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Director's Perspective

Entitlement Reform and Debt Reduction Will Be Major Areas of Policy Debate

In the past few months, U.S. debt and our structural deficit have made headlines, roiled markets, and left Congress and the president to scramble to find policy solutions. Discussions of the deficit and the debt were highlighted during the July 2011 legislative debate over raising the U.S. debt ceiling and again immediately following Standard & Poor's downgrade of the U.S. debt from its AAA status.

The U.S. debt has grown dramatically since 2007 and, under reasonable policy scenarios, is expected to continue to grow. The reasons for the growth in debt vary. They include the 2001-2003 tax cuts, revenue declines in the wake of the recession and the slow recovery, and higher spending due to the bailouts, wars in Afghanistan and Iraq, and new domestic spending initiatives. Andrew Reschovsky discusses these issues and more in this *La Follette Policy Report*.

Although discussions of "who is to blame"

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Solving America's Debt Crisis

By Andrew Reschovsky

On August 2, 2011, just in the nick of time, President Obama signed legislation raising the nation's debt ceiling and avoiding a default. Although the new legislation mandated large cuts in federal government spending and established a joint congressional committee to propose additional debt reduction, many observers argue that these steps are unlikely to do much to address the nation's long-run debt problem. In this article, I describe the nature of the debt crisis and the consequences of doing nothing to solve it. I then discuss several bipartisan proposals to reduce the nation's debt.

The federal government runs a deficit in any year in which total spending is larger than revenue. Deficits are not necessarily bad for the economy. In fact, the ability of the federal government to run a deficit during an economic slowdown is important in the fight against unemployment, while running a surplus during a full employment period counters inflationary pressures. During the current recession, government revenues have declined, and the demand for government programs, such as unemployment compensation, housing assistance, and Medicaid, have increased. Both of these changes increase the deficit.

Since 1960, the federal government has run a deficit in all but five years (1969 and 1998 through 2001). During most of this period, the annual deficits were small relative to the size of the economy, averaging 2.9 percent of the nation's gross domestic product (GDP). As the economy stalled in late 2007 and we entered what has come to be known as the "Great Recession," tax revenues fell and the costs of federal programs to help people in need rose. Government efforts during the Bush and Obama administrations to prevent a complete collapse of the financial markets, to stimulate demand, and to bail out Fannie Mae and Freddie Mac all led to major surges in government spending. As a result, the deficit skyrocketed to 10 percent of GDP in fiscal year 2009.

Additional tax cuts enacted in late 2010 and the cost of the wars in Iraq and Afghanistan have contributed to historically large deficits in fiscal years 2010 and 2011. As the economy continues to recover, the deficits are likely to decline to about 6 percent of GDP, still a very high level by historical standards.

However, by the end of the decade, annual deficits as a percentage of GDP will begin to grow again. If current spending and taxation policies are maintained, total federal government revenue would be sufficient by 2025 to finance only the three major entitlement programs — Social Security, Medicare, and Medicaid — and interest payments on the federal debt. The financing of all other government activities, from operating Congress to maintaining national defense and homeland security, would require borrowed money. By 2040, with interest on the debt growing rapidly, tax revenue would not even be sufficient to fund the major entitlement programs.

Under existing tax policies, revenues grow at about the rate of GDP growth. However, the combination of an aging population and ever-increasing health-care costs result in a rapid and continual rise in the amount of money needed to finance Social Security, Medicare, and Medicaid. The retirement of the Baby Boom generation will greatly increase the number of people eligible for these government entitlement programs and consequently drive up costs.

To finance its deficits, the U.S. government must borrow funds. The cumulative amount borrowed is the nation's outstanding debt. As long as annual deficits remain modest in size, the debt relative to the size of the economy remains low. Although the federal government debt was larger than GDP during World War II, it declined rapidly during the postwar years and remained well below 50 percent of GDP from fiscal years 1957 through 2008.

Since fiscal year 2008, the debt has grown precipitously. It jumped from 40 to 54 percent of GDP from 2008 to 2009, rose to 62 percent in 2010, and it is likely to reach 72 percent of GDP in fiscal year 2011.

Forecasting the size of deficits and aggregate debt is difficult. Among the most widely cited forecasts are those issued annually by the Congressional Budget Office (CBO). In its June 2011 report, the CBO presents two long-term budget scenarios, each based on a different set of assumptions about future government revenue and spending policies. The "extended baseline" is based on existing law, which calls for the expiration of all tax cuts enacted since 2001 and for very large reductions in discretionary government spending

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(including defense) relative to GDP.

The CBO's "alternative fiscal" scenario is based on the assumption that Congress will continue to retain many popular tax and spending provisions. For example, Congress is likely to extend most of the Bush-era tax cuts and prevent a large expansion in the reach of the alternative minimum tax. Also, discretionary spending as a percentage of GDP is unlikely to fall as rapidly as required under existing law.

Figure 1 illustrates the actual ratio of public debt to GDP from 1970 to 2010 and the forecasted ratios based on the two

CBO scenarios for the years 2011 to 2035. Under both scenarios, the debt held by the public would grow to about 75 percent of GDP by 2013. After that, the debt-to-GDP ratio would remain relatively stable under the extended baseline scenario, rising to 84 percent of GDP by 2035, but would increase rapidly under the more realistic alternative fiscal scenario. Debt would be equal to 97 percent of GDP by 2020, about 150 percent of GDP by 2030 and equal to nearly 190 percent of GDP by 2035.

The Economic Consequences of Rising Debt

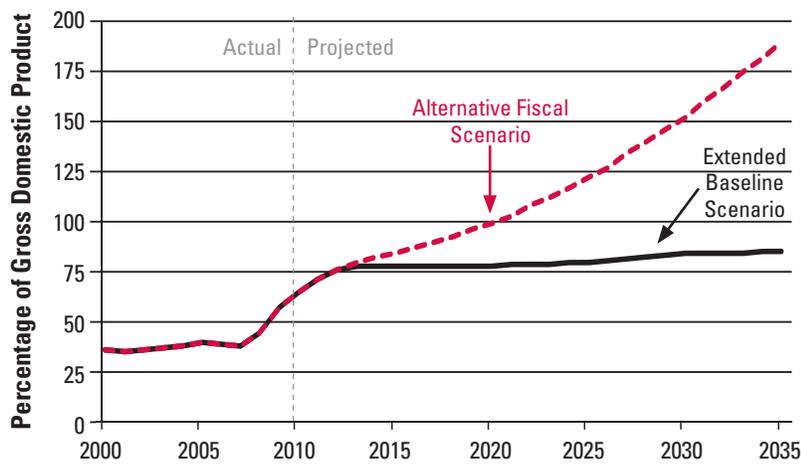
Foreign governments, individuals, and businesses hold more than half of U.S. debt. As long as these investors are confident that we can repay our debt, they will continue lending. They benefit in part because the money we borrow helps finance our purchase of their exports. However, the United States clearly cannot continue forever on its current course. If we fail to rein in our growing debt, lenders will at some point stop purchasing U.S. Treasury bonds.

If the decision to stop lending to the U.S. Treasury were precipitous, the consequences would be truly catastrophic. Interest rates would rise sharply, and the dollar would fall. The country's inability to borrow would force large cuts in government spending and increases in taxes. The result of these actions would almost certainly lead to a deep recession. The ability of the government to combat the recession would be limited given the near impossibility of further debt financing.

Although the U.S. Treasury bond market could collapse, a more likely outcome is that borrowers would grow increasingly worried about the rising U.S. debt and would begin to drive up the cost of borrowing for the U.S. Treasury. In effect, potential lenders would require a risk premium in the form of higher interest rates, which would harm the U.S. economy. Higher interest rates mean that interest

Figure 1: Federal Debt Held by the Public

The Congressional Budget Office projects two scenarios for U.S. public debt as a percentage of gross domestic product.



Source: Congressional Budget Office

costs would take up more than the current 6 percent of the federal budget. Greece provides a cautionary tale. In 2010, with massive borrowing required to fund deficits of about 15 percent of GDP, the sustainability of the government's fiscal policies seemed doubtful and the possibility of default on their bonds rose. Borrowers required higher interest rates: the rate on government bonds increased from about 6 percent early in 2010 as the crisis developed to more than 17 percent in mid-2011. Higher borrowing costs in the United States would increase our deficits or replace public spending, including funds for education, research and development, and infrastructure, that contributes to economic growth.

A rising debt-to-GDP ratio would be likely to lower the nation's productivity and economic growth even if it did not directly result in higher borrowing costs. Research by economists Carmen Reinhart and Kenneth Rogoff finds that countries with debt ratios topping 90 percent experience substantially lower rates of economic growth. The slower growth is attributable to the government borrowing replacing some private-sector investment, investment that would contribute to faster growth. Slower growth translates into a lower standard of living for most Americans.

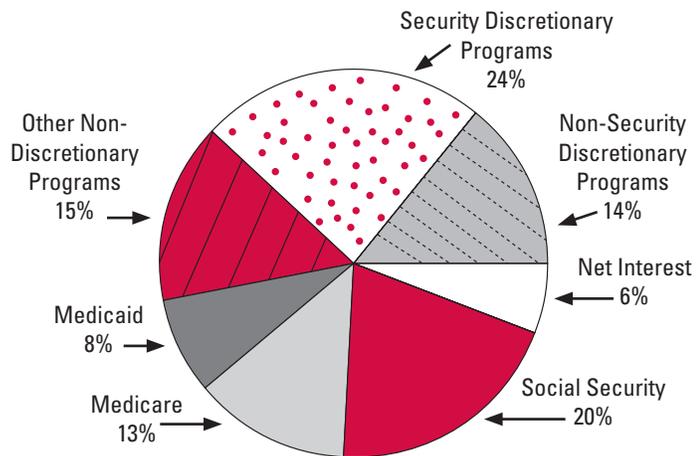
Why Is It So Difficult to Reduce the Nation's Debt?

In principle, solving the nation's debt problems is easy. Almost all experts agree that a combination of reduced spending and increased tax revenues is needed. Cuts in spending and increases in tax revenues equal to about 5 percent of GDP are required to prevent an increase in the debt-to-GDP ratio. If a constant debt-to-GDP ratio were achieved with spending cuts alone, annual non-interest government spending would have to be reduced by about 20 percent. Alternatively, if a constant debt-to-GDP ratio were achieved by relying solely on increased tax revenues, taxes would have to be raised by about 33 percent. It is impossible to imagine that Congress would ever adopt spending cuts or tax increases of these magnitudes.

The logical conclusion is that only a balanced approach to solving our debt crisis, one that includes both spending cuts and increased taxes, is feasible. That being said, neither spending cuts nor tax increases will be politically easy to enact.

Last fiscal year, federal government spending was \$3.5 trillion. Figure 2 illustrates the major spending categories. Social Security, Medicare, and Medicaid made up 41 percent of the budget. Another 15 percent was allocated to other mandated programs, and 6 percent to interest payments on the nation's debt. The remaining 38 percent of the budget went to a wide array of discretionary programs, with nearly two-thirds going to defense and homeland security.

Figure 2: Federal Government Spending for Fiscal Year 2010



Budget of the U.S. Government, fiscal year 2012, Table S-4

The current budget (fiscal year 2011 started October 1, 2010) contained tax reductions and substantial cuts in non-security discretionary programs. For the fiscal 2012 budget, the House has called for additional and controversial cuts in the same programs, but the Senate is likely to disagree. However, even if the House version were adopted, large deficits would continue and the debt-to-GDP ratio would continue to grow. The reason is the projected growth in entitlement programs, due to rising health-care costs and an aging population. As Figure 3 illustrates, after 2030 the cost of Social Security levels off at about 6 percent of GDP. The story is quite different for Medicare. Costs rise faster than GDP far into the future and are forecast to reach 10 percent of GDP in 2050. Proposals to restructure Medicare and Social Security benefits are controversial, partisan, and divisive.

The alternative route to deficit reduction is to raise government revenues. However, Congress seems to oppose tax increases even more than spending cuts. Congress has repeatedly reduced taxes by enacting rate reductions or by adding exemptions, deductions, and credits. As a result, federal tax revenues last year were 14.9 percent of GDP, their lowest level in the past 60 years. Not only have tax revenues been growing less slowly than the economy, they are substantially lower than taxes in most other developed nations. Figure 4 compares total taxes (including state and local government taxes) in the United States relative to GDP with total taxes in the 32 countries that are members of the Organisation of Economic Co-operation and Development (OECD). Among these countries, only Chile and Mexico have taxes relative to GDP that are lower than those in the United States. In a June 2011 analysis in the *New York Times*, economist Bruce Bartlett argues that one reason U.S. taxes are so much lower is that most other countries finance most of their health care through taxes rather than through private payments as we do. He then demonstrates that even if one adds private health-care spending as a percentage of GDP to the tax data presented in

Figure 4, the United States remains below the OECD average.

Despite these data on the relatively low level of taxation in the United States, 236 members of the House of Representatives and 41 senators have signed a pledge to vote against all tax increases, which has been circulated by the anti-tax organization Americans for Tax Reform.

Moving Toward a Solution to the Debt Problem

The gap between the approaches to debt reduction favored by Democrats and Republicans is immense. In general, Democrats prefer solutions that maintain the structure of the major entitlement programs, split spending cuts between domestic programs and national defense, and rely on substantial increases in tax revenues, especially from people with high incomes. Republicans favor no increases in

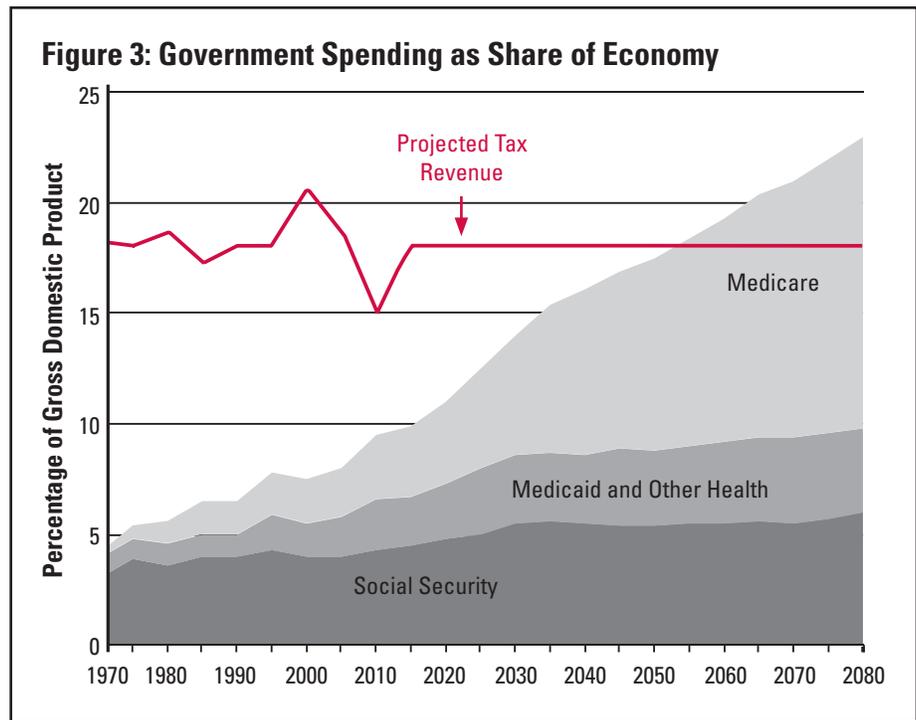
tax revenues, large reductions in discretionary non-defense spending, and major cost-saving changes to Medicare, Medicaid, and Social Security. Their preferred reforms of Medicare and Social Security include partial privatization.

Despite what appear to be irreconcilable differences between these approaches, several bipartisan efforts outline a road map for an overall deficit-debt reduction strategy.

One of the more visible bipartisan efforts is President Obama's National Commission on Fiscal Responsibility and Reform chaired by former Republican Senator Alan Simpson and Erskine Bowles, former chief of staff to President Clinton. The other effort is that of the Bipartisan Policy Center's Debt Reduction Task Force chaired by former Republican Senator Pete Dominici and Alice Rivlin, a former director of the Office and Management and Budget during the Clinton administration and former vice chair of the Federal Reserve Board.

Both bipartisan plans rely on spending reductions, entitlement reform, and revenue increases, and both are designed to achieve similar debt-reduction goals. The Bowles-Simpson plan would reduce the debt-to-GDP ratio to 65 percent in 2020 and to 40 percent by 2035, while the Dominici-Rivlin plan would achieve a 60 percent debt-to-GDP ratio in 2020 and a 52 percent ratio by 2040.

On the spending side, both plans would reduce defense and non-defense discretionary spending and restrain the rate of long-term growth in expenditures on these programs. Both plans also call for reductions in farm subsidies and cost-saving reforms to the military and civil service retirement systems. The Bowles-Simpson plan would also reduce student loan subsidies. Although differing in some details, both plans reduce the rate of growth in the cost of Social Security with small reductions in benefits for high-income workers and an



Source: Congressional Budget Office

alternative inflation measure that would reduce annual cost-of-living increases. Both plans call for slowly raising the payroll tax on higher earning workers.

Similarly, both plans include major policy changes designed to reduce federal health-care spending, including placing a strict limit on total government health-care spending, increasing Medicare premiums, reducing some provider payments, and undertaking reform of the malpractice system. The Dominici-Rivlin plan would transform Medicare into a system of "premium support" in a manner similar to the proposal by Wisconsin's Paul Ryan, chair of the House Budget Committee. Individuals on Medicare would be allocated an amount of money to purchase private health insurance. They would pay any additional costs.

On the tax side, both plans start from the premise, accepted by most economists, that our individual and corporate income tax systems are in need of fundamental reform. Although the basic purpose of taxes is to raise revenues to finance government programs, for a long time the U.S. tax system has been used to encourage various behaviors by individuals and businesses, and to bestow benefits on favored groups. For example, to encourage families to buy homes, mortgage interest is deductible. To encourage corporations to increase spending on research, credits are given. These tax expenditures add tremendously to the complexity of our tax system. Understanding, navigating, and monitoring the hundreds of exclusions, exemptions, deductions, and credits that have been added to the federal tax system costs taxpayers and the Internal Revenue Service billions of dollars. The byzantine nature of our tax system also reduces public trust in its integrity and reduces fairness. According to the Office of Management and Budget, in 2011 the 50 largest special

features of the federal individual and corporate income tax systems will reduce federal tax revenues by about \$1 trillion, an amount that is equal to 70 percent of the expected revenue this year from the individual and corporate income taxes. These numbers suggest that eliminating most tax expenditures would raise additional tax revenue while simultaneously allowing for reduced tax rates. The resulting tax system would be much simpler and fairer, and would, in the view of most economists, encourage economic growth.

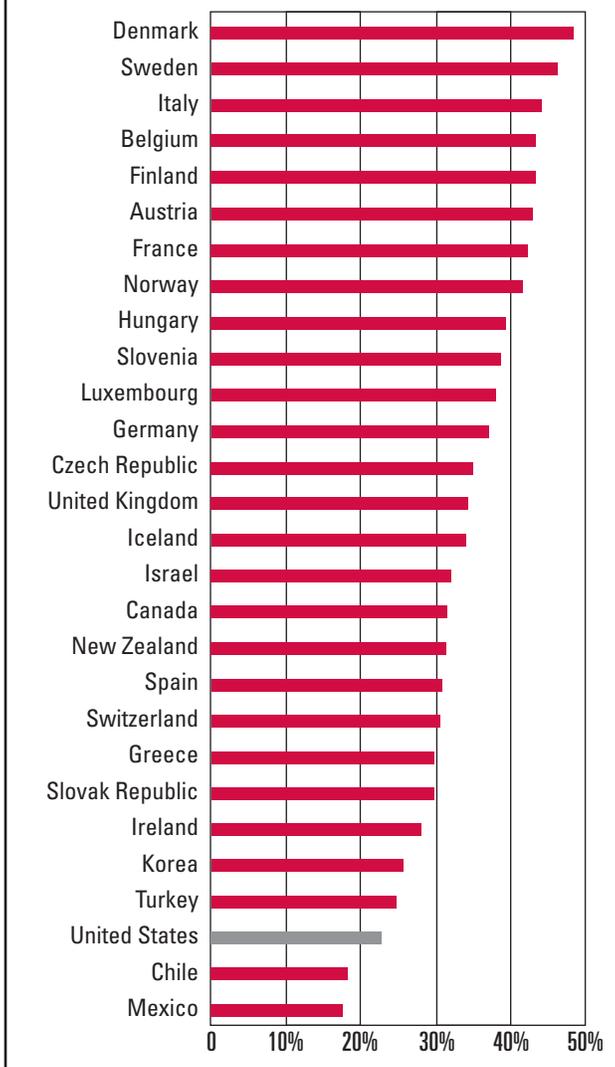
Both bipartisan plans call for eliminating most tax expenditures and substantially reducing marginal income tax rates. The Bowles-Simpson plan would set the top marginal tax rate, which is currently 35 percent, at 23 to 29 percent depending on how many tax expenditures Congress chooses to eliminate. The Dominici-Rivlin plan would establish two tax rates, 15 and 27 percent, and lower the corporate tax rate to 27 percent. In addition, it includes a 6.5 percent value added tax that would be called a “debt reduction sales tax.” Under both plans, tax revenue as a percentage of GDP would rise, reaching 20.5 percent in 2020 under the Bowles-Simpson plan and 21.5 percent under the Dominici-Rivlin plan.

The Way Forward

It appears that after many years of ignoring the fact that existing fiscal policies are driving U.S. debt to unsustainable levels, a consensus has developed among our political leaders that the nation’s debt problem is real and that the costs of any further delay in responding to the problem are likely to be quite high.

Participants in the fiscal debate agree that rapid economic growth would be the best solution to deficit and debt reduction. However, there is considerable disagreement among economists and politicians on the best policies to boost the nation’s rate of long-term economic growth. Republicans tend to argue that tax cuts, especially those targeted to businesses and the wealthy, would spur growth. Democrats emphasize

Figure 4: Total 2009 U.S. Taxes as a Percentage of GDP



Source: Organisation for Economic Co-operation and Development

the importance of enhancing the nation’s human capital through increased investments in education and in research and development. In the short run, both of these approaches would increase the debt and thus would need to be offset by additional cuts in entitlements and discretionary spending or with increases in tax revenues.

Reducing the debt requires that the United States bring spending into line with revenues, but doing so quickly and rapidly would further undermine the nation’s anemic recovery from the Great Recession. In mid-2011, the unemployment rate remains over 9 percent, the housing market remains depressed, and state and local governments around the country are cutting spending and laying off workers. Many economists fear that large spending cuts or tax increases implemented over the next few years may turn out to be counter-productive. Government austerity before the country is fully recovered from the recession raises the chance that the economy will be pushed into another recession. Slower economic growth lowers tax revenues and may well raise, rather than lower, the nation’s debt to GDP ratio.

While the case for delaying the implementation of debt-reduction policies until the economy gets back on track seems strong, Congress should not delay the adoption of a framework for reducing the federal government debt. The joint committee established as part of the debt ceiling legislation should not limit its goal to a \$1.5 trillion debt reduction mandated in the legislation. Rather, it should develop a credible plan for tax reform and for dealing with the ballooning cost of our major entitlement programs. Failure to develop a plan now will reduce the confidence of the holders of our debt. Our creditors could come to doubt that our leaders have the political will to make the hard decisions needed to solve our long-standing debt problem. In the words of Federal Reserve Board Chairman Ben Bernanke, if we don’t put in place a firm plan for entitlement reform, “in the longer run we will have neither financial stability nor healthy economic growth.” ♦

Health Shocks in Retirement: Incidence and Implications

By Geoffrey Wallace, Robert Haveman, Karen Holden, and Barbara Wolfe

Retirement years are a precarious time for many older Americans. Even if retirees succeed in accumulating resources that they expect to be sufficient to maintain their pre-retirement standard of living, many of them face unexpected adverse health shocks after retirement. Because of these shocks, the adequacy of retirement resources can deteriorate significantly as retirees and their families pay for medical needs and required care. They may also see their earnings diverted from savings into care and support for the ailing retiree. Moreover, shocks to physical and cognitive health can harm psychological well-being.

In this study, we assess the risk of several types of health shocks older adults experience. These estimates, based on a sample from Health and Retirement Study data, are a precursor to studying the effect of the occurrence of shocks on financial well-being. We specify the particular shocks to physical and cognitive health for which individuals are at risk during retirement and estimate the risk of these shocks and their persistence. Finally, we suggest how our estimates could help answer policy questions affecting retirees.

Although much is known about the adequacy of retirement savings at the time of retirement, we understand little about how the adequacy of retirement resources changes during retirement. By affecting patterns of consumption, out-of-pocket medical expenses, and work and earnings of the retiree or spouse, health shocks and their persistence may erode retirement resources.

Evidence about the rate of health shocks during retirement provides insights on the implications of proposals to maintain the solvency of Social Security and Medicare. According to the Social Security Administration in 2011, the Medicare Trust Fund will be insolvent by 2024, and Social Security Old-Age, Survivors, and Disability Trust Fund will be exhausted by 2036. Most proposals to sustain the funds' solvency include

increasing the age at which seniors are eligible for benefits. One prominent proposal for reforming Medicare involves transitioning to a voucher program that would substantially increase out-of-pocket medical expenses for all older Americans. Both of these changes shift the responsibility for covering the financial burden associated with growing old to individual retirees and away from public support. In both cases, retirement savings are likely to erode more and faster when shocks to physical or mental health occur.

Proposals to increase the Social Security retirement age are motivated by the fact that average life expectancy — and presumably the working lives of older workers — has steadily increased. Currently most retirees claim Social Security benefits when they are relatively young; only 5 percent of first-time 2008 claimants are 66 or older. If the health of some of these early retirees deteriorates rapidly early in their retirement years, the presumption of the proposals — that retirees can work into their late 60s — may be wrong. A related issue is whether retirees at the greatest risk of health shocks and the corresponding outlay in out-of-pocket medical expenses under a Medicare voucher program are in a position to absorb such expenses.

Overall, we find that while average rates of shocks are fairly low, some individuals are at substantial risk for transitioning to poor health in retirement. Additionally, we find that while most health shocks are short lived, a bout of poor health persisting for a long duration is not a rare phenomenon. Longer spells of poor health following a shock indicate more severe shocks or less resilient individuals, or they suggest decreases in the chances of recovery the older the person is and the longer the shock lasts.

Taken together, our findings suggest that, overall, retirees face rather low probabilities of experiencing health shocks early in retirement, but racial minorities, retirees with low levels of education, and people who retired on Social Security Disability Insurance (SSDI) are at substantial risk for shocks to physical and cognitive health. Groups that are most vulnerable to health shocks are also the groups most likely to have inadequate resources at retirement. These results suggest that many retirees would not have been able to work into their late 60s and that individuals at the greatest risk for large out-of-pocket medical expenses under a Medicare voucher program are the least equipped to absorb these expenses.

Geoffrey Wallace is an associate professor of public affairs and economics. **Robert Haveman** is a professor emeritus of public affairs and economics. **Karen Holden** is a professor emeritus of public affairs and consumer science. **Barbara Wolfe** is a professor of public affairs, economics, and population health sciences. All have affiliations with the Institute for Research on Poverty at the University of Wisconsin–Madison.

Table 1: Descriptions of Shock Measures for Declines in Physical and Cognitive Health

Health Measure		Description	Health Shock Measure
Physical Health	Self-Reported Health	5-point scale (poor, fair, good, very good, excellent)	Self-reported health declines to poor
	Gross Motor Skills Index	Number out of five gross motor skills with which respondent reports having some difficulty. Skills include walking one block, walking across a room, climbing a flight of stairs, getting in and out of bed, and bathing.	Trouble with three or more gross motor skills
	Activities of Daily Living Index	Number out of five activities of daily living with which respondents report having some difficulty. The activities include bathing, getting dressed, eating, getting in and out of bed, and walking across a room.	Trouble with three or more activities of daily living
Cognitive Health	Telephone Interview for Cognitive Status Score	This 10-question survey is designed to detect poor cognitive performance in a brief period of time. Respondents are scored on a range of 0-10. The questions involve naming and counting.	Score of less than 8 out of 10
	10 Noun Recall Test Score	Number of words that can be immediately recalled from a list of 10 four-letter nouns	Fewer than four nouns can be recalled
	Self-Reported Memory	5-point scale (poor, fair, good, very good, excellent)	Self-reported memory declines to poor

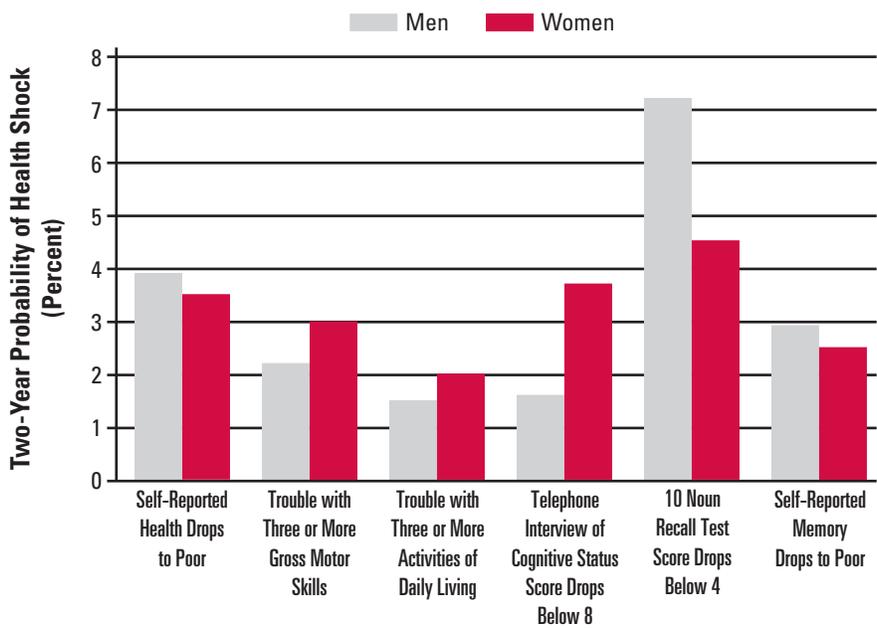
Data, Methods, and Findings

Our data come from the initial cohort of the Health and Retirement Study (HRS) that first interviewed older people in 1992. We selected these households because they include at least one person born between 1931 and 1941, which made them 51 to 61 years old in the first survey year. These same households were re-interviewed every two years; we use their data through 2008. We define our sample as “retired” when they first report receiving Social Security benefits at age 62 or later. We then tracked these individuals and observed information on their exposure to shocks to physical and cognitive health.

We identified declines in six broad measures of physical and cognitive health and treated these as unexpected shocks when each measure of health fell below a specified threshold. These measures include:

- ◆ self-reported health,
- ◆ a gross motor skills index,
- ◆ an activities of daily living index,
- ◆ a score from a modified telephone interview for cognitive status,
- ◆ the results of a 10-noun recall test score, and
- ◆ self-reported memory.

Figure 1: Average Rates of Transition into Poor Physical and Cognitive Health by Gender



We describe the measures and related thresholds in Table 1. While none of the health shocks involves work limitations per se, having trouble with three or more gross motor skills or activities of daily living would likely preclude most work involving manual labor; shocks to cognitive health may preclude work in more skilled positions.

For each of the six measures, we identified the retirees who were in the “good” status immediately after retirement. We followed these “healthy” retirees until they experienced

and recovered from a health shock, or until the data failed to contain information on their health status. We then estimated the rate of shock for each measure using a statistical framework that controls for several background variables — like schooling, marital status, race, gender, the number of years retired, and receipt of disability benefits — that are likely to be related to experiencing a health shock. We also estimate how the rate of recovery following a health shock is related to these same background variables, and the number of years (HRS waves) that the health shock persists.

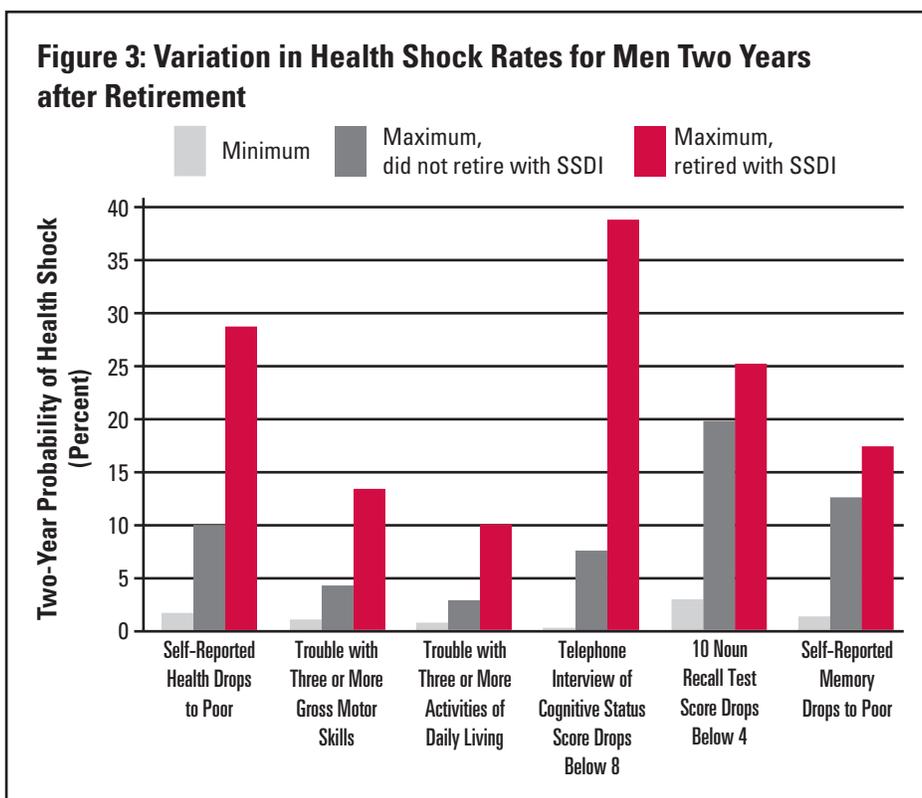
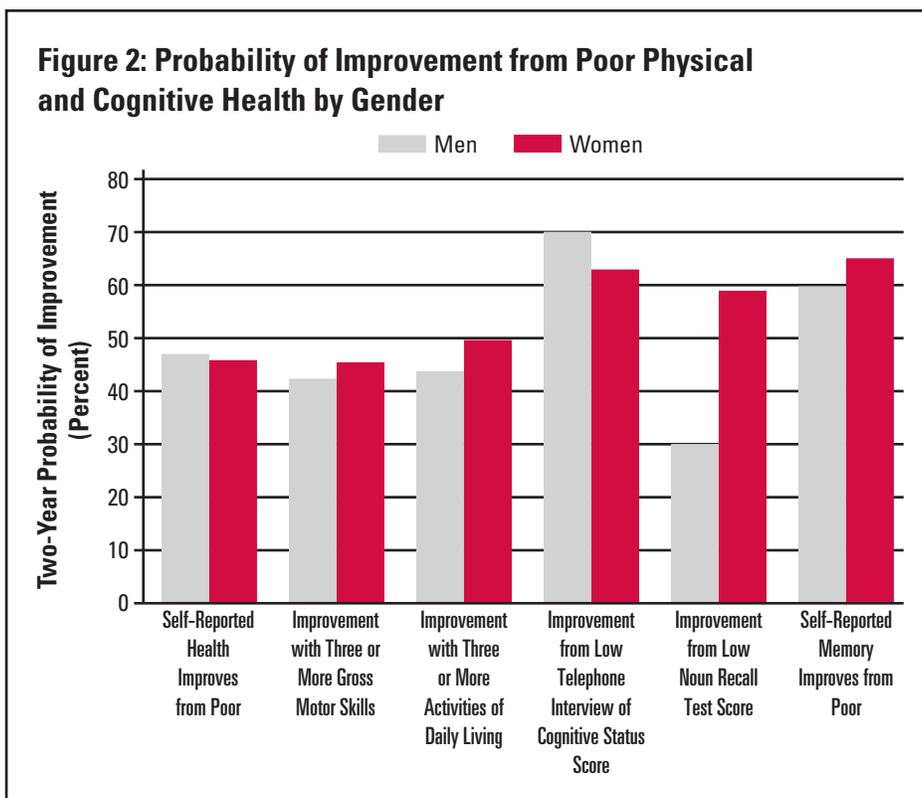
Probability of Health Shocks for Retirees

Figure 1 provides information on the average rates of health shock by gender during the first two-year HRS wave after retirement. In general, the probability of experiencing any one of these shocks during this two-year period after retirement is low. Across the six measures, the two-year probability of experiencing a health shock is about 4.5 percent. However, for the noun recall score decline, the probability is about 7 percent for men and more than 4.5 percent for women. The patterns of shock probabilities are similar for men and women except for the drop in the telephone interview score and the noun-recall score. For the telephone interview score, the probability of women having a health shock is about double that for men, while for the noun-recall score, the probability for men is substantially greater than for women.

Probability of Returning to Healthy Status

In addition to the rate of health shock, we are interested in how long poor physical or cognitive health persists following a shock. To measure this persistence, we estimate for men and women the probability of their health improving after the shock.

Average rates of health improvement during the first HRS



wave following a health shock are shown in Figure 2. In contrast to the rates of health shock shown in Figure 1, the rates of improvement are high, suggesting that poor health early in retirement is transitory in most cases. For all of the measures

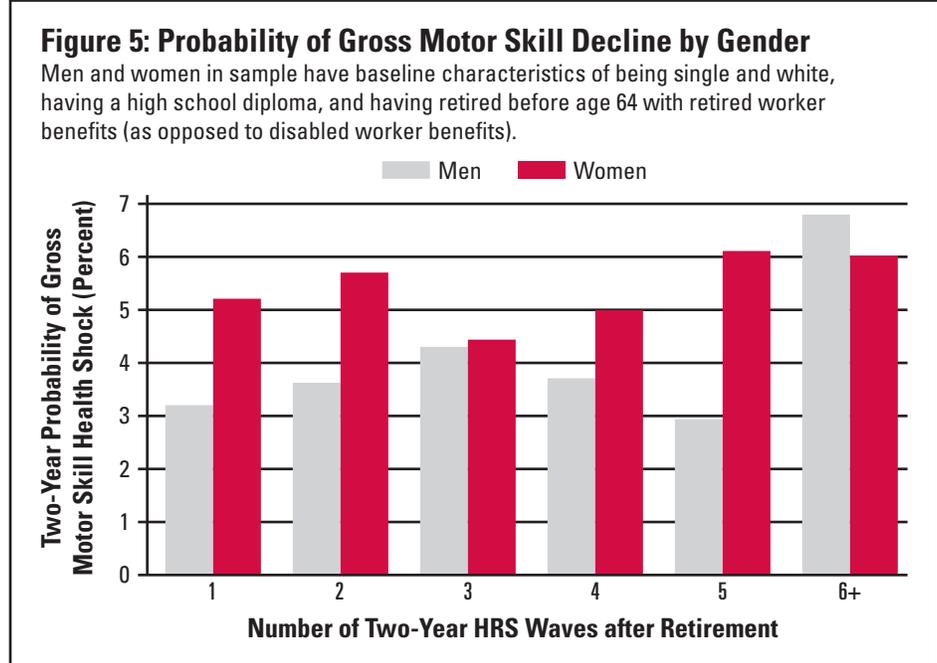
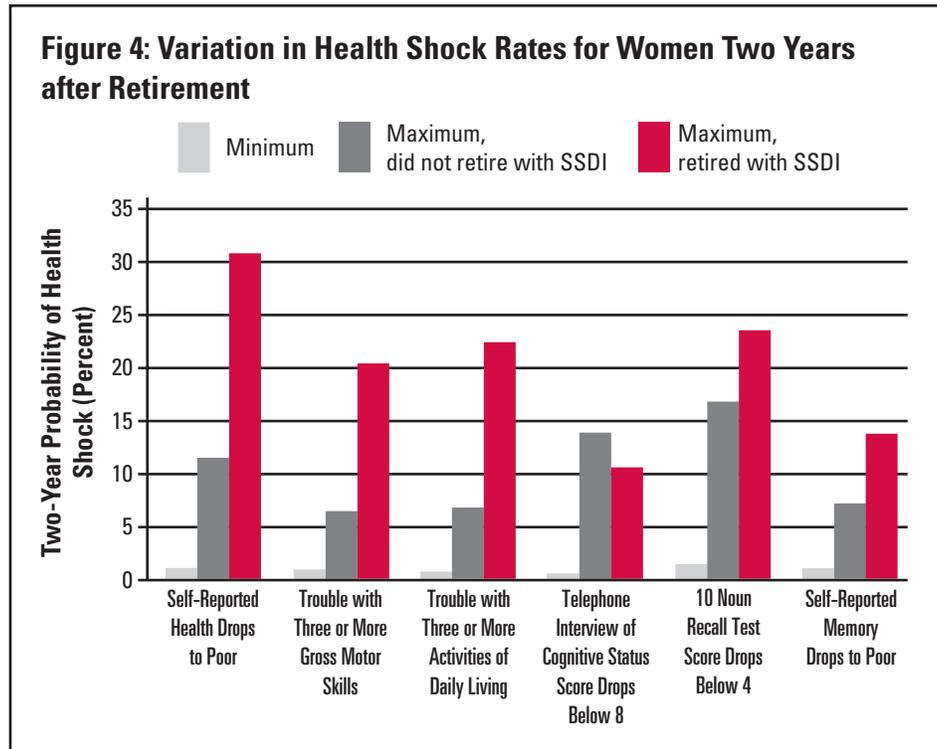
except the noun recall score for men, the two-year probability of improving exceeds 40 percent. For the noun recall score, women are less likely to experience a shock and more likely to rebound than are men.

Variation in the Chances of a Health Shock

The average rates shown in Figures 1 and 2 obscure substantial variation in individual rates of health shock and health improvement following a shock. In Figures 3 and 4, we show the minimum and the maximum rate of each of the health shocks during the first wave after retirement among men and women, respectively; these rates are predicted values from our statistical model. For the maximum value of the shock, we distinguish those who retired with SSDI benefits and those who did not.

The variation in likelihood of experiencing a health shock across individuals with varying characteristics is substantial. Retirees who are white and attended college had a very small likelihood of experiencing a shock. On the other hand, racial minorities and those who did not attend college — especially those who retired with SSDI benefits — had a much higher likelihood of experiencing health shocks within two years of retirement.

Few socioeconomic characteristics had large effects or were statistically significant in the rate of health improvement after a shock. This finding contrasts to rates of health shock, where several of these characteristics appeared to be important determinants of health shock.



Pattern of Health Shocks and Recovery

Finally, we studied the incidences of health shocks and how improvement from shocks varies for individuals over time. We expected the probability of a negative shock would be larger for individuals deeper into retirement, all else equal. We also expected that the probability of improvement from a health shock would decrease the longer the shock persists, either because shocks that persist longer are on average more severe, or because recovery from longer durations of poor health is more difficult.

Figure 5 compares men and women with the baseline characteristics of being single and white, having a high school diploma, and having retired before age 64 with retired worker benefits (as opposed to disabled worker benefits) according to their likelihood of experiencing gross motor skills health shock for each two-year period after retirement. For both men and women, the probability of having trouble with three or more of the five gross motor skills remains fairly low initially, but increases as the time into retirement deepens. The increase for women is gradual following the third post-retirement HRS

wave; it is rather rapid for men following the fifth post-retirement wave. Other measures of health shocks show a similar pattern with respect to the lapse of time since retirement, suggesting that the likelihood of health shock remains low in the early retirement years and then increases dramatically.

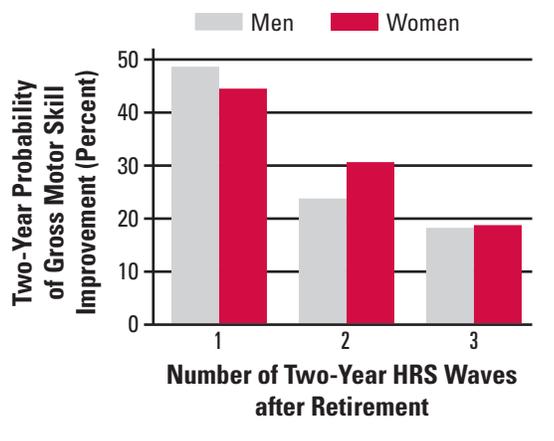
In Figure 6, we show the likelihood of an improvement after reporting trouble with three or more gross motor skills for men and women with the same baseline characteristics. The likelihood of one's health improving after this shock declines sharply with the number of years that the health shock persists. Indeed, the probability of improving in the third wave — after about seven years of persistently poor health — is less than one-half the probability of improving in the period just after the decline. A similar pattern is observed for recovery from other health shocks. This pattern of “shock persistence” suggest that health shocks that last longer are more severe, that people who experience long-lasting shocks are less resilient, or that the very nature of a persistent health shock reduces the probability of recovery.

Conclusion

We have used a sample of recent retirees from the HRS original cohort to examine the prevalence of six types of shocks to physical and cognitive health occurring after retirement. We found that within the entire group of retirees, the chance of experiencing any one of the six shocks is about 4 to 5 percent during the first two-year period following retirement. For men, the chance of experiencing a loss of recall ability exceeded 7 percent during this period. We found evidence of some differences in the risk of cognitive decline between

Figure 6: Probability of Gross Motor Skill Improvement by Gender

Men and women in sample have baseline characteristics of being single and white, having a high school diploma, and having retired before age 64 with retired worker benefits (as opposed to disabled worker benefits).



men and women, with men being at greater risk of such event; the risk rates for other shocks appear to be similar across gender. The probability of experiencing a shock increased with time. Beginning about a decade after retirement, the chances of experiencing one or another of the shocks increased substantially. Overall, retirees who experienced a shock had about a 40 percent chance of recovering in the subsequent two years, but the longer the shock persists, the lower the chances of recovery.

Across the group of retirees, there is substantial variation in the chances of experiencing a health shock. The more advantaged the group — whites, those with some college, and those who did not retire due to a disabling

condition — the lower the probability of experiencing a health shock. Conversely, minorities, those with low schooling, and those who were disabled when retiring had substantially higher chances of experiencing shocks. These patterns suggest that policymakers should pay special attention to the needs of these vulnerable older people. In particular, the retirees who are most likely to experience a health shock — racial minorities, retirees with low levels of education, and retirees who retired with SSDI — start retirement with the lowest level of retirement resources. These vulnerable retirees do not have adequate resources to deal with large out-of-pocket medical expenses that are the anticipated result of some Medicare reform proposals. Nor would these retirees have fared well with a higher Social Security retirement age that would have required them to work into their late 60s, well past the point when many of them had trouble with their physical and cognitive health. ♦



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Director's Perspective

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for the S&P downgrade and for the growing debt likely will fill many opinion pages and Sunday talk shows in the months to come, most analysts agree that the projected growth in the debt is due to the ongoing U.S. structural deficit. The major reasons for this deficit are rising entitlement obligations (primarily Medicare and Social Security) and flat projected revenues as a percentage of gross domestic product. Reforms to our entitlement programs that would reduce expenditure growth along with proposals to reshape the tax system represent the twin pillars of virtually all bipartisan proposals to reduce the deficit.

The need to reduce the structural deficit (and perhaps even occasionally run a surplus) is highlighted by Isao Kamata's discussion of Japan's experience as the country grapples with how to restore the prefectures devastated by the earthquake, tsunami, and nuclear power plant accident. When countries are hit by unpredictable events — be they natural disasters, wars, or terrorist attacks — governments often need to increase spending in response.

If many in the United States believe that entitlement reform is one key to solving the debt problem, why is achieving it so difficult? One reason is interest-group politics and the large divide in Congress between Democratic and Republican views on the best way forward. However, there are also legitimate policy reasons why reforms to the entitlement system are difficult. Geoffrey Wallace, Robert Haveman, Karen Holden, and Barbara Wolfe highlight some of these reasons. They note that a sizable minority of older Americans suffer health shocks around the time of their retirement. Raising the age of eligibility for Medicare would directly affect those with health shocks and end their access to the generous health coverage that program provides.

Thus, we have a policy tension.

In the United States, as a part of any "grand compromise" about debt reduction, we need to begin to reduce the rate of growth in the benefits we promise to working people as they age and retire. However, reductions in the entitlement system can and likely would disproportionately affect people at risk of poor health at or around the age of retirement. In the coming months, we likely will at least partially address entitlement reform, as the bipartisan congressional "super-committee" on deficit reduction meets and releases its recommendations. Reform will almost certainly be an issue in the run-up to the 2012 election. Undoubtedly, how we can efficiently and equitably reform and reduce entitlement expenditures without unduly curtailing protections for vulnerable citizens will be a top policy debate for years to come.

The Great East Japan Earthquake: A View on Its Implication for Japan's Economy

By Isao Kamata

With a magnitude of 9.0, the world's fourth greatest recorded earthquake hit eastern and northeastern Japan at 2:46 p.m. on March 11, 2011. Within minutes, a tsunami said to have reached more than 10 meters (33 feet) surged onto the Pacific Ocean coast, hitting a large area of the Tohoku and northern Kanto regions and causing catastrophic damage, especially to coastal cities, towns, and villages of three prefectures in Tohoku. Television news programs and the internet showed shocking scenes of the tsunami crashing over breakwaters and flooding those towns. The waves engulfed and swept away everything on the land, leaving behind rubble from cars, ships, and concrete buildings.

The tsunami made the Great East Japan Earthquake one of the worst disasters in human history. Human casualties total 16,000 people killed, 5,000 missing, and 6,000 injured, the Japanese government estimated in late July 2011. More than 110,000 houses and buildings were destroyed, and more than 608,000 were damaged. Ninety thousand people were living as evacuees more than four months after the disaster, down from the peak of 450,000, many of them taking shelter in uncomfortable surroundings. The subsequent accident at the Fukushima Daiichi nuclear power plant makes the damage even worse.

I would like to express my heartfelt sympathy to all the victims, including the relatives of those who lost their lives in this disaster, and pay my deep respect to those who have

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been closely involved in rescue and restoration efforts in risky environments such as the disaster-damaged sites and nuclear plant. As a Japanese native, I would also like to express many thanks to the people and governments of many countries that have been offering support to the victims and to Japan.

This article gives an overview of the impacts of the Great East Japan Earthquake on Japan's economy, mainly from a macroeconomic view of nationwide production and consumption. I, however, understand that what we care the most about are the people who lost family and friends and the impacts on individuals whose economic and social lives have been damaged. These losses are not adequately counted in the macroeconomic impacts that I will discuss. I should also mention that the information and statistics available in August 2011 on the impacts of this huge disaster are still very far from settled, and have yet to be updated and confirmed; hence the data we can rely on involve a lot of estimates. The statistical data that I use in this piece are basically from those released from Japanese government offices.

Economic Impacts on Affected Regions and the Whole Country

I consider the following aspects of this disaster. First, as the map shows, the earthquake and tsunami damaged a very large area. Second, damage to production facilities resulted in the shutdown or decrease of manufacturing production in non-disaster-affected parts of the country, as well as other countries, due to the damage to the "supply chains." Third, a serious accident at a nuclear power plant compounded the disaster.

Direct Impacts on Disaster Area

The monetary value of direct damage to buildings, utilities, roads, and other infrastructure is 16.9 trillion Japanese yen, Japan's Cabinet Office estimated in June (equivalent to about 220 billion U.S. dollars), or 3.6 percent of the Japan's gross domestic product (GDP), as compared to Japan's nominal GDP in 2009. The 16.9 trillion yen figure was estimated before the whole impact of the disaster could be assessed, so that the amount could be even larger. This estimate includes only losses in physical capital stock but does not include the loss and damages of human lives or losses in economic "flows," the added value that physical and human capital

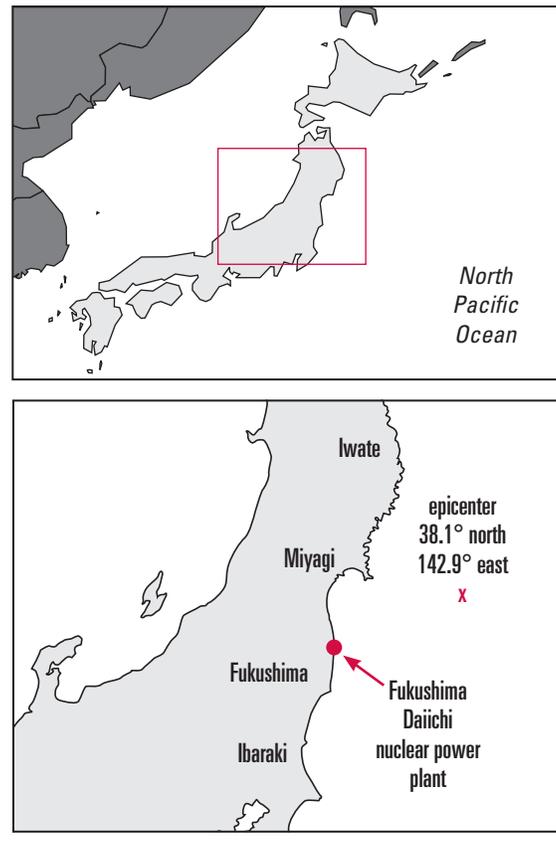
would otherwise have been generated if the earthquake had not occurred.

As for the economic flows, Japan's real GDP in the first quarter of 2011, which includes the month of the disaster, decreased by 0.9 percent from the previous quarter, which is equivalent to a decrease by the annual rate of 3.5 percent, according to the Cabinet Office's Economic and Social Research Institute. Although it is difficult to identify the exact contribution of the disaster to this decrease in GDP, there is no doubt that the disaster had a significant influence on the economic contraction, taking into account a large decrease in the country's manufacturing production due to the disaster. Moreover, the disaster's impacts on the economic flows are expected to last for a while, due to the large loss in the capital stock. While official estimates of Japan's GDP in the second quarter of the year were not available by the end of July, private research institutes predict that Japan's economy will contract again in the second quarter of 2011.

According to a June study by the Cabinet Office, the average GDP growth rates predicted by private research institutes indicate that Japan's real GDP is expected to grow marginally by 0.2 percent in fiscal year 2011 (April 2011 through March 2012). Before the disaster occurred, this fiscal year's growth rate was predicted to be 1.5 percent. The country's GDP is expected to grow by about 3 percent in the next fiscal year (April 2012 through March 2013), because experts expect that the economy will start to recover as reconstruction progresses. However, if the disruption of supply chains and/or the shortage of electricity are prolonged, this predicted economic recovery could slow.

The disaster most severely damaged three prefectures on the Pacific side of the Tohoku region: Iwate, Miyagi, and Fukushima. As Table 1 shows, the three prefectures produced about 4 percent of Japan's GDP. Another widely damaged prefecture, Ibaraki, accounted for another 2.3 percent of national GDP. One feature of the three prefectures in Tohoku is that their share of agriculture, forestry, and fisheries in the entire economy has been high relative to other parts of Japan. These three industries accounted for 2.3 percent of the total GDP of the three prefectures, which was twice the industries' share in the national GDP (1.1 percent). In addition, the three prefectures accounted for 8.1 percent

Map 1: East Japan Great Earthquake: Epicenter and Four Most Disaster-Damaged Prefectures



of all agriculture, forestry, and fisheries in Japan, and they shared 11 percent of the country's fisheries industry. Fishing ports in these three prefectures have been destroyed, and almost all of the ports were shut down for at least four months after the disaster. Although these three prefectures' share of agriculture, forestry, and fisheries in Japan's overall economy is very small, the practical impacts of the disaster on the economy of the prefectures as well as the entire country may be much larger than these figures indicate, given that the three Tohoku prefectures had been the major source of food supply to the country — especially to the Tokyo metropolitan area.

Impacts of Disruption of Supply Chains

The Tohoku and northern Kanto regions severely damaged by the Great East Japan Earthquake had been populated by many firms that produce materials (such as metals and chemicals) and parts of motor vehicles and electronics. The disaster

damaged these firms and stopped their production activities; it also stopped or diminished the production activities of non-disaster-affected firms that used the products of the disaster-damaged firms, because of the shortage of those intermediate inputs. This phenomenon of disrupted supply chains amplified the impacts of the disaster on manufacturing production and expanded the impacts broadly to other (non-damaged) regions in the country.

The impacts of the disruption of supply chains have been the largest in the transportation equipment industry that includes manufacturing cars, trucks and their parts. According to statistics from Japan's Ministry of Economy, Trade, and Industry (METI), the total manufacturing production in March 2011 was 15.5 percent lower than that in the previous month, which was the largest decrease for 58 years since the production index was established. More than a half of this decrease was due to a drop in production in the transportation equipment industry, which experienced a 46.7 percent decline in March 2011, the disaster month. The industry further decreased production by 1.9 percent in April, while the total manufacturing production recovered by 1.6 percent in the same month. This large impact on nationwide manufacturing production should indicate the complexity of today's supply chains that have been globally constructed for production efficiency and

cost minimization. It may also be that intermediate products supplied by the disaster-damaged firms had been so specialized that the “downstream” producers cannot readily switch to alternative products or suppliers. The large nationwide decrease in manufacturing production in March likely is not solely due to the disrupted supply chains but also to the rolling electricity blackouts prompted by the accident at the Fukushima Daiichi nuclear power plant. Rolling blackouts were not implemented in April.

An initial fear was that the impact could become more severe if the disruption of the supply chains continued. If “downstream” producers, such as a General Motors truck plant in Louisiana, anticipated that the shutdown or partial operation of the disaster-damaged firms, they might seek material from other firms to maintain production. With the global nature of supply chains, those alternative suppliers could be in other countries. One concern is that if new supply chains are established, Japanese firms damaged by the earthquake and tsunami might find they are excluded from the market when they are able to restart manufacturing of intermediate products. This scenario could permanently lower Japan’s manufacturing production and exports.

However, the operation of the disaster-damaged Japanese firms and the supply chains recovered very rapidly, due to large efforts of those firms themselves as well as related “downstream” producers to recover. A METI survey shows that, as of early April, more than 60 percent of the damaged firms have been restored, and another 30 percent were expected to be restored by summer 2011. Their actual restoration seems to have been even faster.

Impacts of Nuclear Accident

The earthquake and tsunami caused an accident and radiation leakage at the nuclear power plant on the Pacific coast of Fukushima prefecture. In this section I would like to discuss the impacts of the accident at Fukushima Daiichi (meaning No. 1 or the first) nuclear power plant in terms of the tight power supply, especially in east Japan, due to the loss of a large power source and the environmental pollution by radioactive materials.

Electricity Shortage and Electricity Conservation

The earthquake and tsunami also caused significant damage to power plants and grids in the east Japan, especially to the Tohoku and Tokyo electric power companies. Tohoku Electric Power serves the most severely disaster-affected Tohoku region. The Tokyo Electric Power Company (TEPCO), which serves the Tokyo metropolitan area and surrounding prefectures in the Kanto region, has large power plants in the Tohoku and northern Kanto regions, including the

Table 1: Gross Domestic Products of the Most Disaster-Affected Prefectures (fiscal year 2008, nominal)

	Iwate	Miyagi	Fukushima	Ibaraki	Japan’s 47 Prefectures
GDP (billion yen)	4,392	8,193	7,667	11,516	505,016
National share	0.87%	1.62%	1.52%	2.28%	
Agriculture, Forestry, and Fisheries (billion yen)	168	139	156	264	5,742
National share	2.93%	2.42%	2.71%	4.59%	
Share of Agriculture, Forestry, and Fisheries in Prefectural GDP	3.83%	1.70%	2.03%	2.29%	1.14%

Source: Economics and Social Research Institute, Cabinet Office, annual report on prefectural accounts

Fukushima Daiichi nuclear plant. These two power companies are still suffering from the shortage of power supply, even after they restored their power grids, due to the shutdown of some major power sources. In the immediate aftermath of the disaster, TEPCO’s supply capacity decreased by about 40 percent, according to some official sources, and the company found it could not fulfill the demand for power. As an emergency measure, TEPCO implemented rolling blackouts from March 14–28 that caused economic and social confusion among the public due to short notice and the complex grouping of blacked-out areas. In some cases, the company did not implement the blackouts as announced.

Since April, TEPCO and Tohoku Electric Power have avoided rolling blackouts. One reason for this situation is that each power company has maximized its supply capacity by operating as many back-up or shut-down power plants as possible. Another — and perhaps the primary — reason is that power users such as households and firms have been putting a lot of effort into *setsu-den* — electricity conservation — in response to the government and power companies’ requests. *Setsu-den* was initially voluntary. However, *setsu-den* later became a legal obligation for all large-sized electricity consumers in the service areas of these two power companies but not for households. Because the expected supply capacities of TEPCO and Tohoku Electric Power were not enough to meet the predicted summer-time peak demands, the Japanese government issued an executive order to restrict the electricity usage of all large customers. This order became effective in the beginning of July and was to be in effect through the end of September. During this three-month period, each large-size user had to limit power usage to the 15 percent of the peak hourly amount it used during the summer of 2010. Due to these measures and efforts for *setsu-den*, no planned or unplanned blackouts occurred since the end of March in any part of Japan. However, such restrictions on electricity use must be inhibiting economic activities, including such as production and consumption in the east Japan.

In addition, the Fukushima Daiichi accident affected the

power supply in other parts of the country. Due to widespread public concerns about the safety of nuclear plants, even in the areas served by power companies other than TEPCO or Tohoku Electric Power, some nuclear plants that were offline for regular maintenance when the disaster occurred were not back in operation five months later. The nuclear accident at Fukushima Daiichi threatens the national electricity supply.

A tightened power supply capacity requiring users' voluntary or mandatory electricity conservation could narrow the bottleneck in Japan's economy in the medium to long term. For instance, the activities of firms in manufacturing and other industries could "fly out" of the country to other countries that offer a more stable electricity supply despite the exhaustive efforts of the disaster-affected firms for rapid restoration of supply chains. To avoid further stagnation or contraction of Japan's economy, it is necessary to bring back a stable electricity supply. However, the problem of the limited supply capacity will be difficult to resolve rapidly because resuming the operation of the existing nuclear plants seems to be difficult, at least in the immediate future, under the present circumstances with the public's large anxiety and because rising fuel prices and Japan's international commitment to the reduction of carbon dioxide emissions impede increasing the capacity of thermal power plants. In addition, development of alternative power sources will take time.

With such difficulty in the restoration and increase of the supply capacity of electricity, the efficient use and allocation of the limited power is important. Approaching the problem from demand-side management might be effective. One possibility would be to modify the electricity pricing system to adjust the prices frequently and flexibly in response to changes in power demand. This peak-load pricing charges a higher price when demand is high relative to limited supply. The expectation is that some customers would reduce consumption to avoid the higher price, while those with strong needs for electricity would keep using power even for the high price.

Radiation

The accident at the Fukushima Daiichi nuclear power plant has been causing serious radiation contamination to a broad area of the country. Radioactive materials emitted and diffused from the damaged nuclear plant for several days after the accident have been polluting soils, crops, sewage, sludge, and waste incineration ash in the area. Some areas surrounding the plant have been designated as restricted zones, and as a result a large number of people have become refugees — 113,000 people had been evacuated from the designated zones, the vice minister of economy, trade and industry told a House of Representatives committee meeting in June.

An economic impact of the diffusion of radiation has been actualized in the production, distribution, and consumption of food. So far, for some food items in which high levels of radiation are detected — such as leaf greens, milk, tea leaves, and beef — the government has restricted or the producers have voluntarily restrained shipment. In addition, consumers are avoiding food produced in the regions near the nuclear plant, including items for which radiation detection has not

been reported. The economic loss of the parties engaged in agricultural production and distribution in those regions should have been substantial.

The radiation contamination of food produced in the east Japan has affected international trade. Since the nuclear accident, many countries have imposed some restrictions on food imports from east Japan regions, and some of these countries extend the import limits to products from other Japanese regions or even to non-food items. According to the METI's 2011 white paper on international economy and trade, Japan's exports of food in April 2011 were 22.9 percent lower than in the same month in 2010, and food exports in May were lower than the previous year by 22.2 percent. These decreases in Japan's exports should be, at least partially, results of the restrictive measures imposed by other countries. Indeed, even before the disaster people were concerned about the possible stagnation of Japan's foreign exports due to a lasting trend of yen appreciation. However, the concern is now greater: the country's slump in exports could be larger and longer since the brand image of "Made in Japan" or "Product of Japan," which has been regarded as safe or high-quality, might have been hurt by the nuclear accident.

Moreover, the nuclear accident and radiation problem have affected the inflows of people from abroad to Japan. In the immediate aftermath of the disaster, the number of foreign visitors to Japan dramatically decreased, while the number of foreign nationals leaving the country sharply increased. Although those who settled in Japan have been gradually coming back, the number of short-term foreign visitors for sightseeing or business remains stagnant. If this trend continues, Japan's tourism industry and service exports — realized as consumption activities of those foreign visitors — would be damaged. Especially because the disaster-damaged Tohoku and northern Kanto regions are rich in natural and cultural tourism resources, the stagnation of foreign visitor inflows could discourage the reconstruction of these regions. Furthermore, if concern about radiation contamination is prolonged, the return of residential foreign nationals might be slowed down or decreased again, removing their contributions to Japan's economy.

I strongly believe that the Japanese government and TEPCO, the company owning and operating the Fukushima Daiichi nuclear power plant, should conduct thorough examinations of the environment and food for radiation contamination and give complete disclosure of the findings. I would have to say that the actions of the government and TEPCO for information disclosure on radiation have been poor, even taking into account the confusion after the tsunami and accident. For instance, they failed to provide accurate and prompt information to the public, and in some cases they revised the information with more serious findings as much as one month after the initial release. This practice, as well as their overall attitude toward disclosure, may have raised the level of distrust among domestic and international publics toward the information they released. As radioactive materials pose health risks to human bodies, it is natural that people try to

protect themselves. Other countries' import restrictions on Japanese products and the decrease in foreign visitors to Japan should be forms of such self protection. The excessive avoidance of food items from regions near the Fukushima Daiichi nuclear power plant and "harmful rumors" may be a reaction of consumers to inadequate information. The government and TEPCO should not only devote all their energies to controlling and resolving the nuclear accident as early as possible but also disclose accurate information on the situation of the nuclear plant and radiation contamination promptly. This transparency will help lead to the recovery of their credibility and the rehabilitation of the brand image of "Made in Japan."

Constructing Japan's Future: Some Policy Perspectives

To conclude this essay, I would like to present my personal view about a direction of Japan's policy for reconstruction from the disaster.

As the primary goal of the restoration and reconstruction from this enormous disaster, Japan should devote as many policy resources as possible to bringing the lives of those who continue refugee lives back to as normal and autonomous as possible, as quickly as possible. As mentioned, the disaster damage has been so large that the loss to capital stock alone amounts to 17 trillion yen or about 220 billion U.S. dollars. Government funding for the restoration and reconstruction from the disaster should be no less than this amount. However, the commitment to helping refugees must be fulfilled in a fiscally responsible manner.

Japan's public finance has been problematic for a long time, with budget deficits running for 20 years and government debt amounting to more than 200 percent of the country's GDP, and thus Japan must make fiscal restructuring a policy priority. The disaster and fiscal burdens for reconstruction are an additional blow to Japan's public finance. To minimize the medium- to long-term negative impacts of the disaster on public finance, Japan should make the nation's best efforts to cut expenditures on items other than the disaster reconstruction.

Japan's public finance problems are closely linked to

problems in the country's whole economy and its structure. Indeed, I think that fundamental problems in Japan's economy have not changed since before the disaster — for instance, a shrinking workforce due to the falling birthrate and aging population. The failure of Lehman Brothers investment bank in September 2008 severely hit Japan as well as other economies, but Japan's economic recovery from the shock has not seemed to be as strong as in other industrial countries or emerging economies. Before the March 2011 natural disaster, Japan's economy barely showed a sign of an upturn. Although the great earthquake stopped this slight upswing, policymakers should have taken steps to help the Japanese economy achieve more robust recovery and growth long before the earthquake hit.

In Japan I have heard voices saying, in a pessimistic tone, that the disaster has changed our country and we will not be able to bring the country back to what it was. However, in terms of the economy, I am rather worried about "restoring" the country to its state right before the disaster, which might lead Japan's economy to further stagnation or even to downfall. Instead, I think "reconstruction" from this disaster should be taken as a precious opportunity to create a more vigorous economic society.

To strengthen Japan's economy, I suggest several policy options. One policy would be to allocate adequate reconstruction resources to industries and firms that are expected to grow and expand rather than giving limited resources to industries and firms that would have declined or vanished even without the damage of the disaster. Another step is to develop, for the mid- and long-term future, a safer and more sustainable energy system. The electric power industry needs to be institutionally restructured, and energy-saving technologies for user-side power conservation must be developed. Policymakers should also enhance investment in human capital and the formation of intangible assets (such as intellectual properties) to provide more proof against natural disasters than physical capital or tangible assets can provide — an important diversification for a disaster-prone country like Japan. Another is to (further) lower barriers to the inflows of capital and workers from overseas, which may help maintain or increase productive resources in Japan's aging society. ♦