What will be the impact of the Tohoku earthquake?

The Tohoku Pacific earthquake and tsunami which struck Japan on March 11 was the most serious to hit Japan since the Kobe earthquake of 1995, and can be expected to have significant short-term economic and financial impacts.

The quake was of magnitude 9.0, somewhat stronger than the 7.3 magnitude of the Kobe earthquake. Indeed, the amount of energy released by last week's quake was over 300 times that of the Kobe quake. The epicentre of last week's quake was located some 130 kilometres offshore, reducing the damage, but nevertheless the impact has been severe both through shaking and especially the impact of the tsunami induced by the quake.

Quantifying the economic costs is difficult given the limited information currently available and because last week's quake has impacted in a substantially different way from the Kobe incident. The Kobe quake hit a relatively narrow and urbanised area, and caused substantial damage to infrastructure such as roads, bridges and ports.

The Tohoku earthquake and tsunami struck a broader, more rural area. The two regions most affected (Miyagi and Fukushima prefectures) have GDP around US$200 billion or perhaps 4% of the Japanese total – somewhat less than the Hyogo region containing Kobe. **But as well as damaging local infrastructure it has also led to major damage to electricity production facilities including nuclear plants – an impact that may have significant knock-on effects on the broader economy.**

Early tentative estimates of the damage suggest costs of up to US$200 billion or around 4% of Japanese GDP (compared to US$100 billion for the Kobe quake), which can be expected to come through a variety of channels:

- **Direct disruption of economic activity**. Economic activity can be expected to be severely affected in the main zones of impact with regional GDP initially falling steeply. Some port facilities will also be out of action for a considerable time although shippers may be able to use alternative routes.

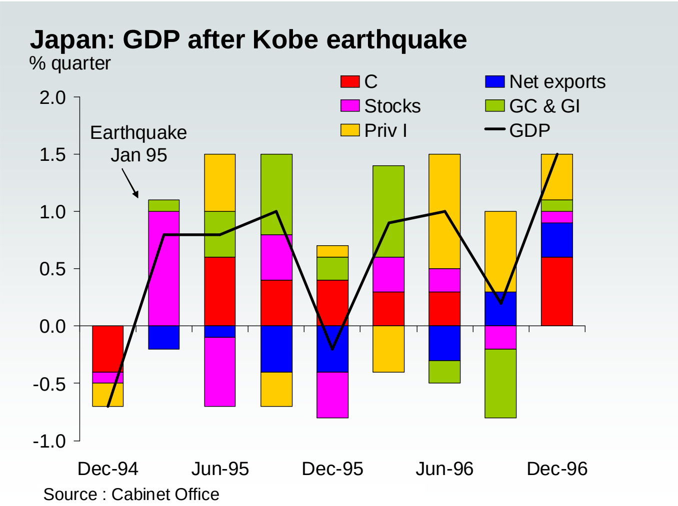
- **Industrial shutdowns**. Several major Japanese industries including the car industry – which represents 15% of manufacturing output – have announced closures of their production facilities for up to a week (and perhaps longer). This will directly cut industrial output in the current month. Some production may be switched to foreign plants, with a possible risk of this switch being permanent in some cases.

- **Power shortages**. Plant shutdowns in part reflect a response to the disruption of power supplies caused by major problems at three of Japan's nuclear facilities. With nuclear power supplying a third of Japan's energy needs, power companies have announced a rolling programme of power cuts lasting up to several hours per day. This can be expected to have a significant negative impact on economic output especially of energy intensive industries in the near-term, on top of the direct fall in GDP related to lower power output. The extent of the impact must be subject to significant uncertainty however, being dependent on the extent to which Japan can quickly substitute other power sources for the lost nuclear capacity and just how long the planned power outages last.

- **Financial contagion**. Activity may also be negatively affected by wealth effects such as stock market losses and uninsured losses faced by households and firms (only around 15% of homes and businesses are believed to have earthquake insurance), and losses at banks and insurers. Banks may face loan losses in badly affected areas, especially regionally-based lenders. In the case of insurers, much of the potential insured losses (preliminarily estimated at up to US$35 billion) may be passed on to global reinsurers.

Looking back to the Kobe earthquake in January 1995, industrial output fell 2.6% in the month containing the quake and retail sales fell 1.4%. **We estimate industrial output could fall by around 5% in March,** which would wipe out the previously expected strong growth in output for the first quarter.

Assuming drops in construction and retail sales similar in scale to those seen after the Kobe earthquake, **we now expect GDP in the first quarter to contract by 0.2-0.5%. This would put Japan back into technical recession as 2010Q4 also saw a fall in GDP**.



Taking a longer view, however, the growth picture is less dire. **Assuming no further major aftershocks or deterioration in the nuclear situation, there is a good chance the economy will regain much of the lost output relatively quickly**. In the five quarters following the Kobe earthquake, Japanese GDP rose by an average of 0.7% per quarter and industrial output in the Kobe region regained 98% of its pre-quake level within eighteen months.

This happened in large part because of significant reconstruction spending by the Japanese authorities – special relief and reconstruction spending in 1995/1996 totalled ¥3.4 trillion (around 0.7% of GDP) and around two-thirds of the rise in GDP in this period was the result of government investment and consumption. This gave way to a strong rise in private investment in the rest of 1996. A similar pattern has been observed after other earthquakes, i.e. of major initial disruption giving way to strong recovery as rebuilding efforts get under way.

Our central forecast now would be for a repetition of this pattern, with a contraction in GDP in 2011Q1 to be followed by growth at around 0.6-0.8% per quarter in the next three-four quarters (compared to 0.4-0.5% quarterly growth seen in our pre-earthquake forecast). Our GDP forecast for 2011 is likely to slip to around 1% from 1.3% but for 2012 to rise to perhaps 2.5% from 2%.

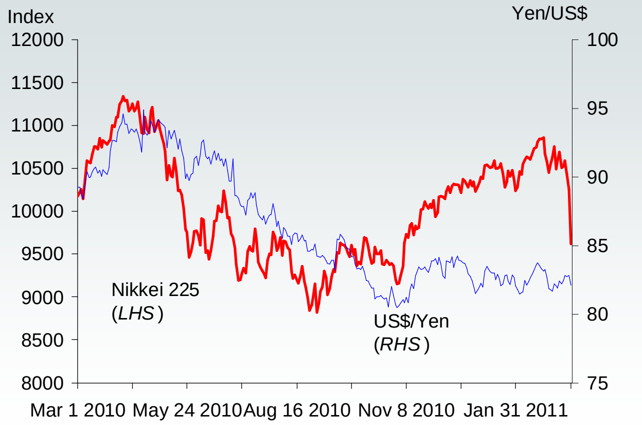
One possible risk to a repeat of this pattern is the poor state of Japan's public finances. In 1995, Japan's net public debt was only around 20% of GDP and the budget deficit around 5% of GDP. Today, the equivalent figures are 120% of GDP and 10% of GDP, implying much less room for manoeuvre. Moreover, just prior to the earthquake the government was locked in a political battle to push its budget proposals through parliament in the face of strong opposition resistance.

This implies some risk that reconstruction efforts this time could be slower to get off the ground and be ramped up compared to 1995/1996 either due to political delays, financing constraints or both. Alternatively, part of the reconstruction spend might have to be financed by tax hikes or spending cuts elsewhere which would reduce the positive impact on GDP.

In the near-term, it appears that the Bank of Japan will have to do some of the heavy lifting. The BoJ has already announced the injection of ¥15 trillion into money markets to support their smooth operation and an expansion of its asset purchase programme by ¥5 trillion (around 1% of GDP). This carries some potential inflation risks, but it should be remembered that Japan's economy has been operating well below capacity and that the quake will have cut both aggregate supply (through damaged factories etc.) and demand so the impact on the output gap may be limited.

Part of the reconstruction spending may also be funded by the repatriation of foreign assets by the private sector. In 1995, Japanese assets abroad fell by over US$100 billion in part due to this process. Japan remains a large net external creditor despite its large public debt, so the scope for this is substantial. In principle, the government could sell some foreign assets, too, such as the US treasury bonds in which FX reserves are largely invested. This could push up US yields but we think such a move is relatively unlikely.

Japan: Financial markets



Source : Oxford Economics/Haver Analytics

In terms of financial market impacts, the pattern so far has been for a steep fall in equities of around 9% combined with a drop in 10-year bond yields of around 10 basis points and little change in the value of the yen. These effects are not dissimilar to those seen after the Kobe quake and we **would expect much of the 'shock impact' to wear off quickly** – two-thirds of the drop in the Nikkei 225 index seen after Kobe was recovered after a week. There is also little evidence that the stock market was overvalued prior to the earthquake so that the danger of a 'bubble' being deflated by this disaster seems limited.

The yen is likely to be supported initially by the repatriation of financial assets mentioned above, but might weaken in the medium-term if monetary policy is substantially loosened on an enduring basis to help counter the quake impact and fund reconstruction. The compression in bond yields seen so far is also unlikely to last, either because extra borrowing is needed to fund reconstruction or because a much looser monetary stance raises inflation expectations.

The broader global impacts will include a near-term drop in exports to Japan from its major trading partners and a fall in commodity prices – Japan is a substantial net importer of commodities including oil to the tune of 4.3 million barrels per day. The commodity impact has already come through, with the CRB index down around 3% since the middle of last week.

As with the domestic financial market impacts above, we would expect the initial shock effect on commodities to wear off relatively quickly (although some fuels such as perhaps LPG might get a more permanent boost if Japan switches to these in place of lost nuclear capacity) and trade between Japan and its partners should also recover relatively quickly, implying limited spillovers to global growth. This is of course dependent, as with our estimates for Japanese growth in the coming quarters, on the situation not deteriorating substantially further.