What to do about the Financial Transparency Crisis

Harry M. Markowitz

The current financial crisis is a combination of three ill winds that combined to make the "perfect" storm. One ill wind is the bursting of the real estate bubble; the second is the ongoing consequences of the subprime and near-subprime mortgage fiasco; the third concerns financial instruments—including, but not limited to CMOs (Collateralized Mortgage Obligations)—which combine mortgages and perhaps other assets, slice them into "tranches" and sell them to clients which, in some cases, use these tranches as inputs to other exotic instruments. The result is that nobody knows the risks to which they and their possible counter parties are exposed. The proposal herein concerns this last ill wind, the lack of transparency of many modern financial instruments.

When the Bear-Stearns weathervane first suggested that all was not well with complicated financial instruments, lending between financial counterparties started to dry up. The Fed addressed this problem by adding liquidity to the financial system. The effect of this liquidity was to devalue the dollar. The prices of commodities such as gold, oil and grains went up; dollars per euro went up; and, finally, the unthinkable happened: the dollar sold on a par with the loonie (the Canadian dollar). But despite this and ever increasing liquidity, the problem remained: because the problem was not lack of liquidity it was lack of confidence. Nobody knew who had bad paper.

The government has passed the 700 billion dollar Paulson plan. The long-term effectiveness of the bailout plan, however, remains unknown until firms, counter parties, regulators and their supervisors are able to accurately value the exotic financial instruments. What good is supervision, for example, if supervisors have no more idea than anyone else of the value of supposedly 700 billion dollars worth of pieces of paper?

My proposal for gaining insight into these instruments has four parts. I first enumerate these parts, then expand on each part briefly, and then defend the whole proposal from possible objections. The parts then are these:

(1) Take a census of what goes into what in the first instance, and what is the rules of the game for each financial instrument, as well as who issues and who owns each instrument.

(2) Calculate the direct and indirect exposure of each instrument; i.e., piece of paper A, contains tranche B of CMO C etc. and therefore is exposed to these amounts of those underlying mortgages.

(3) Aggregate the direct and indirect exposures of a given instrument (and the instruments of a given institution) into meaningful categories. It is not sufficient to know that a given instrument is directly and indirectly exposed to a long list of mortgages. These mortgages should be aggregated in various ways, such as by zip code and late-payment history. The leverage of the instrument, and of the firm that holds it, should be analyzed—directly and indirectly (i.e., has the firm borrowed to buy a tranche in an instrument which itself is leveraged).

(4) This information should be disseminated on a need-to-know basis to various parties such as firms, stockholders, counterparties, regulators and academicians. As with census data, the more public of these disclosures may be more aggregate than less public disclosures.

(1) With respect to Point (1), the size of the proposed survey is not large as compared to government efforts such as the Census Bureau's Annual Survey of Manufactures (ASM). The motivation for responding to the proposed survey can include whatever motivates the respondents to the ASM, plus the additional motivation that if you don't respond we (the government) will assume that your paper is worthless, evaluate your firm on that basis and maybe shut you down.

(2) The computation described in Point (2) is feasible is more technical than is appropriate here. I will content myself with a remark about my background that might encourage you to "trust me" on this one. The year before I got a Nobel Prize in Economics for my work on portfolio theory, I received the von Neumann Theory Prize from TIMS/ORSA (The Institute of Management Sciences and The Operations Research Society of America, now combined into one organization called INFORMS). While the von Neumann prize had no monetary award, I consider it three times as good as my Nobel Prize since it recognizes three of my accomplishments, namely, portfolio theory; the SIMSCIPT programming language (once widely used to tell computers how to simulate manufacturing, transportation, computer systems, and war games; and, most relevant here, sparse matrix techniques. "Sparse matrix" is the way I characterized huge sets of equations whose coefficients are mostly zeros. Sparse matrix techniques are now part of any production code for solving large systems of equations. Great progress has been made in this area since I published in the 1950s, but the Markowitz-rule (or a "modified" Markowitz-rule) is still part of standard codes. An analogy to the way sparse matrices are solved is the way a web browser crawls across the world-wide web looking for matches. The finding of the indirect exposures of exotic financial instruments would be an application of sparse matrix techniques (made slightly interesting by the presence of non-linearities in the payoffs of some financial instruments). Step (2) above is not trivial, but it's no big deal either

given modern algorithms, computers and mathematicians that make exciting advances to related techniques every year.

(3) Every reader who has queried large databases with modern facilities knows that Point (3) is literally business as usual.

(4) As to Point (4), clearly stockholders, counterparties, regulators and invited merger partners have a right as well as need to know risk exposures of a firm. Academicians perhaps can do with aggregates, or use databases confidentially, and may contribute to an understanding of how not to get into this mess again.

I don't imagine that too many readers will object to the cost or doubt the importance of the above proposal. One possible objection is that its results will not be available in a timely fashion. Even if the census specified in (1) is conducted, and the mathematicians, clerks, economists and computers required by steps (2) and (3) are assembled on a crash basis, the results in (4) will not be available for twelve to eighteen months. Since the agony of such a wait is unbearable, we should not pursue the proposal.

But the bursting of the Japanese real estate bubble and the sluggish Japanese economy in the decade that followed showed that it is not sufficient to cover over and ignore structural problems. The structural problem with Japan consisted of "zombies," firms that were in fact bankrupt but Japanese banks refused to recognize them as such on their books. Our own structural problem is that we have "700 billion dollars worth" (more or less) of paper whose value nobody understands. No matter what laws are passed and where these pieces of paper get moved, we will still have this same problem twelve to eighteen months from now. We cannot reasonably expect that we will have the opportunity to sell these securities until we have assigned a value to them. Once we have done so, we will have a marketable security that will carry a value, a risk measure and an expected return. The opacity of the instruments as they stand today prevents this important exercise that will initiate the sale of these securities.

A second objection might go like this, "You, Harry Markowitz, brought math into the investment process with your 1952 article and 1959 book. It is fancy math that brought on this crisis. What makes you think now that you can solve it?" This objection fails to distinguish between my contribution, *portfolio theory,* and a later development, *financial engineering.* A typical application of portfolio theory chooses a portfolio similar to a 60-40 or 70-30 or even 80-20 mixture of stocks and bonds, but more sophisticated, combining more asset classes in a way that minimizes risk for a given level of return on the average. Financial engineers create new financial instruments from old. This can be a good thing—not all financial engineering is always bad—but the

layers of financially engineered products of recent years, combined with high levels of leverage, have proved to be too much of a good thing.

Neither my own portfolio, nor those which my clients supervise or advise nor, to my knowledge, any of the large institutional investors (e.g., pension funds) who apply portfolio theory in a generally accepted manner, have suffered excessively from the crisis of the last thirteen months. Most have lost of course. It is part of a risk-return view of portfolio selection that if you want more return on average, and you proceed efficiently, you will have to accept greater fluctuations in the short run.

The current financial crisis is certainly a danger to the economy generally. An important component of the financial crisis is the obscurity of billions of dollars of financial instruments. The U.S. crisis could last as long as Japan's if we don't solve the structural problem posed by this lack of transparency. I hope that my argument persuades you, and the powers-that-be, that it is worth a careful look. Of course, the twelve to eighteen month estimate is from the time that the project begins, not from the time discussions begin. If it takes eighteen months for "them" to start implementation, it might be three years before the results projected in (4) become available.

Just as with all securities, the fundamental exercise of the analysis and understanding of the trade-off between risk and return has no shortcuts. Arbitrarily assigning expected returns absent an understanding of the risks of the securities is precisely how the economy arrived at this point. We cannot shortcut this important process. The valuation process will take as long as it takes, but it is the primary step toward effectively utilizing the very controversial bailout and avoid the structural problem of a stagnant economy.

Harry M. Markowitz