of multiple scenarios to build operational confidence to manage a euro event.

Business continuity plans must be well defined and tested with internal and external participants to ensure readiness. Firms must recognize critical deficiencies in contingency plans, particularly where system and database functionality depends on one or two people. Such a shaky workflow must be acknowledged and resolved prior to an event unfolding, or the firm may face unknown and potentially disastrous risk. Policies governing process, most notably valuation, should be reviewed to ensure flexibility to meet any scenario resulting from a euro event.

In summary, these recommendations are presented to help firms within the investment management industry plan for and successfully navigate any potential euro event. By taking collective action now, the industry can instill confidence in its ability to mitigate operational impacts. I contend that the winning formula for a contingency play is communicate, collaborate, and get ready.

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Moral Hazard and the Eurozone Crisis

Can joint sovereign guarantees provide a satisfactory solution?

BY OSMAN GHANI, CFA

The eurozone debt crisis has reached a critical point, with many market participants seriously questioning the EU's ability to prevent a contagion that spreads from Greece to larger EU member states, such as Italy, and the onset of a second global recession in the span of five years.

The EU member states have held numerous conferences in an effort to arrive at a common solution to the debt crises and to shore up both investor confidence in EU sovereign debt and concerns over the future of the euro. Leaders have discussed the possibility of implementing joint sovereign guarantees or a fiscal union as a means to reduce investor and capital market fears and to prevent the possibility of both a disorderly default by some EU member states and the collapse of the euro as a currency union.

Most EU members touted a joint sovereign guarantee scheme to tackle the growing EU debt crises, but German Chancellor Angela Merkel was reluctant to sign up to such a proposal, leading the EU to choose the fiscal union strategy instead. In this article, I use a "moral hazard" approach to discuss both proposals.

In a moral-hazard model, a principal–agent conflict occurs when the agent has more information about his or her actions than the principal does (as proposed by K.J. Arrow, "Uncertainty and the Welfare Economics of Medical Care." *The American Economic Review* [1963]). This issue arises from the principal's inability to effectively monitor the agent's actions, which in turn gives the agent an opportunity to act in a manner that would adversely affect the principal's interests.

To apply this model to the current euro debt crises, the principals are the euro debt-holders who have lent money to EU member states and the agents are the governments that have borrowed the money.

The moral-hazard problem arises in this situation because the debt-holder cannot determine *ex ante* whether the government will be in a position to repay the debt. For a government debt-holder, the ability to be repaid promised coupons at face value depends not only on economic fundamentals but also on the government's ability to tax and repay the debt.

The problem for the debt-holder (principal) arises when he or she thinks that the relevant government either will not use the borrowed money properly or will be unable to generate enough revenue (collect tax) to meet the debt contract requirements (coupon payments and the repayment of face value).

Part of the problem may arise from poor economic conditions in the relevant country, but another part arises from a moral-hazard scenario with the borrowing government. The moral hazard occurs because the government has no incentive to undertake unpopular, but at times necessary, steps in order to ensure that the debt-holders receive their promised amounts.

One way a government can pay the promised amount is by having its economy grow over the maturity of the debt, generating a higher revenue stream for the government while holding tax rates constant. Failing that, if the economy is in a recession (as is currently the case for several EU member states), the government has three main options. First, it could cut back on spending, thus reducing its borrowing needs so it can pay back the promised amounts to debt-holders. Second, it could increase current tax rates and thereby attempt to generate sufficient tax receipts for revenue to pay back the debt. Or it could institute tighter fiscal control over the budget by both reducing discretionary government spending and cracking down on tax evasion.

The first two possible measures could in fact negatively affect a country's economy and its government's ability to repay the debt. In the first case, the government may reinforce a recession by cutting spending when spending is actually necessary to maintain or encourage economic growth. In the second case, the increased tax may lead to a "Tobin's Tax," whereby the net tax receipts collected under the increased tax rate might actually be lower than would be the case under the lower-tax regime. (See J. Tobin, "Proposal for Inter-

national Monetary Reform," *Eastern Economic Journal,* [July/October 1978]). The third option—to cut nonessential spending and to increase the tax receipts by pursuing evasive taxpayers—is likely the best of the three approaches.

The size of the black market in Germany is roughly 10 percent of GDP, but in Italy and Greece, it is 22 percent and 25 percent of GDP, respectively. (For more details, see V. Mallet and G. Dinmore, "Europe: Hidden Economy," *Financial Times* [8 June 2011]). According to data from the International Monetary Fund, the GDP for Italy and Greece was roughly US$2 trillion and ~US$0.3 trillion, respectively, in 2010. Thus, if the Italian government tried to bring its black market economy down to Germany's level, an additional US$240 billion would be available to tax. For Greece, the comparable figure is US$45 billion. (The differences between the size of the black markets in Italy and Greece compared with Germany are 12 percent and 15 percent, respectively. Multiplying these numbers by the 2010 GDP figure produces the above estimated numbers.)

In a classic moral-hazard problem, the agent should exert maximum *effort* in order to ensure that the principal receives the best return for his or her investment. The agent is assumed to have a *cost* associated with exerting effort, however, which leads the agent to exert a suboptimal level of effort. As a result, the agent and the principal's interests are no longer aligned.

When we apply this framework to the current crises, the optimal outcome for the debt-holder (principal) is that the government (agent) makes the best effort to ensure that it repays the promised coupons at face value. The effort required from the governments may take the form of large cuts in government spending, a tax increase, or a crackdown on tax evasion. The problem the principal faces is that the government has an incentive not to exert full effort because of the cost of exerting such effort. This cost can take the form of becoming unpopular with the electorate close to an election year and/or antagonizing trade unions or business lobbies, among other scenarios.

The problem with the joint sovereign guarantee proposed by members of the EU and blocked by Germany is that it will not incentivize countries to become more fiscally conservative in terms of reducing budgetary excesses and increasing the population that is taxed. This lack of incentive comes from the mechanism under which the debt will be issued. In a joint-guarantee scheme, the debt issued by a particular country (for example, Greece) would be explicitly backed by all the other member states. So, if Greece were unable to pay the promised amount to its debt-holders, the other member states would be liable for making those payments. In such a case, the agent has no incentive to actually exert effort because he or she can receive the benefit (subsidized debt) without making any effort to become more fiscally conservative. So, the joint-guarantee scheme would actually become a wealth transfer scheme, which would not mitigate or rectify the problem. ("Subsidized" in this case means that the yield on the debt will be lower than would be the case if the debt were instead issued without a joint guarantee. A joint guarantee would result in a lower yield because the guarantee acts as an insurance policy that promises to pay the coupon and face value if the issuer cannot.)

In the case of a fiscal union with the member governments' budgets set and monitored by a central body, there is more scope to force the governments to exert effort. To ensure that each government sticks to the committed budget, the central body must undertake complete monitoring. Such oversight will ensure that each member government exerts effort in an attempt to meet the requirements set under the fiscal union. To ensure that none of the governments drifts from the commitment of the agreed budget, however, the central body must impose penalties.

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The penalties under the fiscal union need to be punitive to prevent member countries from straying from the predefined budget. Such penalties should be a function of GDP, not a flat amount, to ensure that even the fiscal union's larger economies keep the commitments placed under the union.

To sum up, a joint-guarantee scheme will not motivate governments to become more fiscally conservative. A fiscal union is a better alternative, provided that all the member states have constant monitoring and face punitive penalties for failing to meet the requirements. In any case, the problem that debt-holders face is one of *moral hazard,* and the EU must implement mechanisms to ensure that member states will try to exert maximum effort to become more fiscally conservative.

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