18.3	18.3	18.3	18.3

Source: Compiled by DIR.
Note: Through FY10: actual; some FY10 figures: DIR estimates.

Introduction

We have revised our previous medium-term forecast, *Japan's Medium-term Economic Outlook: June 2011*, published 13 July 2011. This is because, with the elapse of 10 months since the Great East Japan Earthquake domestically and the problem of sovereign debt risk deepening in Europe externally, the economic environment has changed significantly since then. Our current forecasts reflect National Accounts for 2010 (published by the Cabinet Office in December 2011), which incorporate benchmark revision every five years. Our current forecasting period is the 10 years from FY12 to FY21 (our previous forecast covered the period from FY11 to FY20).

In Section 1 of this report, we present our assumptions for framing the world economy and provide forecasts of Japan's economy for the next 10 years. In Section 2, we focus our attention on persistent yen appreciation. In Section 3, we estimate the possible consequences of shortages in electricity supply in view of the current situation where nuclear power plants are not being restarted after inspection. Finally, in Section 4 we provide an assessment from the perspective of repairing battered government finances of the draft proposal for the integrated reform of social security and tax systems announced at the start of 2012.

1. Japan's Economy over the Next 10 Years

1.1 World Economy Sees Big Changes: Positives and negatives of globalization

1.1.1 Enlarged world economy and current state of Japan's economy

Changed conditions for both advanced and emerging economies

First, we begin by discussing the current state of the world economy, on which our forecast of Japan's economy is based, together with the situation for Japan. Among major changes occurring since our previous medium-term forecast, the sovereign debt crisis has deepened in the eurozone, and adverse repercussions are spreading to financial systems and real economies. After enjoying sustained economic growth through the inflow of foreign capital to the point of worrying about inflation, emerging economies have now shifted monetary policy toward easing. The world economy has been unable to recover smoothly from the Lehman Shock, and a major test appears to be looming. Bearing all this in mind, how should the current state of the world economy be understood?

Meaning of globalized economies

According to the IMF, the world economy grew at an annual rate of 3.0% between 1990 and 1999. Then, between 2000 and 2007 prior to the Lehman Shock, growth accelerated to 4.2%. With a growth rate of 3%, GDP will double in 24 years, a figure that accelerates to 17 years with growth of 4.2%. In the orthodox production function, economic growth is explained by labor inputs, capital inputs, and total factor productivity. While the production function has shifted from 3% to 4% growth, the available quantity of labor and/or capital has not increased dramatically in the world at the same time. Hence, even if labor and capital inputs remain unchanged, if they can be more skillfully combined, the growth rate of total factor productivity will rise, and the potential growth rate of the world economy increase. The twenty-first century is being distinguished by being the period when world income began to grow through the globalization of economies, that is to say, through the advance of the production function due to the more efficient utilization of the factors of production.

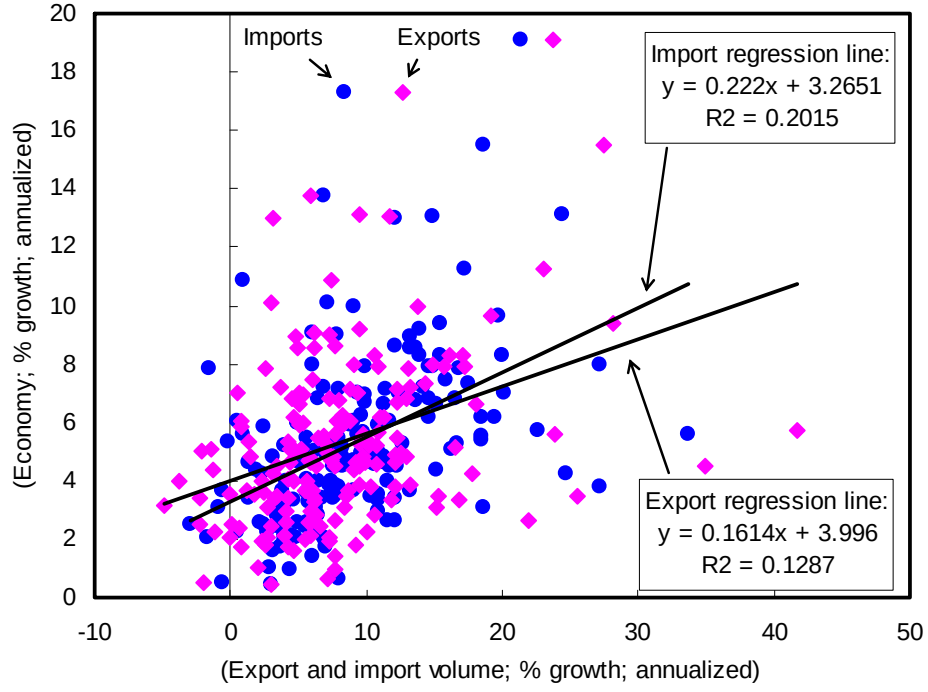
Expansion of trade and investment

This change is manifested by the expansion of trade and direct investments. In a free trade system, trade will not take place under terms that profit one nation but impose losses on another. Nations do not manage their economies in isolation. If trade and exchanges with other nations increase, production constraints will be eased, and new ideas can be adopted. Also, through the promotion of competition with other nations, the productivity of an entire nation will be significantly increased. While the strengths and weaknesses of nations vary, trade offers them a means of utilizing their comparative advantage. Through the growth of trade, nations and regions have been able to benefit from economic development. This represents the true meaning of trade. Since labor is restricted in its movement, what is believed to have changed the input structure of the factors of production is the growth of trade and direct investments that ushered in the indirect transfer of labor. Another important factor is the advances in IT that enabled rational and timely procurement and sales.

Trade and economic growth

Chart 1.1 examines the correlation between import and export growth rates and economic growth rates from 2002 to 2007. The chart indicates that nations where trade is growing strongly also tend to have high economic growth rates. When GDP is viewed from the demand side rather than in terms of the production function, it is easy to understand that higher exports will increase GDP. Imports, however, are subtracted from GDP (imports represent the shift of demand overseas), and GDP is normally an independent variable of the import function. If exports are to expand over the long term, imports will also need to grow. An economy that is vigorous and where production is efficient is one where both imports and exports are increasing. In Chart 1.1, the slope of the regression line is steeper for imports than for exports.

Export and Import Growth vs. Economic Growth (2002-07 avg) **Chart 1.1**



Source: IMF; compiled by DIR.

Japan's trade not necessarily large

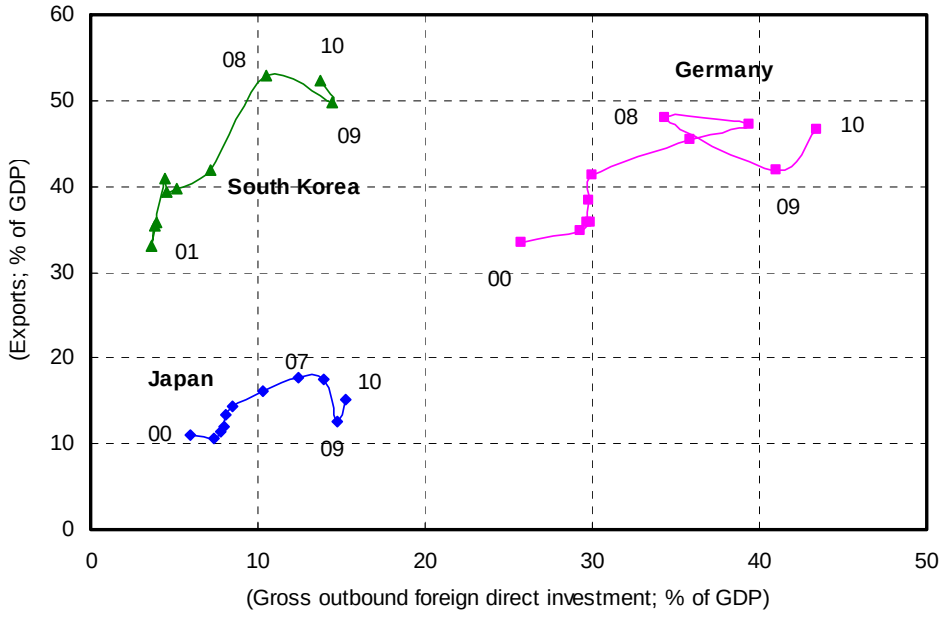
During the period covered by Chart 1.1, Japan's exports grew at an annual rate of 9.3% and imports at 4.1% (the economic growth rate was 1.8%). While Japan has been called a trading nation, the export of goods and services most recently peaked at 18.0% of GDP in FY07. This is only a slight rise from around 2005, making it difficult to claim that Japan's economy depends on exports. Export's share of GDP

is 46.8% for Germany, a competitor in trade with Japan, and it is 50% for Sweden, a social welfare nation frequently discussed in recent years (both figures are for 2010). Setting aside the pros and cons of the Trans-Pacific Partnership Agreement, the expansion of exports will remain a significant strategy for Japan and Japanese companies.

Industry hollowing out and investment-based economy

The argument is sometimes made that Japan should move from being a trading nation to an investment-based nation, in other words, a creditor nation with an aging population. The need to expand not only GDP but GNI through higher outbound foreign direct investments has already been discussed in our June report. Direct investments, however, are more risky than trade transactions, and building direct investment relations will require adequate knowledge of counterparties. Accordingly, the expansion of trade will be indispensable. A general relationship is seen in the world where large trading nations also make large foreign direct investments. In other words, the growth of foreign direct investments does not necessarily entail the hollowing out of industry through lower exports and employment. In Chart 1.2, we can see that Germany and South Korea, competitors in world markets, have increased both exports and foreign direct investments. There is no inevitable trade-off between companies advancing overseas and exports. While the difference between these two nations and Japan also reflects the effect of exchange rates, their situation points to the importance of building multi-layered and organic economic relations whether for trade or investment in terms of both inbound and outbound flows. Global economic shocks like the Lehman Shock would be alleviated to some extent if a nation could build such multi-layered and organic economic relations.

Exports vs. Outbound Foreign Direct Investment **Chart 1.2**



Source: IMF; compiled by DIR.
Note: Exports: those of goods and services.

1.1.2 Growing synchronization of world economy and its significance

Trend shift toward unification of world economy

Depending on the phase an economy is going through, the so-called decoupling theory makes an appearance on an ad hoc basis. The world economy, however, is trending toward unification in the medium to long term. As trade and investment relations deepen, the relationship between them is expected to strengthen further. Chart 1.3 presents correlation coefficients for the annual real economic growth

rates of nations and geographic regions. The upper right of the chart pertains to the 1990s and the lower left the 2000s.

Correlation Coefficient of Real Economic Growth in 1990s and 2000s **Chart 1.3**

2000s (2001-2011) \ 1990s (1990-2000)	Worldwide	Advanced economies					Emerging & developing economies										
			Japan	US	EU	Asian NIEs		Emerging Asia	China	ASEAN-5	India	Russia	Central & Eastern Europe	Latin America	Brazil	Middle East & North Africa	Sub-Saharan Africa
Worldwide		0.92	0.27	0.52	0.80	0.23	0.82	-0.03	-0.37	0.13	0.45	0.72	0.51	0.08	0.26	-0.05	0.75
Advanced economies	0.94		0.12	0.65	0.89	0.12	0.54	-0.11	-0.42	-0.02	0.55	0.66	0.41	-0.10	0.10	-0.11	0.62
Japan	0.93	0.97		-0.57	0.07	0.63	0.43	0.04	-0.43	0.66	-0.18	0.32	-0.24	-0.08	-0.29	0.71	0.16
US	0.90	0.98	0.95		0.46	-0.33	0.13	0.02	0.08	-0.38	0.58	0.45	0.63	0.08	0.25	-0.55	0.42
EU	0.90	0.95	0.89	0.88		-0.10	0.46	-0.34	-0.54	-0.24	0.48	0.54	0.32	-0.20	0.06	-0.04	0.58
Asian NIEs	0.86	0.85	0.86	0.83	0.71		0.34	0.57	0.12	0.91	-0.09	0.18	-0.26	0.06	0.18	0.08	-0.06
Emerging & developing economies	0.94	0.78	0.79	0.73	0.76	0.75		0.07	-0.23	0.30	0.14	0.61	0.44	0.31	0.41	0.09	0.71
Emerging Asia	0.75	0.52	0.55	0.45	0.49	0.61	0.90		0.79	0.74	0.19	-0.40	0.24	0.32	0.59	-0.43	-0.08
China	0.65	0.46	0.46	0.36	0.50	0.47	0.82	0.95		0.28	-0.12	-0.76	0.16	0.54	0.63	-0.53	-0.40
ASEAN-5	0.93	0.86	0.89	0.85	0.75	0.89	0.89	0.70	0.55		-0.03	-0.07	-0.07	0.14	0.23	0.09	-0.01
India	0.66	0.41	0.47	0.38	0.32	0.59	0.80	0.93	0.79	0.64		0.03	0.60	-0.46	0.12	-0.45	0.66
Russia	0.86	0.90	0.85	0.85	0.96	0.61	0.75	0.45	0.47	0.76	0.24		0.23	-0.27	-0.36	0.36	0.38
Central & Eastern Europe	0.93	0.90	0.86	0.90	0.85	0.81	0.87	0.62	0.53	0.91	0.49	0.87		0.10	0.45	-0.47	0.66
Latin America	0.91	0.75	0.77	0.69	0.72	0.74	0.94	0.77	0.62	0.86	0.75	0.68	0.82		0.62	-0.05	-0.07
Brazil	0.78	0.65	0.71	0.56	0.60	0.77	0.77	0.62	0.47	0.81	0.60	0.55	0.67	0.88		-0.66	0.21
Middle East & North Africa	0.71	0.61	0.63	0.62	0.59	0.43	0.80	0.70	0.69	0.73	0.55	0.71	0.75	0.62	0.38		-0.12
Sub-Saharan Africa	0.76	0.79	0.73	0.73	0.80	0.73	0.68	0.46	0.49	0.70	0.22	0.80	0.84	0.60	0.62	0.49	

Source: IMF; compiled by DIR.
Note: Coefficients in colored boxes are those whose absolute values are more than 0.6.

Growing synchronization of world economy

Chart 1.3 reveals that the correlation coefficients of growth rates were sometimes negative in the 1990s, and, whether positive or negative, never particularly strong. In the 2000s, however, economic relations with negative correlations disappeared (economies became more coupled without exception), and the degree of correlation grew considerably. In the changes occurring between the 1990s and the 2000s, the degree of coupling strengthened with the US and Central and Eastern Europe in the case of Japan, with Japan, Asian NIEs, the Middle East and North Africa in the case of the US, and with the EU, Russia, the Middle East and North Africa in the case of China.

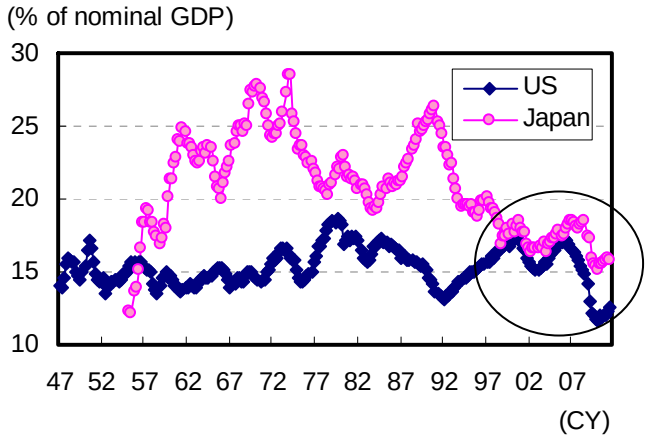
China and India

Despite assertions that we have entered the age of Asia, Chart 1.3 discloses that synchronization between China/India and other economies has been relatively weak, even in the 2000s. This situation is thought to be explained by the two nations' distinctive political structures and economic and social systems. A key issue for the world economy going forward is whether these two nations will adopt similar values and responsibilities as current advanced economies with respect to exchange rate regimes and trade policies or whether they will carve out distinctive paths of an unprecedented nature.

Growing synchronization of Japanese and US economies

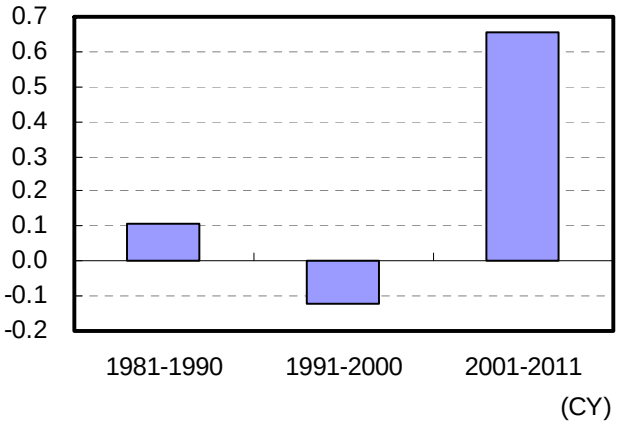
The synchronization of Japan's economy is revealed in its relations with the US, which remains its most important partner. For example, the investment cycles of both nations were long out of step but became synchronized in the twenty-first century (Chart 1.4). The same can be said for corporate profits. The ROAs of Japanese and US manufacturers have become highly correlated on a quarterly basis (Chart 1.5). The countercyclical nature of the investment cycles of Japan and the US from the end of World War II to the 1990s may be explained by the changes that followed. As the factors of production grew more mobile, the transmission speed of information increased and search costs declined through IT innovation, which enabled a range of arbitrage transactions to occur more rapidly. As a result, the investment cycles of Japan and the US fell into step.

Japan and US Investment Moving in Tandem **Chart 1.4**



Source: Cabinet Office; US Department of Commerce; compiled by DIR.
Note: Nominal private fixed capital formation (capex and private housing investment).

Correlation Coefficient of Japan-US Manufacturing ROA **Chart 1.5**



Source: Ministry of Economy, Trade and Industry; compiled by DIR.
Note: Non-adjusted quarterly basis; recurring profit ratio of net worth and total liabilities in the case of Japan; return on assets before tax in the case of the US.

Problems associated with synchronization

One of the implications of the global synchronization of economies is the lessening of diversity. Synchronization more often than not functions positively. However, one nation's economy moving countercyclically to that of another can be viewed more broadly as having a safety device available. When the economies of nearly all nations are moving in the same direction, economic fluctuations will be magnified, and such nations will without exception suffer the effects of events like the Lehman Shock. For this reason, the fiscal and monetary crises of Europe should not be viewed as a remote event. It will be essential to carefully guard against crises propagating in a chain reaction from any region.

Synchronization to promote international cooperation in terms of economic policies

Also, in a global economy where coupling has strengthened, it will be all the more important to deepen the coordination and harmonization of economic policies between nations. Should economic fluctuations increase, the role of reducing them will fall on the public sector in the form of monetary and fiscal policies. Even though a greater number of players increases the difficulty of decision making, the transition from G7 to G20 was a necessary development.

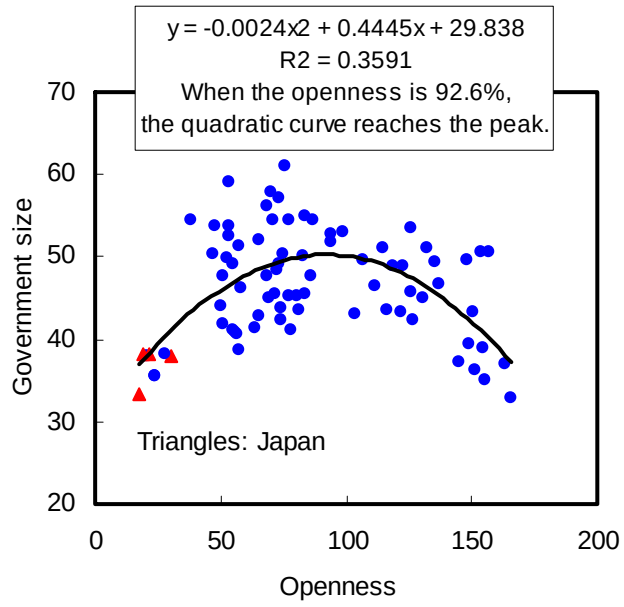
Globalization to increase importance of domestic policies

While seemingly paradoxical, greater synchronization accompanying globalization will further increase the importance of domestic policies for nations. As indicated in Chart 1.6, nations with more open economies (valued in the volume of imports and exports) are those with the larger governments. It is frequently the case that only the aspect of free markets is focused on in the discussion of globalization. Globalization, however, also pressures nations to reform their economic and social structures. When moving from less open to sufficiently open economies, the individuals and companies of a nation will be exposed to economic and social risks. During this process, policies providing temporary support and encouraging structural change will be indispensable from the perspective of promoting higher standards of living over the medium and long term. If the friction and difficulties accompanying globalization cannot be solved through domestic policies, nations will be blocked in their efforts to advance the process of globalization to achieve greater prosperity. Chart 1.6 also suggests that advanced nations with sufficiently open and globally integrated economies as well as nations seeking to benefit from globalization through bold opening measures, such as the former Eastern European nations, have (or can get by with) smaller governments.

Growing inequality worldwide

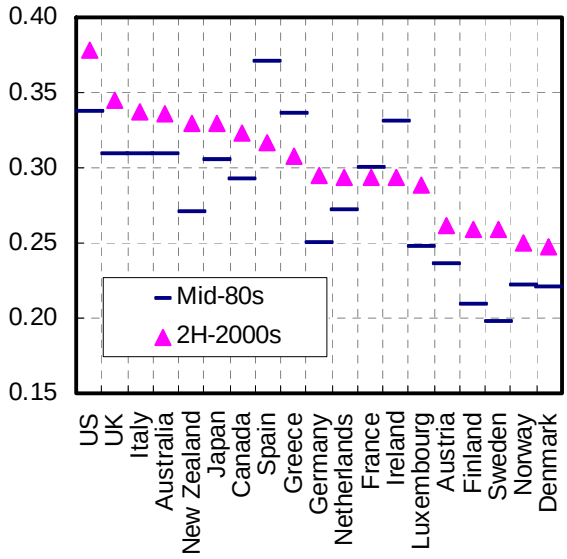
Currently, inequality is surfacing in emerging economies. Once these economies achieve a certain level of growth, they may find further growth hard to achieve if they do not skillfully address the problems created by inequality. When living standards (per capita GDP) reach a certain level, emerging economies are reported to confront a wall to growth where further growth becomes difficult, such as through higher wages, despite having caught up in terms of production technology. With the global spread of the Internet, inequality would be a factor triggering discontent and possible uprising, curbing further growth in emerging economies. Inequality is also widening in advanced economies, including those with traditions of social democracy and equality (Chart 1.7). Many causes have been cited beyond globalization, such as skill inequality (technological progress), deregulation, the spread of informal labor, weakening positions in labor negotiations, the increase of one-person households, growing inequality in asset-based income, and governments' decreasing ability to redistribute income. Whatever the cause, as the synchronization of economies spreads globally, domestic policies are gaining in importance.

Economic Openness vs. Government Size
(OECD nations) **Chart 1.6**



Source: OECD; compiled by DIR.
Notes: 1) Degree of economic openness = (export value + import value) x 100/GDP.
2) Government size = government expenditure x 100 / GDP.
3) Four 5-year periods from 1991 to 2010 for each nation, excl. Luxembourg (city state focusing on financial industry) and South Korea (nation with exceptionally small government size).

Gini Coefficient by Nation
Chart 1.7



Source: OECD; compiled by DIR.
Note: Inequality measured in terms of real disposable income (entire population basis) with the coefficient of zero indicating perfect equality, and 1 maximum inequality.

1.1.3 Flow of funds

Lower inflationary expectations and growing liquidity

Parallel to the expansion of trade and investments for real economies, the global flow of funds has changed significantly in both quantitative and qualitative terms. Increasing scope for applying labor power in production activities means the effective expansion of labor supply on a global basis as well as decrease in inflationary pressure through higher unit labor costs. These changes have reduced the need to tighten monetary policy at the global level, and they have generated a virtuous cycle between the ample flow of funds and the generation of new income and savings. Ample liquidity has also given rise to the expansion of the housing loan market and the financial derivatives market, factors behind the Lehman Shock. This shock, however, also revealed the lack of appropriate financial regulation, and

it would be improper to place the entire blame on problems associated with liquidity.

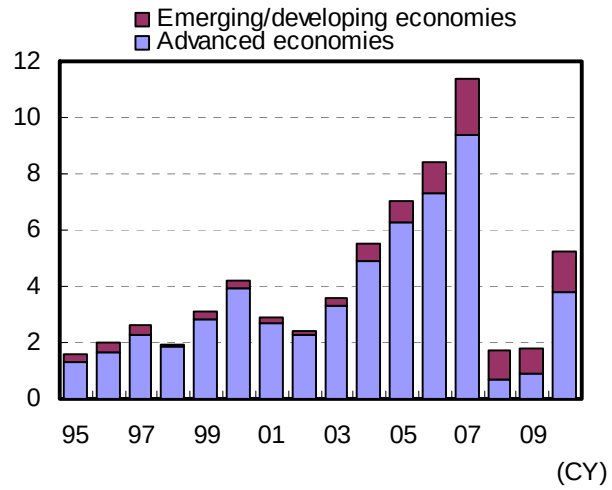
Budget deficit financing

The supply-demand balance for funds and low inflationary expectations have served to limit the rise of nominal long-term interest rates, which supported the budget deficits of advanced nations. Budget crises in Europe are not only the result of fiscal responses to the Lehman Shock but are distantly related to housing bubbles and insufficient fiscal discipline in the peripheral eurozone nations in the process of currency unification. It is possible to say that the underlying factor was real economies and finance being integrated in a way that would realize such outcomes.

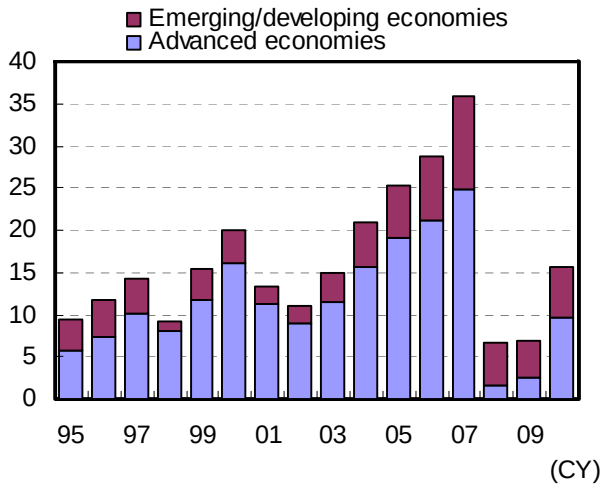
International flow of funds recovering to $5.2 tril in 2010

With respect to the international flow of funds, inbound flows (the liability side for economic agents) increased from $0.5 trillion in 1980 to $1.0 trillion in 1990 (doubling in size in 10 years) and reached $4.2 trillion in 2000 (quadrupling in size in 10 years). As indicated in Chart 1.8, such flows fell in subsequent years with the collapse of the IT bubble but rose to $8.4 trillion in 2006 and $11.3 trillion in 2007. Affected by the Lehman Shock, the international flow of funds shrank to less than $2 trillion in 2008 and 2009 but then recovered to $5.2 trillion in 2010.

Capital Inflow ($ tril) **Chart 1.8**



Capital Inflow (% of GDP) **Chart 1.9**



Source: IMF, *International Financial Statistics*; compiled by DIR.
Note: Inbound foreign direct investment, portfolio investment, and lending; 189 nations/areas.

Capital inflow to emerging economies continues

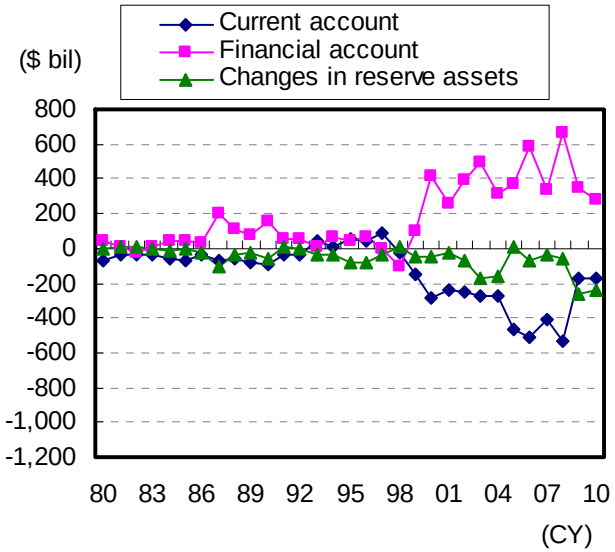
These trends represent more than a money game. In addition to fund transactions arising from narrowly defined demand accompanying the growth of trade (flows), the international flow of funds has expanded dramatically through the increasing demand for direct investments, mergers and acquisitions, and portfolio investments (stocks). When we examine the flow of funds separately for advanced economies and emerging and developing economies, we can see that the inflow of capital to emerging and developing economies became pronounced in the 2000s relative to economic size (Chart 1.9), and such inflows have not diminished by much since the Lehman Shock. Advanced economies with immense stocks of financial assets are faced with the need of realizing high returns on their investments to prepare for the further aging of society. Direct and portfolio investments in emerging economies are a part of this process. Emerging economies would not be able to gain momentum without such investments, and it is difficult to imagine these investment needs receding in the years ahead.

Financial accounts in surplus in emerging economies

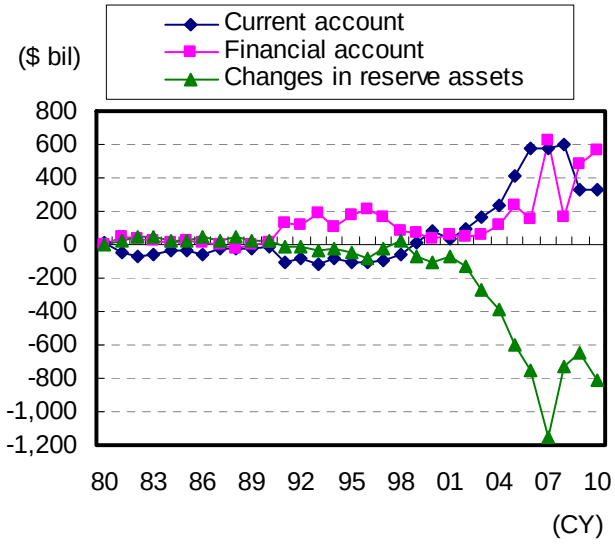
When the global flow of funds is examined by comparing the balance of payments of advanced and emerging economies, advanced economies are found to have

current account deficits and emerging economies current account surpluses. Naturally, the financial accounts of advanced economies have corresponding surpluses (Chart 1.10). In the case of emerging economies, these surpluses are huge (Chart 1.11). The financial account mainly consists of the capital account and can be regarded as the financial balance of the private sector. For both advanced economies and emerging economies, the financial balance of the private sector is positive, meaning that capital is flowing into these economies. In the case of emerging economies, however, they have current account surpluses (macro capital account net outflow) as well as massive surpluses rather than deficits in their financial accounts (private sector financial account net inflow). This situation is cancelled out by increases in reserve assets (foreign reserves). In other words, governments are investing in foreign assets (government capital net outflow).

International Balance of Payments: Advanced economies **Chart 1.10**



International Balance of Payments: Emerging/developing economies **Chart 1.11**



Source: IMF, *International Financial Statistics*; compiled by DIR.

Income generated by emerging economies being recycled through their governments

Such a structure has surfaced for emerging economies through the contribution of nations benefiting from undervalued currencies (China and South Korea) and those whose economies have expanded supported by exports by way of heightened demand for resources (oil producing nations). These contributions have taken the form of soaring resource prices as well as currency market intervention to sell the home currency for foreign currencies in order to restrain upward pressure on the home currency. The key point is that, as the reserve assets and sovereign wealth funds of these nations expanded, such wealth recycled through global financial markets, including advanced economies (financing their budget deficits). The accumulation of foreign reserve assets by emerging economies has also been viewed as magnifying the risk of a more unstable international currency system, and it may be casting a shadow over the future of the current dollar reserve currency regime.[1] However, a situation where the reserve currency (the dollar) loses value rapidly rather than gradually would also be inconvenient for those nations with dollar reserves.

Will funds continue to flow into emerging economies?

Should such events as European fiscal crises reduce the risk tolerance of investors and should funds no longer flow into emerging economies, such economies can no longer be expected to drive the growth of the world economy. Even if such a prospect does not materialize, they are facing the difficulty of supporting the

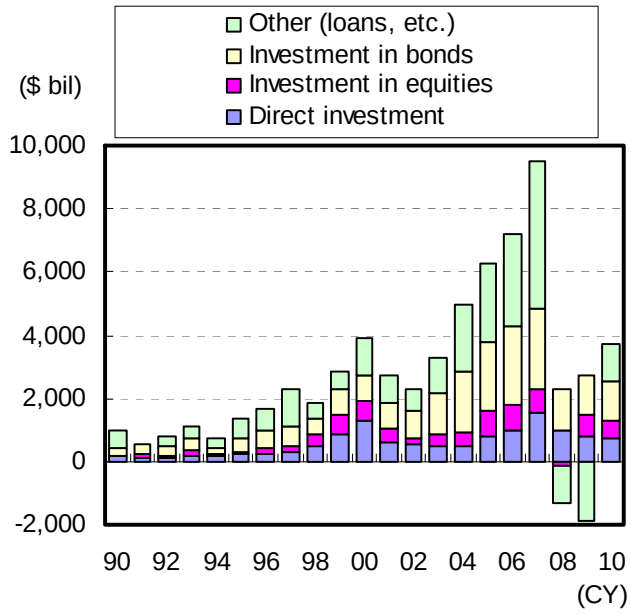
1. Keiji Kanda, Hitoshi Suzuki, *Rolling Back the Strong Yen under a Dollar Reserve Currency Regime*, 30 Dec 2011.

economy while continuing to present themselves as an attractive destination for foreign capital.

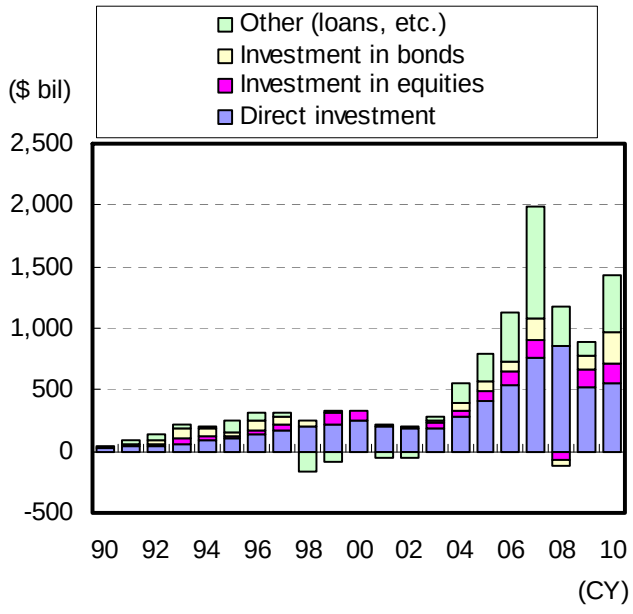
Current situation differs from Asian currency crisis

When we examine the form of inbound capital in light of such awareness, we notice in charts 1.12 and 1.13 that the share of inbound direct investment is higher for emerging economies than for advanced economies. The fiscal and financial problems in Europe are largely a problem of a banking system that acquired sovereign debt holdings of insufficient creditworthiness. This suggests that the flow of funds into emerging economies in recent years centering on direct investments will not be immediately affected by problems in Europe. Right before the Asian currency crisis of 1997, the outstanding balance of bank loans came to around 40% of Thailand's external liabilities, a high figure. Certainly, careful vigilance will be required when the share of bank loans is high since such loans consist of capital based on short-term and flighty assets. Currently, however, the outstanding balance of bank loans comes to around 10% of the external liabilities of emerging and developing nations on average. While the risk that the European crisis will deepen further cannot be ignored, it would be shortsighted to argue in extension that the flow of funds to emerging economies will stop and that the globalization that has characterized the twenty-first century will come to an end.

Foreign Debt: Advanced economies **Chart 1.12**



Foreign Debt: Emerging/developing economies **Chart 1.13**



Source: IMF, *International Financial Statistics*; compiled by DIR.
Note: Gross inbound investment.

Fund flow into advanced economies

Compared to emerging economies, bonds and loans take a prominent place in the flow of funds into advanced economies. It was this inflow that made possible the trend of rising bond prices, rising stock prices, and the growth of consumption prior to the Lehman Shock. In recent years, foreign investors are increasing their presence in the sovereign bond markets of advanced economies. In this we see a structure where the budget deficits of advanced economies are supported by the bond investments of other advanced economies and by that of emerging economies with accumulated reserve assets.

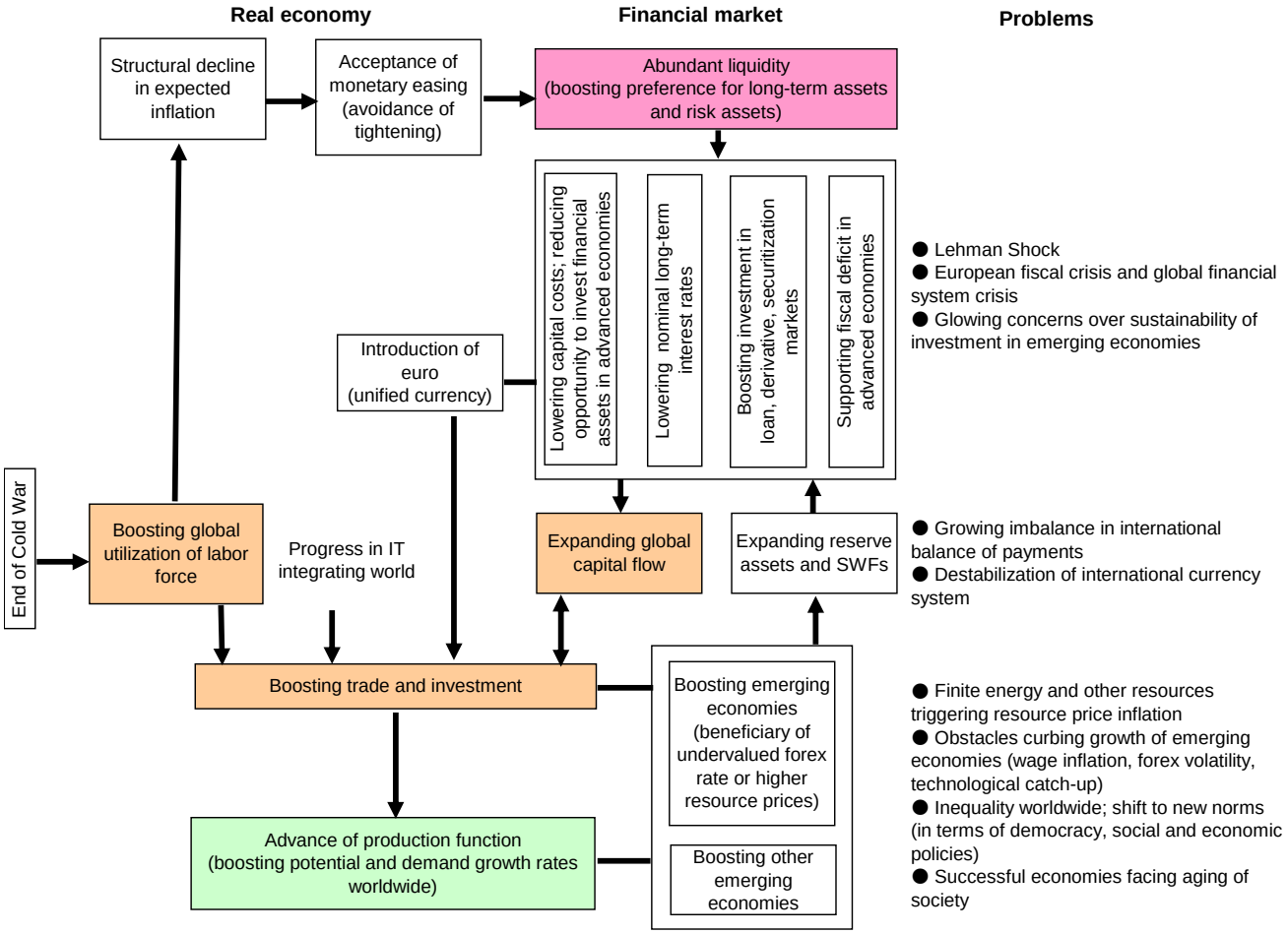
1.1.4 Assumptions for world economy: three risks to bear in mind

Clarifying risks that might cause collapse of current structure

An overview in schematic form of the economic and financial structure that came into being in the twenty-first century is presented in Chart 1.14. Whether this

structure will break down will depend on what happens to the problems and issues embodied within this structure. Thus, it will be meaningful at this point to clarify the risk factors that would cause this structure to collapse. Stated another way, as long as these risks do not materialize, it is reasonable to believe that the synchronized global economy will continue to grow. Broadly speaking, three risks can be identified.

Globalization at the Beginning of the 21st Century **Chart 1.14**



Source: Compiled by DIR.

Necessity of maintaining loose monetary policies

First, there is much that can be learned from the way the approval of imprudent monetary easing, when reasonable financial regulations and other restraining measures were lacking, unleashed problems to the point of stirring debate about whether capitalism has reached a dead end. In the aftermath of these problems, the resolution of budget problems (Europe and Japan) and balance sheet adjustments (US) will be necessary for some time to come to make way for the next stages of growth. With this in mind, the maintenance of monetary easing will be an essential condition for the ongoing development of the world economy.

Need for capital to continue flowing into emerging economies

Second, there can be no doubt that the continued flow of capital into emerging economies is another prerequisite. The world will lose its growth engine if risk tolerance declines and if short-term funds and direct investments are withdrawn from emerging economies. The current growth of emerging economies is associated with such worrisome factors as resource restrictions and instability of the international currency system. Prescriptions, however, are available. The former can be addressed by transferring energy-saving technology and the latter by restructuring the exchange rate system. If emerging economies can no longer

realize their underlying growth potential, nations might well turn inward risking reversal of the expansion of free trade.

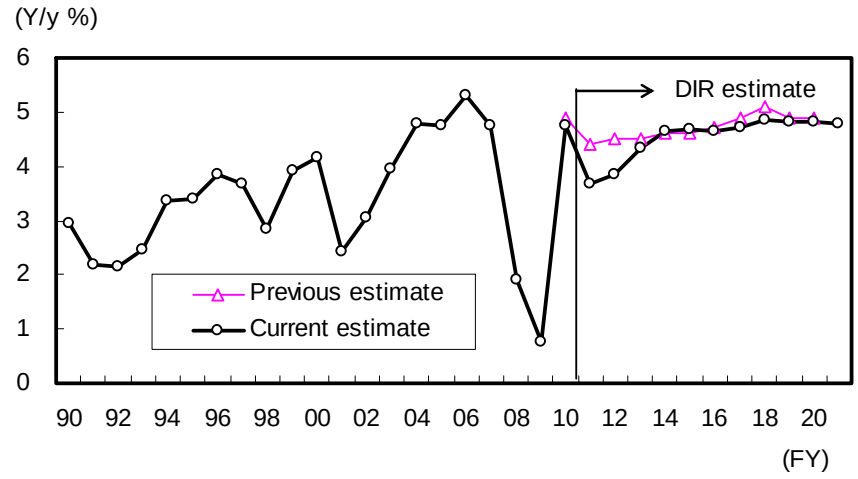
Domestic policies also extremely important

Third, another important question is whether it will be possible to maintain economic and social policies that seek to share and control the risks individuals and companies are exposed to through globalization. Despite trying fiscal conditions, nations will need to strive for governments of optimal size and to reallocate government expenditures. Inequality and other problems in advanced economies not being addressed adequately would risk democracy ceasing to function properly. Emerging economies will have to convert their industrial structures and enhance creativity if they are to break through walls obstructing growth.

Assumptions for world economy

While bearing in mind the risk factors described above, we do not think they will actually materialize. The growth rates we have assumed for the world economy are listed in Chart 1.15. The eurozone is strengthening the movement toward fiscal unification, which is an essential measure, and it is hard to envision it readily abandoning a currency strategy built over a long period of time. Compared to Europe, business confidence and production activity are at tolerable levels in the US, and the economy is continuing to recover slowly, as evidenced by the improvement of consumption. Balance sheet adjustment in the US is an issue for the household sector, as we surmised in our previous medium-term outlook for Japan's economy, and the rapid disposal of debt will thus be difficult. This in itself, however, is not a problem since adjustment can occur over time. Looking at emerging economies, with the increase in the middle classes it has become possible to envision a growth pattern based on domestic demand in the medium term, a situation that differs from before. The global need to invest funds is strong, and emerging economies will remain a destination for such investments.

Global Economic Outlook **Chart 1.15**



Source: IMF; compiled by DIR.
Note: Purchasing power parity basis.

1.2 Japan's Economy in the Next 10 Years

1.2.1 Premises, hypothesis, and assumptions for our forecast

The main assumptions and premises for our current forecast are as follows:

- The world economy will grow by an annual average of 4.6% over the next 10 years.
- Private-sector reconstruction demand related to the Great East Japan Earthquake is assumed to be about Y7 trillion, and government sector reconstruction

projects will total Y19 trillion. This entire amount will materialize in the first half of our forecasting period.

- Nuclear power plants found to be safe will be restarted once stress tests are concluded. Investments in renewable energy will increase in the second half of our forecasting period, and such investments will grow to total Y17 trillion. After climbing sharply to FY12, electricity prices will subsequently rise gradually due to the growth of electricity demand accompanying the expansion of the economy and increase in renewable energy investments.

- Based on the draft proposal for the integrated reform of the social security and tax systems, the consumption tax will be increased (to 8% in April 2014 and to 10% in October 2015) and the social security system revamped. The consumption tax is assumed to average 8% in FY14, 9% in FY15, and 10% in FY16 and beyond on a fiscal year basis in our macroeconomic forecasting model.

- Our forecast also assumes an increase in taxes for reconstruction purposes (a total of Y10.5 trillion from corporation tax, income tax, and local inhabitant taxes). Since the increase in the income tax and local inhabitant taxes will be small and will remain in place for a long time, its impact on the economy will be small.

1.2.2 Forecast overview

Japan's economy to grow 2.4% (nominal) and 1.8% (real) over next 10 years

Forecast results factoring in various premises are as shown in the tables at the start of our report (pages 3 to 6). We predict that Japan's economy will grow 2.4% (nominal) and 1.8% (real) over the next 10 years (annualized average; Chart 1.16).

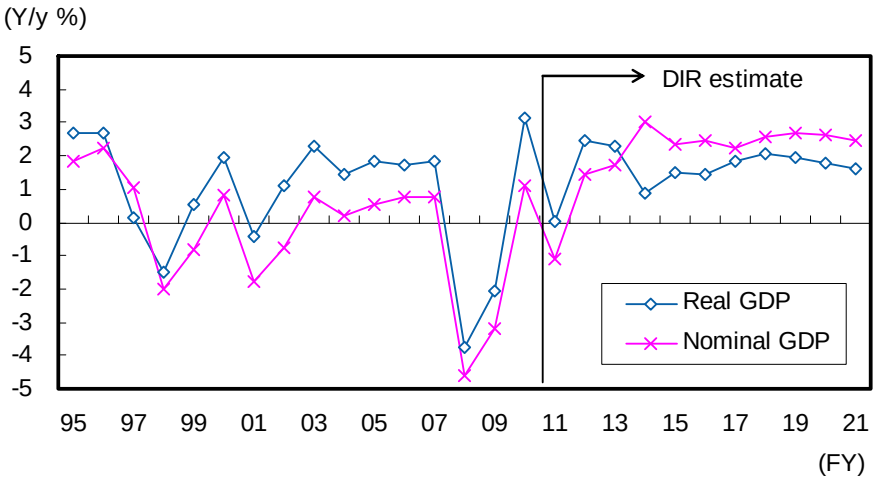
If our current forecast is adjusted to cover the same period as our previous forecast, the annual rate of real economic growth will be 1.6% from FY11 to FY20, a slight upward adjustment from the previous figure of 1.5%. While we have revised export growth downward based on our belief that the world economy will slow compared to our previous forecast, we now foresee domestic demand growing somewhat because of reconstruction demand and increased investment in renewable energy. Should domestic demand strengthen to some degree, prices will rise somewhat through the normalization of wages.

Growth Outlook Over 10 Years to FY21 (annualized; %) **Chart 1.16**

	Nominal	Real	Per capita (real)
Gross domestic production	2.4	1.8	2.2
Gross domestic income	2.4	1.3	1.7
Gross national income	2.4	1.4	1.8

Source: Compiled by DIR.

P Growth Rate **Chart 1.17**



Source: Compiled by DIR.

Real growth of 2.2% on a per capita basis

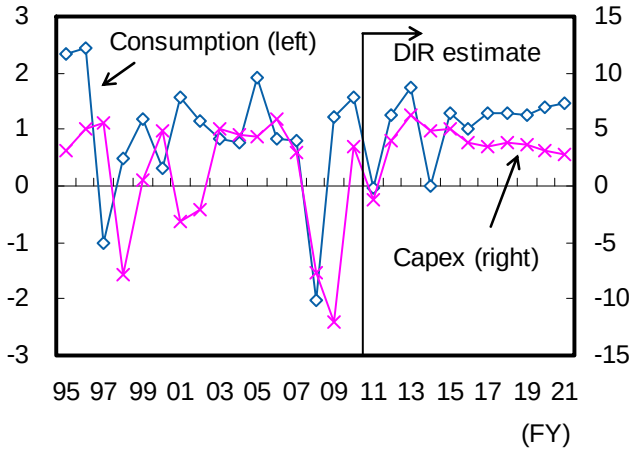
Our medium-term forecast includes forecasts not only for gross domestic product (GDP) but also for gross domestic income (GDI) and gross national income (GNI) on a macro and per capita basis (Chart 1.16). The meaning and significance of these different statistics are discussed in our June 2011 report. Real GDI factors in changes in the terms of trade, and is an extremely important indicator when referring to Japan's trade structure. GNI, which factors in the cross-border receipt and payment of factor income, is an indicator that should be followed by Japan, the world's greatest net creditor nation. Moreover, there will be an increasing need to examine not only macro figures but per capita figures in a society with a shrinking population.

1.2.3 Several points worth noting

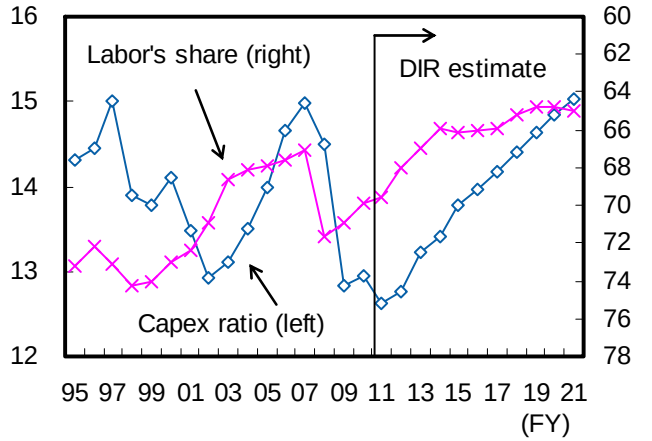
Capex to drive first half of our forecasting period

When economic growth over the next 10 years is examined in terms of the demand components of real GDP, we anticipate that the first half of our forecasting period (FY12 to FY16) will see a recovery driven by capex. We predict that the growth of private capex will average 4.1% in real terms in the next 10 years, with such growth being 4.8% in the first half and 3.3% in the second half. Investments will move past their adjustment phase brought on by the synchronized downturn of the world economy ensuing from the Lehman Shock as well as by concerns over shortages in the stable supply of electricity. In addition, reconstruction investments can be anticipated in relation to the Great East Japan Earthquake. This outlook, however, assumes that the future image of electric power policies will come more or less into view. If the stable supply of electricity cannot be anticipated, companies will hold back from making investment decisions.

Consumption and Capital Expenditures
(private sector; real; y/y %) **Chart 1.18**



Capex Ratio and Labor's Share
(private sector; %) **Chart 1.19**



Source: Cabinet Office; compiled by DIR.
Note: Consumption: Final consumption expenditure.

Problem of deflation

We believe that deflation will be overcome in FY13 when CPI is expected to turn positive y/y. Wages and the GDP gap are significant factors to consider when analyzing prices. Similar to our June 2011 forecast, we believe that the factors currently restraining wages are (1) the need by exporting companies to allocate resources to offset the worsening terms of trade (lower export prices) and (2) the correction of the differential between domestic and foreign prices and increasing competition centering on non-manufacturing industries. These trends are expected to continue for a while in the first half of our forecasting period. In the second half (FY17 to FY21), however, the decline in labor's share will more or less end as the part-time employee ratio reaches an optimal level, and the labor market will tighten due to demographic factors. The GDP gap (deflation gap) is expected to shrink on account of capex and reconstruction demand occurring in the first half.

Labor market foreseen to tighten in second half

In other words, wages will experience upside pressure in the second half of our forecasting period. Given their long-term restraint, wages have fallen by a sufficient amount relative to productivity. We therefore believe that wages will begin evincing a tendency to rise by some degree and that a more normal economy free of deflationary concerns will materialize. While it will take some time, export companies will begin to develop business models where they do not depend on reducing prices, as will be discussed in Section 2, and domestic non-manufacturing industries will gain more muscular profiles following a shakeout process. Upward pressure on wages will not be of the sort that invites inflation. What we envision for the medium to long term is income being allocated optimally in accordance with growing productivity. In the second half of our forecasting period, we estimate that CPI will increase by an average 1.3% and that the unemployment rate will fall to 3.6%, nearly corresponding to the structural unemployment rate.

Problem of government-controlled markets

Currently, the price mechanism is not fully functioning in so-called government-controlled markets (markets for such services as health care, nursing care, and child care). Despite demand being great enough to create waiting lists, reform on the supply side is lagging. Potential demand is not materializing as a result, and this is thought to be another factor behind deflationary conditions. Reforms, however, are likely to progress over the next 10 years regarding this situation, and demand and employment are anticipated to gradually increase.

Consumption to grow by a certain degree despite higher consumption tax

With an increase in wages and the elimination of deflationary conditions, we predict that employee compensation and consumption expenditures will grow to some extent in the second half of our forecasting period. We anticipate that nominal employee compensation will increase at an annual rate of 2.3% and that real private final consumption will grow 1.3% in the second half. Our current forecast factors in an increase in the consumption tax being pushed by the current administration. While the consumption tax rate being raised to 10% will cause consumption to stagnate temporarily, bring demand forward, and generate corresponding reactions, we do not believe it will bend the economy's trend growth rate downward. Concerns about higher taxes have been ever present. Once the consumption tax rate is increased to 10%, a new world will appear.

Interest rates

We have revised upward our outlook for the nominal long-term interest rate in view of our upward adjustment of the real economic growth rate and inflation rate. We predict that the yield on 10-year government bonds will reach the 2% level in FY14, the 3% level in FY17, and equal 4.0% in FY21. In contrast, we have revised downward the short-term interest rate (call rate) in view of the direction of the world economy and the effect of fiscal problems. The Bank of Japan is foreseen to maintain its zero interest rate policy to FY15 and raise interest rates in FY16. Since a higher consumption tax will have a short-term deflationary impact at the very least, there will be no need to tighten monetary policy, as indeed was the case when the tax rate was raised once before. The lesson provided by Europe's problems is that, if fiscal problems are ignored, they will in the end have a strong adverse impact on monetary policy and the role of central banks. It is thus quite reasonable for central banks to maintain loose monetary policies while government finances are being restored to health. The fact that the upturn of economic conditions has been made a requirement for raising Japan's consumption tax is likely to have a subtle effect on monetary policy.

Exchange rates

In view of Japan's low inflation rate relative to other nations and loose monetary policy, the yen is predicted to experience some weakening when the consumption tax is raised. We believe, however, that the trend over the next 10 years will be for a stronger yen. Even so, we do not anticipate major changes to effective exchange rates. The yen's appreciation will be on an order that reflects the differential in inflation rates.

Housing investments

Given the current state of Japan's housing stock, such as lagging efforts to earthquake proof houses, potential demand exists for the expansion of private housing investment. We predict, however, that housing investment will decline an average 1.4% annually over the next 10 years in an environment of rising interest rates and higher consumption tax. Should housing coinciding with consumer needs be offered, however, such as environmentally friendly housing centering on home solar power generation or housing designed for the elderly, we believe that a certain level of demand will be maintained.

Public works spending

In the first half of our forecasting period, the demand for public works spending will be relatively high due to reconstruction needs arising from the Great East Japan Earthquake. Subsequently, such demand will gradually wane. Even so, major cuts are no longer likely to be made to the government budget. In the medium to long term, maintaining and replacing the stock of social capital will become an issue. Failing to adequately maintain social capital which has a high utilization rate will at the very least risk harming the supply capacity of the economy.

Exports, imports, and current account balance

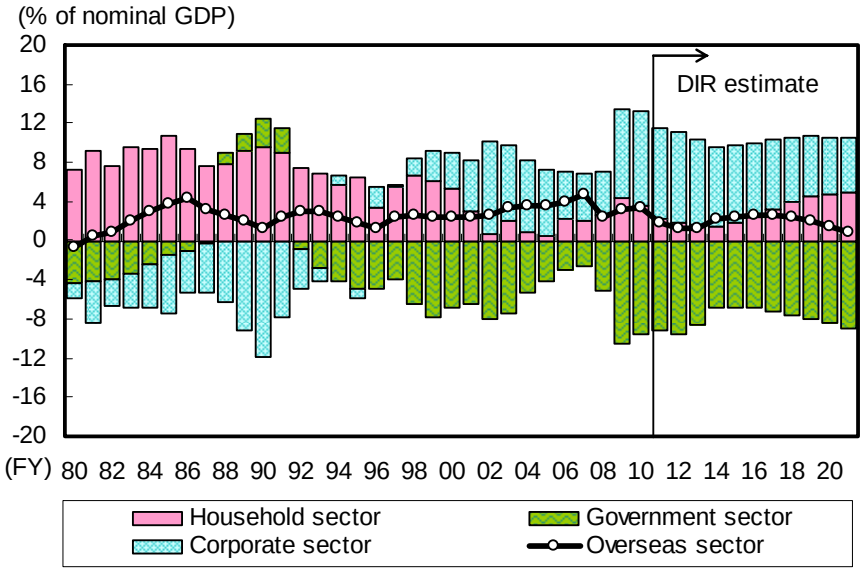
Real exports are forecast to grow an annual average 4.3%. Since exports climbed 10.1% between FY02 and FY06, we predict that they will grow at about 40% of their former speed on account of the slowing of the world economy. In the case of real imports, we anticipate they will increase 4.0% over the next 10 years. Real net

exports in FY07 prior to the Lehman Shock totaled Y18.3 trillion (chained 2005 prices). Such exports are expected to gradually increase from Y11.5 trillion in FY11 to around Y20 trillion in the second half of our forecasting period. With the worsening of the terms of trade, net exports on a nominal basis will remain negative for some time, although by a small margin. In the second half of our forecasting period, such exports are expected to amount to around -1% of GDP. Since the income account will maintain growth of more than 2% of GDP, the current account balance will not turn negative at any time during our forecasting period (Chart 1.20).

Government finances

The primary budget deficit (central and local government basis, after adjusting for ad-hoc factors), which was 6.7% of GDP in FY10, will decline toward the mid-2010s with the increase in the consumption tax rate. We estimate that the budget deficit will be 4.2% of GDP in FY15 and 3.7% in FY16, and hence the fiscal management strategy target (a budget deficit of 3.2% of GDP or less in FY15) will not be achieved. This issue will be discussed further in Section 4.

Investment and Savings Balance (adjusted for ad-hoc factors) **Chart 1.20**



Source: Cabinet Office; compiled by DIR.

2. Long-term Measures to Counter Strong Yen

The vicious circle between a strong yen and deflation is something that Japan's economy must overcome. It should be evident from the past, however, that this vicious circle cannot be broken by treating the symptoms through aggressive fiscal and monetary policies or currency market intervention.

In this section we begin by examining the sorts of effects a strong yen has on the economy. We note that, rather than actual level, what has become problematic with respect to currency rates is the fluctuation that far exceeds changes in economic fundamentals. Next, we look at how excessive fluctuation in market exchange rates not only directly worsens Japan's economy but also has the indirect but still major adverse effect of restraining the growth of nominal wages as companies seek to maintain export competitiveness. Finally, building on the historical record, we offer proposals on what Japan can do to roll back the overly strong yen. Specific steps that could be taken are rules to control excessive fluctuation accompanying a floating exchange rate system and Japan's manufacturers endeavoring to make products whose selling prices do not fall and developing sales methods where price reductions are not necessary.

2.1 Vicious Circle in Japan's Economy Produced by a Floating Exchange Rate System

2.1.1 Adverse effects of a strong yen should not be measured by exchange rate levels alone

Considering economic effects solely in terms of actual level of exchange rates not necessarily right

The economic effects of a strong yen are frequently discussed in terms of the actual level of exchange rates. For example, people are sometimes heard to say, "When the yen used to trade at 100 to the dollar that was called a strong yen. Now it is trading at the 70 per dollar level which is a dreadful situation." It is not necessarily right, however, to consider economic effects solely in terms of the actual level of exchange rates. When the exchange rate between two nations is at a level that reflects their respective economic fundamentals (equilibrium exchange rate), the exchange rate factor will not have any impact on either nation. Should this level coincide with the actual yen/dollar rate, the actual rate would represent neither a strong yen nor a weak yen.

Purchasing power parity offers one means for knowing equilibrium exchange rate

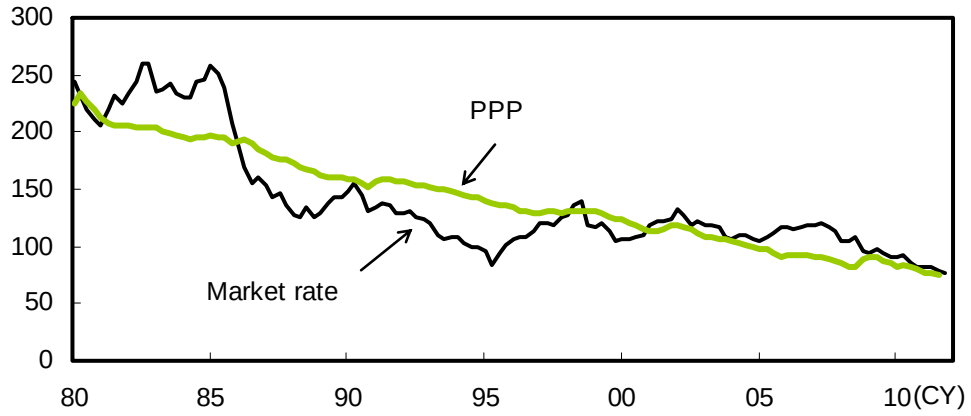
Purchasing power parity (PPP) offers one means for knowing the equilibrium exchange rate. PPP assumes that exchange rates are determined so that the purchasing power of nations equalizes to realize one price for identical products in the long term with respect to trade goods. While no ideal trade goods price index exists for calculating PPP, the calculation itself is easy to perform and has empirical support. Specifically, the growth rate of PPP corresponds to the difference in the inflation rates of trade goods between respective nations (strictly speaking, our discussion concerns relative PPP since it employs growth rates rather than price levels).

Let us then examine the market exchange rate (which nearly fully explains the movement of nominal effective exchange rates[2]) and PPP (Chart 2.1). Since an ideal trade-goods price index does not exist, the Domestic Corporate Goods Price Index of Japan and the Producer Price Index of the US are used as proxy variables

2. The nominal effective exchange rate is a weighted average of the exchange rate between two currencies weighted by trade volume, and it expresses the general external price of the yen.

for the prices of trade goods in the chart.[3] We can see in Chart 2.1 that PPP portrays the trend of the market exchange rate. Thus, theory proves to be applicable in the long term. These two statistics rarely coincide, however, in the short term. While the movement of PPP is smooth, the market exchange rate fluctuates sharply and abruptly and does at times diverge from PPP. This divergence is precisely the strong or weak yen that affects the economy in a manner that cannot be explained by the basic factor of prices.

Y/$: Market Rate and PPP **Chart 2.1**



Source: Bank of Japan, US Bureau of Labor Statistics; compiled by DIR.
Note: Purchasing power parity (PPP) estimated for the period from Jan-Mar 1970 to Jul-Sep 2011 based on the following equation:
ln (Y/$) = 5.086 + 1.163 x ln (Japan's Domestic Corporate Goods Price Index / US Producer Price Index).

Reasons why movements in PPP and market exchange rate differ

Factors thought to influence the differences in the inflation rates of trade goods include the wage growth rate and production structure (labor input ratio, intermediate input ratio, and capital input ratio) of the trade good sector as well as rate of technological progress. These factors change only gradually at the macroeconomic level, and the movement of relative prices is moderate. As a result, the movement of PPP is smooth. Market exchange rates, however, change in accordance with such indeterminate factors as the occasional news that sways forex markets, differences in nominal market interest rates, and the outlook for relative inflation rates. As a result, they can at times swing widely. Also, since a floating exchange rate system by its nature increases future uncertainty, volatility is magnified by the inability to fully hedge currency risk.[4]

2.1.2 Adverse effects of abrupt changes in exchange rates

Should PPP as measured by the prices of trade goods be viewed as the equilibrium exchange rate, market exchange rates deviating above PPP (a strong yen) or below PPP (a weak yen) will distort resource allocation, wage rates, and market interest rates, adversely impacting the real economy. Companies generally manage production activities by considering the optimum input of people and goods in relation to economic fundamentals so as to generate as much value added as possible. Should the yen appreciate suddenly, companies must rethink the optimum allocation of people and goods to correspond with the new environment. Since a certain amount of time will be needed to respond appropriately, higher costs and

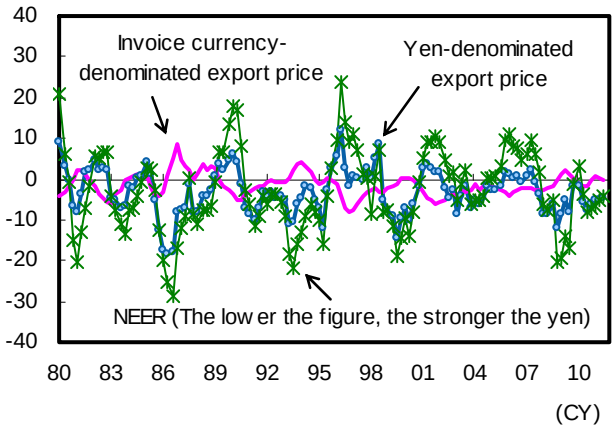
3. Due to statistical limitations, an ideal trade-goods price index does not exist. Also, the PPP level indicated in the chart is not absolute. It will differ according to the statistics or estimation period used. The Consumer Price Index or unit labor cost of the manufacturing sector could also be used as price indices, and a similar trend is revealed by PPP derived from such statistics.
4. Ronald I. McKinnon and Kenichi Ohno (1997), *Dollar and Yen: Resolving Economic Conflict between the United States and Japan*, MIT Press.

other inefficiencies will be experienced during the period responses are inadequate, which will curb long-term economic growth, entailing lower corporate profits, lower household income, as well as lower GDP.

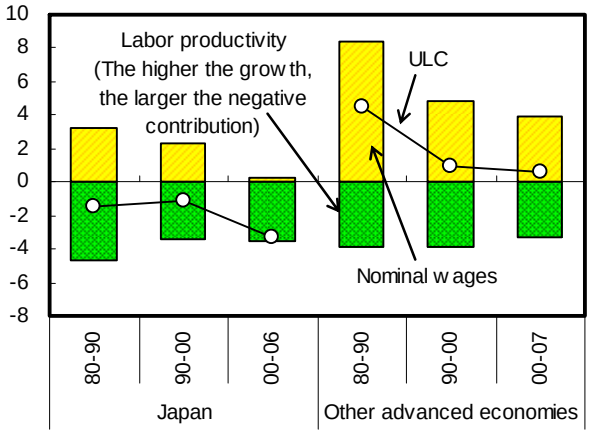
Exporters did not change selling prices denominated in invoice currencies when the yen appreciated, rather they responded by increasing cost competitiveness

In the case of Japan, the yen strengthening above PPP has a strong tendency to promote cost reduction efforts by companies. Japan's exporters set product prices in invoice currencies, and, for the most part when the yen appreciated they did not increase such prices in order to maintain price competitiveness. Chart 2.2 illustrates the trend of the export prices of exporting industries (general machinery, electrical machinery, transportation equipment, and precision instruments) on an invoice currency basis and a yen basis as well as the trend of the nominal effective exchange rate. If changes in exchange rates are not passed through to selling prices, there will be no change in export prices on an invoice currency basis. Export prices on a yen basis, however, will change in accordance with forex rates. We can see in the chart that the movement of export prices corresponds fairly closely with these conditions, meaning very little of the change in exchange rates was passed through to product prices on an invoice currency basis. In other words, Japanese exporters chose to bear the cost of yen appreciation themselves (on the Japan side). Specifically, they increased productivity or reduced manufacturing costs so as to secure profits.

Export Prices for Export-oriented Industries and Nominal Effective Exchange Rate (y/y %)
Chart 2.2



Manufacturing ULC (% change)**: Japan vs. Other Advanced Nations**
Chart 2.3



Source: Bank of Japan, EU KLEMS database; compiled by DIR.
Notes: 1) Yen-denominated and invoice currency-denominated export prices: average with 2005 weightings of export-oriented industries (general machinery, electrical machinery, transportation equipment, and precision instruments).
2) NEER: nominal effective exchange rate.
3) ULC: unit labor cost; manufacturing; per person and per hour.
4) Other advanced economies' ULC: avg of 16 countries (Australia, Austria, Belgium, Denmark, Finland, France, Germany, Italy, South Korea, Luxembourg, the Netherlands, Norway, Portugal, Sweden, the UK, and the US); Portugal: through 2006.

Compared to other developed nations, manufacturers' ULC was slow to grow in Japan

Chart 2.3 offers an international comparison of the unit labor cost (ULC) of manufacturers (nominal employee compensation / real GDP), which expresses the domestic production cost of trade goods. While costs include raw materials, such goods can be readily obtained by any nation through trade with foreign markets. Thus, differences in the production costs of the trade goods of nations are closely approximated by differences in labor costs, given the difficulty of the cross-border movement of labor. Chart 2.3 reveals that nominal wages grew faster than labor productivity, pushing up ULC, in other developed nations. In Japan, however, while labor productivity grew on par with other nations, the growth of nominal wages was contained, dragging down ULC. Such corporate behavior is believed to

have suppressed domestic demand, generated deflationary pressure, and induced further yen appreciation.[5]

Relationship between PPP and market exchange rates goes both ways

What should be recalled at this juncture is that PPP essentially determines forex rates according to relative inflation rates. However, when forex rates deviate from PPP and undergo excessive shifts, such changes will alter PPP. That is to say, the relationship between PPP and market forex rates goes both ways. When the yen diverges greatly from PPP and appreciates sharply as occurred after the 1985 Plaza Agreement or in 1995, the allocation of resources and income becomes distorted to the same degree, the economy worsens, and PPP shifts toward the strong yen as companies work to reduce costs. Chart 2.1 above indicates that the recent market exchange rate is nearly the same as PPP. What is worth underscoring is that, if the recent market exchange rate represents a strong yen, so too does PPP, and the divergence between the two appears to have been eliminated.

This relationship between PPP and market exchange rates can serve to counter the reasoning behind criticisms repeatedly made by foreign authorities regarding Japan's currency intervention. It is claimed in such criticism that the appreciation of the yen since the Lehman Shock does not necessarily mean that the yen is strong since Japan's current real effective exchange rate corresponds to its long-term average. However, the current correspondence between the market exchange rate and its long-term average on a real basis is merely the result, and no consideration is given to the extent to which deflation and a strong yen have exhausted Japanese companies and households in the meantime.

Should expectations take hold that the yen will appreciate over the long term, wages and capex will be curtailed

Over a period of about 40 years since the 1970s, Japanese companies have repeatedly experienced the sharp appreciation of the yen. Just lately the yen recorded its all-time high in the postwar period. Moreover, while a dollar reserve currency regime is likely to continue, confidence in the dollar has fallen due to the persistent current account deficits and massive budget deficits in the US.[6] This history has the potential of causing companies to develop enduring expectations that the yen will remain strong over the long term. Should such expectations take hold, exporting companies may become reluctant to increase wages or to make capital expenditures in view of their long-term impact on earnings.[7] As a matter of fact, in the mid-2000s when growth of the US economy and the yen carry trade resulted in a persistently weak yen, Japanese companies recorded strong earnings but they held down the rise of nominal wages. Capex also did not increase as much as initially expected, and concerns that companies would shift operations overseas and that Japan's industries would be hollowed out continued to smolder.

Simulation with a macroeconomic forecasting model

It is not a simple matter to factor in the above observations and to calculate the degree to which Japan's economy has worsened because of a strong yen. A simulation with a macroeconomic forecasting model reflecting Japan's economic structure, however, should provide a certain point of reference.

The yen appreciating 5% against the dollar would reduce real GDP by about 0.3%

Chart 2.4 provides an estimation of how Japan's economy would be affected by the yen appreciating 5% against the dollar using DIR's medium-term macroeconomic forecasting model.[8] Figures in the chart indicate the deviation from the situation where the yen does not appreciate. The yen appreciating 5% against the dollar would reduce real GDP by around 0.3% from the second year forward. The

5. Keiji Kanda, Hitoshi Suzuki, *Meaning of Weaker Yen in Terms of REER*, 1 Dec 2010, DIR.
6. Keiji Kanda, Hitoshi Suzuki, *Rolling Back the Strong Yen under a Dollar Reserve Currency Regime*, 30 Dec 2011.
7. While expectations for a strong yen are a positive factor for importing companies, since Japan has a trade surplus, it is highly probable that the net effect is negative. Also, goods that can be exported have high value added and are very competitive internationally. Since sectors producing such goods are the driving force of Japan's economy, investments and wages stagnating in these sectors will adversely affect the broader economy.
8. Details of the model are described in Section 5 of this report.

deviation is the greatest in the fourth year when it reaches -0.34%. In terms of demand components, yen appreciation against the dollar would reduce real exports with a lag, and this effect would spread primarily to capex. In addition, the yen's appreciation would lower import prices and stimulate import demand, and real imports would increase compared to the case where the yen did not appreciate. The worsening of the economy would ease the macro supply-demand balance, unleash deflationary pressure, and the unemployment rate would rise. While long-term interest rates would fall, the budget balance would worsen as tax revenues contract due to the worsening economy.

Impact on Japan's Economy of 5% Appreciation against $ (deviation from standard scenario; %; %pt)
Chart 2.4

	Real GDP							
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports
1st year	-0.09	-0.07	0.00	0.00	0.10	0.14	0.00	0.45
2nd year	-0.27	0.01	-0.13	-0.52	-0.05	0.43	-1.15	-0.08
3rd year	-0.30	0.01	0.02	-0.58	-0.01	0.46	-0.87	0.16
4th year	-0.34	-0.01	0.08	-0.28	-0.01	0.50	-0.48	1.05
5th year	-0.28	-0.03	0.03	-0.13	0.00	0.40	-0.19	1.16
	GDP deflator	GDP gap	Unemployment rate	CPI	Long-term interest rate	Current balance	Fiscal balance (central & local governments)	
						(% of nominal GDP)		
1st year	0.08	-0.06	0.01	-0.02	-0.02	0.06	0.00	
2nd year	0.01	-0.17	0.04	-0.08	-0.09	-0.21	-0.07	
3rd year	-0.05	-0.18	0.05	-0.13	-0.10	-0.18	-0.10	
4th year	-0.12	-0.19	0.06	-0.17	-0.10	-0.23	-0.09	
5th year	-0.17	-0.16	0.06	-0.20	-0.07	-0.19	-0.06	

Source: Compiled by DIR based on DIR medium-term macroeconomic model.

2.2 Measures for Dealing with a Strong Yen

2.2.1 Curbing volatility of the floating exchange rate system

Building a system to curb adverse effects of a floating exchange rate system

It should be evident from the above discussion that, rather than actual level, what has become problematic with respect to currency rates is the fluctuation that far exceeds changes in economic fundamentals. One measure that could reduce the excessive fluctuation in exchange rates is building a system to curb the adverse effects of a floating exchange rate system.

As noted above, a floating exchange rate system not only reflects the price shocks of the real economy but it also can at times undergo extreme fluctuations as it reflects various financial shocks and the expectations (forecasts) of market participants. From the viewpoint of restraining as much as possible disturbances ensuing from the expectations (forecasts) of market participants, it will likely prove effective if national authorities provide indicators or rules that will serve as a reference for market participants and to implement such indicators or rules. Taking the extreme case of a fixed exchange rate system, since market participants always understood what the authorities believed desirable exchange rates to be, it is quite plausible that the uncertainties of economic transactions were reduced. The basis of our proposal is to draw out the benefits of a floating exchange rate system while lessening future uncertainties.

No one knows desirable exchange rates under the current floating exchange rate system

In the current floating exchange rate system, currency authorities do not state what they believe desirable exchange rates to be, and there is no shared method for determining desirable exchange rates. The common understanding of national authorities is likely no more than intervening when exchange rates reach levels that

they believe they cannot accept. Since intervention appears to be based on sentiment, market participants will not have accurate answers to such questions as what the authorities believe desirable levels are or what they base their thinking on. Consequently, market participants must engage in foreign exchange transactions guided by such factors as the announcements of the authorities, news, and short-term interest rate gaps.

Nations should commit to monetary policies where PPP is referenced in determining exchange rates

Given this situation, it might be beneficial to work toward the development of international rules where (1) nations (major currency nations) develop trade-goods price indexes based on uniform methods and (2) the US and non-reserve currency nations are mandated to intervene in currency markets when market exchange rates deviate by a certain degree from their respective PPPs. Moreover, (3) the US should work toward achieving a balanced primary balance (sum of current account balance and long-term capital account balance), maintain stable prices, and manage its budget with restraint. The key point of our proposal is having national authorities and market participants share the same thinking about what desirable exchange rates are. No doubt other methods exist for determining optimum exchange rates. PPP, however, is supported in empirical terms and is easy to calculate, so it readily holds the attention of market participants. There will likely be considerable room for examining the degree of commitment to be made, such as how much deviation will be allowed. The crucial point will be to reduce excessive exchange rate volatility to lessen its adverse impact on the real economy and to achieve a situation where economic agents are able to respond to changes in exchange rates.

Can commitments be made?

Naturally, it will not be easy to reach such an agreement in our complicated global political community. In particular, nearly 100% of the international trade of the US, the reserve currency nation, is denominated in its own currency. If the US decides that the gradual depreciation of the dollar is in its national interest, it may not agree to a commitment that would restrict its own monetary policy. Other nations also tend to give priority to domestic conditions rather than exchange rates in implementing monetary policy. Their stance appears to be one where they will steer monetary policy to deal with domestic issues but where they will not steer exchange rates as a general rule. Japan intervenes in currency markets by sterilizing its intervention. Since a strong yen is a significant economic issue for Japan, it may not be exceptionally difficult for Japan to subscribe to the commitment we have described.

Given present strong economic ties, stable exchange rates will benefit all nations

The economic structure of our present-day world is one where globalization has strengthened ties between nations. Therefore, the distortion of forex rates accelerating the economy of one nation in the short run and braking that of another will magnify the fluctuations of the world economy. If such a factor impairing the global allocation of resources can be tempered, this would contribute to the further development of the world economy. What all nations are seeking to achieve is stable and sustained economic growth. Committing to stable forex rates even if some independence of monetary policy is lost is certain to bring enormous benefits to all nations. If a nation thinks only of itself and allows its currency to depreciate when the domestic economy worsens, a round of competitive devaluations would be unleashed, the effects of which would circle back to its disadvantage. This adverse potential will grow only greater with the globalization of the world economy. Major currency nations should conceive the international currency system according to such a global perspective, and Japan, burdened as it is with a strong yen, should promote such a strategy.

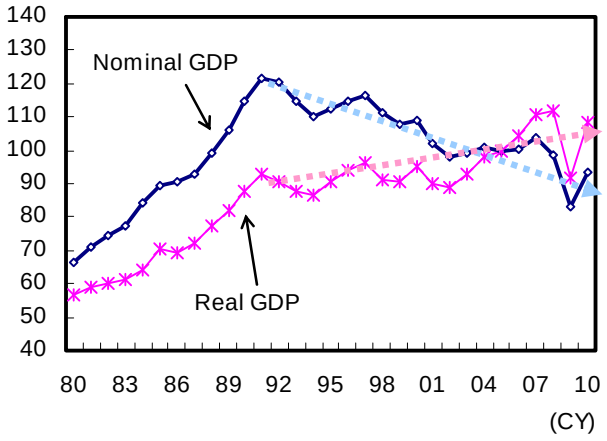
2.2.2 Changing sales methods of Japanese manufacturers

Second, Japan must somehow find a way to break the vicious circle between a strong yen and deflation. While this will not be easily achieved, in coping with a strong yen it will be important for Japanese companies to endeavor to make high value-added products and to develop marketing methods where selling prices need not be reduced. At the same time, there will be a need to promote efforts to increase productivity and competitiveness whether for domestic or foreign demand as part of a forceful growth strategy.

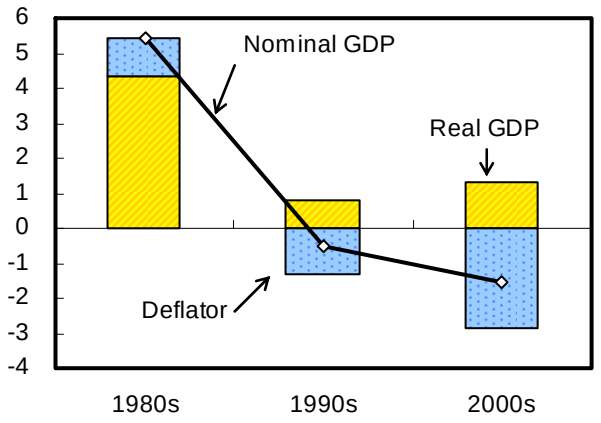
Nominal GDP of Japanese manufacturers has trended downward since peaking in 1991

As has been described above, in the face of the dollar's ongoing depreciation against the yen, Japanese exporters worked to reduce costs in order to maintain price competitiveness (charts 2.2 and 2.3).As a result, real GDP, the statistic we usually follow, has managed to increase, but nominal GDP has decreased. Chart 2.5 compares the real and nominal GDP of Japan's manufacturing sector (1980 to 2010). While real GDP has risen and fallen, it was on an uptrend to 2009 when the effects of the Lehman Shock became pronounced. In the case of nominal GDP, it had already peaked in 1991 and has been on a long-term downtrend since (dashed blue line). Despite Japan experiencing its longest postwar expansion between 2002 and 2007, for which the manufacturing sector was the driving force, the sector's nominal GDP (nominal value added generated by the manufacturing sector; solid blue line with box markers) barely escaped tracing a long-term downtrend (dashed blue line).

Japan's Manufacturing Industry GDP (Y tril) **Chart 2.5**



Japan's Manufacturing Industry GDP (% change in period) **Chart 2.6**



Source: Cabinet Office; compiled by DIR.
Note: 2005 basis; through 2000: retroactively estimated by DIR using y/y rate on a previous benchmark basis.

At the macro level, manufacturers have had a loss structure since 1990

GDP is a statistic derived by excluding intermediate inputs from total production. In conceptual terms, it is similar to the gross profit of companies. Real GDP also has a quantitative meaning. Hence, when we consider the earnings structure of the manufacturing sector since 1990 at the macro level, it is possible to say that firms reduced selling prices (GDP deflator) to increase sales volume (real GDP) but in so doing they created a loss structure where sales amounts (nominal GDP) decreased (Chart 2.6). As long as sales amounts are declining, it is not feasible to increase the allocation of income to employees for Japan as a whole, and tax revenues would also drop. These will become factors that worsen sluggish domestic demand, deflationary pressure, and the budget deficit problem. Despite individual companies acting rationally to maximize profits, the expansion of Japan's economy did not necessarily follow.

Companies are agents which reduce costs and increase value added and the prices of products with the view of maximizing profits. What is desired of individual companies is to invest in R&D to create products that are differentiated from those of other companies and nations and to steadily build a business structure through branding and marketing so prices need not fall even when the yen appreciates. In macro terms, this would mean not only an increase in real GDP (volume) but also an increase in nominal GDP (volume x price), which corresponds to sales amounts. At the same time, there will be a need to promote efforts to increase productivity and competitiveness whether for domestic or foreign demand as part of a forceful growth strategy. If such behavior by the corporate sector can be promoted through government and private-sector efforts, it will be possible for companies to shift to a profit structure from the previously mentioned loss structure. This in turn will have the potential of breaking the vicious circle between deflation and a strong yen, which constitutes a macro phenomenon.

3. How Should the Increasingly Serious Effects of Electricity Shortages Be Averted?

Concerns that electricity shortages will be prolonged

The further prolongation of electricity shortages is causing concern. In 2011 when the Great East Japan Earthquake struck, a number of nuclear power plants were unable to restart in different parts of Japan. Within the supply areas of Tokyo Electric Power (TEPCO) and Tohoku Electric Power, electricity shortages resulted in the implementation of rolling power outages and the enforcement of a ministerial order on restricting electricity use. Since then, stress tests have been carried out as a first step toward restarting nuclear power plants by assuring their safety. As of 23 January 2012, initial assessments of 14 nuclear power plants had been submitted to the Nuclear and Industrial Safety Agency.

If nuclear power plants are not restarted, all 54 power plants will halt operations in April

No nuclear power plants, however, have been restarted following the completion of regular inspections. Also, initial assessments include nuclear power plants that have been operating for 30 years or more, and some analysts are wary about their safety. Should the current situation continue, the five remaining power plants in operation will undergo regular inspection, and all 54 nuclear power plants will halt operations by end-April 2012.

Growing use of thermal power generation as alternative power source will lead to higher electricity prices

With the halt of nuclear power plants, the use of renewable energy and of LNG- and oil-fired power generation as alternative power sources is drawing attention. In the first half of FY11, many nuclear power plants still remained in operation, and the efforts of industry and households to suppress electricity consumption had an effect. As a result, thermal power generation increased relatively slowly. In the second half of FY11, however, with nearly all nuclear power plants shut down, LNG- and oil-fired power generation surged (charts 3.7 and 3.8). This has led to soaring imports of LNG and oil. Moreover, the need to restart aging and high-cost oil-fired power plants has boosted the generating cost of electricity, and there are concerns that this will result in steep increases in electricity prices. TEPCO has in fact decided to raise deregulated electricity prices for corporations by 17% on average in April 2012 to cover the increase in fuel costs that cannot be offset by cost reductions achieved through rationalizing operations (TEPCO reports that this increase will not include compensation and/or decommissioning costs related to the nuclear power incident).

Expansion of renewable energy will require careful study

Expanding the use of renewable energy (solar power and wind power) takes time, and trying to do so at an early stage will entail huge purchase costs. Also, renewable energy has the weakness of being dependent on nature, meaning that power generation is not stable. Hence, whether the desired level of power generation can be achieved relative to costs will need to be studied with care.

Averting a higher taxpayer burden ensuing from the growing seriousness of electricity shortages

Dramatic increases in electricity prices and/or electricity quotas, even when instituted to avert adverse effects of electricity shortages, are highly likely to impose a huge burden on consumers and to generate significant economic inefficiencies. In this section, we examine what can be done to avert as much as possible a higher taxpayer burden ensuing from the growing seriousness of electricity shortages.

3.1 Electricity Shortages since Summer 2011

3.1.1 Suppression of electricity demand during peak periods

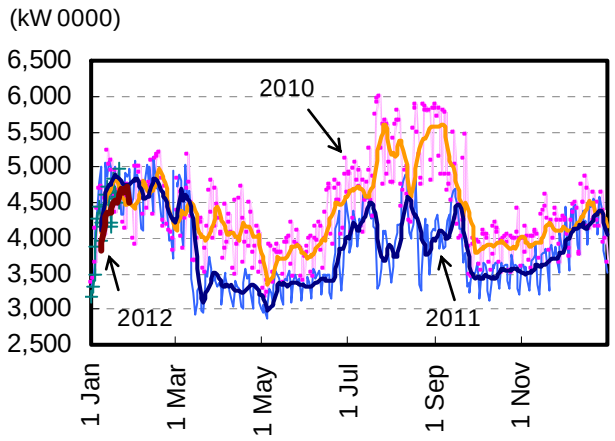
Peak electricity demand has fallen sharply in TEPCO supply area since the earthquake

First, we examine changes in electricity demand in the TEPCO supply area in summer 2011. Chart 3.1 discloses that peak electricity demand plunged after the Great East Japan Earthquake of 11 March 2011 and remained at a level below the prior-year peak. Since December 2011, however, peak demand has not fallen as far

and has returned to its prior-year level. It is possible that, now that some time has passed since the disaster, peak demand has returned to normal levels.

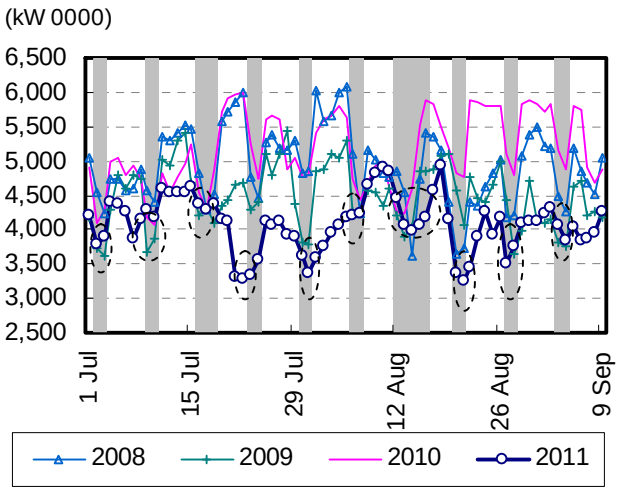
When a ministerial order on restricting electricity use was enforced in summer 2011, peak electricity demand fell by a smaller margin on weekends, holidays, and during the August *obon* vacation period compared to past years (Chart 3.2). Much of electricity demand is influenced by temperature, however, and the effect of temperature will need to be considered.

Electricity Peak Demand (TEPCO supply area) **Chart 3.1**



Source: TEPCO; compiled by DIR.
Note: Thick lines: 7-day MA.

Shift of Electricity Peak Demand by Day of Week (TEPCO supply area) **Chart 3.2**



Source: TEPCO; compiled by DIR.
Note: Shaded areas denote weekends, holidays, and *obon* vacation period (12-16 Aug). To match day of week in 2011, day of month in other years shifted (1 Jul does not mean 1 Jul for other years).

Production activity shifts to non-work days, and peak electricity demand levels out

Chart 3.3 illustrates the results of estimating the relationship between peak electricity demand in summer and ambient temperature/non-work days. The maximum temperature coefficient shows by how much electricity demand will increase (in 10,000 kW) when the temperature rises by 1 degree Centigrade. The maximum temperature coefficient in 2011 was less than the 2008-10 average, indicating that summer electricity demand was suppressed somewhat by refraining from the use of air conditioning even when temperatures rose. The difference between the past average and 2011 with respect to the constant term indicates that the ministerial order on restricting electricity use suppressed peak electricity demand by about 8 million kW. And, the negative values of the weekend and holiday dummy coefficient and *obon* vacation dummy coefficient clearly narrowed for summer 2011. In other words, production activity shifted from weekdays to non-work days (weekends, holidays, and the *obon* vacation), and peak electricity demand was evened.

Chart 3.4 compares the trend of hourly electricity demand on summer days with similar temperatures (in terms of maximum and average temperature) from different years. The left graph is for weekdays with a maximum temperature between 34.5 and 34.6 centigrade and an average temperature between 30.2 and 30.8 centigrade. The right graph is for non-work days (weekends and holidays) with a maximum temperature between 32.5 and 32.7 centigrade and an average temperature between 29.2 and 29.4 centigrade.

Electricity demand shows a similar pattern for weekdays and non-work days in summer 2011

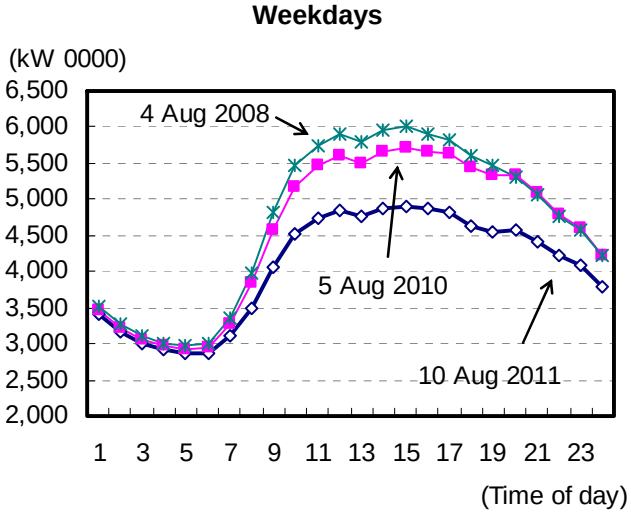
The weekday graph indicates that electricity demand fell by about 8 million kW at peak demand times, which is similar to the estimation of Chart 3.3. In the case of non-work days, with some companies shifting production to non-work days in summer 2011, electricity demand decreased by a smaller margin compared to weekdays. Electricity demand on non-work days tends to peak around 8 pm when household demand is high. In summer 2011, however, since production increased on non-work days, electricity demand also peaked around 2 pm, showing a similar pattern between weekdays and non-work days. By shifting demand between the days of the week, electricity demand was evened out in summer 2011.

Summer Time Electricity Peak Demand, Temperature, and Holidays (Coefficients; TEPCO supply area) **Chart 3.3**

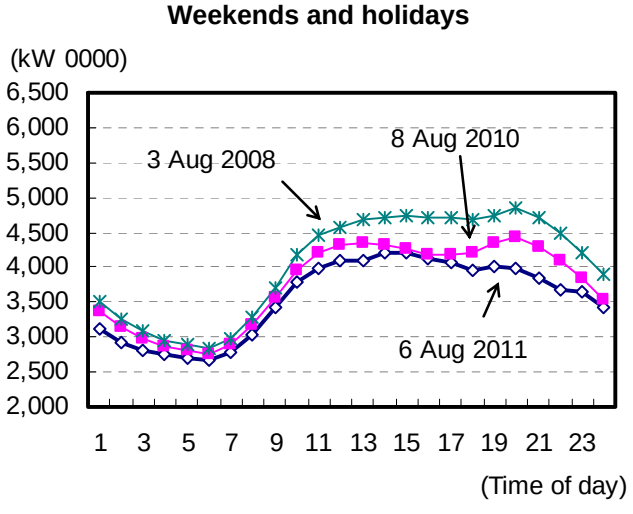
Explained variable (summer time electricity demand)	Constant term	Max temperature	Weekends/holidays dummy	*Obon* vacation dummy	Adjusted R-squared	D.W.
2008	4,372.0	139.0	-728.8	-634.4	0.860	1.060
t-value	(74.2)	(15.6)	(-13.3)	(-6.3)		
2009	4,245.8	112.9	-749.9	-465.4	0.909	1.738
t-value	(135.7)	(18.7)	(-20.6)	(-7.1)		
2010	4,148.8	164.2	-792.5	-565.2	0.929	1.638
t-value	(71.5)	(22.9)	(-20.5)	(-8.2)		
2008-10 avg. (a)	4,255.5	138.7	-757.1	-555.0		
2011 (b)	3,453.6	120.8	-225.3	-291.8	0.866	1.245
t-value	(82.3)	(19.7)	(-6.0)	(-4.2)		
(b) - (a)	-801.9	-17.9	531.8	263.3		

Source: TEPCO; compiled by DIR.
Note: Variables not logarithmic figures.

Change in Electricity Demand by Hour in Summer Time (TEPCO supply area) **Chart 3.4**



Source: TEPCO; Japan Meteorological Agency; compiled by DIR.
Note: Peak temperature of the day being 34.5-34.6 centigrade and average temperature being 30.2-30.8 centigrade.



Source: TEPCO; Japan Meteorological Agency; compiled by DIR.
Note: Peak temperature of the day being 32.5-32.7 centigrade and average temperature being 29.2-29.4 centigrade.

3.1.2 Volume of electricity demand by customer category

Volume of electricity demand closely related to economic activity

In analyzing the relationship between electricity shortages and economic activity, it is important to examine not just momentary electricity consumption but the volume of electricity (kWh basis) consumed over time. From such a perspective, which were the customer categories where demand was reduced in summer 2011?

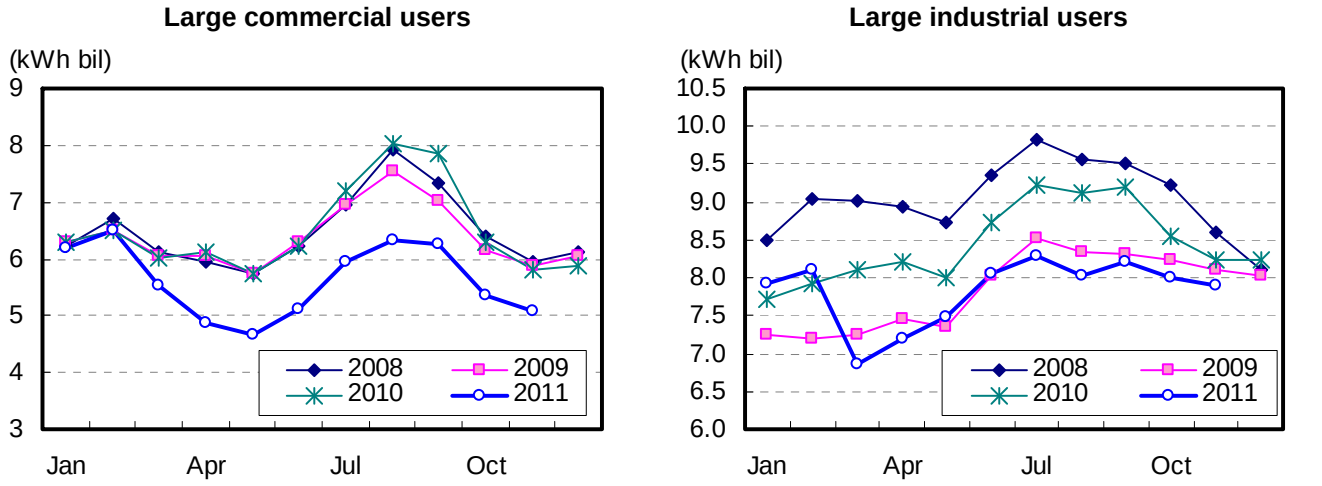
Electricity demand fell sharply for large-volume users in industrial and commercial sectors

Charts 3.5 and 3.6 compare the monthly volume of electricity demand by customer category for the last four years based on *Electricity Demand* of the Federation of Electric Power Companies of Japan. In the period since March 2011, electricity demand has fallen sharply in the commercial sector comprising large offices, department stores, and hospitals. The electricity usage of large-volume manufacturers (industrial sector) is greatly influenced by the business cycle, but here too demand declined overall. In the conservation of electricity since March 2011, efforts to reduce demand by large-volume users have made a significant contribution.

Demand did not decrease by much for households and other small-volume users

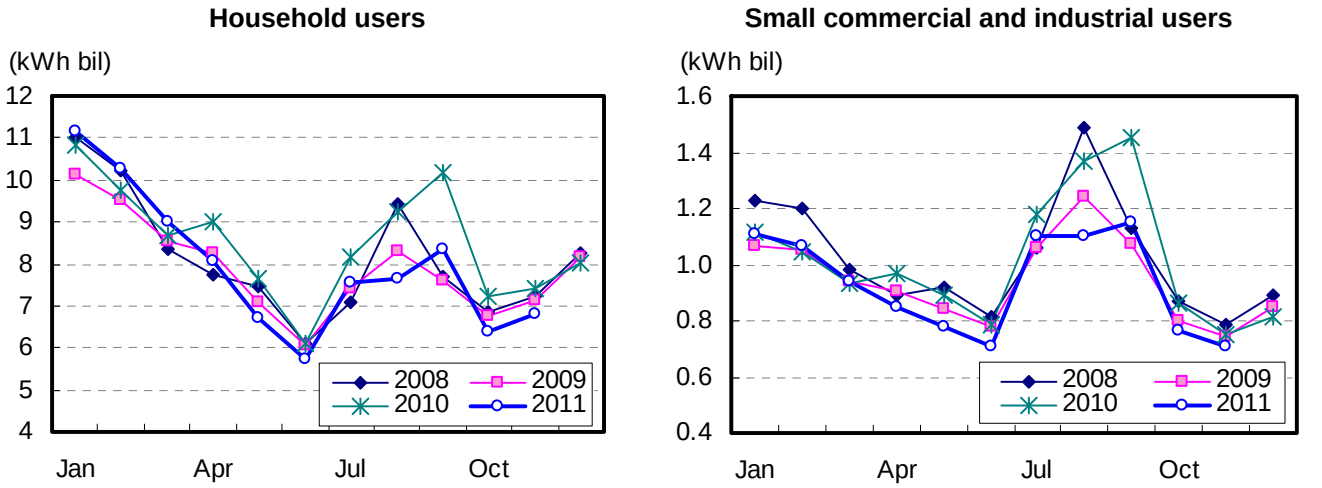
The electricity demand of households and small-volume industrial and commercial users was suppressed somewhat in August compared to a typical year, but such demand did not decrease by much over the full year (Chart 3.6). The reason the decrease in electricity demand was small is thought to be explained by mandatory conservation having less of an effect for these users compared to large-volume users. There are limits to what households can do to diligently conserve electricity, and a system for controlling the demand of the household sector is needed. This issue is explored in detail below.

Electricity Demand by Source **Chart 3.5**



Source: Federation of Electric Power Companies of Japan; compiled by DIR.

Electricity Demand by Source **Chart 3.6**



Source: Federation of Electric Power Companies of Japan; compiled by DIR.

3.1.3 For the time being, stand-ins for nuclear power generation will be LNG- and oil-fired thermal power and conservation

Drop in nuclear power generation leads to sharp increase in thermal power generation

What have been the responses on the supply side? As illustrated in Chart 3.7, the composition of power generation has changed greatly in Japan since the earthquake. Nuclear power generation has fallen sharply, and thermal power generation has increased as a replacement. In contrast, hydropower generation and power from alternative energy sources (solar power, wind power, geothermal power, and other renewable energy excluding hydropower) have barely risen.[9] Also, while not shown in the graph, pumped storage power generation has not climbed y/y with the exception of June 2011.

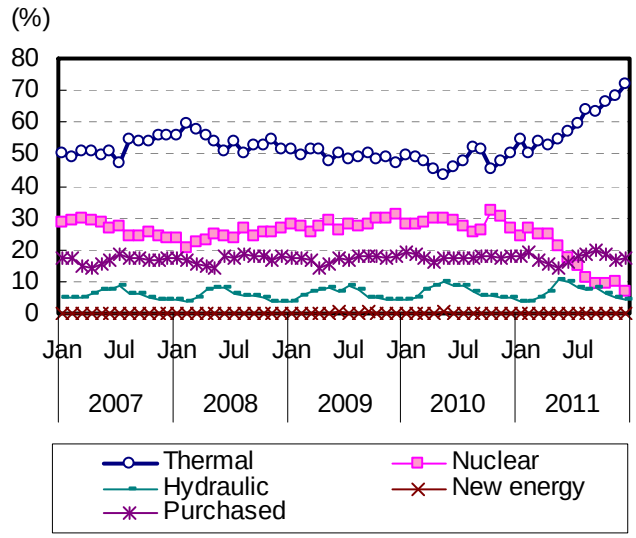
Dependence on LNG and oil grows rapidly

In other words, the decrease in nuclear power generation could not be offset by shifting peak demand and by conservation efforts alone, and thermal power generation stepped in as a substitute to satisfy demand. What increased in thermal power generation was LNG- and oil-fired power. Chart 3.8 portrays the trend of fuels used in thermal power generation by the ten major electric power companies. Since April 2011, the consumption of LNG and oil has surged compared to 2009 and 2010. Unlike coal-fired thermal power, which usually operates at full capacity to supply base load power, LNG- and oil-fired thermal power provide middle to peak power to match supply with changes in demand. Since there was some reserve in installed capacity, it was possible to increase power generation by raising the operating rate.

Greater oil-fired power generation to lead to higher electricity prices

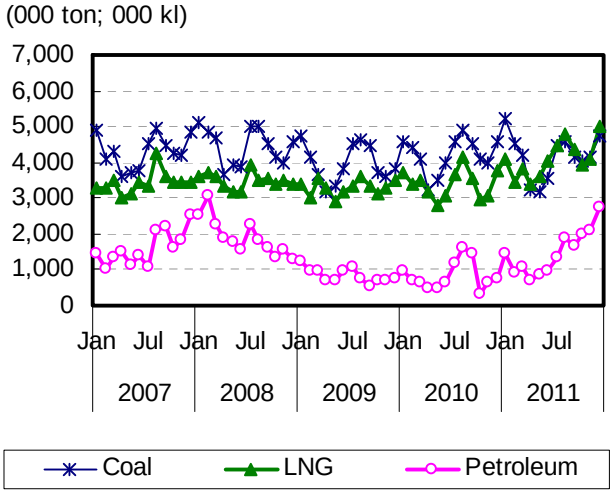
Power generation costs are higher for LNG- and oil-fired thermal power than for coal-fired thermal power. Such costs are exceedingly high for oil-fired thermal power, which is Y36 per kWh (operating rate of 10%, 2010 model) according to the latest government estimate that is discussed below. Greater oil-fired power generation will not only squeeze the earnings of electric power companies but also increase the burden falling on industries/businesses and households through higher electricity prices.

Ratio of Power Source to Electricity Generated and Purchased **Chart 3.7**



Source: Federation of Electric Power Companies of Japan; compiled by DIR.

Fuel Used For Thermal Power Generation **Chart 3.8**



Source: Federation of Electric Power Companies of Japan; compiled by DIR.
Note: Coal and LNG: 000 tons; petroleum (heavy fuel oil and crude oil): 000 kl.

9. Power generation using alternative energy sources is rapidly growing with mega solar farms coming on line. Even so, such power generation remains small compared to total power generation.

Electricity demand greatly suppressed for industrial and commercial users; household sector has further room to improve

Evaluating the responses to electricity shortages since summer 2011, companies that are large-volume users of electricity shifted production activities to non-work days due to the ministerial order on restricting electricity use. Also, the commercial sector maintained its suppression of electricity demand, and such demand was greatly curtailed not only during the peak demand periods in summer but also throughout the year. In contrast, there is further room for improvement in reducing electricity demand in the household sector.

Halt of all nuclear power plants may lead to higher electricity prices nationwide

To meet the demand still remaining after suppressing electricity demand, the use of thermal power, particularly oil-fired thermal power with high generating costs, is increasing. The shortfall of electricity supply was somehow met in summer 2011 through the operation of nuclear power plants unaffected by the earthquake. Should operation of all nuclear power plants come to a halt, however, the further suppression of demand would become necessary. And, if the use of oil-fired thermal power grew as a consequence, electricity prices may rise nationwide, which would risk curtailing economic activity and increasing living costs.

3.2 Effect of Electricity Shortages on Japan's Economy

3.2.1 Release of new generating costs by the government and the premises of our estimation

Government releases new estimates of generating costs by power source

On 19 December 2011, the government (a committee under the National Policy Unit commissioned with making electricity generation cost projections) released new estimates of generating costs by power source (hereafter "new estimates"; Chart 3.9). What is noteworthy about the new estimates are (1) the calculation of new generating costs by including cleanup costs of the nuclear power plant incident as well as nuclear plant site subsidies and (2) the re-estimation of generating costs using a uniform standard for all power sources including renewable energy. According to estimation results, the generating cost of nuclear power, which was held to be the lowest, is little changed and remains less than the generating cost of existing thermal power (LNG and coal). In addition, the generating cost of oil-fired thermal power is shown to be very expensive, and the unit cost of power generation from renewable energy sources, such as solar power and wind power, is anticipated to decline greatly in the future.

High costs of oil-fired thermal power determine trends of electricity prices

As noted above, TEPCO has decided to raise electricity prices for corporations by 17% on average in April 2012, and there is speculation that it will submit a request to increase electricity prices for households by as much as 10% within the year. If a situation like the present continues where the operation of nuclear power plants is problematic, it will be oil-fired thermal power with very high operating costs that must step in to make up for most of the loss of electricity supply. In this case, unless electric power companies shoulder a considerable cost burden, a further increase in electricity prices can be expected.

Electricity Generation Cost **Chart 3.9**

Unit electricity generation cost (Y/kWh)	Coal	LNG	Petroleum		Solar power		Wind power	
					Mega solar farm	Residential solar panels	On land	On water
Old benchmark (2004 estimate)	5.7	6.2	16.5					
New benchmark (2010 model)	9.5	10.7	36.0	22.1	30.1-45.8	33.4-38.3	9.9-17.3	9.4-23.1
New benchmark (2030 model)	10.3	10.9	38.9	25.1	12.1-26.4	9.9-20.0	8.8-17.3	8.6-23.1
Utilization rate	80%	80%	10%	50%	12%	12%	20%	30%

Unit electricity generation cost (Y/kWh)	Geothermal power	Hydropower	
		General	Small scale
Old benchmark (2004 estimate)			
New benchmark (2010 model)	9.2-11.6	10.6	19.1-22.0
New benchmark (2030 model)	9.2-11.6	10.6	19.1-22.0
Utilization rate	80%	45%	60%

Unit electricity generation cost (Y/kWh)	Nuclear energy
Old benchmark (2004 estimate)	5.9
New benchmark (incl. provision of Y10 tril for post-disaster restoration)	9.3
New benchmark (incl. provision of Y20 tril for post-disaster restoration)	10.2
Utilization rate	70%

Source: National Policy Unit (Dec 2011 report by a committee commissioned with making electricity generation cost projections); compiled by DIR.

New estimation of effects of electricity shortages on Japan's economy

Mizobata et al. (2011a)[10] have estimated that, in the case of a pessimistic scenario where all nuclear power plants are halted, the GDP lost over a 10-year period would exceed Y14 trillion as an annual average. In this report, we have estimated how Japan's economy will be affected by electricity shortages, with reference to the government's new estimates of generating costs and to the latest electricity-related data which became available recently. Specifically, based on the government's new estimates, and in terms of the real GDP growth rate over the medium-term described in Section 1, we developed standard and pessimistic scenarios to estimate the impact on GDP and the size of electricity price increases over the next 10 years. Cleanup costs for the nuclear incident at the Fukushima Daiichi Nuclear Power Plant is included in generating costs and is assumed to be Y20 trillion, the largest figure recorded in the new estimates.

Standard and pessimistic scenarios

The specifics of both scenarios are shown in Chart 3.10. In the standard scenario, we assume that nuclear power plants will be successively restarted in July 2012 and forward. However, nuclear power plants that have operated for 40 years will be decommissioned, and no new ones will be built. The number of nuclear power plants in operation will gradually decrease (an orderly decrease in nuclear power generation), and the number of nuclear power plants in operation will be reduced to 28 by FY21. With respect to renewable energy, we assume that generation costs will fall through technological innovation. Should costs decline, the purchase cost (and electricity prices) borne by consumers will decrease in the same degree.

In our pessimistic scenario, we assume that all nuclear power plants will be halted and will not be restarted. In addition, we assume that technological innovation does not progress for renewable energy and that purchase prices do not fall.

10.Mikio Mizobata, Keiji Kanda, and Hitoshi Suzuki (2011a), *Power Shortage and Japan's Economy*, 25 Jul 2011.

Assumptions for Estimating Electricity Supply: Standard and Pessimistic Scenarios **Chart 3.10**

	Standard scenario	Pessimistic scenario
Nuclear power	* Facilities currently undergoing routine inspection will be restarted in turn beginning July 2012 following the completion of stress tests. * Ten nuclear power reactors that were temporarily shut down due to the earthquake or other problems will be restarted in Jan 2013. * The Fukushima Daiichi, Daini, and Hamaoka plants will not become operational. * No new nuclear power stations will be built, and those already begun will not be completed. *Reactors will be decommissioned 40 years after start of operation. * We assumed the nuclear power generation cost to be Y10.2/kWh, based on the Dec 2011 government worst case scenario, which estimates Fukushima Daiichi Power Plant incident-related expenditures to be Y20 trillion.	* No reactors will be restarted, including those currently undergoing routine inspection. * In April 2012, there will be no power generated from nuclear reactors.
Thermal power	* To meet the demand for power, operating rates will immediately be boosted significantly (with the operating rate at peak times raised to 92%). * Power supply to increase in line with completion of pre-earthquake planned construction and recent expansion. * Based on the Dec 2011 government estimate, we assumed power generation cost to move in a range of Y24.6-39.1/kWh for crude oil, Y10.9-11.3/kWh for LNG, and Y9.7-10.3/kWh for coal, depending on utilization rate.	* Same as the standard scenario.
Renewable energy	* The government goal of having 21% of power generated from these sources by FY30 (Jun 2010 basic energy plan) will be achieved by FY25; power generated from renewable energy (excl. hydraulic power) will increase seven-fold the current level in FY21. * The feed-in tariff (cost) of solar power will decline to about 70% of the current rate by FY21 thanks to technological innovation and upscaling.	* There will be little technological innovation in solar power, and feed-in tariffs and construction costs will remain constant until FY21.

Source: Compiled by DIR.

Installed capacity of renewable energy same for both scenarios

The installed capacity of renewable energy is the same for both scenarios. We assume that the installed capacity projected for FY30 in the Basic Energy Plan of June 2010 will be achieved five years earlier and that renewable energy will account for around 15% of total power generation in FY21, the final year of our current forecast (21% in FY25). Given that a feed-in tariff system, where all renewable electricity generated will be purchased at a fixed price, will be introduced in July 2012, we believe the possibility of realizing the Basic Energy Plan has increased.

3.2.2 Estimation of the electricity shortage rate

Reason for gauging electricity shortage rate by kWh

In considering the impact on the economy, the more significant measure of the supply-demand gap for electricity is the sustained gap over time on a kWh basis (momentary electricity supply-demand gap x usage time near peak demand = unmet electricity demand) rather than the momentary supply-demand gap on a kW basis. By determining the volume of unmet electricity demand, it will be possible to understand the size of the impact on the broader economy. This is based on the thinking that unmet electricity demand will be reconciled by suppressing production and consumption activities.

Potential electricity demand assumed to equal average for last seven years (FY04 to FY10)

We calculated average maximum electricity demand for the past seven years (FY04 to FY10) and determined the difference between this level of demand and the projected electricity supply. Assuming that this supply-demand gap would be sustained during 12 hours between 9 am and 8 pm when electricity demand is strong, we determined the potential electricity shortage rate (supply shortage as a percentage of potential electricity demand).

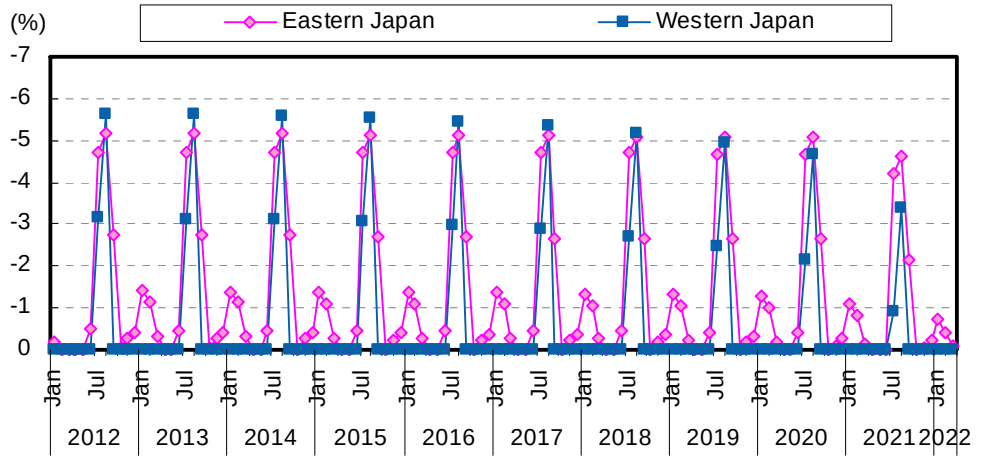
Electricity shortage rate likely approximately 6% for western Japan and about 5% for eastern Japan in summer; some 1% for eastern Japan in winter

Chart 3.11 shows the electricity shortage rates for our pessimistic scenario for eastern Japan with an alternating current of 50 Hz and for western Japan with an alternating current of 60 Hz. According to the chart, should nuclear power generation be halted, the electricity shortage rate will be approximately 6% for western Japan and about 5% for eastern Japan in summer and some 1% for eastern Japan in winter.[11] This indicates that, even if the operating rate of thermal power generation is increased and renewable energy installations are promoted when nuclear power generation is halted, it will not be possible to maintain electricity demand (economic activity) at the same level as before (the adverse impact on the economy will be substantial). Since past electricity consumption likely included wasteful consumption, the adverse impact on the economy will not be the same as the full extent of electricity shortages. There can be no doubt, however, that a considerable adverse impact will arise.

Elimination of electricity shortages will require restarting of nuclear power plants (with assured adequate safety levels) and evening out of electricity demand

Two responses are possible regarding electricity shortages for the time being. The first is to restart nuclear power plants with assured adequate safety levels. The second is to conserve electricity further and to greatly suppress electricity demand. Since the issue is excess demand during peak periods whether during a single day, a week, a month, or a year, if peak demand can be restrained, the electricity shortage rate (adverse impact on the economy) can be suppressed. Specifically, an effective approach would be to even out electricity demand in a manner that does not place strain on the economy or society by shifting usage periods within a day, by shifting usage from weekdays to weekends or holidays, and by accumulating inventories in spring or fall. Shifting peak demand, however, will come at the cost of adjusting supply chains, labor policies, and individual lifestyles at the level of society as a whole.

Expected Ratio of Power Shortage (kWh basis) **Chart 3.11**



Source: Ministry of Economy, Trade and Industry; Agency for Natural Resources and Energy; compiled by DIR.
Note: Electricity demand: FY04-10 monthly avg.; electricity supply: based on assumptions for pessimistic scenario in Chart 3.10.

11. The reason our electricity shortage rates differ from Mizobata et al. (2011a) is the outcome of the greater availability of post-earthquake data increasing the clarity of electric power companies' supply outlooks.

3.2.3 Pressure on electricity prices to rise

Pressure for electricity prices to increase mounts day by day

Following the Great East Japan Earthquake, concerns about electricity shortages and stable supply arising from the halt of nuclear power plants are thought to have had an adverse effect on the economy. The impression that this effect was small is likely explained by sluggish production activity, by summer temperatures being lower in 2011 than in 2010, and by the substantial efforts of companies and households to conserve electricity. Another significant factor was supply capacity being secured by increasing the operating rate of thermal power generation, for which reserve capacity was available. Pressure to increase electricity prices is mounting day by day, however, and TEPCO has decided to raise electricity prices as we have noted above. The likelihood is quite high that the increase in electricity prices will spread to other electric power companies that have halted nuclear power generation.

Likely trend of electricity prices over the next 10 years

We therefore estimated what is likely to happen to electricity prices. In doing so, we established two cases for electricity demand: (1) a growth case where electricity demand increases at the same rate as real GDP and (2) a flat case where electricity demand remains at its FY11 level due to the conservation of electricity and the spread of energy-saving household appliances.[12]

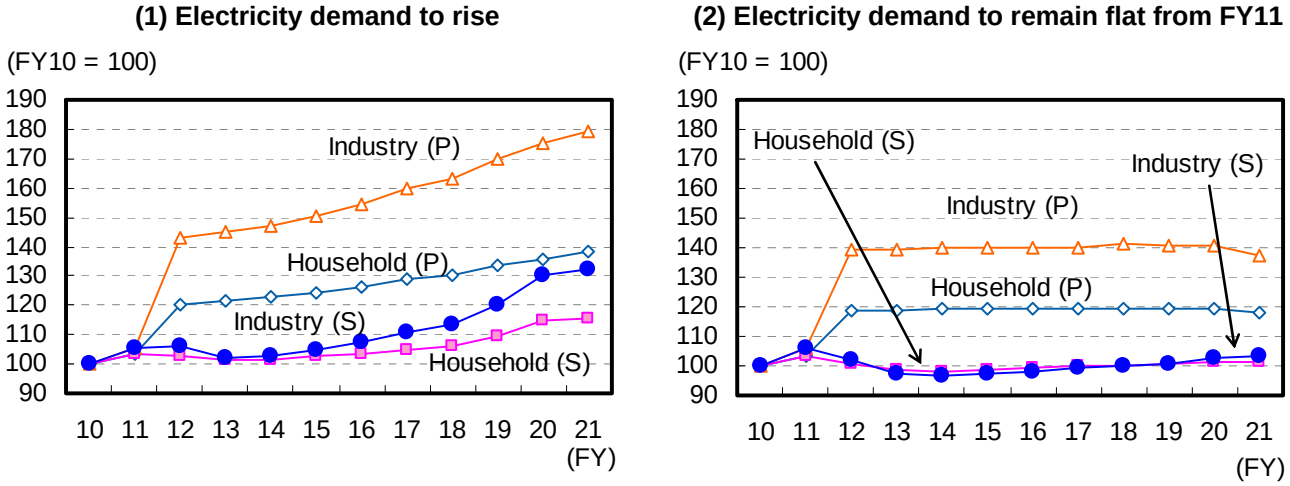
In the pessimistic scenario under the case of electricity demand rising, electricity prices would rise 20% for households and more than 40% for industrial users in FY12

The results of our estimation are shown in Chart 3.12. The growth case is shown in the left graph. In the case of our pessimistic scenario where all nuclear power plants are halted, FY12 electricity prices will rise 20% for households and more than 40% for industrial users (relative to FY10).[13] In the case of our standard scenario where nuclear power plants are successively restarted, the increase in electricity prices is small for both households and industrial users. Since nuclear power plants will begin operating again in this scenario, the share of power generated by oil-fired thermal power plants with very high generating costs will fall sharply, and the increase in electricity prices will be restrained.

In both scenarios, electricity prices will climb in FY16 and beyond. In FY21, electricity prices will rise 80% for industrial users and nearly 40% for households in the pessimistic scenario. In the case of the standard scenario, electricity prices will climb 30% for industrial users and nearly 20% for households. These outcomes reflect our assumption that electricity demand will increase in line with economic growth. The standard scenario will also be affected by nuclear power plants reaching 40 years of operation being successively shut down. Also, the massive installation of renewable energy capacity will entail higher generation costs (inclusion of the purchase cost of renewable electricity). If progress is not made in electricity conservation technology, higher electricity prices will be unavoidable in the medium to long term.

12. In this estimation, we did not allow for higher electricity prices reducing electricity demand. The estimation of electricity demand in FY11 is based on the amount of electricity generated and purchased for the period of Apr-Dec 2011 reported in the Electricity Generated and Purchased (Federation of Electric Power Companies of Japan).
13. It will take some time before electricity prices rise. First, electric power companies are anticipated to work at absorbing costs so as to avoid the raising of electricity prices as much as possible. Then, when they have to raise prices, procedures will differ depending on reasons for raising prices—the first reason is increases in the unit cost of fuel and the second changes in the composition of power sources (such as decline in nuclear power generation accompanied by a rise in thermal power generation). In the first case, higher costs will be passed through as a surcharge to existing electricity prices as needed based on the judgment of electric power companies in accordance with the fuel cost adjustment system. In the latter case, raising the electricity price for small-volume users contracting for less than 50 kW requires the approval of the Ministry of Economy, Trade and Industry. Thus, there will be some time before approval is received and becomes reflected in electricity prices.

Expected Electricity Prices Over 10 years **Chart 3.12**



Source: National Policy Unit (Dec 2011 report by a committee commissioned with making electricity generation cost projections); compiled by DIR.
Notes: 1) Case (1) based on DIR medium-term macroeconomic model.
2) (P) and (S) represent "Pessimistic scenario" and "Standard scenario", respectively.

In case of electricity demand remaining flat, electricity prices to rise 20% or 40% if nuclear power plants are not restarted

Next, we examine the flat case where electricity conservation awareness and electricity conservation technology accelerate and where electricity demand does not grow even if the economy expands. With the major suppression of electricity demand (to the FY11 level), electricity prices for households and industrial users will remain at about the same level as in FY10 in our standard scenario. However, in our pessimistic scenario where all nuclear power plants are halted, electricity prices will level off at a high level in FY12 and beyond, and by FY21 such prices will have risen 20% for households and 40% for industrial users (compared to FY10 prices). In other words, even if rapid progress is made in energy-saving technology and even if smart grids and deregulation enable electricity conservation, should all nuclear power plants be halted, there is a strong likelihood that major increases in electricity prices will be inescapable.

To restrain electricity prices, progress of energy-saving technology, efforts to conserve electricity, restart to some extent of nuclear power plants will be necessary

The increase in electricity prices will mean higher living costs for households and higher production costs for companies. If such an increase is to be restrained, the progress of energy-saving technology and efforts to conserve electricity will need to be accompanied with the restart, to some extent, of nuclear power plants. In our current estimation, we assumed that the cleanup cost of the nuclear incident at the Fukushima Daiichi Nuclear Power Plant will be Y20 trillion, which we included in generating costs. Even if the cleanup cost is doubled to Y40 trillion, this will have little effect on calculation results. The effect of higher costs accompanying increased oil-fired thermal power generation would have an enormous adverse impact on electricity prices.

3.2.4 Effect on the macroeconomy in terms of economic growth and employment

How much of an adverse effect will the halt of all nuclear power plants have on the macroeconomy? When electricity is in short supply, in addition to suppressing electricity use, it will be necessary to shift production activities to time periods when electricity supply is in surplus (late night and other time) or to other days like the weekend. When such efforts are not enough, production activity itself must be suppressed. Reducing the wasteful use of electricity will increase economic welfare, but reducing electricity use that is not wasteful will lower economic welfare both directly and indirectly.

Halt of nuclear power plants to blunt real GDP growth 1.2 pt in FY12 and 0.3 pt from FY13 to FY15

Charts 3.13 and 3.14 show the results of using our medium-term macroeconomic forecasting model to simulate to what extent the growth rate of real GDP will be reduced in our pessimistic scenario. According to these results, real GDP growth will slow 1.2 percentage points in FY12 and 0.3 points between FY13 and FY15 compared to our standard scenario. The large decline in the GDP growth rate in FY12 stems from the downward shift of the yen amount of real GDP (level) in FY12 when all nuclear power plants are halted (Chart 3.14). The amount of real GDP lost in the 10 years starting FY12 will be an average Y10 trillion annually.

With electricity prices remaining high, bad inflation will strengthen deflationary pressure

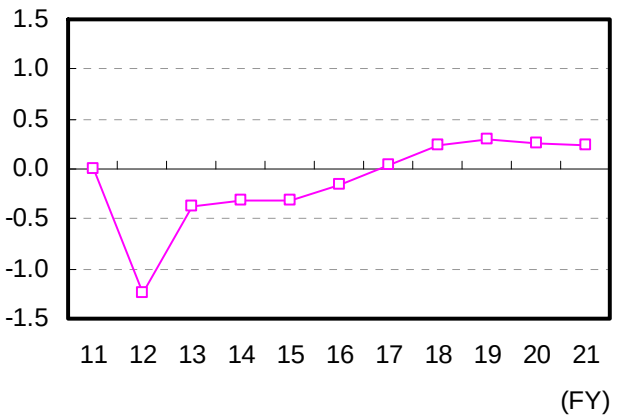
Chart 3.15 indicates how prices (CPI) will be affected. As shown in Chart 3.12, due to the increase in electricity prices, CPI will rise around 0.3 points in FY12 compared to our standard scenario. This, however, will not usher in the sustained growth of general prices. Production, consumption, and investment turning sluggish from electricity shortages combined with the shock of bad inflation will stifle disposable income and soften prices in the medium to long term. This will be a major problem for Japan that needs to break the grip of deflation. As depicted in Chart 3.16, the number unemployed will peak in FY17 and exceed our standard scenario by nearly 300,000. Should electricity shortages give way to the suppression of production activities, employment opportunities will be lost. The combination of falling prices and higher unemployment will be a problem for the short-term business cycle and will undermine the capacity for growth in the long term. In the pessimistic scenario, the growth of thermal power generation will entail higher LNG and oil imports. However, with the flagging of the domestic economy, imports overall will decline. Thus, in our pessimistic scenario, the current account balance will not be one where surpluses shrink and deficits expand. Rather, the surplus will be larger than in our standard scenario.

Transition from or decrease in nuclear power generation should occur gradually

Electricity shortages arising from hasty moves away from nuclear power generation will have an enormous impact on the macroeconomy. Naturally, safety measures for nuclear power generation should receive the highest priority. Even so, nuclear power plants should be restarted gradually as is feasible by reaching decisions about safety measures, such as regarding earthquakes/tsunamis, and the aging of facilities in an integrated manner. This should be accompanied at the same time by a range of measures to effectively conserve electricity and to build new power generation facilities. The transition away from or decrease in nuclear power generation should occur gradually.

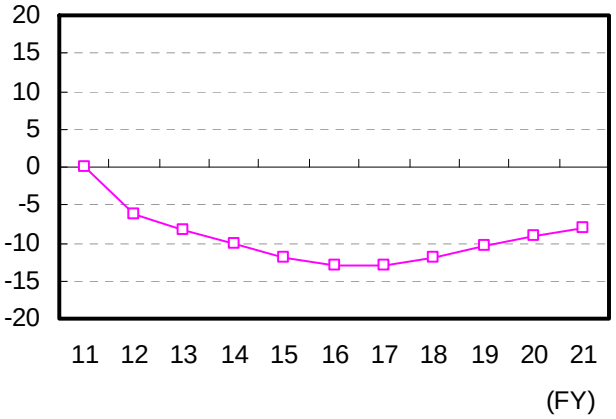
Outlook for Real GDP Growth **Chart 3.13**

(Difference from standard scenario; % pt)



Outlook for Real GDP Level **Chart 3.14**

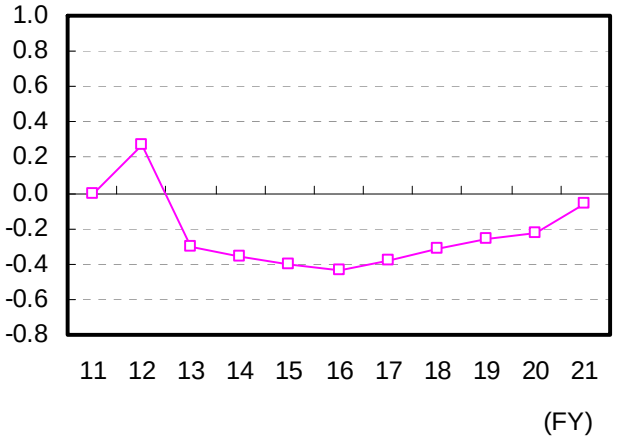
(Difference from standard scenario; Y tril)



Source: Compiled by DIR based on DIR medium-term macroeconomic model.

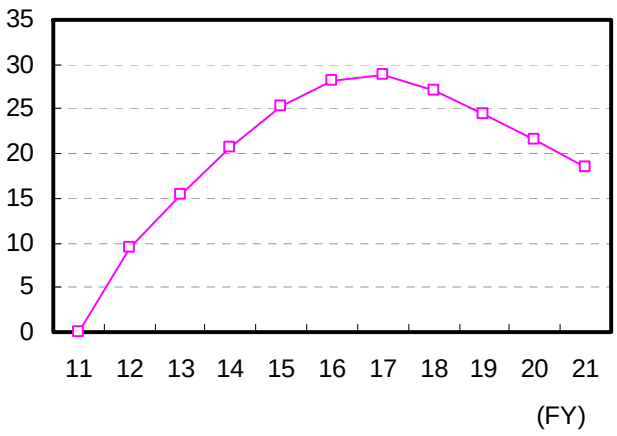
Y/y CPI **Chart 3.15**

(Difference from standard scenario; % pt)



Number Unemployed **Chart 3.16**

(Difference from standard scenario; 0000)



Source: Compiled by DIR based on DIR medium-term macroeconomic model.

3.3 Future Issues

Multiple measures will be needed to respond to electricity shortages

Multiple measures will be needed to avoid as much as possible the effects of accelerating electricity shortages, such as (1) restarting nuclear power plants in succession whose safety has been adequately verified, (2) increasing LNG-fired thermal power facilities, (3) suppressing electricity demand, and (4) promoting the installation of renewable energy capacity. In the paragraphs to follow, we look more closely at measures (3) and (4).

3.3.1 Using market mechanism to effectively suppress electricity demand

Effectively suppressing household electricity demand through market mechanism and smart grid system

In the suppression of electricity demand in 2011, substantial reductions were made by large-volume users in the manufacturing (industrial) sector and service (commercial) sector. This was the consequence of quotas imposed by a ministerial order on restricting electricity use. As a means for allocating resources, however, the order caused significant economic and social losses. Moreover, the electricity demand of households, which is difficult to control, did not decline that much with the exception of summer. There will be a need going forward to raise the efficiency of controlling household electricity demand. Effective means for doing so will be the use of the supply-demand adjustment function of the price mechanism and combining this with direct controls through a smart grid. Further information on this subject can be found in Mizobata et al. (2011b)[14].

Price elasticity of household electricity demand not low

Despite the longstanding impression that the price elasticity of electricity demand is low, there has not been enough analysis focusing on the demand side. According to the results of estimating an electricity demand function for households in Mizobata et al. (2011b), the price elasticity of the electricity demand of households is –0.47 in the short term and –1.48 in the long term. Thus, it should be possible as well as desirable to build an efficient electricity supply-demand system around the price mechanism. Under the existing supply-demand system, it is not all that evident which economic agent truly requires how much electricity at what time. The price mechanism can be used to draw out such internal information. The idea of making maximum use of the advantages of the market mechanism to control

14. Mikio Mizobata, Keiji Kanda, Hitoshi Suzuki, Yuko Manabe, Yukiko Oguro (2011b), *Households Hold Key to Resolving Power Shortage*, 22 Nov 2011.

electricity supply and demand, whose adjustment is difficult, is one that deserves wider acceptance.[15]

Building electricity- and energy-saving systems that do not assume massive consumption of electricity

Promoting the spread of energy-saving household appliances and the diversification of energy use are other effective means to cut electricity demand. The use of gas and other alternative energy as well as not using energy at all are other possibilities. For example, sunlight can take the place of room lighting during the daytime, or the ventilation of buildings can be improved to moderate the use of air conditioning. There will also be a need for policy incentives to change a range of existing systems that assume the massive consumption of electricity.

Evening out electricity demand will also lower electricity prices

Rather than suppressing electricity demand itself, the perspective of lower peak electricity demand (promoting the evening out of electricity demand) will be important. Power sources such as oil-fired thermal power with high generating costs are retained by electric power companies to meet electricity demand during the peak periods of summer and winter. For this reason, should it become possible to increase electricity prices when demand surges and to suppress peak electricity demand, while this will mean momentarily higher electricity prices, high-cost oil-fired thermal power's share of total power generation will decline, which will in the end restrain electricity prices.

3.3.2 Feed-in tariff for renewable energy will require careful design

Feed-in tariff system for renewable energy to be adopted in July 2012

In July 2012, a feed-in tariff system will be adopted where all renewable electricity generated will be purchased at a fixed price. By mandating electric power companies to purchase electricity generated through such renewable energy sources as solar power, wind power, small and micro hydropower, and geothermal power over a certain period, the system seeks to promote the spread of such energy. Expanding the use of renewable energy will be effective from the perspective of energy security since it will eliminate excessive dependence on fossil fuels, and it will also reduce CO2 emissions. For these reasons, the use of such energy should be accelerated.

Replacing thermal power and/or nuclear power generation with renewable energy alone will be difficult

Renewable energy, however, is considerably less efficient than thermal power or nuclear power generation. Hence, if attempts are made to replace the shortages of thermal power and nuclear power entirely with renewable energy, a huge and unrealistic amount of generating capacity will have to be installed. Given the current state of technology, the use of renewable energy will necessarily be limited.

In establishing a feed-in tariff system, reasonable and highly transparent price setting desired

Expanding the use of renewable energy will greatly depend on how purchase prices are set. As noted in Kanda et al. (2011)[16], Spain's experience underscores that establishing an extremely high purchase price will promote the massive installation of renewable energy capacity, but the likelihood is high that this will foment a bubble and impede technological innovation. In contrast, reducing the purchase price in steps like Germany will encourage the installation of an appropriate amount of renewable energy capacity and promote technological innovation by the supply side (manufacturers of generating systems and electricity suppliers) so as to realize profits. The setting of purchase prices should be reasonable and highly transparent so people making fixed investments can better forecast the future.

15. The market is no panacea, and the design of systems will require ingenuity. If areas where the market mechanism does not work well are supplemented, such as through the use of a smart grid, it should be possible to suppress electricity demand without worsening economic welfare. See Mizobata et al. (2011b) on this matter as well.
16. Keiji Kanda, Mikio Mizobata, and Hitoshi Suzuki, *Renewable Energy Act and Effect on Electricity Prices*, 16 Sep 2011.

Characteristics of renewable energy should be considered by power source

Renewable energy capacity will need to be installed in accordance with the characteristics of power sources. Renewable energy includes power sources like hydropower and thermal power where stable power generation is possible, and those like solar power and wind power where power generation is unstable. If the share of unstable power sources is increased, backup power sources or large storage batteries will be needed for the times when power generation is not possible. Moreover, should the installed capacity of solar power generation exceed a certain level, the transmission and distribution grid will experience a reverse flow, which will require that certain fixed investments are made. Solar power and wind power are associated with the additional cost of backup power sources and storage batteries. For such power sources, generating costs will rise correspondingly, and electricity prices will increase.

Incorporating renewable energy appropriately with respect to Japan's natural environment

Thus, in the use of renewable energy, technological and geographical limitations will need to be fully considered in the process of developing a power source structure that is highly cost effective. Rather than setting an excessively high purchase price to force the spread of renewable energy use, it will be important to consider how to incorporate renewable energy in a manner that is appropriate for Japan's natural environment while suppressing the consumer burden as much as possible.

4. Fiscal Situation

4.1 Global Fiscal Problems and Japan's Response

Global economy grew thanks to interdependence

Almost without exception, government fiscal woes are becoming a serious issue for industrialized nations worldwide. The labor forces of the emerging economies entered the global market economy in the 21st century, which held down inflationary expectations and kept nominal long-term interest rates low in developed nations. Capital from the developed nations demands a return, and this capital therefore turned to emerging economies and became the driving force behind their growth. Resource prices climbed due to growing demand from emerging economies, but resource-rich nations and those that successfully increased exports thanks to assembly and processing sent back capital in the form of current account surpluses, supporting the fiscal deficits of the developed nations.

Monetary & fiscal policy in the wake of the global financial crisis

This pattern was broken by the financial market turmoil in 2007-08. Of course, monetary policy was put into action. This helped to avoid a deflationary spiral and has not yet sparked a global rise in general prices. At the same time, governments attempted to prop up their economies through fiscal policy, with some even resigning themselves to sizeable tax cuts. Although sovereign debt should carry little risk, ballooning budget deficits are causing yields to rise and ratings to fall.

US

US Treasuries were downgraded in August 2011 despite the fact that the US is the key currency nation, which shows the extent to which its fiscal situation has deteriorated. Although the US economy has shown that it is improving gradually, there is still a huge gulf between the Democratic Party and the Republican Party when it comes to their views on how to reduce the fiscal deficit. There is a lack of consensus on issues such as the debt limit and tax cut extensions, so it is hard to predict its fiscal policy. With a presidential election taking place in 2012, the issues of economic stimulus measures and the balance between tax increases and spending cuts will remain unsettled.

Europe

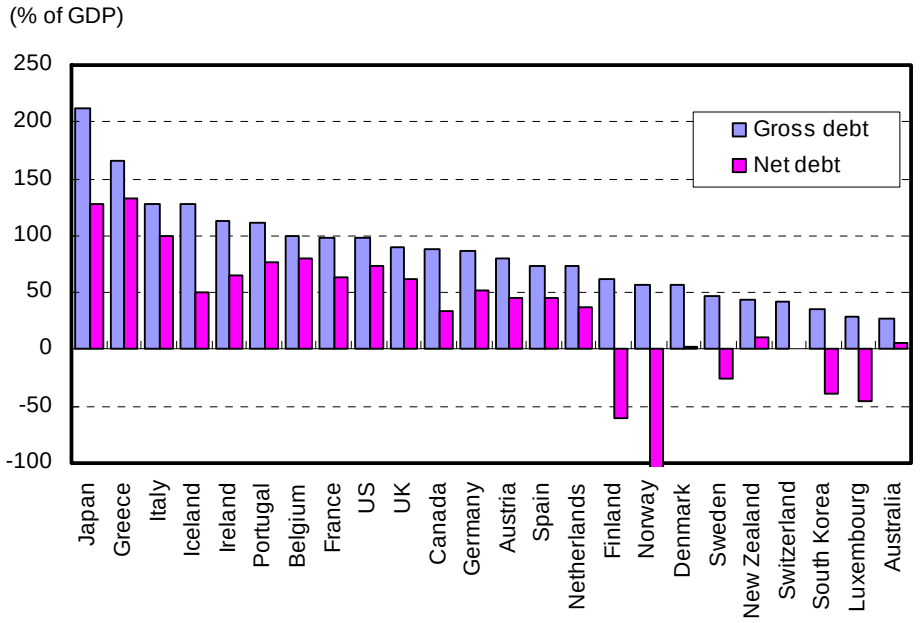
In the case of the eurozone, there is the short-term issue of worsening government finances in the wake of the global financial crisis. However, the eurozone must deal with the aftermath of the economic bubble (twin deficits) in GIIPS (Greece, Italy, Ireland, Portugal, and Spain) and other nations on its periphery that was fed by the decline in interest rates that happened in the process of currency integration. Europe's sovereign debt risk problem is further complicated by the fact that it operates under a unified currency and a unified monetary policy, but each nation has its own fiscal policy, and also by the fact that money moves freely within the region but labor does not move from one place to another in any real sense. The situation is also engulfing core nations, as evidenced by the downgrade of French government debt, and there are fears that a European recession will have an adverse effect on exports from Asia and the US to Europe, and on the fund flow from Europe to emerging economies. Europe's woes probably represent the greatest risk to the global economy in 2012 (or even the next few years).

Japan

Government finances are a growing problem around the world, but among advanced economies Japan has the highest debt-to-GDP ratio (Chart 4.1). Furthermore Japan is experiencing the problems of an aging society ahead of other nations, so it has the most severe budget problems. There is a tendency to emphasize the fact that, unlike the US and the GIIPS, Japan has a current account surplus. However, the current account balance is the result of the separately-determined activities of each sector—businesses, households, and the government. The current account surplus gives bond investors a certain sense of security. However, the problem is whether posting sizeable budget deficits year after year and running up the debt is a sustainable situation. It is not as simple as whether

there is a current account deficit or surplus. Furthermore, whether it is possible to finance deficits of this size and how much it will cost (in terms of interest rate) are two separate issues. It is claimed that Japan has been able to absorb its JGBs domestically, but foreign investors account for some 40% of the trading on JGB futures markets, which play an important role in price formation and are highly liquid. Domestic and foreign markets are not entirely separate from each other, and foreign investors can sell JGBs short whenever they like. As such, it would be better to break away from a structure almost entirely dependent on domestic institutional investors and to promote diversification of investors in JGBs by widening the foreign investor base.

2011 Outstanding Balance of General Government Debt **Chart 4.1**



Source: OECD, "Economic Outlook, No. 90, Nov 2011"; compiled by DIR.
Note: Negative figure of net debt (gross debt – government financial assets) means positive net assets. In the case of Norway, net debt is –162.5%.

The very significant "Draft"

From this perspective, it is very significant that the Headquarters of the Government and Ruling Parties for Social Security Reform finalized a draft outline for integrated reform of the social security and tax systems ("the Draft") on 6 January. The root of Japan's fiscal woes is the balance between social security costs (recurring government outlays) and fiscal resources. Recurring outlays must be covered by recurring revenue, but in recent years this recurring gap has been covered by budget deficits.[17] Given Europe's fiscal woes, there is a big need to show the Japanese people and global financial markets that Japan has the will to become fiscally sound and has a concrete plan to make it happen. It was initially thought that the Draft might turn out as some kind of general program lacking in specifics, but instead it clearly spelled out both the size and timing of consumption tax hikes, which should be considered major progress.

17. In the FY09 to FY11 budgets, the fiscal resources for the increased treasury portion of the basic pension, which is part of social security spending, came from funds transferred from the Fiscal Investment and Loan Program (FILP) special account and the Foreign Exchange Fund Special Account, and from the treasury payments of Japan Railway Construction, Transport and Technology Agency. However, using the "buried treasure of Kasumigaseki" (the Tokyo center of government ministries) to cover government spending is still drawing down government assets, so it still amounts to a budget deficit.

4.2 Our Assessment of the Draft for Integrated Reform of the Social Security and Tax Systems

4.2.1 Philosophy of social security reform

We positively evaluate the idea

The Draft says that the beneficiaries of the current social security system are mainly the elderly, while the financial burden falls mainly on the working population, and that the aim is to move towards a system that insures inter-generational and intra-generational fairness. We see this element of the Draft as positive. As we explained in *Japan's Medium-term Economic Outlook: June 2011*, our previous forecast, the intergenerational inequity of Japan's current social security system is a major problem, and the lack of reciprocity between the retired and working generations must be corrected.

How will benefits, which mainly go to the elderly, change?

However, the extent to which the proposed reforms will adhere to this principle is unclear. Firstly, it is unclear how the new childcare system differs from the existing policies aimed at addressing the country's low fertility, and at this juncture it is also unclear whether sufficient fiscal resources will be set aside. The Draft also says certain things about employment opportunities for both the elderly and the young, but more needs to be said about how this will lead to the revival of a broad middle class that Prime Minister Yoshihiko Noda has talked about. Initiatives for children and the young will have an especially large influence on the future of Japan, so if social security reform does not emphasize these areas it will lead to problems in the future. The key to reform will be how to redistribute benefits that currently go mainly to the elderly. However, it seems that many proposals in the Draft will enhance existing benefits for the elderly.

Relationship with the economy

Secondly, how is this related to the economy? The Draft explains that social security contributes to economic growth from both the demand and supply sides. On the demand side it helps alleviate people's concerns about the future, and on the supply side expands the health care and social services industries. However, it is hard to be optimistic that carrying out what is proposed in the Draft will be a plus for growth. Nevertheless, creating a mechanism to cope with an aging society, including managing the fiscal problem, is a minimum requirement for economic growth, and the Draft seems to be a step in that direction.

Expanding social insurance applied to part-timers and increasing the burden in areas other than consumption tax

As a practical matter, the focus of attention will be on how expanding eligibility for employee pension plans and employee health plans for part-time workers will affect the labor market and business activity. After obtaining opinions on the Draft from stakeholders, the ruling party intends to submit the bill in the 2012 ordinary Diet session. When it comes to the increased burden on taxpayers, attention so far has only focused on the consumption tax. However, the draft contains measures that would seem to increase the burden in a fair number of other areas. Specifically, employers will shoulder the burden associated with changes in social insurance eligibility for part-time workers. But there are also glimpses of an intention to "pick the low-hanging fruit" by doing things like introducing a scheme for determining payments by health insurance unions (only consisting of large corporate groups) to make up deficits in the long-life medical insurance program (for those over 75) to be based on each union member's total remuneration—currently based on both (1) each union member's total remuneration and (2) number of union members—, determining long-term care insurance premiums based on union member's total remuneration (currently based on number of union members), reducing the old age basic pension for high income individuals, and raising the upper threshold for monthly standard remuneration for the employees' pension program. Because increases in areas besides the consumption tax are hard to see, they might be treated differently politically, so it will be necessary to take a good look at how they will affect the economy.

Many items left for future examination

Thirdly, it is important to note that the Draft contains numerous items that have been left open for future examination. The Draft is supposedly aimed at transitioning to a social security system "for all generations." While it is only natural to do something for every generation, if the reforms do not strike a balance, ultimately both the benefits and burdens could expand unchecked. The basis for the Draft is the *Definite Plan for the Comprehensive Reform of Social Security and Tax* adopted by the Headquarters of the Government and Ruling Parties for Social Security Reform on 30 June 2011 ("Definite Plan"). However, amid the political and social turmoil following the Great East Japan Earthquake the priority was on meeting a deadline, so the Definite Plan seems to be lacking in substance.

4.2.2 The pension debate from the longer term point of view

No signs of progress in the debate over a new pension system

The pension system is a quintessential example of putting off a controversial issue. The Democratic Party of Japan's manifesto for the 2009 general election promised that it would pass a law to create a new pension system by 2013, but it contained few details. It says that the new system will combine a tax-financed minimum guaranteed pension with a social security-type earnings-linked pension, but this is something that has been talked about before. Specific details and actuarial information, such as the maximum income level for those receiving the minimum guaranteed pension were left open. The Draft says that the ruling party plans to submit the bill to the Diet in 2013 after working to build a national consensus and otherwise laying the groundwork.

If entirely financed by tax revenue, the minimum guaranteed pension should be closely related with the consumption tax

It has been rumored that there could be a general election in 2012 over the consumption tax issue. If the minimum guaranteed pension is to be entirely financed by tax receipts, the new pension system and consumption tax hike should be closely related. Furthermore, the Draft proposes a minimum guaranteed pension of Y70,000 monthly. If this amount is entirely financed by tax revenue then it would no longer be a kind of social insurance, and it would instead be a kind of tax-financed "senior allowance." The root cause of Japan's aging society is low fertility, and there should be ample discussion about whether greatly expanding the current basic pension (the portion funded by taxes), while reducing childcare allowances, will help bring about a dynamic older society. Naturally, the relationship between a tax-financed minimum guarantee and public assistance will also become an issue.

Issue of raising the starting age of pension benefits

No conclusion has been reached regarding raising the starting age for pension benefits and nothing in this context will be submitted to the 2012 ordinary Diet session. Nevertheless, raising the starting age for pension benefits is an inescapable issue. Back in 1985 it was argued that the starting age for pension benefits should be raised to 65, but even so, based on the current plan such a system could not be in place until 2030, so for a long time many people will be receiving benefits beginning in their early 60s. In light of Japan's rapidly aging society, taking about half a century to carry out the necessary increase in the starting age for pension benefits is simply too long. Average life expectancy has increased from 1985. For example, in the case of a 65 year-old man, he can add three years to his life expectancy, and a similarly aged woman, five years, and it is expected to continue to rise in the future. Japan not only has the world's longest average life expectancy, but also the world's longest healthy life expectancy. As a result, it has the capacity to create a society in which able and willing seniors can remain active irrespective of their age. If fairness is considered from the perspective of the total pension benefits received over a person's lifetime, it would be reasonable to raise the starting age for pension benefits to above 65.

Relationship with mandatory retirement age

Of course, if the starting age for pension benefits is raised, this would have to be done in synchronization with the employment system, given the issue of its connection to employment (the mandatory retirement age). Individuals who still

have some time left before reaching the starting age could work with their employers to prepare for the higher starting age for pension benefits. Financial institutions could offer annuity-type financial instruments that would allow people to cover living expenses during the resulting gap of several years. In any case, Japan is approaching a situation where there is one worker for each elderly pension recipient, so the system will be unsustainable unless more seniors shift over to being contributors to the system. The old age pension for active employees should have a mechanism to make it fair in actuarial terms between those who begin receiving a pension while they are still working and those who start receiving a pension after they have left employment.

Many important points will only be decided after further consideration

The Draft says that a number of issues will be considered in the future. These issues include reviewing the class 3 insured system (for non-working housewives), applying macroeconomic indexing during a deflationary period, reviewing the old age pension for active employees, and reviewing the upper threshold for monthly standard remuneration for the employees' pension program. Each of these issues contains serious points of contention, so it is hard to predict the future.

4.2.3 Current pension debate

Pension reforms with a high likelihood of implementation

Although there is insufficient clarity on a number of points—for instance, shortening the vesting period, limiting pension benefits for high income individuals, waiving insurance premiums during maternity leave, making part-time workers eligible for employee pension schemes, and consolidating government-administered workers' pensions with other pensions—the ruling party is expected to submit a bill in the 2012 ordinary Diet session. There are two items that stand a good chance of happening as part of pension reform.

(a) Elimination of excess benefit payments

Problem of excess benefit payments

The first item concerns the elimination of excess benefit payments (lowering pension benefits to a proper level). Today's pensions are 2.5% higher (more than Y1 trillion) than the level that had originally been envisioned. This is because, rather than using inflation indexing during the deflationary period as provided by law, an exception was made so as to maintain a nominal amount (thus increasing the buying power of pension recipients). It is thus no wonder that the fiscal situation is difficult when real benefits have grown at a time when today's workers—who represent the tax base for premiums—have not seen their wages rise. There is nothing that can be done about the benefits that have already been paid, but immediately halting these excess payments should be a condition for a tax increase. Even at their intended level Japan's public pension benefits are higher than those in other nations, so there is room to reduce them.

Will excess benefit payments be deliberately maintained?

However, it will take about three years to completely eliminate the excess benefit payments, and they will only be curbed by some 30-40% in FY12 (based on the 2012 budget). Even granting the need to make gradual adjustments for those who are truly disadvantaged, it is hard to understand why average excess benefit payment (to all recipients) is continuing. Furthermore, the Draft says that the fiscal resources arising from the elimination of this exception will be used to shore up social security. We can only draw the conclusion that there is little understanding of how severely the foundation of the pension system's finances is being shaken.

Relationship with macroeconomic indexing

Currently, macroeconomic indexing is used in long-term pension calculations with the aim of ensuring the long-term sustainability of the system by holding down pension benefits for a certain period. Macroeconomic indexing is a mechanism under which effective pension benefits are reduced if average life expectancy rises or the working-age population—which represents the people who are actually

supporting the pension system—shrinks.[18] However, macroeconomic indexing is currently not functioning at all because the exceptional level is not exceptional at all because of deflation, and indexing will not be invoked unless deflation will progress to a certain degree.

First apply inflation indexing under deflationary environment before implementing macroeconomic indexing

If Japan escapes from deflation earlier, it would help to keep the pension system going. However, the excess benefit payment problem is actually the failure to even properly apply inflation indexing (adjusting nominal payment amounts in accordance with rules in order to maintain effective benefits at a level corresponding to the cost of living), never mind macroeconomic indexing, to pension benefits. Macroeconomic indexing takes into account changing demographics, and this is a separate issue from changing prices. The current level of pensions is fairly high in view of what they would have been if macroeconomic indexing had been applied during the deflationary period. It is doubtful whether a government that cannot apply inflation indexing during a time of deflation can implement macroeconomic indexing during a time of deflation, but the pension system's finances are so troubled that this is exactly what is necessary.

(b) Pension supplement for low-income individuals

Pension supplement

The second item that might be incorporated into pension reform is a pension supplement for low-income individuals, which is seen as the centerpiece of the enhancements that would be introduced at the same time as a consumption tax hike. It has been proposed that a certain monthly supplement would be paid to low income individuals.

System needs to take into account the incentive structure

However, paying a uniform pension supplement without sufficiently taking into consideration a person's premium payment history would give rise to a strong feeling of unfairness, and with non-payment rates already rising, it would further reduce the incentive to pay premiums. Furthermore, there is already intergenerational inequity in the pension system, so boosting current or soon-to-be paid pensions could further exacerbate this inequity.

Comprehensive system design that takes low-income individuals into consideration

We think that at a time when it is impossible to accurately measure income and assets in the first place, it is necessary to exercise caution in raising the threshold for the uniform minimum guarantee. According to media reports, it appears that policymakers are moving in the direction of amending the initial proposal to make it more fair by, for example, taking into account the length of time that a person has paid into the system. Nevertheless, policy consideration for low-income individuals should be designed in conjunction with a taxpayer ID number system and refundable tax credits, rather than through a bureaucratically isolated approach. If that does not happen, spending could grow more than necessary, resulting in inefficiency.

4.2.4 Medical insurance/long-term care insurance

Is it possible to provide in-home care efficiently?

With respect to medical insurance and long-term care insurance, the Draft advocates making the system for providing medical and long-term care services more efficient, focused, and better functioning, in accordance with a community's circumstances. It talks about moving towards differentiating, strengthening, and coordinating inpatient medical care and enhancing in-home medical care and in-home long-term care. However, most of what it says is qualitative in substance, so we will have to see how the Medical Care Act and other laws are amended and how these goals are achieved. The intention seems to be away from facilities and into in-home care and away from medical care and into in-home long-term care,

18. In light of what it actually means, the term "macroeconomic indexing" is somewhat hard to grasp, so perhaps the term should be changed.

but the point is how to make this happen efficiently and without putting an undue burden on the public.

Shift to prefectural control of NHI

When talking about strengthening insurers, two areas of discussion are (1) shoring up the finances of the municipal programs for National Health Insurance (NHI) and (2) overhauling the medical insurance program for the elderly. Specifically, with municipal NHI finances in trouble, it is expected that the financial assistance that is granted depending on the number of low-income individuals will be made permanent, as will the joint programs for high-cost medical care in each prefecture. Additionally, the scope of medical expenses covered by the insurance finance joint stabilization program in each prefecture is expected to be expanded to all medical expenses (currently more than Y300,000 per treatment) beginning FY15.

What to do about medical care for those aged 75 or older

Meanwhile, terminating the long-life medical insurance program (for those over 75) is something of great concern to the public, and it has become a political issue. The intention is to deal with this as part of the drive to place municipal NHIs under prefectural control (because most of the elderly in this group would join the NHI, it would be no different from the previous insurance system for the elderly). However, this is nothing new at all (it was already proposed in a December 2010 report issued by the Council for the Reform of Health Care Services for the Elderly, a body formed in 2009 under Akira Nagatsuma, Minister of Health, Labour and Welfare—the report was finalized by his successor, Ritsuo Hosokawa). Thus, the priority of the Draft was the public appeal of abolishing the age categories. The intention is to practice fiscal management at the prefectural level, but the proposal has been criticized by both local government officials and medical sources, so there will probably be many twists and turns before the bill is submitted in the 2012 ordinary Diet session. The system for providing health care to the elderly is the biggest issue when it comes to maintaining the finances of the medical insurance system. The long-life medical insurance program has its good points, but the conclusion of the council, which operated under the principle of giving due consideration to the increased burden on both NHI (the insurer) and the elderly (the patients), was that the funding required to maintain the system could become enormous. We will keep a close eye on future developments.

4.2.5 Major tax system reform

Changing the income tax and inheritance tax

A number of changes are expected to be made to the tax system, including raising the top income tax rate to 45% (on taxable income greater than Y50 million) and reducing the basic exemption for the inheritance tax along with making the tax rate structure progressive. Suggestions have also been made to review the spousal deduction for income tax, old age and pension-related taxes, and local government corporation taxes. However, in this report, we will discuss the consumption tax, which is the main bone of contention. There are a number of points of contention in connection with raising the consumption tax rate.

Allocation of tax hikes between central and local governments

First, there is the allocation between the central government and local governments. The proposal is to raise the consumption tax rate to 8% in April 2014 and to 10% in October 2015. At the 10% rate, the national consumption tax rate would be 7.8% and the local consumption tax rate 2.2%. The local government portion of the 5-point increase, including the local allocation tax, would be 1.54 points (at the current 5% rate, it is 2.18 points). Thus, ultimately 6.28 points of the 10% consumption tax rate would go to the central government and 3.72 points to local governments. In light of the fact that most of Japan's government deficit is being

shouldered by the central government,[19] the portion being allocated to the central government is surprisingly small. In static terms, a 1 percentage point hike in the consumption tax rate should yield about Y2.5 trillion in tax revenue, and a 5 point increase about Y12.5 trillion.

How consumption tax revenue will be used

The second point is how consumption tax revenue will be used. It is becoming clear that the national portion of consumption tax revenue will be effectively turned into a social security tax and thus be returned to the public. However, even if consumption tax revenue is used for social security as claimed, it should be explained that most of it is the portion that was covered by deficit spending in the past. The goal of integrated reform is to secure a stable source of financing to enhance and maintain the social security system and at the same time make it fiscally sound. If most of the new tax revenue is used for social security enhancements, neither will be accomplished. At best, 1 percentage point of the 5-point increase will be used for enhancements, and this is an indication of just how dire social security finances are.

Measures for low-income individuals

The third point is policies aimed at low-income individuals and ways of addressing regressivity. The current proposal does not incorporate reduced tax rates, and instead maintains a single tax rate. As we explained in *Japan's Medium-term Economic Outlook, June 2011*, there were numerous problems with reduced tax rates, so this is the right move, in our view. In addition to the detailed measures spelled out as part of social security reform, policymakers are expected to look at other policies aimed at low-income individuals, such as a refundable tax credit or a total aggregate system (a system that establishes a maximum out-of-pocket total for a household's spending on medical care, long-term care, child care, and other items), assuming that a taxpayer ID number system is implemented. However, the taxpayer ID number system is not expected to begin operating before FY15. When it comes to levying the consumption tax, one major point of contention is whether the increase in prices will be reflected in social security benefits. We will present a simulation of this later in this report.

Economic turnaround a condition for a tax hike

The fourth point is the conditions for implementing a consumption tax increase. Article 104 of the Supplementary Provisions of the 2009 Tax Reform Act and the Definite Plan establish two major conditions. The first is related to the state of the economy. The idea is that if, for example, the economy is in the midst of a significant recession, the tax should not be increased. An economic turnaround is a condition for a consumption tax hike, and the Draft says that after the legislation is passed, along with making a determination about the state of the economy when raising the tax, a mechanism will be established to allow a flexible response to any sudden changes in the economic or fiscal situation. Specifically, it says that there will be a provision in the bill to check various economic indicators, including nominal and real growth and price trends to verify the economic turnaround before carrying out an increase in the consumption tax rate. It also says that necessary measures, including suspending the increase, will be taken after taking the state of the economy into general consideration.

Does the law require nothing more than an examination?

Upon close reading, the law contains only a provision saying that the economic climate will be examined when raising the tax, but the law does not spell out any specific objective criteria. Of course a general determination should be made about the state of the economy, but there is too much room for discretion, so there could be considerable debate over things like whether the tax should be increased during a deflationary spell. We think it would be best to clarify in advance, to the extent

19. According to the Annual Report on National Accounts (Cabinet Office), the central government accounted for Y27.0 trillion of the primary balance deficit and local governments Y0.2 trillion in FY10. The local government primary balance was in the black from FY04 to FY09, and the red ink in FY10 may have been a temporary phenomenon caused by the recession.

possible, the conditions under which a tax increase would be allowed, and what sort of circumstances represent the kind of sudden economic change that would warrant postponing a tax increase.[20]

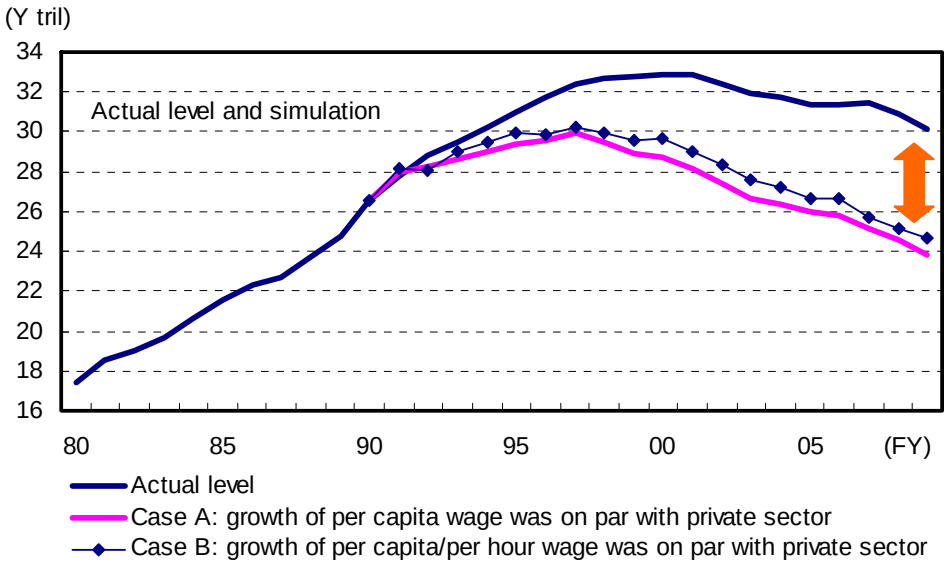
Should government reform be a condition for raising the tax?

The second condition is administrative reform. Reducing the number of Diet members has become a topic of discussion. Against the backdrop of a possible general election, correcting the unconstitutional disparities in the value of a vote is a pressing issue. But, in any event, adjusting the number of Diet members is unrelated to administrative reform, and when compared to a consumption tax increase the fiscal effect of reducing the number of Diet members is so small that it can be ignored.

Should administrative reform be a condition for raising the tax?

On the other hand, lowering public sector wages would probably have a real impact on finances. Even though public sector wages have been held down in the last few years, they have nevertheless continued to grow more quickly, on average, than private sector wages because factors such as the rising proportion of part-time workers have tended to hold down average wages in the private sector. Chart 4.2 simulates what wages for general government employees would have been like if they had trended in the same way as private sector wages, using 1990 as the index year. Based on this macroeconomic data, actual public employee wages are Y5-6 trillion higher (equivalent to a 2% consumption tax rate). Even if wages cannot suddenly be reduced by 20%, we think that there should be a demonstrated effort to adjust them to a proper level over a few years.

General Government Employee Compensation **Chart 4.2**



Source: Cabinet Office; compiled by DIR.
Note: FY90 benchmark basis.

4.3 Fiscal Simulation of Draft for Integrated Reform of the Social Security and Tax Systems

FY16 primary balance deficit equivalent to 3.7% of GDP

As we explained in section 1, to the extent possible, this forecast incorporates the proposals contained in the Definite Plan and in the Draft (tax increases; expansion and cuts in social security programs). Under such conditions, we forecast that the central and local government primary balance deficit, which was 5.7% of GDP in

20. From the outset there were assertions that Article 104 of the Supplementary Provisions of the 2009 Tax Reform Act made an economic turnaround a condition for submitting a bill to raise the tax, so we expect to see fierce debate between ruling and opposition parties concerning the relationship between the economy and a tax increase.

FY10 (6.7% after excluding special factors such as the one-time inclusion of funds from the FILP special account) will narrow to 4.2% in FY15 and 3.7% in FY16 (in the latter case, the effects of the consumption tax rate will be felt throughout the year). However, given political chaos over the consumption tax hike, it is uncertain whether the consumption tax hike will succeed. If the Diet is unable to reach a conclusion on the consumption tax, the public might change their opinion of Japan's financial situation.

Meeting medium-term objectives of government's fiscal management strategy could be hard

And, even if the tax hike goes through as spelled out in the Draft, we think it will be hard to achieve the objective of reducing the primary balance deficit to 3.2% of GDP by FY15 at the latest, as stated in the government's fiscal management strategy. This suggests that the government will need to make an even bigger effort to reduce outlays, from the perspective of what we have already discussed in section 4.2.

What to do after raising the tax to 10%

Nevertheless, in our current outlook, which assumes a certain amount of economic growth, we expect the primary balance deficit to steadily narrow during the forecast period, albeit slowly.[21] The question is whether this pace will be fast enough. If the primary balance remains in the red, the debt-to-GDP ratio will only continue to rise. Currently, we see nominal growth remaining above the 10-year JGB yield until FY14, but we think the bond yield will be higher from FY15 onwards. The relationship between economic growth and sovereign yields is really a battle between growth strategy and fiscal risk premium. Once interest rates become higher, the fiscal balance deteriorates due to interest costs, which in turn expands the fiscal risk premium, and this cycle ultimately results in fiscal collapse. To achieve the current objectives of bringing the primary balance into the black by FY20 and of steadily lowering the debt-to-GDP ratio in the 2020s, it will be necessary to carry out reforms of the same magnitude as those proposed in the Draft—or even bigger—in the second half of this decade.

In the case of Italy and Spain, positive primary balances were not enough

As an aside, the market takes a dim view of the finances of Italy and Spain, but in fact underlying trends of the primary balances of both nations have been in the black, and their debt-to-GDP ratios have been fairly stable. This means that merely having a positive primary balance and a stable debt-to-GDP ratio are not enough to gain market confidence. The lesson of the European experience is that a country like Japan, with its high level of government debt, could easily be confronted by a crisis caused by market opinion.

Consumption tax simulation

From the above perspective, we have run simulations of a scenario in which a tax increase is avoided and another scenario in which the tax is raised again in the second half of the decade (charts 4.3 and 4.4). The standard scenario shows the baseline values when the consumption tax rate is raised as proposed in the Draft. The Daiwa medium-term macroeconomic model that we have used is an annual model, and therefore the standard scenario assumes that the consumption tax rate is 8% in FY14, 9% in FY15, and 10% in FY16. The additional tax hike scenario assumes that the consumption tax rate is 13% in FY18, 16% in FY19, and 18% in FY20.

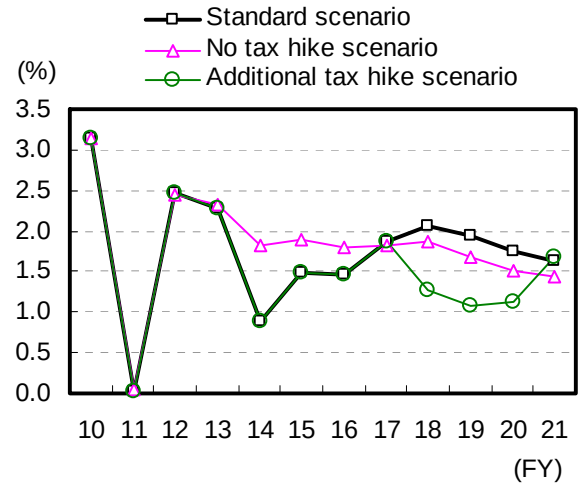
Standard scenario vs. no tax hike scenario

Looking at Chart 4.3, growth will be 0.3-0.9 percentage point slower when the consumption tax is raised compared to what it would be if the consumption tax was not raised. However, thereafter growth would gradually recover thanks to various

21. There are a variety of arguments concerning the extent to which the fiscal situation will improve driven by economic growth. In our current outlook, we assume nominal growth of 2.4% and real growth of 1.8% on average over a ten-year period. According to "research report on economic growth and fiscal consolidation" by the Cabinet Office, 17 October 2011 (available in Japanese), it is unreasonable to assume high tax revenue elasticity, and, furthermore, even if tax revenue rises when nominal growth is higher, outlays are also linked to nominal growth, so the fiscal balance does not necessarily improve.

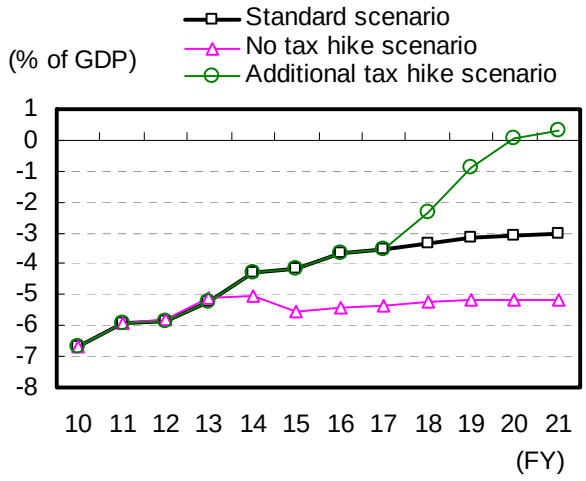
mechanisms within the economy. In fact, in the latter half of the forecast period, there is virtually no difference in real GDP level between the standard scenario and the no tax hike scenario (which is not shown here). In contrast, under the no tax hike scenario Japan's fiscal situation would continue to deteriorate and the country's fiscal woes would persist (Chart 4.4).

Impact of Consumption Tax Hike on Economic Growth Rate **Chart 4.3**



Source: Compiled by DIR based on DIR medium-term macroeconomic simulation model.

Impact of Consumption Tax Hike on Primary Balance (central and local governments) **Chart 4.4**



Source: Compiled by DIR based on DIR medium-term macroeconomic simulation model.
Note: Adjusted for ad-hoc factors.

Lack of clarity about a tax increase in the second half of the decade is not good

In evaluating the Draft in Section 4.2 we did not explain that although it presents a roadmap for raising the consumption tax rate by the middle of the decade, discussion of what to do thereafter has not progressed much. Although it is of little use to discuss things that are too far out in the future, Japan's fiscal management strategy calls for bringing the primary balance back into the black by FY20 and for steadily lowering the debt-to-GDP ratio in the 2020s, so examining ways to accomplish these goals should be an urgent priority. Based on how the Japanese population is expected to age, years around 2030 are expected to be the most challenging, so what kind of socio-economic system will be built in the 2020s should be of critical importance.

Consumption tax hike to 18% would bring the primary balance into the black

In this context, when we used the medium-term model to ascertain the consumption tax rate that would bring the primary balance into the black in FY20 through a tax hike alone, we found that the rate in FY20 would have to be 18%. Under our standard scenario, we project annual GDP growth of 1.9% for the second half of the forecast period (FY17-21), but under the additional tax hike scenario, which increases the tax rate to 18%, annual GDP growth would fall to 1.4%. Some question whether we should pay the price of lower annual growth, but others point out that it might be possible to greatly reduce the risk of fiscal collapse through such a sacrifice.

Actual size of tax hike depends on spending reform

Furthermore, we are not actually advocating that the consumption tax rate be raised to 18%. Depending on the substance of social security reform, and the reasonable steps taken to curb outlays, it might not be necessary to increase the consumption tax rate to that level. However, if spending reform falls by the wayside, given society keeps getting older and older, it is completely possible that the consumption tax rate might have to be increased to an even higher level. The consumption tax rate in the second half of the decade will probably not be determined until the specifics about the new pension system and long-life medical insurance program are known.

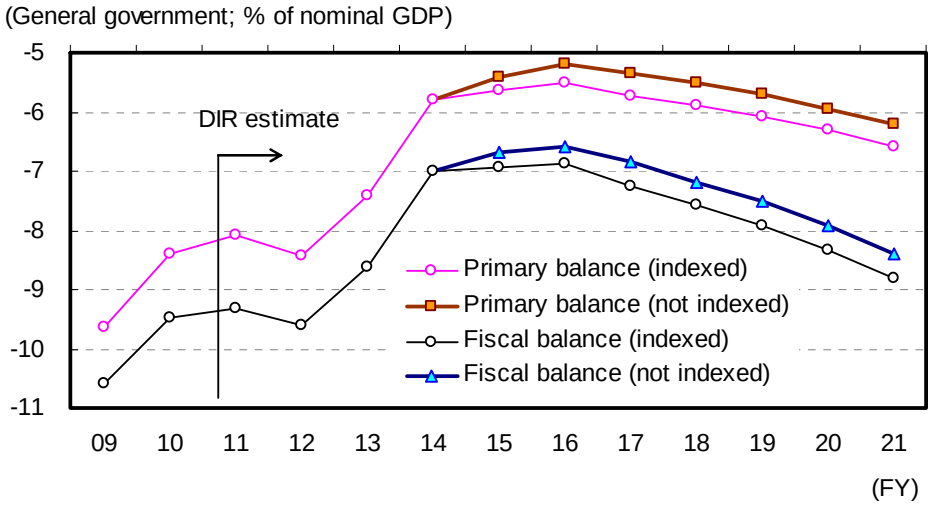
Simulation without inflation-indexing pension benefits

As an example of spending reform, Chart 4.5 shows the results of a simulation that assumes that the rise in prices stemming from the proposed consumption tax rate hike is not reflected in pension benefits. Put another way, when CPI rises as a result of an increase in the consumption tax, nominal outlays increase if inflation indexing is applied to social security benefits, which substantially offsets the effect of the tax hike on the fiscal balance. Furthermore, the objective of the consumption tax hike is to widely support social security by spreading the burden across all of society, including the elderly, not just some of the working population. If benefits are indexed to inflation, spending from pension income is not taxed.

Consumption tax hike as way of reducing outlays

This problem is not limited to the portion shouldered by central and local government finances and we measured the impact on the general government account. Chart 4.5 shows that the fiscal balance-to-GDP ratio (general government) varies by about 0.4 percentage points depending on whether pension benefits are indexed to inflation when the consumption tax is raised by 5 points (this difference grows wider if the consumption tax rate is raised even more). In this report we estimated only the effect from pension benefits, but if the same thinking is applied, even partly, to other government spending such as medical care and long-term care, raising the consumption tax could have the effect of reducing outlays in real terms, and it could have a great effect on the fiscal position. As such, this is one point that deserves serious attention as social security systems are formulated based on the Draft.

Simulation of Fiscal Balance: Indexed and Not-indexed Pension Cases
Chart 4.5



Source: Compiled by DIR based on DIR medium-term macroeconomic simulation model.
Notes: 1) "Indexed"/"not indexed" indicate rise in CPI due to consumption tax hike "being passed through to pension benefit"/"not passed through", respectively. Rise in CPI due to consumption tax hike estimated to be 0.78%, based on DIR medium-term macroeconomic simulation model.
2) Adjusted for ad-hoc factors.

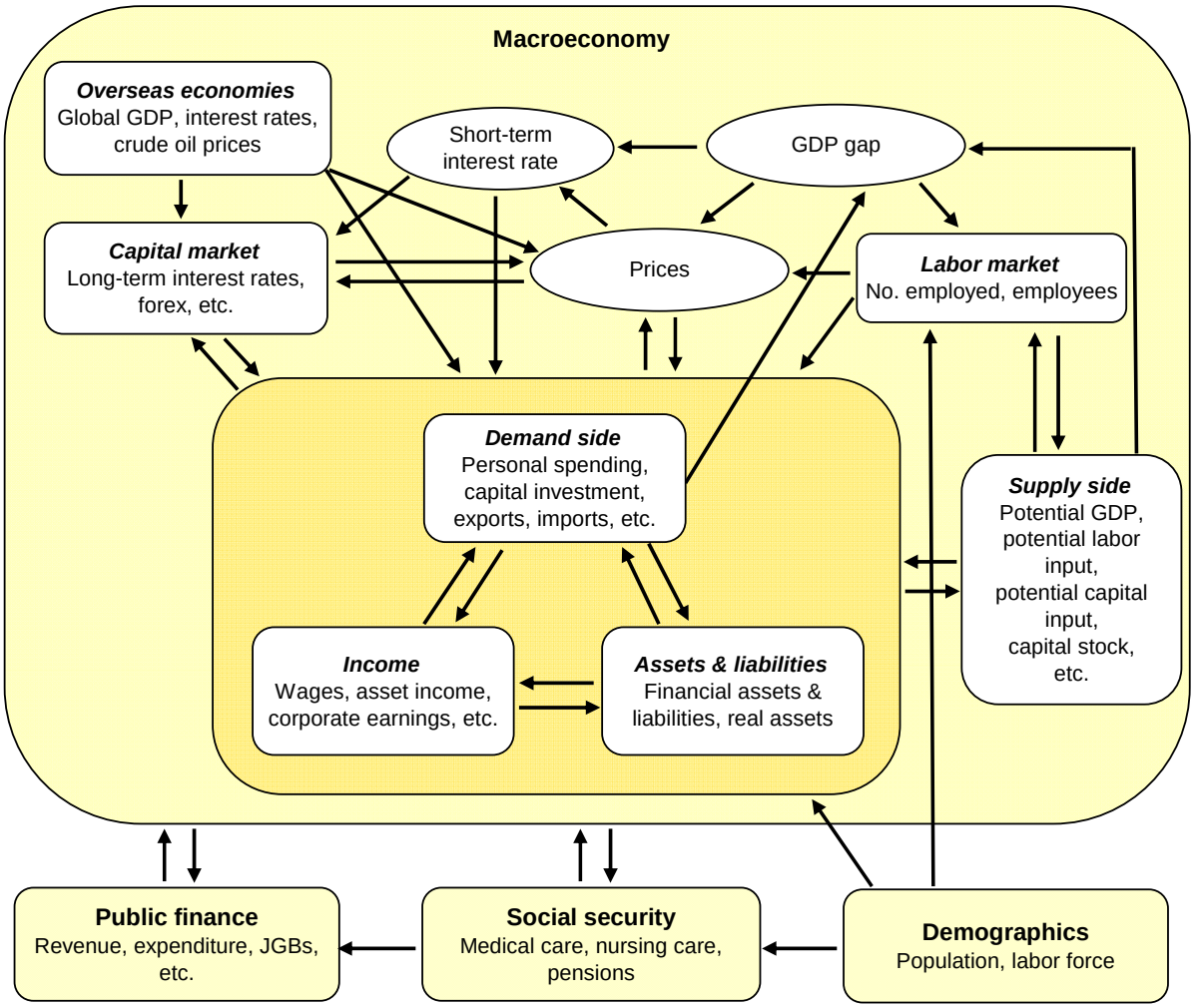
5. Overview of Model and Simulation Results

In this section, we provide an overview of DIR's medium-term macro model and discuss the effects on Japan's economy under four different scenarios, including a consumption tax hike.

Structure of DIR medium-term macro model

The DIR medium-term macro model comprises roughly 400 equations (of which about 70 are estimating equations) and about 550 variables (of which about 150 are exogenous variables). An overview of the model is shown in Chart 5.1. If real GDP changes, the GDP gap (rate of deviation between potential GDP and actual GDP) changes, which affects prices and short-term interest rates, effects of which will, in turn, spread to other areas, such as financial markets. Such a change in each variable occurs simultaneously and the expected value of each variable is generated by running the model. We treated foreign economic and demographic data as exogenous variables—for instance, the future values of global GDP reflect IMF and DIR forecasts. Mainly for demand components, the estimating equations incorporate not only variables that explain short-term changes (impact of employee compensation on consumer spending) but also terms that adjust deviation from long-term equilibrium based on economic theory.

Conceptual Image of Daiwa Medium-term Macro Model **Chart 5.1**



Source: Compiled by DIR.

Four scenarios

Using the DIR medium-term macro model, we carried out simulations to determine the effect on the real economy under four scenarios: (1) a 1%-pt hike in the consumption tax; (2) a $10/bbl rise in the price of crude oil (WTI); (3) a 1%-pt drop in global economic growth; and (4) a 1%-pt rise in the long-term interest rate. The results are shown in Chart 5.2. There are some points to consider when interpreting simulation results.

Points to consider when interpreting simulation results

First, we assumed that the effects under each scenario would persist throughout the estimation period. For example, in the case of a 1%-pt hike in the consumption tax, the tax rate will not return to the original rate the following year. Instead, the rate hike will remain in effect in the future. The exception to this is a 1%-pt rise in the long-term interest rate—the margin of rise is for only one year (change in the rate from the second year is determined endogenously as an outcome of the model). Figures in Chart 5.2 show the degree of impact on each component and represent deviation from the standard scenario (what would have occurred in the absence of the event simulated in each scenario). For example, the chart shows that if the consumption tax is raised 1% point, the effect on real GDP is –0.27% in the first year and –0.28% in the second year. This means that real GDP will be 0.27% lower in the year when the consumption tax rate is raised than it would otherwise have been, and that it will be another 0.01%-point lower (–0.28% minus –0.27% lower) in the second year.

Next, it is assumed that the short-term interest rate is in positive territory when any of the four scenarios arises. The short-term interest rate is currently zero, and if the economy is adversely impacted under such circumstances, the adverse effect would be exacerbated to the degree that the short-term interest does not decline. Because these simulations are performed based on the assumption that there is room for the short-term interest rate to decline, when there is a negative impact on the economy the short-term interest rate will simultaneously decline, leading to a decline in the long-term interest rate, and this will have the effect of buoying the economy through a weaker yen and increased investment.

Lastly, simply multiplying assumptions by a constant to change the alternative conditions did not yield substantially different results. For example, if the simulation is performed for a 5%-pt rise rather than a 1%-pt hike in the consumption tax, the resulting real GDP deviation was –1.02%. This is close to 5X the deviation shown for the fifth year in the first scenario presented in Chart 5.2. Accordingly, by simply multiplying the simulation results by a constant that corresponds to the desired condition, it is possible, to some degree, to grasp the effect on the real economy.

Simulation Results — Chart 5.2

(1) 1%-pt hike in consumption tax rate (deviation from standard scenario; %, %pt)

	Real GDP								Nominal GDP	GDP deflator	Potential GDP	GDP gap
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports				
1st year	-0.27	-0.49	0.00	0.00	-0.61	0.43	0.00	-0.72	0.49	0.76	-0.10	-0.16
2nd year	-0.28	-0.41	-0.41	0.24	-0.66	0.46	0.09	-0.48	0.46	0.75	-0.11	-0.18
3rd year	-0.30	-0.48	-0.57	0.18	-0.49	0.49	0.18	-0.39	0.42	0.72	-0.11	-0.19
4th year	-0.27	-0.49	-0.75	0.29	-0.50	0.45	0.22	-0.30	0.41	0.69	-0.10	-0.17
5th year	-0.21	-0.46	-0.75	0.47	-0.50	0.37	0.22	-0.21	0.45	0.66	-0.07	-0.14

	Unemployment rate	Y/$	CPI	Short-term interest rate	Long-term interest rate	Current balance	Fiscal balance	Primary balance
							(Central & local governments)	
						(% of nominal GDP)		
1st year	0.03	0.32	0.78	-0.15	-0.07	0.19	0.33	0.33
2nd year	0.04	0.60	0.74	-0.19	-0.08	0.19	0.45	0.43
3rd year	0.05	0.71	0.74	-0.16	-0.07	0.22	0.46	0.43
4th year	0.06	0.65	0.71	-0.10	-0.04	0.23	0.49	0.45
5th year	0.06	0.59	0.69	-0.10	-0.04	0.24	0.52	0.47

(2) $10/bbl rise in crude oil prices (WTI; deviation from standard scenario; %, %pt)

	Real GDP								Nominal GDP	GDP deflator	Potential GDP	GDP gap
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports				
1st year	-0.02	0.01	0.00	0.00	-0.10	0.04	0.00	0.05	-0.20	-0.18	-0.01	-0.01
2nd year	-0.06	-0.08	0.11	-0.22	0.00	0.09	0.01	-0.16	-0.26	-0.20	-0.02	-0.03
3rd year	-0.07	-0.11	-0.10	-0.26	-0.04	0.11	0.02	-0.27	-0.31	-0.23	-0.03	-0.04
4th year	-0.08	-0.13	-0.21	-0.32	-0.03	0.12	0.06	-0.35	-0.35	-0.27	-0.04	-0.04
5th year	-0.09	-0.15	-0.23	-0.34	-0.06	0.11	0.10	-0.41	-0.39	-0.30	-0.04	-0.04

	Unemployment rate	Y/$	CPI	Short-term interest rate	Long-term interest rate	Current balance	Fiscal balance	Primary balance
							(Central & local governments)	
						(% of nominal GDP)		
1st year	0.00	0.03	0.00	-0.01	-0.01	-0.22	-0.06	-0.06
2nd year	0.01	0.08	-0.01	-0.03	-0.02	-0.19	-0.09	-0.08
3rd year	0.01	0.19	-0.05	-0.07	-0.03	-0.16	-0.08	-0.08
4th year	0.01	0.30	-0.09	-0.09	-0.05	-0.14	-0.08	-0.08
5th year	0.01	0.35	-0.13	-0.09	-0.04	-0.12	-0.07	-0.06

Source: Compiled by DIR based on DIR medium-term macroeconomic model.

(3) 1%-pt drop in global economic growth (deviation from standard scenario; %, %pt)

	Real GDP								Nominal GDP	GDP deflator	Potential GDP	GDP gap
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports				
1st year	-0.57	-0.12	0.00	-1.89	0.05	0.92	-3.75	-2.25	-0.68	-0.11	-0.22	-0.35
2nd year	-0.78	-0.14	-0.15	-2.32	-0.03	1.18	-4.84	-3.40	-1.03	-0.26	-0.33	-0.46
3rd year	-0.85	-0.22	-0.18	-2.30	-0.05	1.22	-5.38	-4.01	-1.26	-0.41	-0.38	-0.47
4th year	-0.84	-0.28	-0.25	-2.14	-0.13	1.12	-5.87	-4.49	-1.38	-0.55	-0.41	-0.43
5th year	-0.78	-0.29	-0.25	-1.90	-0.19	0.96	-6.46	-4.99	-1.42	-0.65	-0.41	-0.37

	Unemployment rate	Y/$	CPI	Short-term interest rate	Long-term interest rate	Current balance	Fiscal balance	Primary balance
							(Central & local governments)	
						(% of nominal GDP)		
1st year	0.07	0.69	-0.10	-0.32	-0.16	-0.22	-0.15	-0.14
2nd year	0.11	1.57	-0.27	-0.54	-0.26	-0.18	-0.18	-0.17
3rd year	0.13	2.22	-0.42	-0.60	-0.29	-0.13	-0.14	-0.13
4th year	0.14	2.38	-0.57	-0.51	-0.25	-0.09	-0.06	-0.07
5th year	0.14	2.25	-0.71	-0.42	-0.20	-0.06	0.02	-0.01

(4) 1%-pt rise in long-term interest rates (deviation from standard scenario; %, %pt)

	Real GDP								Nominal GDP	GDP deflator	Potential GDP	GDP gap
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports				
1st year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
2nd year	-0.27	-0.34	-1.61	-1.97	0.43	0.42	0.02	-0.92	-0.31	-0.04	-0.10	-0.16
3rd year	-0.61	-0.62	-2.82	-3.71	0.34	0.90	0.13	-1.78	-0.76	-0.15	-0.27	-0.35
4th year	-0.87	-0.92	-3.38	-4.28	0.23	1.16	0.34	-2.14	-1.18	-0.31	-0.43	-0.45
5th year	-1.04	-1.22	-3.65	-4.55	0.07	1.27	0.60	-2.34	-1.54	-0.50	-0.56	-0.49

	Unemployment rate	Y/$	CPI	Short-term interest rate	Long-term interest rate	Current balance	Fiscal balance	Primary balance
							(Central & local governments)	
						(% of nominal GDP)		
1st year	0.00	0.10	0.00	0.00	1.00	0.00	-0.19	-0.19
2nd year	0.03	0.48	-0.05	-0.15	0.92	0.17	-0.59	-0.54
3rd year	0.08	1.21	-0.16	-0.38	0.80	0.37	-0.84	-0.72
4th year	0.11	2.03	-0.31	-0.56	0.72	0.53	-0.99	-0.76
5th year	0.14	2.67	-0.48	-0.63	0.68	0.68	-1.08	-0.74

Source: Compiled by DIR based on DIR medium-term macroeconomic model.