KNOWLEDGE NOTE 6-4

CLUSTER 6: The economics of disaster risk, risk management, and risk financing

The Financial and Fiscal Impacts

GFDRR
Global Facility for Disaster Reduction and Recovery
THE WORLD BANK

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The Financial and Fiscal Impacts

The Great East Japan Earthquake (GEJE) occurred against the backdrop of a struggling economy and public finance system under stress, implying an exceptional fiscal cost and imposing a fiscal management challenge to the government of Japan (GoJ). In response, the government committed to a full-scale national initiative that has evinced its ability to quickly mobilize short-term liquidity but leaves in question its reliance on debt issuance and taxation measures to finance longer-term reconstruction. This note examines the fiscal costs of the event, the financial measures taken by the GoJ to fund these expenses, and the fiscal implications of these actions. Lessons learned and recommendations for developing countries are distilled from this discussion.

The Great East Japan Earthquake (GEJE) inflicted massive physical damage on private and public assets, destroyed livelihoods, and disrupted local and national economies. In the aftermath of the event, the GoJ announced a full-scale national response in which the government would support (i) rebuilding disaster-resilient regions, (ii) restoring the livelihoods of the disaster-affected population, and (iii) reviving the local economy and industry. To finance this approach, the GoJ mobilized a portfolio of fiscal measures that minimized the financial burden on local governments, residents, and industry but significantly increased the financial burden of the central government, and thus, indirectly, of the current and future Japanese population and economy. According to the Cabinet Office, the GEJE was a "crisis in the midst of a crisis" for the Japanese economy and its public finance (Cabinet Office 2011c). The GoJ has had to balance financing and executing an effective postdisaster response against planning how to spread the costs of this response across generations.

FINDINGS

Understanding the GoJ's postdisaster roles and responsibilities, as stated in Japanese laws and as evidenced by past disasters, helps to explain the GoJ's expenditures and revenues

TABLE 1: **Direct economic impact of the GEJE**

Law(s)	*Relevance to the GoJ's contingent liability in natural disasters*
Disaster Relief Act (1947)	• Provides for disaster relief and welfare support (including repair of private housing, cash transfers and/or loans, and so on) to affected populations. • Establishes subsidization of local governments' measures by the central government. • Mandates the establishment of a disaster relief fund for emergency relief activities by each prefecture.
Disaster Countermeasures Basic Act (1961)	• Is the cornerstone of Japan's disaster risk management (DRM) system. • Sets out local and central governments' responsibilities at all points in the DRM cycle, including levels and forms of the local and central governments' postdisaster responsibilities • Embeds financial measures as one of the eight core components of Japan's DRM system; under this section, defines disaster-expense-sharing fiscal mechanisms that can be employed by the government postdisaster (for example, subsidy, tax, and debt measures).

related to the GEJE. Japanese law clearly defines the roles and responsibilities, including financial, of the local and central governments in disaster response. A number of laws lay out a broad scope for the GoJ's legal contingent liability[1] in the event of natural disasters, inclusive of responsibilities for disaster response, reconstruction of public and certain private assets, and social and economic restoration. At the center of these laws are the *Disaster Relief Act* and *Disaster Countermeasures Basic Act* (table 1).

Other laws, such as the *Act on Special Financial Support to Deal with Extremely Severe Disasters* (1962) and the *Natural Disaster Victims Relief Law* (1998) further extend the scope of the government's financial responsibility. Additionally, a series of laws that provide for government support to provision certain lines of insurance (earthquake, agricultural, fisheries, fishing boat, and forest; see KNs 6-1 and 6-2), establish a contingent liability of the government to pay its portion of reinsurance payouts under these schemes.

COST OF THE GEJE TO THE GOJ

The GoJ estimates that the GEJE caused direct economic damages to private and public capital and infrastructure in the amount of ¥16.9 trillion ($210 billion), 4 percent of Japan's gross domestic product (GDP). The indirect costs of the event in the short, medium, and long term are difficult to quantify but are likely much greater.[2] Although originally forecasted

1 As defined in World Bank (forthcoming), a contingent liability is a spending obligation arising from past events that will be incurred in the future if uncertain discrete future events occur.
2 Indirect losses are losses that result from physical damage, such as business interruption, reduced tourism, reduced tax revenue, and so on.

to grow during 2011, Japan's GDP contracted by 3.5 percent during the first quarter and by 0.7 percent for the full year (IMF 2011; World Bank 2012).

While the public sector's share of the direct and indirect losses from the GEJE is difficult to determine, it is undoubtedly significant. More easily analyzed are the fiscal costs of the government's relief, recovery, and reconstruction measures after the GEJE. For short- to medium-term costs, government budgetary and cash-flow data (that is, disaster-related expenditures and revenues) can be used. For assessment of longer-term fiscal impacts, projections are more difficult, as they embody a great deal of uncertainty due to possible variances in expected tax revenues, changes in the Japanese bond market, and/or changes in the GoJ's debt-management capacity. Furthermore, fat-tailed risks, such as the possibility of long-term impacts from the nuclear accident in Fukushima, could increase the fiscal costs of the disaster in the long run.

CENTRAL GOVERNMENT SPENDING FOR THE GEJE

As of mid-2012, total central government funding allocated to the GEJE totals ¥19.17 trillion (table 2). This total includes spending from the first contingency funding approved in Japan's fiscal year (FY) 2010,[3] through the most recently approved funding for the FY12. While earlier funding (that is, up to and including the second supplementary budget) was primarily for relief and recovery costs, the later budgets were primarily for reconstruction. Thus, a significant share of the later budgets may be disbursed for reconstruction projects over multiple fiscal years.

Note: The Third Supplementary Budget included a ¥2,489.3 billion allocation to repay the financing borrowed from FY11 pension funding. This repayment has been considered in this accounting of the GoJ spending on the GEJE.

TABLE 2: **Approved central government spending on the GEJE, FY10–FY12**

Date	*Fiscal year*	*Financing mechanism*	*Amount (¥ billion)*
14 Mar 11	10	FY10 General Contingency Budget	67.8
19 Apr 11	11	FY11 General Contingency Budget	50.3
2 May 11	11	1st Supplementary Budget	4,015.3
25 Jul 11	11	2nd Supplementary Budget	1,998.8
21 Nov 11	11	3rd Supplementary Budget	9,243.8
8 Feb 12	11	4th Supplementary Budget	6.7
1 Apr 12	12	FY12 Bridge Budget	9.3
6 Apr 12	12	FY12 Budget	3,775.4
TOTAL			**19,167.4**
TOTAL FY11			**15,314.9**

Source: Authors, with data from Japan Ministry of Finance (2012).

3 Japan's fiscal year runs April 1 to March 31. The GEJE struck on March 11, 2011, toward the tail end of FY10.

TABLE 3: **Estimated costs of the GEJE to the central government of Japan**

	Percentage of FY10 GDP	*Percentage of FY11 initial General Account Budget*
Total, FY10–12	4.0	20.7
Total, FY11	3.2	16.6

Source: Authors, with data from Japan Ministry of Finance and Cabinet Office.

The GEJE imposed an exceptional cost on Japan's central government: total central government funding for the event through mid-2012 represented 4 percent of FY10 GDP and 20.7 percent of GoJ's initial FY11 general account budget (table 3).[4] Considering only the costs incurred during FY11 following the event, these represent 16.6 percent of the initial general account budget and 3.2 percent of FY10 GDP. In comparison, central government spending on the Great Hanshin-Awaji (Kobe) Earthquake of 1995 totaled about 1 percent of Japan's GDP at the time (IMF 2011).

The GEJE reconstruction period is planned for ten years, with the first five as the concentrated reconstruction period. The latest GoJ figures for central and local government reconstruction expenditures (released on July 29, 2011) estimate at least ¥19 trillion[5] until the end of FY15 and ¥23 trillion for the full ten years (Reconstruction Headquarters 2011). As central government spending through FY12 has already exceeded ¥19 trillion, it is likely that total public expenditures on the GEJE will run fairly above these levels.

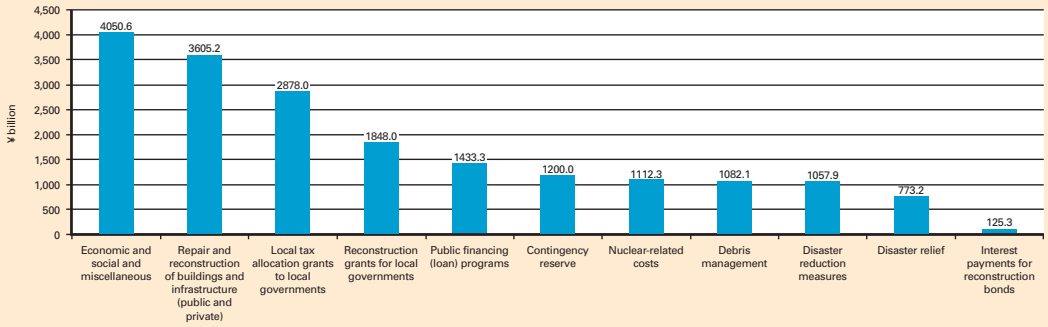
The central government is also responsible for its portion of insurance payouts under the public-private insurance programs for earthquakes, agriculture, fisheries, fishing boats, and forests. Payments for the government's liability under the fisheries and fishing boat insurance, ¥93.9 billion, are included in the first supplementary budget. The central government's share of payouts for the GEJE under the agricultural and forest insurance programs is still undetermined.[6] Its payment under the earthquake insurance program, not financed by the supplementary budgets, totals ¥540 billion.

ALLOCATION OF CENTRAL GOVERNMENT EXPENDITURES ON THE GEJE

The most significant funding allocations by the central government on the GEJE from FY10 through FY12 are for economic and social support programs and miscellaneous expenditures, followed by repair and reconstruction costs for public and private buildings (figure 1 and table 4). If transfers to local governments under local tax allocation grants for discretionary spending and reconstruction grants are aggregated, however, these take the lead, being greater than ¥4.7 trillion.

4 FY10 GDP was ¥479.2 trillion and FY11 initial general account budget was ¥92.4 trillion (Ministry of Finance 2011).
5 This estimate includes the first and second supplementary budgets, which had already been approved at that time.
6 The level of payout for the agricultural insurance program remains uncertain due to the nuclear accident at Fukushima.

FIGURE 1: **Central government funding allocation for the GEJE, FY10–FY12**



Source: Authors, with data from Japan Ministry of Finance.
Notes: (i) Due to rounding, the sum of these totals is not exactly equal to total central government expenditure, ¥19,167.4 billion. (ii) This categorization of allocations is based on that used by the GoJ. In some cases, two GoJ categories have been combined when funding is for similar activities.

While these figures are informative, they must be interpreted with care. Some categories provide estimates of close to final or final totals for allocations to the category; others, such as repair and reconstruction and interest payments for reconstruction bonds, will continue to grow. In addition, because the local tax allocation grants to local governments represent a discretionary spending category, the governments can allocate these funds across the remaining categories (that is, the total of central and local government spending on disaster relief may be greater than what is captured here); similarly, the reconstruction grants for local governments increase the total amount spent on repair and reconstruction of buildings and infrastructure.

COSTS TO LOCAL GOVERNMENTS

The fiscal impact of the GEJE on local governments (prefectural and municipal) is much more difficult to assess, in great part due to the very limited availability of information on disaster-related expenditures and revenues at local levels. The scale of the disaster—primarily in the three most-effected prefectures, Fukushima, Iwate, and Miyagi—suggests that it far exceeded the capacity of local public finance to fund a significant share of reconstruction costs.

From the designation of the GEJE as an "extremely severe disaster" the day after the event, the GoJ's decisions and policies have aimed to shift as much of the financial burden of the GEJE to the central government. For example, under the Natural Disaster Victims Relief Law, which provides subsidies up to ¥3 million to affected households, the central

TABLE 4: **Explanation of central government funding allocations for the GEJE**

Allocation category	*Amount (¥ billion)*	*Additional explanation*
Repair and reconstruction of buildings and infrastructure (public and private)	3.605.2	Repair and reconstruction of public and private buildings (airports, facilities, housing, schools, and so on) and infrastructure (sanitation, roads, railroads, and so on).
Local allocation tax grants to local governments	2,878.0	Special tax allocation for discretionary spending.
Reconstruction grants for local governments	1,848.0	Program for municipalities in the Special Zone for Reconstruction.
Public financing (loan) programs	1,433.3	Loan programs for small and medium enterprises (SMEs), agriculture and education industries, homeowners, and so on.
Economic and social restoration measures and miscellaneous expenses	4,050.6	Support to economic restoration such as employment measures, measures for SMEs, agriculture-related industries, and so on. Support to social restoration such as housing grants, health-care support, education assistance, and so on. Miscellaneous costs such as self-defense and police forces; food, fuel, electricity, and natural resource supplies; international information sharing; and so on.
Contingency reserve for recovery and reconstruction from the GEJE	1,200.0	
Debris management	1,082.1	
Disaster relief	773.2	Temporary housing, condolence money, and so on.
Disaster reduction measures	1,057.9	Earthquake-resistant building of schools (national).
Reconstruction from nuclear damage	836.9	
Compensation for damage by nuclear accident	275.4	Security money, investment.
Interest payments for reconstruction bonds	125.3	

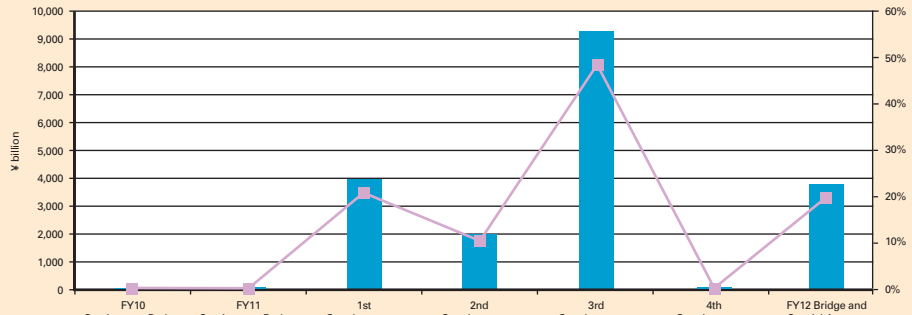
Source: Authors, with data from Japan Ministry of Finance.

and local governments equally share the liability. Following the GEJE, however, the law was amended with the central government's share being increased to 80 percent for the GEJE.[7] The central government budgeted ¥352 billion between the first and second supplementary budgets to fund its additional liability under the program.

The role of the central government in funding reconstruction is emphasized in the central reconstruction policy, the *Basic Guidelines for Reconstruction in Response to the Great East Japan Earthquake*. The *Basic Guidelines* promote a full-scale national response that will "make use of all possible measures to support reconstruction efforts of the disaster-afflicted local governments," and establish a Special Zone for Reconstruction within which local governments, residents, and industries are eligible for tax reductions and incentives and budget and financial subsidies. One of the most significant supporting subsidies is the reconstruction grant program for local governments. Under this program, after having their reconstruction plans approved, municipalities receive grants worth 50 percent of project costs for infrastructure and asset reconstruction and 80 percent for supporting projects. The remainder of the project costs can be financed by the special local allocation tax provided by the central government, effectively eliminating any additional expenses to the municipal government (Reconstruction Agency 2012).

Through FY12, the central government provided ¥1.6 trillion in GEJE reconstruction grants and about ¥3 trillion in local allocation tax grants to local governments. Restrictions on the use of the special local allocation tax grants have been relaxed for the GEJE reconstruction, allowing for spending at the discretion of local governments.

FIGURE 2: **The GEJE financial allocations and timing, FY10–12**



	FY10 Contingency Budget	FY11 Contingency Budget	1st Supplementary Budget	2nd Supplementary Budget	3rd Supplementary Budget	4th Supplementary Budget	FY12 Bridge and Special Account Budgets
	14 Mar11	Apr 11	2 May 11	25 Jul 11	21 Nov 11	8 Feb 12	1 Apr 12
Amount (billion yen)	67.8	50.3	4015.3	1998.8	9243.8	6.7	3784.6
% of total GEJE spending through FY12	0.35%	0.26%	20.95%	10.43%	48.23	0.03%	19.75%

Source: Authors, with data from Japan Ministry of Finance (2012).

7 This amendment only applies for the GEJE. Cost sharing remains 50/50 for all other disaster events.

TABLE 5: **Special tax measures in response to the GEJE**

Target	*Goal of measures*	*Measures*
Japanese population and private sector	Encourage contributions to recovery and reconstruction efforts	• Increase of maximum deduction from income tax for contributions to the GEJE. • Income tax deduction for investments in companies contributing to the regional recovery.
Disaster-affected population and enterprises	Relieve financial and administrative burden	• Individuals: Special treatments for casualty losses, property damage (housing, household assets, motor vehicles), pension savings, and so on. • Firms: Special treatments for inventory and asset losses, withholding taxes, and so on.
	Promote investment and growth in reconstruction zones	• Tax incentives to promote investment, employment, and research and development in selected industries (for example, renewable energy, agriculture, and medical).

Source: Authors, with information from the Japan National Tax Agency (2011).

REDUCED TAX REVENUES FROM SPECIAL TAX MEASURES

The GoJ implemented a series of special tax measures designed to increase the cost sharing of disaster recovery and reconstruction by the Japanese population and private sector (table 5). Many tax incentive measures also aimed to attract the development of priority industries in the reconstruction zone. These tax incentives were complemented by financial incentives through subsidies in some cases.

In the longer term, these tax measures would help to widen and deepen the government's tax base and raise tax revenue. In the short term, however, they reduced the tax revenues of the central and local governments. The central government, therefore, bore the full costs and compensated the local governments for their decrease in revenues (Reconstruction Agency 2012).

GOJ'S SHORT-, MEDIUM-, AND LONG-TERM DISASTER FINANCING METHODS AND THEIR FISCAL IMPACTS

SHORT-TERM FINANCING MECHANISMS

The GoJ moved with remarkable speed to mobilize emergency relief funding following the GEJE. Within three days, the Cabinet Office was determined to draw down on Japan's FY10 general contingency budget[8] to procure and transport emergency relief supplies to the disaster-affected areas. A total of ¥67.8 billion was mobilized before the end of March; in April, another ¥50.3 billion was drawn down from the FY11 general contingency budget for transitional shelter. This funding was quickly mobilized because, unlike supplementary budgets, prior parliamentary approval was not required.[9] Thus, the general contingency budget provided immediate bridge financing till more substantial funding could be mobilized (figure 2).

Within two months, the GoJ approved a ¥4,015.3 billion supplementary budget for relief-and-recovery costs. For this First Supplementary Budget, the Ministry of Finance looked within the existing budget for funding sources. The approved budget relied on a combination of budget reallocation (¥660.6 billion), borrowing from the pension fund (¥2,489.7 billion), contribution from public works projects (¥55.1 billion), and liquidation of the full FY11 allocation to the Contingency Reserve for Economic Crisis Response and Regional Revitalization (¥810 billion).

This approach illustrates the GoJ's resourcefulness, but also demonstrates the limitations of ex post budget adjustments to finance disasters. Budget reallocation was used for the first supplementary budget and again for the third (¥164.8 billion). In sum, though, less than 1 percent of the FY11 general account budget was reallocated to the GEJE recovery efforts, and budget reallocation contributed only 5.4 percent of current total central government spending on the event. Furthermore, more than half the funding for the first supplementary budget was borrowed from the pension fund, which allowed the government time to mobilize additional resources that have to be repaid at a later date. Finally, the government redirected the full FY11 *Contingency Reserve for Economic Crisis Response and Regional Revitalization* toward the disaster—the intent of this reserve, however, was not for natural disasters but for economic measures required to stabilize Japan's economic situation during times of financial crisis.[10]

In late July, the smaller second supplementary budget was passed. The GoJ was able to fund this budget with surplus from FY10, the result of higher-than-expected FY10 tax revenues and unused funds.

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8 For the 23 years preceding 2010, Japan's general contingency budget was allocated ¥350 million; in 2010 this allocation was lowered to ¥300 billion, representing about 0.3 percent of the central government's initial general account budget for 2010.

9 Retroactive parliamentary approval is allowed for expenditures from the general contingency budget.

10 The Contingency Reserve for Economic Crisis Response and Regional Revitalization was introduced in the budget in FY10 in response to the worsening economic situation caused by the global financial crisis. The contingency budget had previously been used to support employment programs for college graduates as well as other economic support programs.

FIGURE 3: **Financial resources identified in the *Basic Guidelines***

- **Reduction of government expenditures.**
- **Selling of state-owned properties.**
- **Reviews of the special accounts and personnel salaries of public servants.**
- **Increases in nontax revenues.**
- **Temporary taxation measures.**

MEDIUM- TO LONG-TERM FINANCING MECHANISMS

The government's short-term measures funded relief-and-recovery activities while it formulated its reconstruction policy. When the *Basic Guidelines* policy document was released at the end of July, it set a conceptual framework of sharing the costs of GEJE reconstruction within this generation and not passing them on to future generations of Japanese. Financial resources provisioned for use by the *Basic Guidelines* are listed in figure 3.

On November 30, 2011, the bill on special measures to secure financing for GEJE reconstruction was passed. Its approval followed a great deal of debate about what debt and tax measures the government should take for the GEJE. Under the approved plan, issuance of Japanese Government Bonds (JGBs) financed the majority of the estimated reconstruction costs. The bulk of repayment costs for these bonds were secured through tax increases. Personal income tax, in the form of surtax, was raised for 25 years starting in 2013. A 5 percent corporate income tax cut that was initially planned in 2011 was postponed, and a ¥1,000 increase in per capita local tax (currently ¥4,000 per year) was included. Table 6 provides details on the increases and their projected revenue generation.

While the tax measures will be phased starting in FY12, reconstruction bond issuance commenced in early December 2011. In total, slightly more than ¥14.2 trillion of JGBs have been issued or planned thus far: approximately ¥11.6 trillion for the third supplementary budget of 2011 and nearly ¥2.7 trillion for FY12. Interestingly, about 25 to 30 percent of reconstruction bonds are being sold to retail investors with 3-, 5-, and 10-year maturities. A portion of these bonds are reconstruction supporters bonds that facilitate financial support and solidarity from the Japanese public. These bonds offer the lowest possible interest rate for government bonds (0.05 percent) for three years, before converting to standard JGB rates. The GoJ has recruited Japanese celebrities to market the bonds and is offering gold and silver commemorative coins to purchasers (figure 4).

FISCAL IMPACTS OF THE GOJ'S FINANCIAL MEASURES

Although the GoJ is endeavoring to minimize debt costs and tax increases, the financial measures it has taken for reconstruction have had significant fiscal impacts. The GEJE was "a crisis in the midst of a crisis," and the financial burden of the event has placed significant additional strain on public finance.

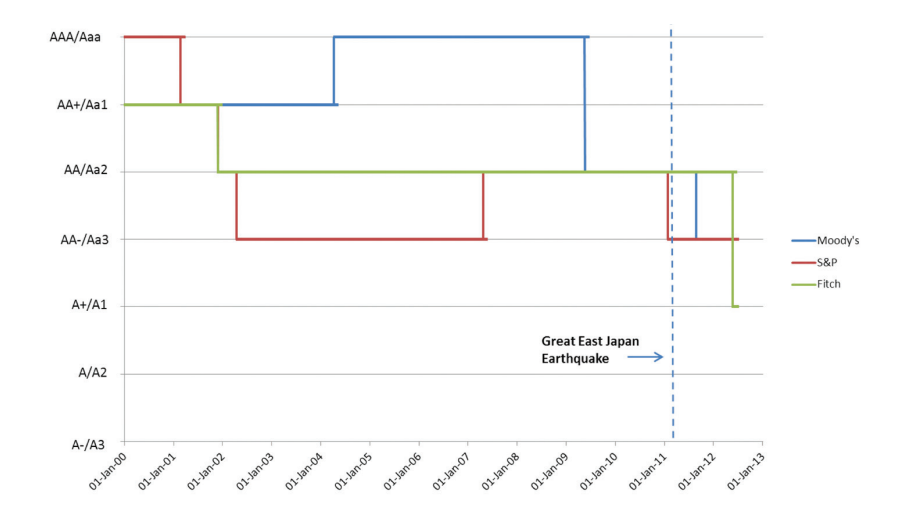
FIGURE 4: **Design of commemorative coin by elementary student**

Even before the GEJE, Japan's public finance under stress, as budget deficits of the central and local governments grew. Credibility of the JGBs and its sovereign debt rating was, and still is, declining—it is now rated at the same level as China by each major rating agency (figure 5). Compared to its accumulated central government debt-to-GDP ratio at the time of the 1995 Kobe earthquake, which was lower than one-half of GDP, the GoJ's central government debt was about 140 percent and growing at the start of FY11 (debt ratios of Hyogo prefectural and municipal governments doubled and remain higher than prior to the event).

One of the factors driving the government's increasing dependence on debt has been Japan's aging population and decreasing tax revenue. The population share aged 65 and above is expected to increase from 21.5 percent in 2007 up to 40 percent in 2050. Such aging is already increasing the fiscal burden on the government, as it needs to spend more on social expenditure. In addition, in recent years, tax revenues have been declining due to the global financial crisis and tax cuts. While Japan still can increase some tax forms, others, such as the corporate income tax, are already high.[11]

11 According to the IMF (2011), Japan's consumption tax (value added tax, or VAT) is the lowest of advanced economies with a VAT, and its personal income tax structure allows much room for deductions and provides low marginal rates for the middle class.

FIGURE 5: **Sovereign credit rating of Japan by major rating agencies, 2000 to current**



Source: Authors, with data from Moody's, S&P, and Fitch.

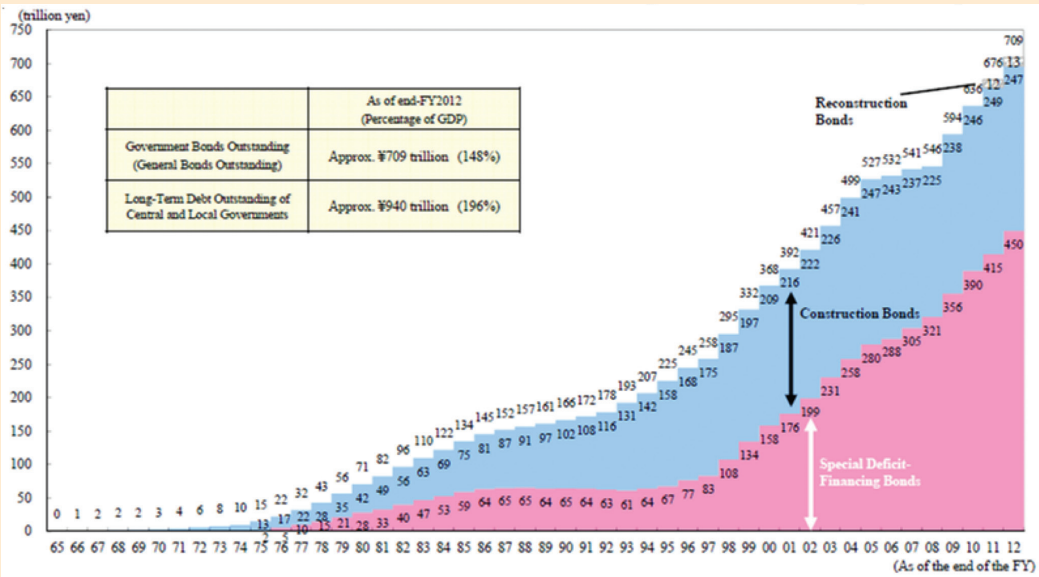
In sum, at the time of the GEJE, the GoJ had little leeway in terms of either its ability to utilize debt financing or taxation measures. Debt issuance increases demand for fiscal reconstruction that further undermines confidence in the creditworthiness of the JGBs. Regarding tax increases, the government was relying on existing room for tax increases to finance rising social expenditures. The aging of the population means that the government is less able to spread the costs of the GEJET intergenerationally because there is already such a high burden placed on the young and future generations.

While initial policy goals following the GEJE were to minimize debt issuance and to keep taxation measures temporary, the plan finally agreed upon was somewhat different than that initially proposed. Issuance of reconstruction bonds was widely accepted as a short-term measure to finance the reconstruction costs. Opinions differed, however, regarding their redemption period. Standard construction bonds have a 60-year maturity, leaving the burden of repayment to future generations. For reconstruction bonds, though, the GoJ proposed that they be paid back within 10 years, with tax increases also within the redemption period to secure revenues to redeem them.

Ultimately, negotiation and compromise resulted in the final package of debt and tax measures for the GEJE. A much-discussed increase of consumption tax was left out of the package.[12] The marginal increase of personal income tax was low, but the surtax was put in place for 25 years, placing the public debt burden on the "shrinking," relatively speaking,

12 The GoJ has proposed to increase the consumption tax rate by 5 percent to fund increasing social expenditure costs until the mid-2010s as a part of its "unified reform of tax and social spending" initiative.

FIGURE 6: **Accumulated GoJ bonds outstanding, FY1965–FY2012**



Source: Japan Ministry of Finance (2011).

younger generation. Furthermore, there is a risk that reconstruction tax revenues will not match with expenditures for servicing reconstruction debt, which is being aligned with the broader plan for government debt issuance.[13] In addition, long-term uncertainty about macroeconomic conditions increases the risk of mismatch between projected and actual tax revenues.

In the context of the government's gross outstanding debt, the additional reconstruction bonds issued in FY11 and FY12 make small contributions (figure 6). That said, they force a change in the government's medium-term fiscal policy to reduce debt issuance year on year, as the total amounts issued in FY11 and FY12 are greater than the reduction in nonreconstruction debt issuance. This dynamic poses challenges for the government's fiscal consolidation target to halve the deficit-to-GDP ratio from FY10 by FY15 (Cabinet Office 2010).

13 The Act for Special Measures for Securing Financial Resources Necessary to Implement Measures for Reconstruction Following the GEJE does stipulate, though, that reconstruction bonds must be redeemed by 2037, within the term of income tax increase (Article 71).

LESSONS

- **The GoJ's broad contingent liability to natural disasters results from its responsibilities explicitly defined in Japanese laws and the implicit expectations of society, which can result in extraordinary fiscal costs, as evidenced by the GEJE.** The GoJ is expected not only to reconstruct assets, but to restore social and economic well-being following a major disaster. This role aligns with the Japanese values of solidarity and cooperation, but implies that the public finance system is highly exposed to disaster risks. The GEJE raised general account spending by nearly 16.6 percent in FY11—an earthquake striking Tokyo, for example, could stress the system much further. Quantitative analysis of the government's contingent liability to disasters would be an important first step toward management of its financial exposure to this type of event.

- **Local governments are at the frontlines of disaster response and reconstruction and thus the most aware of local needs, but local public finance has limited capacity to cope with large-scale disasters.** The liability of the central government was expanded following the GEJE (for example, under the Natural Disaster Victims' Relief Law), and transfer schemes were designed to allow the central government to fund locally designed reconstruction plans. While the magnitude of the GEJE exceeded what might be reasonably expected for local public finance to manage, it provides an opportunity to review and strengthen the effectiveness of local governments' disaster-financing mechanisms.

- **The GoJ's contingency budget allows it to quickly mobilize funding for an effective disaster response.**[14] The flexibility and immediate availability of the GoJ's contingency budget allowed it to approve funding within three days of the GEJE to finance immediate emergency relief. Although relief costs represent a very small portion of the overall amount spent on the disaster, they serve an essential function in mitigating additional fatalities and damages linked to a slow response effort.

- **Tax measures can be used effectively ex ante to incentivize investment in disaster prevention and ex post to facilitate cost-sharing of reconstruction by the population and private sector.** Japan has a series of laws that provide tax incentives for investment in earthquake mitigation. Although difficult to quantify, these incentives promote risk reduction and likely reduced losses from the GEJE in some areas. Following the event, the government immediately enacted tax relief measures for affected populations and industries, and it built tax incentives into its reconstruction policy. It also offered special tax deductions to individuals and corporations that contributed to the reconstruction and recovery effort, thus facilitating solidarity and cost-sharing by the unaffected population and private sector.

- **Financial demands placed on the government by major disasters exacerbate the underlying structural problems of the fiscal system.** The GEJE forced the government to issue additional debt and pass tax increases in an economic and fiscal environment in which these actions were not only unfavorable, but counter

14 Equally as important, it was able to smoothly execute these funds for reconstruction due to pre-agreements with private sector firms. See KN 4-1 of this series for additional information.

to fiscal management policy. The experience emphasized the imperative of having a robust fiscal system capable of absorbing large disaster shocks. For Japan to achieve prompt and enduring reconstruction, it should look beyond restoration, which brings the Japanese economy back to the predisaster state, and seek to strengthen the economy and society in a broader sense to prepare for the future.

- **A lack of ex ante financial planning for disasters can contribute to disagreements and possible delays around securing reconstruction funding.** Although Japanese law allows for the government to secure funding for disasters in broad terms, lack of a clear "blue print" for how the government would finance reconstruction opened space for prolonged deliberation on appropriate measures. Alternative plans and road maps for flexibly financing reconstruction under different scenarios, both in terms of the type and scale of disaster and the economic and fiscal environment, could be designed to prevent this from occurring in the future.

RECOMMENDATIONS FOR DEVELOPING COUNTRIES

Japan's public finance responsively provided financing for an effective relief effort, but was stressed by the extensive burden of recovery and reconstruction funding requirements. In developing countries, where governments' fiscal options to finance disasters are likely more limited—for example, due to structural weaknesses such as lack of income support, inadequate financial resources, and lack administrative capacity—fiscal impacts of these events can be even more substantial. The following recommendations could mitigate the impacts of disasters on governments' long-term fiscal balances and increase their financial response capacity in the aftermath of a disaster.

TREAT DISASTER RISKS AS A CONTINGENT LIABILITY OF THE GOVERNMENT

- **Quantitatively assess the government's contingent liability in the event of natural disasters.** Identify the government's explicit (that is, stated by law) and implicit (that is, socially and politically expected) contingent liabilities for disasters. Historical analysis, complemented with information from probabilistic risk models, can provide a sense of the government's recurrent financial needs as well as possible major losses from catastrophic events related to these contingent liabilities. In addition, where risks cannot be quantitatively assessed, they should be qualitatively identified and discussed. Clear definition of the government's contingent liability helps to protect public finance from an open-ended financial liability to disaster events.

- **Develop a disaster-risk-financing strategy as part of the government's broader fiscal risk management strategy.** The disaster risk financing and insurance strategy should combine ex post and ex ante measures to optimize the timing, cost-efficiency, and effectiveness of disaster funding. For short-term postdisaster liquidity needs, the strategy should rely on ex ante budgetary and possibly market-based instruments, such as contingency budgets, reserve funds, and contingent credit. For the longer term, major reconstruction costs, a "blue print" for mobiliza-

tion of ex post financial resources (for example, debt issuance and tax increase) should complement the ex ante measures. Scenario analysis should be conducted to ensure the robustness of the strategy for disasters of varying type, magnitude, and location under different macroeconomic and fiscal conditions.

- **Understand the roles and financial responsibilities of the central and local governments in this process.** Local governments should, to some extent, share financial responsibility for disasters affecting their territories. But local and central governments should agree together ex ante whether and how sharing of these financial responsibilities changes after severe disasters.

REDUCE THE CONTINGENT LIABILITY OF THE GOVERNMENT IN THE LONG TERM

- **Use fiscal tools such as taxation and subsidization to encourage ex ante DRM.** The government could decrease residential and private sector dependence on post-disaster government aid by using tax and/or subsidy tools to encourage ex ante DRM. Although the relative power and ease of use of tax versus subsidy tools varies across countries, the government could achieve similar ends through either means by offering tax incentives or subsidies for investment in disaster prevention. It could also promote minimum levels of prevention by imposing tax penalties or fees for underinvestment in risk reduction and/or for risk-increasing actions.

- **Promote the development of private catastrophe risk insurance markets.** The deepening of private catastrophe risk insurance markets shifts more of the burden of postdisaster recovery to specialized risks carriers. The government can encourage the development of functioning catastrophe risk markets by putting in place and enabling the legal and regulatory framework, developing risk market infrastructure, and facilitating risk-pooling mechanisms.

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