The Regional Impact of Japan's Triple Disaster

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Costs of the Disaster for Those Directly Affected

It is impossible to write about the Great East Japan Earthquake without first acknowledging both the scale of the disaster and the impact on those directly affected.

Professor Takatoshi Ito in "Japan's Economic Options: The 3.11 Crisis" in the *APEC Economies Newsletter* Vol.15 No. 04 (May 2011) reported that by April 25, more than 14,000 confirmed deaths had been recorded and over 12,000 people were still missing. Over 18,000 buildings or structures had been completely destroyed with a further 140,000 damaged, while 190,000 were displaced. A METI briefing on June 2 updated these figures to 15,200 deaths, over 6,500 missing, over 5,300 injured, and over 100,000 evacuees as of May 25.

It was a triple disaster. The earthquake measured 9 on the Richter scale, a level of energy which is literally incredible. However, despite some later recriminations, Japan's building codes were strongly resistant, and most deaths and property damage came from the subsequent tsunami. Unfortunately one of the places where precautions proved inadequate was the Fukushima Dai-ichi nuclear plant and the extent of the nuclear disaster remains uncertain (although less than feared when acknowledgment of possible contamination resulted in the disappearance of bottled water from supermarket shelves over quite a wide area. Radioactive contamination was brief and limited to a restricted area.)

While it is important to provide a dispassionate analysis of the triple disaster, this must accompany and not supplant genuine human sympathy (and help) for those on whom the losses fell most heavily.

Extent of Cost

The scale of the disaster is hard to comprehend. Yet it is not among the biggest global disasters relative to the wealth of the affected area.

In its *Financial Stability Report* (May 2011), p. 16, the Reserve Bank of New Zealand reports that the standard international compilation of earthquake costs, the Integrated Historical Global Catastrophe Database (CATDAT), lists the absolute economic loss of the recent disaster as very large in historical perspective, nearly 25% more than the Kanto earthquake of 1926, but that the intervening growth of the Japanese GDP means that the earlier loss was proportionately 10 times that of the Great East Japan Earthquake (and the 9th highest in the database). On the proportionate scale, the recent disaster is much smaller than the Canterbury earthquakes in 2010-11 and even less than the Hawke's Bay earthquake of 1931.

This is in no way inconsistent with the common view that the resilience of Japanese society was tested and not found wanting. The self-discipline and mutual support of the communities subjected to devastation were truly impressive. The comparative loss figures tell us only about the large population and high level of wealth in modern Japan.

In any case, measuring the cost is not simple, and putting it into an appropriate perspective is even less so.

Indemnity & Replacement Cost; Technical Progress

Valuing life is inherently contentious and as the appropriate calculation depends on the purpose in hand, it is rarely worthwhile in abstract. However, we see the impact of disasters more clearly by considering how property costs are measured.

In most cases, measurement begins with insurance valuations and processes. Insurance contracts can take several forms: they may provide for indemnification of losses with some provisions about the basis on which the amount to be indemnified will be assessed, or they may provide for replacement of the insured asset. In the latter case, too, there may well be room for negotiation. Literal replacement may not be sensible – or even possible where the underlying land has been found inappropriate for the structure placed on it – and the insurer and the insured will negotiate about their appropriate contributions to an improved or alternative asset.

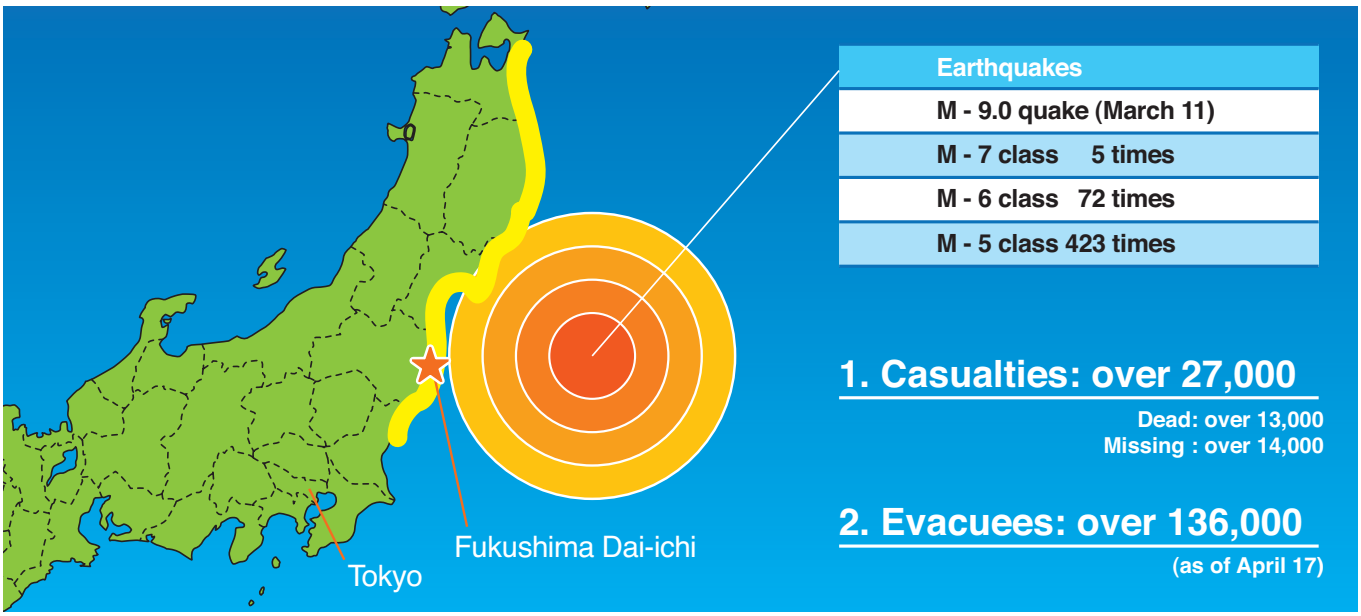
The involvement of insurers reminds us that the ultimate location of costs is not likely to be with those most directly affected. Some costs will be borne by governments and so ultimately by taxpayers, but many will be borne by international reinsurance companies and then by their shareholders and customers, depending on various elasticities reflecting a responsiveness that permits cost-evasion and cost-shifting.

More subtle is the way that losses are mixed with technological progress. We can refer to a specific current case in Canterbury. Several of the buildings of the University of Canterbury were damaged and cannot be used without extensive and expensive restoration. But some of those buildings are 40 years old and were due for extensive refurbishment anyway. Furthermore, whereas buildings of the 1960s had single-glazed steel windows, the current standard is double-glazed aluminium windows, which improves safety and also insulation, so that heating costs are diminished and over time the saving in energy cost will pay for the technological upgrade. Allocation of the cost between indemnification or replacement and new capital expenditure – and between insurers, and the university (and its government and private funders) is clearly not a simple task.

We learn even more by looking at the Hawke's Bay earthquake of 1931, which has been studied by Simon Chapple in "The Economic Effects of the 1931 Hawke's Bay Earthquake" in the *NZIER Working Paper* 97/7 [August 1997]. The damage in Japan came from the tsunami rather than the earthquake, and in Hawke's Bay much of the loss, especially property damage, came from fire rather than directly from the earthquake. The rebuilding operation remains very much in the popular consciousness because it created townscapes, especially in Napier, that are now a model of the art deco architectural style and the basis of a successful tourist industry. Evaluations of the cost of the

Japan faces an unprecedented challenge

(Enormous earthquake, tsunamis and nuclear accident)



Source: Ministry of Economy, Trade and Industry (METI)

events of February 1931 vary very significantly depending on the time horizon being employed. When I grew up in Napier in the 1940s and 1950s, the earthquake was very much part of popular knowledge, with an emphasis on the cost involved and with little recognition of the art deco architectural treasures with which we were surrounded; now the earthquake is remembered mostly as the source of an urban asset.

Furthermore, Napier was a major port, but its facilities were the cause of longstanding civic discord. They were developed within an inner harbor, a shallow estuary of significant rivers, and it was supplemented by wharves behind a constructed breakwater in the open sea. The earthquake raised the floor of the inner harbor (and diverted the rivers into new courses) so that it became obvious that the port would develop on the basis of the breakwater. A modern container port can now be found there. Initial estimates of the cost of the earthquake included large sums for restoring the inner harbor, but those costs were never incurred. Rather the former inner harbor became valuable land for industrial and residential purposes and the regional airport. This "cost" of the earthquake was probably negative, at least over the medium term. The central government's recognition of this before local authorities no doubt contributed to the creation of what Chapple calls the "myth of stingy central government under such upsetting circumstances." Despite ranking high in proportionate costs on a global perspective, the Hawke's Bay earthquake gets little attention from historians of New Zealand's economic development. While it was an enormous event in the lives of those immediately affected, it had little impact on the long-run development of the national economy. Responses to the opportunities created by a major environmental event may eventually have more than compensated for the immediate cost.

It will always be true that the gains from technological progress could have been secured in less adverse circumstances. Disasters necessitate learning to see how risk management can be improved. The Hawke's Bay earthquake resulted not only in revised building codes but better precautions against fire. The recent events in both Canterbury and Japan show the need for new learning. From Christchurch, it is obvious that knowledge about liquefaction is inadequate; on what long ago was a swamp, silt was forced upwards through the violent shaking of subsurface gravels. Japanese building codes were mostly adequate, but tsunami protection was not. And nor were the design codes for nuclear reactors. We should appreciate that learning is costly and risk management is incompatible with certainty about the future. It is fatuous of the IEAE to suggest that codes should ensure complete safety of reactors even if it is slightly generous to characterize the response to the disaster as "exemplary."

Not even learning is entirely beneficial. It is worth reflecting on the general experience of flood protection. Professor Pawson has written in the *Newsletter of the Economic History Society of Australia and New Zealand* (May 2011), "the more that had been spent on flood defenses in New Zealand, the greater the extent of losses from floods over time." The explanation is quite simple. As defenses against floods were improved, more intensive settlement followed, and future losses occurred in more valuable property. Incentives do not always work out exactly as intended, and better tsunami protection has to be calculated, not governed by passion. It sounds sensible to prescribe that nuclear reactors should not be built in a seismically active zone – but all zones are seismically active.

As important as the scale of the disaster will be the energy and innovativeness of the response.

Regional Significance

The Great East Japan Earthquake differs from the Canterbury earthquakes (let alone historical events) in that its absolute size and the regional and international role of Japan make it of regional and global significance.

While the eventual outcome of the Japanese event will depend on responses to it, just as is the case with the New Zealand and other disasters, more of the response and beneficial developments will occur outside Japan than is the case in New Zealand. The regional leadership of Japan will be tested.

〈Speedy Dissemination of Accurate Information〉

- Japan is committed to the speedy dissemination of accurate information.
- All necessary information can be found at the following websites.

Japan's Countermeasures

http://www.kantei.go.jp/foreign/incident/index.html
http://www.meti.go.jp/english/index.html
http://www.nisa.meti.go.jp/english/

Food Safety

http://www.maff.go.jp/e/index.html
http://www.mhlw.go.jp/english/topics/2011eq/index.html

Measurement of Radioactivity Level

http://www.mext.go.jp/english/radioactivity_level/detail/1303962.htm
http://www.nisa.meti.go.jp/english/
http://www.worldvillage.org/fia/kinkyu_english.php
http://www.tepco.co.jp/en/press/corp-com/release/index-e.html

Ports and Airports Safety

http://www.mlit.go.jp/page/kanbo01_hy_001428.html
http://www.mlit.go.jp/koku/flyjapan_en/index.html
http://www.mlit.go.jp/page/kanbo01_hy_001411.html

Drinking Water Safety

http://www.mhlw.go.jp/english/topics/2011eq/index.html
http://www.waterworks.metro.tokyo.jp/press/shinsai22/press110324-02-1e.pdf

Source: METI

It is inevitable that some economic activity will migrate from East Japan not only to West Japan and other Japanese regions, but also overseas. The net impact of the disaster, and the likelihood of following historical precedents whereby the eventual outcome is more favorable than the initial impact, depends on how the process is managed.

Food industries are important in the Tohoku region. There is a natural wish to provide more assistance to both agriculture and processing activities. But the long-term effect of protectionism is no different when it originates in a disaster. A much better outcome, for Tohoku, Japan, and the region would follow from guiding resources to their future best use. Funding should build a regional food industry that fits the likely future regional economy, paying attention to linkages among agricultural production, processing and distribution, all on a regional basis. For more than 25 years, I have heard that Japanese agriculture will be restructured as aging farmers withdraw, but Japanese farmers are long-lived, and are have aged successors, not least because of farmers' privileges in regard to succession taxes. There has indeed been some rise in the average age of farmers, from about 60 to 65, but life expectancy has probably increased faster. The eventual disaster outcome will be more favorable if there are positive policy moves towards modernization in a regional setting.

That can be generalized. Supplies of various manufactured goods have been interrupted by damage to factories in Tohoku and this has an impact on customers who may be final consumers or downward links in a supply chain. The desirable response is to diversify sources of each component in any supply chain, and certainly not to lose the advantages of diversified and fragmented production in an anachronistic search for self-sufficiency. The interruptions are mostly proving to be short and limited anyway. And there is optimism to be derived from the responses through which Tokyo companies found innovative ways to reduce power usage.

This leads to the most important point of all. The future of East Asian supply chains depends on finding ways to generate and implement innovation. To keep its leadership role, Japan needs to provide leadership in regional innovation, in generating and implementing research and development that provides new products and new ways of satisfying consumers. The earthquake and tsunami damaged facilities at several research establishments, and much will depend on the success which visionary leaders achieve in seeking to seize the opportunity to build new collaboration among institutions. This will inevitably include institutions from outside Japan in the new network relationships.

Being forward-looking applies to more than R & D institutions. The problems with electric power have drawn attention to the thoroughly outdated technical barriers within the electricity supply in Japan such that power from Kansai cannot readily be transferred to Kanto. The system of regional supply monopolies is antiquated; service to consumers should be separated from management of the national grid.

Response to the earthquake will be more effective if it is conceived regionally rather than nationally. But maintaining fresh and relevant thinking and not relying on old shibboleths is important everywhere. Debate about the necessity of government spending to avoid recessions is simply outdated. People in the region should all remember the moment of truth in 1978 when James Callaghan, prime minister of the UK, sought understanding of the notion that government as a fairy-angel source of free funds had passed its expiry date.

"We used to think that you could spend your way out of a recession and increase employment by cutting taxes and boosting government spending. I tell you in all candor that that option no longer exists, and that, insofar as it ever did exist, it only worked on each occasion since the war by injecting a bigger dose of inflation into the economy on every occasion, followed by a higher level of unemployment as the next step. Higher inflation followed by higher population… "

Thinking about macroeconomic policy needs to be as clear-eyed as planning for supply chain renovation and development. JS

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