The Geithner Plan and the Taxpayers' Curse

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Summary. People who outbid others in an auction often pay too much, a phenomenon known as the winner's curse. The flip side of the winner's curse is that the seller realizes a windfall. The Geithner proposal for pricing toxic assets is a peculiar type of auction in which the taxpayer is cursed by competition among the buyers. The more that investors compete, the lower are the expected returns for the taxpayers. Naturally, the windfall goes to the banks.

The essential problem is that the Geithner plan creates lopsided incentives in which taxpayers are on the hook for most of the losses while they only get to share half of the potential gains. This point has been made by a number of economists using particular numerical examples. The purpose of this article is to analyze the problem more generally, and to show how the outcome depends on two factors: i) the degree of uncertainty in the asset's value (the variance in possible outcomes) and ii) the rate of return that equity investors demand. The main conclusions are as follows.

1. Under most scenarios taxpayers take a bath, that is, their expected returns are negative. The greater the uncertainty in the asset's value, the worse the returns for investors.

2. Under almost all scenarios the equilibrium bid prices for toxic assets will fail to reflect their true economic value. In most cases the assets are overpriced, but there are also situations in which they can be underpriced.

3. More aggressive bidding by private investors leads to worse outcomes for both the investors and the government. The first is the ordinary winner's curse, while the second is a new type of curse – the taxpayers' curse -- that flows from the distortionary effects of the Geithner plan. Of course someone must benefit, and the answer is (as usual these days) the banks: they get paid more – in some cases much more – than the assets are worth. Instead of increasing transparency, the scheme actually introduces a new source of price distortion and the taxpayers are forced to pick up the bill.

Analysis. The model contains two elements: uncertainty in the expected value of the asset and the return that private investors will demand for purchasing it. Assume for simplicity that the asset has two possible values high (H) or low (L). Assume further that H and L occur with equal probability. (More complicated assumptions lead to similar conclusions.) The expected value of the asset is V = (H + L)/2. This is the expected payout that the current owners (e.g., the banks) will get if they simply hang onto them.

The degree of uncertainty can be represented by the ratio of the high outcome to the expected value: U = H/V. For example an asset that is worth 75 with probability 50% and 25 with probability 50% will have expected value V = 50 and uncertainty U = 1.5. Notice that U is always between 1 and 2 because the highest value occurs when V = 0, and in that case H = 2V due to our assumption that H and V have equal probability. (Similar results hold if the high and low values have unequal probability or there is a larger range of possible values.)

The second key parameter is the rate of return R that private investors will insist on. In recent years successful hedge funds have returned between 10% and 30% per annum. Assuming that toxic assets will have to be held for several years before their actual values (H or L) are realized, this suggests that total cumulative returns probably need to be in excess of 30% to attract private buyers, and they might have to be as high as 50-100% -- more on this later.

The Geithner plan works as follows. Investors bid for a tranche of toxic assets and the government provides subsidized financing for approximately 85% of their value as determined by the winning bid. The remaining 15% is split equally between the government and investors in the form of an equity stake. Future gains are shared equally. Future losses up to 15% are shared equally, while any losses above that are fully covered by the government. (We shall ignore the interest paid on the loan, since this is a fairly minor part of the calculation.)

Suppose for example that the asset will turn out to be worth H = 90 or L = 30 with equal probability. Suppose the bid price P is the expected value V = 60. (As we shall soon see this outcome is quite unlikely, but let us assume it for the moment.) The government provides a loan of (.85)60 = 51. The investors put in one-half of the remainder (9/2 = 4.5) and the government also puts in 4.5; in return both get equal equity stakes.

If the outcome H = 90 materializes, the gains are 90 – 60 = 30 and each party realizes a profit of 15. If the outcome is L = 30 the equity stakes are worthless and the government has to cover the difference between the realized value of the asset (30) and the loan amount (50). In other words, the investors end up with nothing and the government takes a net loss of 50 - 30 = 20.

We now consider the more general situation. Suppose the winning bid price is P. Then the investor puts in .075P and the government puts in .925P: .85P in the form of a loan and .075P for its share of the equity. Assume that the low outcome is sufficiently low that the government will take some loss if it occurs, that is, L < .85P. This reflects the fact that toxic assets have a non-negligible downside. Then with 50% probability the equity is wiped out and the investors end up with nothing. But with 50% probability they make (H – P)/2. Hence the expected value of the investor's stake is

$$.25H - .2125P . \qquad (1)$$

Since the investors put in .075P, their total expected return is R where

$$1 + R = (.25H – .2125P)/(.075P) = 3.33(H/P) – 2.83. \qquad (2)$$

Using the fact that U = H/V, we obtain the following formula relating the winning bid price P and the economic value V:

$$P/V = 3.33U/(R + 3.83). \qquad (3)$$

The price is *undistorted* if P = V. Formula (3) shows that this will be a very rare coincidence. It also shows that *the distortion is increasing in the degree of uncertainty U and decreasing in the rate of return R that the winning investors realize*.

Suppose for example that H = 70 and L = 10, so that V = 40 and U = 1.75. Suppose also that the investors receive a generous 50% return (R = 0.5). Formula (3) shows that P/V = 1.35, that is, the *auction price will be 35% above the expected value of the asset.*

Notice, however, that the distortion can also go in the other direction. For example, suppose that H = 50 and L = 30, and the investors get a 100% return (R = 1). Then U = 1.2 and formula (3) shows that P/V = .83, that is, the asset is underpriced relative to its expected value.

Figure 1 shows the amount of price distortion as a function of different values of U and R. The key point is that for generous but not excessive returns (say R < 50%), there is significant price inflation relative to the actual economic value of the asset.

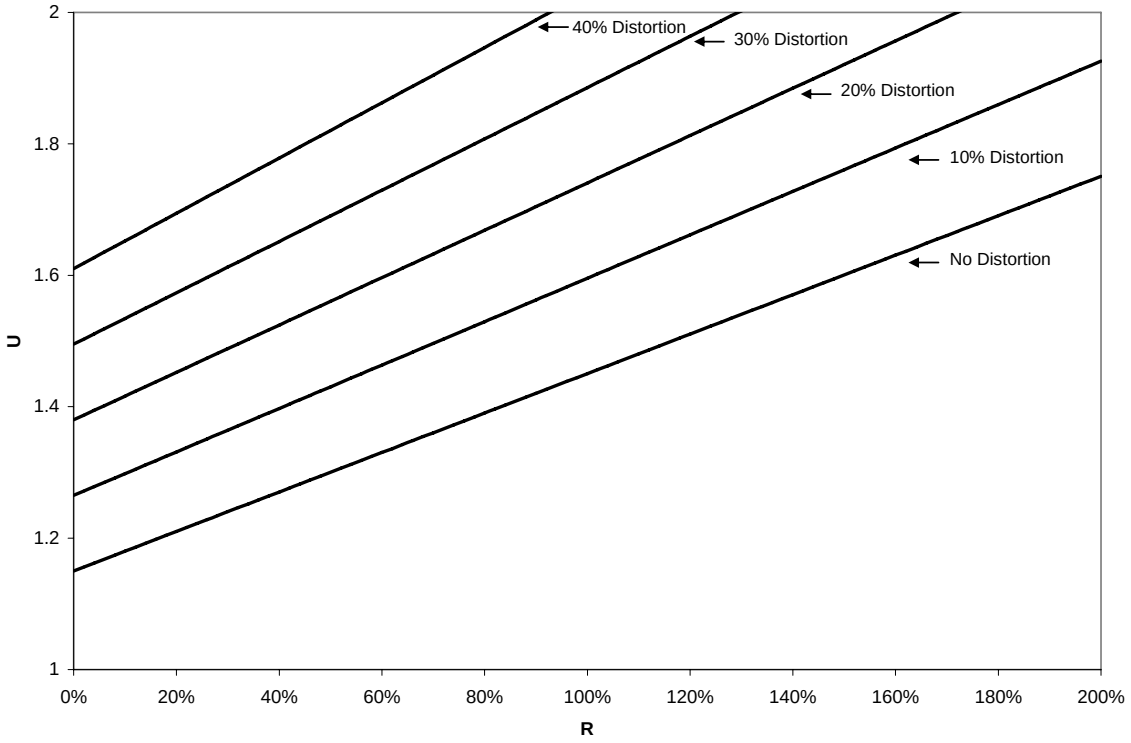

Figure 1. Price distortion as a function of uncertainty (U) and investor returns (R).

Let us now examine the return to the taxpayers as a function of U and R. Recall that the government's commitment is a loan of .85P plus the purchase price of an equity share (.075P), which comes to .925P. With probability 50% the government recoups the loan plus its initial equity investment plus its share of the gains, namely, .925P + (H – P)/2. With probability 50% it only recoups the low payoff L against the value of the loan. Then the expected return R′ to the taxpayers is

$$R' = -1.08 - .08R + .325(R/U) + 1.24/U.^{1} \qquad (4)$$

This shows *that the return to taxpayers decreases the higher the level of uncertainty* U, *and the return to taxpayers is negative unless the return to investors is large.* For example, if U = 1.5 we obtain R′ = - .25 + .136R. Hence taxpayers lose money unless R > 1.85, that is, the expected return to the private investors must exceed 185% for the taxpayers to make anything.

The most perverse feature of the scheme, however, is that R′ and R move in the same direction. In other words, *the more competition there is from investors (which lowers R)*

[1] The expected payoff to the government is (1/2)[.925P + (H – P)/2] + L/2 = .2125P + V – H/4. The amount the government has at risk is .925P. The ratio of the first to the second is 1 + R′. Using the fact that H = UV and formula (3) this simplifies to expression (4).

the lower is the return to the taxpayers as well, and the greater is the price distortion. This is the curse of the Geithner scheme.

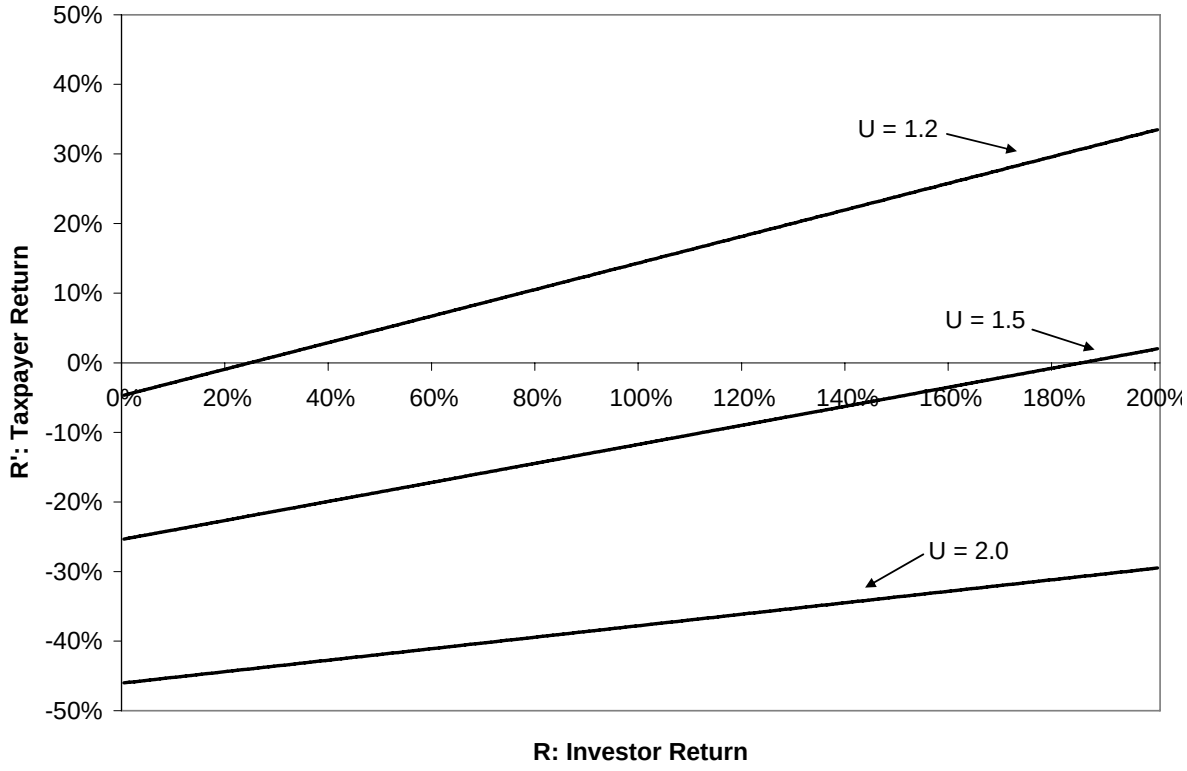

Figure 2. Taxpayers' versus investors' expected returns for three levels of uncertainty in the asset's value: low (U = 1.2), medium (U= 1.5), and high (U = 2.0).

We conclude that Geithner's proposal, which is being billed as a way to make prices of toxic assets more transparent, will actually inject a new level of price distortion and uncertainty into the financial markets while putting taxpayers at great risk. Of course one could argue that this is the price that taxpayers must pay to get the financial system back on its feet. Surely, however, the banks and other holders of such assets should be forced to shoulder a part of the burden instead of enjoying a likely windfall. A much cleaner solution would be for the government to take over the insolvent banks and sell off the toxic assets piecemeal, much as Sweden did in the 1990s and as the United States did in the S&L debacle in the late 1980s.