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AN ASSESSMENT OF THE CREDIT CRISIS SOLUTIONS

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Introduction

It is increasingly accepted that the U.S. and the global economy will not get out of this severe recession unless the credit crisis is resolved. In his recent testimony to Congress, Federal Reserve Chairman Ben Bernanke (February 2009) emphasized once more that the Fed's forecast for a recovery later in the second half of this year is conditional upon resolving the financial crisis, so that credit flows to business and households are returned to normal levels. Fiscal policy on its own will not be able to break the back of the recession unless this precondition is met. This Policy Note attempts to assess the various schemes that have been put forward to alleviate the credit crisis and recommend a solution.

The abiding principle in evaluating the various schemes is that a solution is appropriate if it deals with the causes of the problem. From this angle, there are two basic views on the causes of the credit crisis. In the first view, the depressed assets of the financial sector are currently undervalued, either because of panic or because of the recession. If this view is correct, then the measures that have been adopted by policymakers on both sides of the Atlantic are correct, and in time they will work. Undervalued assets will become fairly valued, if not overvalued, when the recession is over. Therefore, the taxpayer will retrieve the money invested now and maybe with some profit, if governments buy the distressed assets below fair market value. The alternative view is that the assets are worthless and the banks, accordingly, insolvent. In this case, the measures taken so far, and similar measures planned for the future, are inappropriate. The money that governments

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have already spent has been wasted—it's gone into a black hole. Of course, no one knows what the fair value of these assets is, and only time will tell which view is correct. But by then it may be too late.

Despite the caveat of being unable to correctly value these assets, we can still assess the various schemes. Table 1 presents the consolidated balance sheet of the depository institutions. After the collapse of Lehman Brothers, all remaining investment banks have become bank holding companies, so that such a balance sheet is appropriate. Good assets are bonds or collateral for bank loans whose prices have fallen a bit from face value or precrisis levels but hold the promise that they will recover once the recession is over. Bad assets are those whose prices have fallen significantly from face value or precrisis levels but can still be priced with some degree of certainty because there are liquid markets upon which they trade. Finally, there are the toxic assets that no one wants to hold in their portfolios. These assets are hard to price, as they do not trade in liquid markets. They are predominantly derivatives or synthetic assets, such as collateralized debt obligations (CDOs), CDOs-squared (or even cubed), and credit default swaps.

The liability side is presented according to the order in which claims on assets can be made in case of bankruptcy. Deposits are the liabilities that will be satisfied first, and governments have increased the guarantee limit in case these assets are worthless. Preferred stock, which many governments have acquired in exchange for the capital they have injected or the insurance they have provided to troubled banks, are next in the queue. Then there is the secured debt, in the sense that there is collateral value, though it might be smaller than at issue (i.e., the secured debt may be less than the face value of the security or bond). Next in line is the unsecured debt, which will be satisfied according to seniority (senior, mezzanine, and junior) if there is still some cash left from the sale of the assets. Finally, common stock holders will get the residual cash, if any. With this taxonomy we can group the various solutions into two models: "business as usual" and "good bank."

Table 1 Consolidated Bank Balance Sheet

Assets	Liabilities
Good Assets	Deposits
Bad Assets	Preferred Stock
Toxic Assets	Secured Debt
	Unsecured Debt (senior, mezzanine, junior)
	Common Stock

The "Business as Usual" Model

The "business as usual" solution is the one preferred by Wall Street and the global banking community as a whole. It takes three forms that nonetheless amount to the same thing: a bailout by the government. In the first variation, the government guarantees the assets or liabilities of the banks and/or provides insurance for the bulk of the bad and toxic assets, usually after the bank takes the first 10 percent loss. Moreover, the government helps to capitalize the banks in need, but in a way that does not interfere with the running of the bank; this mainly takes the form of acquiring preferred shares that have no voting rights, although this has been muddled by the government desire that troubled banks getting its support should increase lending to business. The second variation is to remove the bad and toxic assets from the banks' consolidated balance sheet and place them into a "bad bank" that is capitalized by public and/or private money. When, or rather if, these assets recover, the money that has been invested will be recovered. But even in this second variation governments will have to add $500 billion in capital to the ailing banks. The third variation is for a temporary nationalization (or whatever term is politically acceptable to the relevant taxpayers) but with a well-defined exit strategy, meaning specified conditions under which the banks will revert to their original shareholders or will be reprivatized. It is clear why this solution has been dubbed "business as usual," as despite the crisis the banks would not bear the cost of their actions and would continue to do business as usual. Their losses would be borne by the taxpayer, as they are perceived as being "too big to fail."

In evaluating the business-as-usual solution, we can clearly see that it makes sense if the bad and toxic assets are undervalued and will in time recover. Even then, the success of this approach depends on the price that the government or the "bad bank" will pay for them. The lower the price, the higher the level of protection afforded the taxpayer, but at the expense of the banks. On the other hand, the higher the price, the lower the level of protection afforded the taxpayer, but the higher the

benefit to the banks. It is obvious that the banks want the government or the "bad bank" to buy these assets at face value or at a small discount. The success of this solution depends on finding the correct price, one that is fair to both parties. But it is hard, if not impossible, to price the toxic assets, and therefore difficult to implement this approach. Moreover, it is hard to sway public opinion in favor of such a scheme. Most people would quite rightly ask why the taxpayer should pay for a mess that bankers created, as a result of which many people will lose their jobs or see their incomes decline. The government response is that this is necessary for the recovery of the economy. If the banks do not return credit to normal levels, there is no chance that the economy will ever recover.

But this assumes that the business-as-usual model is the only available option—that there is no alternative. Yet it emerges that there *is* a viable alternative, and this will make it increasingly difficult to get the public opinion behind this scheme. In addition, there is the well-known argument of "moral hazard"; namely, that a bailout will only encourage more risk taking in the future. The government stance that in the future there will be stricter regulation is not convincing, because regulation only closes past loopholes. It is not a forward-looking approach but a backward-looking one. In any legislation there are always loopholes that will be exploited by clever people. But the biggest blow to this approach comes from the sheer size of the problem. The losses from the bad and toxic assets may be too big to bear, even for governments. The losses from the credit crisis, worldwide, have already swollen to $1.2 trillion; the International Monetary Fund estimates that total losses will mount to $2.2 trillion, while Nouriel Roubini (Dr. Doom) thinks they will exceed $3 trillion. These estimates are based on a simple rule of thumb. U.S. mortgage debt currently stands at $10.5 trillion. Assuming a 20 percent fall in house prices, the loss approaches $2.1 trillion. However, by January 2009 house prices had fallen 26 percent from their peak in mid-2006. Using this percentage, the loss rises to $2.7 trillion. According to the K-model, at the bottom of the current recession house prices will have fallen by 45 percent, boosting the loss to $4.7 trillion. But this estimate does not include bank losses from toxic assets (derivatives). If the toxic assets are worthless, then the banks are insolvent, and the ultimate cost may run into trillions of dollars that ultimately even governments cannot afford. The insolvency case is supported by the highly leveraged status of the consolidated balance sheet of financial institutions due to toxic assets.

Barring the disaster scenario of wholly worthless toxic assets, if the costs of $2.2–$4.7 trillion were to be met by public money, then fiscal deficits in the United States and the United Kingdom as a percentage of GDP will soar to double-digit figures (warlike levels), while the public debt will nudge 100 percent of GDP. With the business-as-usual model, the government, as lender of last resort, runs the risk of becoming insolvent itself. We may tend to think that public opinion memory is too short and irresponsible governments will get away with their decisions to postpone doing the inevitable or pass the burden to the next government, but the vigilante is always the market. Unless the U.S. and U.K. governments prepare a credible plan for curtailing the budget deficits and public debt, their efforts will be thawed in the long run by rising nominal and real long-term interest rates, as inflation risk premiums, default risk premiums, and foreign exchange risk premiums rise. Greece in the 1980s is an example of a country that operated with double-digit fiscal deficits that spurred the public debt from 30 percent of GDP to more than 100 percent. The debt has not been cut, as successive governments have been loath to take the consequences of raising taxes or cutting public spending for fear of not being reelected. They may have avoided the consequences in the short run, as Greece under then Prime Minister Costas Simitis made an effort to curb the deficits and satisfy the criteria for convergence to the European Exchange Rate Mechanism, therefore qualifying for admittance to the European Monetary Union (EMU). Acceptance to the EMU further postponed the inevitable harsh measures, but it is doubtful whether in the current environment Greece—and many other countries, including Italy, Spain, Portugal, Ireland, and Austria (although for different reasons)—would ultimately avoid adopting the inevitable harsh measures, which will have to be adopted when a country is ejected from the common currency.

The "Good Bank" Model

The credit crisis seems insolvable only because there is no consensus on a fair distribution of the costs of the bailout. So far, only bank shareholders have paid for the mess, and only a few bank CEOs have either willingly resigned or been forced to step down. The banks' senior managers are largely unscathed, and they have even received bonuses, albeit (partially) curtailed, which has aroused a public outcry. Moreover, the interests of the bondholders have so far been protected.

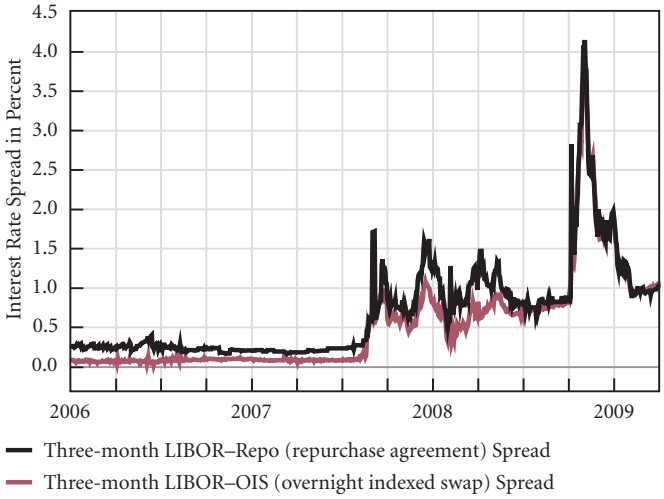
The alternative to the business-as-usual model is a "good bank." This involves creating a new bank, phoenixlike, from the ashes of each old bank. The good assets of the old bank now form the assets of the new bank, and the deposits and secured debt of the old bank form the liabilities (Table 1). The old institution's banking license is replaced by a new one. The new bank is capitalized by public and/or private money, and the government guarantees the new loans of the new bank. The new bank rehires the staff, but not the senior management, of the old bank and is housed in the same buildings. The old bank effectively becomes an asset management company of the bad and toxic assets, with liabilities consisting of unsecured debt and preferred and common stock. It requires only a handful of fund managers and (as has been sardonically put) can be housed in the basement of the bank's old building. The preferred shares and unsecured debt are converted into common stock, so that both equity holders and bondholders share the costs of this voyage to safety.

The advantages of the "good bank" model are obvious. First and foremost, credit flows to the economy return to normal, ensuring the success of easy monetary and fiscal policy in engineering the recovery of the economy. Second, moral hazard is minimized, as there is a clear message to future senior management that there will be no bailout. Third, this is just and fair to the public at large and to the taxpayer in particular, as the bulk of the cost falls on those responsible for the crisis.

However, there is a major drawback that dulls the golden sheen of this solution. If the old banks failed and the losses were very large, then the ramifications will spread to the rest of the economy, sinking the entire ship. One may indeed argue that, by removing all the sound elements from the balance sheet of the old banks, the probability of failure is enhanced. Moreover, the greater the losses of the old banks, the greater the likelihood that the entire economy could go down. Thus, we may be back to square one, and policymakers may have no other option but to bail out the system if the losses of the old banks are too big. As they say, when your house is on fire, you don't talk about safety zones or fences that will prevent future fires; you have to fight the fire now, and worry about future fires later on.

So far, the banks have been unwilling to come clean, or else they don't know what their real exposure is. The potential losses from allowing the old financial system to go bankrupt may be huge. Gross holdings of credit default swaps are unofficially estimated at $60 trillion, although net holdings (namely, netting out cross-holdings) may be half as much. But this may be an underestimate judging from AIG, which recently announced that its own nominal portfolio is on the order of $19 trillion and reported the largest-ever loss ($62 billion) for a U.S. company. But even at $30 trillion, a bankruptcy might entail losses of 30–50 percent, which amounts to $9–$15 trillion, when the entire U.S. GDP is $14 trillion. But are financial institutions really worried about becoming insolvent? Credit default swaps provide market estimates for particular banks, but we are more interested in aggregate measures.

Figure 1 **Liquidity and Credit Risk vs. Credit Risk (LIBOR-repo vs. LIBOR-OIS)**



Source: Author's calculations, based on original data from Reuters

An indirect way of addressing the insolvency issue at the aggregate level is by decomposing risk into interest rate risk, liquidity risk, and credit (or counterparty) risk. The total risk is captured in the three-month London Interbank Offered Rate, or LIBOR, as this reflects the true cost of money for banks. The three-month overnight indexed swap (OIS) is a measure of the interest rate risk, as it reflects market expectations of what the Fed funds rate will be over the next three months. Thus, the spread between LIBOR and OIS for corresponding maturities is a measure of liquidity and credit risk, as it has eliminated the interest rate risk. A measure of credit risk, in turn, is the spread between secured and unsecured borrowing by the banks. One form of secured loan is a government-backed repurchase agreement (repo) between banks. Thus, the spread between LIBOR and repo rates for corresponding maturities provides a measure of credit risk.

The close correlation between the LIBOR–repo and LIBOR–OIS spreads is shown in Figure 1. This suggests that the banks are concerned more about credit risk than liquidity risk and hence are worried about the insolvency of the entire financial system. So far, central banks have diagnosed the crisis as stemming from a lack of liquidity and have flooded the system; but this is not the cause of the problem. This highlights a fundamental difference between the Great Depression and the current credit crisis. The former was due to liquidity risk, and therefore the remedy was an increase in the supply of money. But the current crisis is mainly due to credit risk. The wrong diagnosis of the problem has led policymakers to apply the wrong medicine. The nature of the current crisis as stemming from credit risk is prima facie evidence that the losses of financial institutions may surprise on the upside. The conclusion that emerges from this analysis, therefore, is that the "good bank" solution carries a risk that the entire economy may sink into a worse depression than in the 1930s.

A "Good Bank" with a Personal Sector Shield: A Viable Solution

We believe that the "good bank" model can be salvaged—with one modification. The high risk that the entire ship will sink lies in the cross-holdings of the assets and liabilities within the financial sector. Each bank is holding as assets a large proportion of the liabilities of the others. Thus, if one bank failed it will have a cascading effect, dragging the rest down. This structure involves also the personal sector and to a much lesser extent the corporate sector. The spillover of the losses of the financial sector to the personal sector is through the cross holdings of assets and liabilities. It is this cross-holding structure that has made the bailout of the financial system by governments unavoidable, but it also holds the key to a viable solution. Thus, to save the good-bank model, the obvious solution is to separate the cross-holdings of the personal sector from those of the financial sector. The government can guarantee or provide insurance against some reasonable exposure of the personal sector to the bad and toxic assets of the old financial sector. By doing so, the government will stop the bankruptcy of the old financial sector from spilling over into the personal sector, thus containing the damage. Moreover, the policymakers enforce an automatic deleveraging process that will drain the excess liquidity, which is at the root of the current credit crisis. The automatic deleverage will speed enormously the process to recovery; otherwise, the balance sheet adjustment in the old financial sector and the personal sector will be extremely long—more like ten years than two.

Table 2 Potentially Infected Assets (in millions of dollars)

Type of Fund	Total Assets	Total Credit Market Instruments
Money market funds	3,376,470	2,186,636
Mutual funds	6,588,339	2,366,281
Closed-end and exchange-traded funds	578,409	49,692
Private pension funds	5,192,809	917,639
Federal government pension funds	1,188,495	115,095
S&L pension funds	2,730,283	809,602
Life insurance companies	4,797,992	2,949,652
Other insurance companies	1,337,292	842,090
GSE mortgage pools	4,894,922	3,021,176
Total	**30,685,011**	**13,257,863**

Source: Author's calculations, based on Flow of Funds Accounts data issued by the Federal Reserve

Is this doable? The answer depends on the channels through which the personal sector might be infected by the insolvency of the old banks, along with the type of assets that will need to be guaranteed and their amount. If the cost of the bailout of the personal sector is smaller than the financial system, then it is worth pursuing it (1) from an economic point of view, (2) from an ethical and moral point of view, and (3) from the moral hazard point of view.

Table 2 provides the crucial assets of the personal sector that may be infected by the bankruptcy of the old financial system. First and foremost, the assets that must be protected are those

held indirectly on behalf of the personal sector through pension funds for those working in the private sector and government (federal, state, and local). Next in line are the assets of life insurance and other insurance (property-casualty) companies. Because of securitization, a large portion of federally-related mortgage pools established by government-sponsored enterprises (GSEs) are held indirectly by the personal sector. It is safer to insure all these assets at source, and this will provide an extra shield to the old banks. Money market funds, mutual funds, and other funds are of less importance in providing insurance. Certainly, hedge funds do not need to be insured, as their investors are financially sophisticated and presumably were aware of the risks they were undertaking—or at least, they should have been. These assets amount to more than $30 trillion, as Table 2 reveals. But the exposure of the personal sector to the assets of the banks is through its exposure to credit market instruments. This exposure is only a little more than $13 trillion, less than half the total. Within that category, it is impossible to know precisely who holds what. But there is no doubt that the personal sector has a large exposure to bad assets because of securitization, but a smaller exposure to credit default swaps than the banks. The largest chunk of these swaps is held by the banks. Thus, as a working hypothesis, we can assume that the potential loss of the personal sector will be around 20 percent. This implies that the total loss of the personal sector could be as high as $2.6 trillion.

The government can assume an amount of potential losses on the credit market instruments of the personal sector that will be fair to both parties—say, the first 10–20 percent—with the personal sector bearing the excess. Alternatively, the government can let the personal sector bear the first 10 percent of the loss and guarantee the remainder. In this case, the government cost may be anywhere from zero to just over $1.3 trillion, which in the worst case is equal to the amount of money that it plans to spend on the bailout of the financial system. Such a solution is not only more economical, but it is also ethical, morally correct, and just, in the sense that those responsible for the mess must also pay for it; it also minimizes the moral hazard.

Summary and Conclusions

In this paper we assess the various schemes that have been put forward to resolve the credit crisis, which is a precondition for a recovery of the U.S. and the rest of the world's economies.

All these views can be grouped into two models: "business as usual" and the "good bank." The first takes different forms—insurance or guarantee of the assets or liabilities of the financial institutions, "bad bank," and temporary nationalization—and it is the one favored by banks and pursued by governments in the United States, the U.K., and other countries. It amounts to a bailout of the financial system with taxpayer money. Its drawback is that the cost may exceed by trillions the original estimate of $700 billion; and despite the mounting cost, it may not even prevent the bankruptcy of financial institutions. Moreover, it runs the risk of making the U.S. and U.K. governments insolvent, and turning an already severe recession into a depression worse than in the 1930s. It is also immoral and unjust (in the sense of justice as fairness), and maximizes moral hazard.

The "good bank" solution consists of creating a new (phoenix) banking system from the ashes of the old one by removing the healthy assets and liabilities from the balance sheet of the old banks. It has a small cost and has the major advantage that credit flows will be resumed and the economy will recover. It is also fair and just and minimizes moral hazard. Its drawback is that it lets the old banks swim or sink. But if they sink with huge losses, these might spill over to the personal sector and the ultimate cost may be the same as the business-as-usual model. The downside may again be a depression.

Our own solution is for a modified "good bank" approach, with the government either guaranteeing a large proportion of the personal sector's assets or assuming the first loss in case the old banks fail. It has the same advantages as the original good-bank model, but it makes sure that in the eventuality that the old banks become insolvent, the economy is shielded from falling into depression, and the ultimate recovery is ensured.

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