It is too early to tell the total impact of the earthquake and tsunami yet and uncertainty also remains as to what happens to the nuclear power plants.

There appear total of more than 10,000 people who lost their lives and are still missing after the earthquake on 11 March and it is too early to tell the entire picture. Yet, total of nominal GDP of Iwate, Miyagi, and Fukushima, prefectures that are especially hit by the earthquake severely, is JPY20 trillion taking up total of 4% of Japan's nominal GDP.

Economic impacts: Quarterly real GDP growth for Jan-Mar and Apr-Jun will be pushed down by -0.6% points and -1.5% points, respectively, as the earthquake will suppress household and corporate activities and will partially paralyze the function of municipal governments. Despite negative real GDP growth expected for a couple of quarters ahead, negative impact from supply-side constraints will start fading off from Jul-Sep quarter and positive impacts from reconstruction activities will outweigh them thereafter with very strong growth expected for Oct-Dec quarter.

We assumed the government will compile total of JPY15 trillion economic packages and will decided to increase the JGB issuance by JPY10 trillion to finance the packages.

Overall impact is that real GDP growth will be close to zero% for FY2011 and we expect just +0.1%. The impact appears to be less than the negative shock by the global financial crisis but much greater than Kobe earthquake hit in 1995. We do expect that real GDP growth will recover to +2.3% for FY2012.

Impacts on financial markets: Although the BOJ has been already very active in liquidity provisioning, increased money demand could be expected towards fiscal year end. Also banks will need to increase lending to meet reconstruction demand and insurance companies will need to sell liquid assets in preparation for payouts. Although it will take time for that to happen, possible candidates of high liquidity assets will be foreign bonds and short-dated JGB.

As a result, combination of fiscal expansion and asset liquidation will mean that benchmark 10-year JGB yield will reach 1.5% sooner than later.

Social Impacts of the Earthquake and Tsunami

Direct Impacts

Human lives: The earthquake and tsunami severely hit Iwate, Miyagi, and Fukushima and it is too early to tell the entire picture of the damage. Other prefectures are also hit by the disaster and it is said that there appear total of more than 10,000 people who lost their lives and are still missing.

Evacuees: 4 days after the disaster, it is reported that some 450,000 people are gathering in emergency shelters. As many of them lost their houses, the government would really want to construct provisional houses as soon as possible. However, given the degree of the damage, that would be a very difficult task as people might have to relocate themselves in areas not near to where they used to live.
**Logistics:** Daily necessities are increasingly lacking in those areas that are hit hard by the disaster as the earthquake destroyed the roads that used to lead there. This tough logistics situation is increasingly affecting areas that were less affected, only in terms of comparison though, by the natural disaster. Given how badly the roads are damaged, what is happening now in terms of logistics could continue into another 3 months or so.

**Electricity:** Problems that are happening in the nuclear power plants in Fukushima is causing serious constraints on the supply of electricity. Just to give overall structure of electricity supply in Japan, 29% of total is generated by nuclear power, 61% of total is generated by thermal power, 8% of total is generated by hydro power, and remaining 2% is generated by other means. The troubled nuclear power plants in Fukushima is operated by Tokyo Electric Power Company (TEPCO) and TEPCO, by using all of the power plants it has, could meet up to 64.49 million Kw of electricity demand prior to the disaster. While TEPCO is still using, under limited operations, the nuclear power plant located in Niigata and its hydro power plants, what is mainly left for TEPCO is thermal power plants. Although they, prior to the disaster, could meet up to 38.19 million Kw of demand, there are those ones that are hit by the disaster and thus the full capacity of 38.19 million Kw is not possible at the moment. While it depends on the demand, TEPCO is unlikely to be able to meet up to the demand and now it is conducting what it calls “managed blackout” (i.e. TEPCO is dividing some areas into groups and conducting blackout on one of those groups in turn for a few hours each.) This managed blackout is likely to continue until April, by which TEPCO will recover proper functioning of those thermal power plants.

<table>
<thead>
<tr>
<th>3 prefectures that are severely damaged by the disaster</th>
<th>Population As of February 2011</th>
<th>Nominal Prefectural GDP FY2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iwate</td>
<td>1.328 Million</td>
<td>JPY 4,391.8 Billion</td>
</tr>
<tr>
<td>Miyagi</td>
<td>2.347 Million</td>
<td>JPY 8,193.4 Billion</td>
</tr>
<tr>
<td>Fukushima</td>
<td>2.025 Million</td>
<td>JPY 7,986.9 Billion</td>
</tr>
<tr>
<td>Total of 3 prefectures</td>
<td>5.700 Million</td>
<td>JPY 20.3 Trillion</td>
</tr>
<tr>
<td>Total of Japan</td>
<td>127.37 Million</td>
<td>JPY 492.7 Trillion</td>
</tr>
</tbody>
</table>

Source: Cabinet Office, Crédit Agricole CIB

**Indirect Impacts**

**Gas stations:** Although Tokyo is some 200km away from FUKUSHIMA, the managed blackout by TEPCO is resulting in public transportations operating at somewhere around 70% of their usual services and that, in turn, is now making more people use their cars. As such, while there is no major supply constraints of gasoline in Tokyo, a few dozens of cars are sometimes seen making lines for fuelling, which is also added to by the fact that gas stations are now conducting quota on gasoline sales per car.

**Public transports:** Due to the managed blackout, JR, metro lines, and private railway companies are conducting limited services, and people away from Tokyo by, in general, some 50km are now having difficulty in commuting. As such, there are those businesses and schools that are making their employees stay at home or closing for the time being. Even for those commuting, managed blackout is stopping escalators and elevators in buildings and that is making their transportation all the more painful.

**Commuting:** Disruption in public transport is resulting in people to change their means for commuting and, on the day of the earthquake, 30-minute distance on a usual day took more 5 hours. However, anecdotal evidence after a few days of the disaster is that the amount of transport appears less than usual in central part of Tokyo likely due to the managed blackout and restriction on gasoline sales.

**Supermarkets & convenience stores:** Due to the speculation that cooking food under managed blackout will be difficult, preservatory foods quickly disappeared from the shelves in those stores. Even in central part of Tokyo, people are seen making lines before supermarkets open and it is now taking more than 30 minutes just for paying for purchases. At the same time, people appear staying away from fresh foods for the above reason and Tsukiji fish market looks very calm considering how active it usually is.

**Entertainments:** Many of events have been cancelled. Florence opera evacuated its members to home, world championship of figure skating in Tokyo in March is now cancelled, Japan’s professional football league decided not to hold any matches in March, and many other events are now cancelled.

**Foreigners evacuating from Japan:** Foreigners, though gradually, are seen evacuating from Japan since the day of the earthquake and foreign investors that were planning to come to Japan are also cancelling their schedules. Furthermore, students who came to Japan for studying abroad appear increasingly going back home. City of Tokyo becomes more among Japanese.

**Politics:** While politicians were arguing against each other on the budget plan for FY2011, they are now working even harder to find an agreement for facilitating helping those who are affected by the disaster and for facilitating Japan’s resurgence from the tragedy with the earthquake becoming the
turning point of their behaviour. Realistically speaking, it is not a situation to assume that PM Kan will dissolve the Diet in coming April or June. The Democratic Party of Japan (DPJ) government is now considering a possibility to transfer the budget for childcare cash benefits and free highway to policies for aid.

**Most of TV commercials becoming public in nature:** With almost all of the broadcasting corporations giving special programs of the disaster for consecutive days, most of TV commercials are becoming public in nature rather than introducing products of private sector companies. Similar situation is also seen for advertisement space for newspapers.

**Economic Impacts of the Earthquake and Tsunami**

*Comparison to Kobe's disaster in 1995 does not help much*

Prior to the disaster, our expectation was that the Japanese economic growth will be stable for Jan-Mar and Apr-Jun. However, we think that the scale of direct and indirect impacts from the earthquake and tsunami will be so much more that comparison to Kobe’s earthquake in 1995 does not help much with the implementation of the managed blackout in Kanto area likely beyond anyone’s imagination.

That said, we do need to bear in mind that as GDP is the aggregate of value added in a certain period of time, destruction of social capitals and housing itself does not have any impact on GDP growth. However it is the impact from those losses that will make households and businesses less active than before and thus will have negative impact on the economic growth. Especially, the managed blackout conducted in Kanto area is resulting in businesses lowering their capacity utilization rate somewhere around to 70% (though this number is only preliminary estimate) and social confusion after the disaster is likely magnifying the indirect impacts that we anecdotally saw as above.

**Japan will fall into a temporal recession**

*Real GDP:* While we have to wait for clearer numbers of economic losses, we do revise down our economic forecast that we presented in “Japan Economic Outlook for FY2011”. Very briefly, our conclusion is that quarterly real GDP growth for Jan-Mar and Apr-Jun will be pushed down by -0.6% points and -1.5% points, respectively, due to negative wealth effects from lost national wealth and also negative impacts from destroyed

infrastructures, both social and industrial, on economic activities of households, businesses, and municipal governments that are affected by the disaster. The managed blackout will also work in a way that will weigh on economic activities of those affected. Furthermore, those negative numbers are ones that came out after we factor in positive impacts from reconstruction demand by +0.5% points in total for those quarters.

**Negative real GDP growth for quarters ahead:** Those said, as a result, we now expect that real GDP growth for Jan-Mar and Apr-Jun will be down -0.4% QOQ (+0.2% QOQ before revision) and down -1.2% QOQ (up +0.3% QOQ before revision). As such, Japan’s quarterly real GDP growth will remain negative for 3 straight quarters given that Oct-Dec real GDP was down -0.3% QOQ and Japan will fall into a temporal recession. As consumers become even more careful and increase precautionary saving for rainy days, that will sharply weigh on private consumption in those quarters. However, strong reconstruction demand from Jul-Sep quarter onwards will result in positive real GDP growth rates thereafter.

**Counter-disaster economic package**

*Prospective scale:* For an immediate use, the government will use JPY200 billion of precautionary reserve from FY2010 budget and, after passing the budget plan for FY2011, will use FY350 billion of the same source of fund from FY2011 budget. Supplementary budget for counter-disaster economic package will be planned over the course of April and will be immediately approved in the month. We do not yet see any clear candidate scale but we suspect that it will be somewhere around JPY15 trillion (3% of nominal GDP).

*How will the plan will be financed?* To be more precise about what we think will likely happen, the government will quickly plan JPY5 trillion (1% of nominal GDP) supplementary budget to provide money needed for immediate purposes as a first stage within April and then considers another JPY10 trillion (2% of nominal GDP) package for providing money needed for recovery and reconstruction. The government will finance part of the supplementary budgets through transferring money from fiscal year’s budget plan and, for the rest of the money needed for the supplementary budgets, it will decide to increase the amount of JGB issuance. Our expectation is that the government will finance JPY10 trillion out of the total of JPY15 trillion supplementary budgets by increased issuance of JGB.
Strong reconstruction demand to emerge from Jul-Sep

Despite those short-term negative impacts, supplementary budget plans will trigger strong construction demand and we expect that quarterly real GDP growth rates in the recovery phase will exceed our previous forecast. We now expect quarterly real GDP growth rate for Jul-Sep and Oct-Dec will be up +0.8% QOQ (+0.7% QOQ before revision) and up +1.3% QOQ (+0.6% QOQ before revision), respectively and those strong numbers will be followed by +0.9% QOQ for Jan-Mar 2012 (+0.5% QOQ before revision). Then this strong construction demand will start fading away thereafter.

Impacts on financial markets

What will the Bank of Japan do?

Right after the earthquake on weekend on 11 Mar, the BOJ has been very active in liquidity provisioning since 14 Mar with total of JPY55 billion deposit withdrawals on 13-14 Mar responded by printing money. Short-term money market also saw strong demand for liquidity and that is countered by an unprecedented JPY15 trillion liquidity provisioning on 14 Mar, followed by another JPY8 trillion on 15 Mar and still another JPY5 trillion on 16 Mar in order to maintain overnight call rate to be traded near the target range.

In addition, the Bank of Japan changed to its monetary policy meeting to 1-day gathering and concluded on 14 Mar. While the policy interest rate target range was maintained, the BOJ unexpectedly expanded the amount of asset purchase to JPY10 trillion from JPY5 trillion. However, the market reactions thereafter suggest that the decision was taken as short of stabilizing financial market conditions.

Although the BOJ will continue the massive liquidity provisioning campaign as necessary, we suspect that enough liquidity provisioning alone will work only so much. In addition to passively responding demand for liquidity from financial institutions, the BOJ will need to act in an active manner and there will be increasing expectation that the BOJ should increase the outright purchase of JGB (so-called Rimban) in order to ease the concern for increased issuance of JGB. Otherwise, sharp rise in bond yields that are seen of late will become a trend and that could increase the prospect of downside risks in recovery phase.
What will the private financial institutions do?

Domestic banks are now busy responding to deposit withdrawals that are triggered by the disaster. Although money needed for this purpose has been amply covered by the BOJ’s massive liquidity provisioning and thus overnight call rate appears to be calm, those financial institutions are now busier in procuring longer term money and thus have not been active in the JGB market recently. Yet, present situation is that they are under normal operations and no major settlement problem has been reported thus far.

Thanks to the BOJ’s massive money provisioning, those financial institutions do not have immediate need for changing asset allocation by selling liquid assets like foreign bonds or JGB. However, strong demand for loans that will become evident in recovery phase will mean that banks will no longer be big buyers of JGB and they will increasingly go back to the market where they really should operate (i.e. loan market).

Similar to domestic banks, insurance companies appear to be under normal operations. With total economic losses from the disaster yet to be confirmed, they appear to be still on sidelines. However, lifers, as a whole, have JPY290 trillion assets and they will face increasing need to liquidate them in order to respond to insurance payouts. In comparison to domestic banks’ asset allocation, lifers have more exposure to foreign securities, which take up 14.9% of total assets compared to 2.8% for domestic banks. As such, first possible candidate for liquidation will be those foreign securities and that will be followed by short-dated JGB that are indeed very liquid, though we have to emphasize that what we are insisting here is highly uncertain as the size of economic losses is yet to be checked.

Looking at which sectors insurance companies have more exposures through which maturity sector they are buying more, data for FY2010 YTD shows that they have very high exposure to super-long sector (i.e. JGB with maturity longer than 20 years). While it is tempting to assume that they will start selling what they have more, they yet have strong demand for super-long sector JGB for Asset-Liability Management (ALM) purpose and they likely thing that it is not their interest to collapse the sector by their own sales. Thus we suspect that the first sector they will start to consider selling will be short-dated JGB.
What happens to the JGB market?

While the JGB yields went sharply lower across the curve right after the earthquake on safe-haven bids, the JGB yield curve saw a sharp flattening thereafter with JGB's massive liquidity provisioning contributing to lowering yields on short-dated bonds and speculation that insurance companies will have to sell longer-dated bonds putting upward pressure on yields of longer-dated bonds. Under those circumstances, however, 20-year JGB (coupon rate at 2.2%, intended amount at JPY4 trillion) auction conducted on 16 Mar saw decent bids that totalled JPY4,155.4 billion (i.e. bid-cover ratio at 4.13 times) despite that some were speculating that bid-cover will fall short of 1.00 time. The government will have to face combination of pressure on the JGB market through increased issuance of JGB and less demand by domestic banks that are likely to increase loans for reconstruction demand. As such, we expect that the benchmark 10-year JGB yield will reach 1.5% sooner than later and could reach that level by the end of Apr-Jun quarter. However, we do maintain our view that the government will not have major problem in raising money in the bond market and we also do maintain our view that increasing outright purchase of JGB will be an effective way to counter present difficulty as a nation.

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