



Municipal Bombs

Randall Dodd

ASIDE from some shared names—and the movie *Paris, Texas*, which celebrates one of them—there seem to be few connections between European and U.S. cities. But modern finance has changed that some. Similar but complex derivatives transactions on both sides of the Atlantic have resulted in crippling financial losses for local governments.

The deals went sour in part because of the global economic crisis, which showed that many supposedly sound transactions were riskier than the municipalities believed. These deals usually involved unsophisticated local governments making deals using derivatives (see box) traded over the counter between two parties, rather than on an organized exchange or through a central clearing counterparty.

France has a reported €11 billion in outstanding notional amounts of derivatives involving 1,000 cities (a notional amount is akin to the face value of a bond). In Italy there are 467 cities with a reported €2.5 billion outstanding. Comprehensive data for Germany are not available, but at least 50 cities have derivatives transactions with Deutsche Bank alone. In the United States, where 40 states have passed laws authorizing municipal authorities to trade derivatives, such transactions have a total estimated notional amount of \$250–\$500 billion. As in Europe, financial disasters related to trading in those instruments have come to light in court actions. In the United States, large losses have been reported in cities and counties in Alabama, California, Ohio, and Pennsylvania, and like

those in Europe, many U.S. municipalities have not publicized their bad trades, presumably to avoid embarrassment and political consequences. As a result, although there are sizable losses on both continents, comprehensive numbers are not available.

Some municipalities got into trouble simply trying to lower the cost of issuing debt for such common local government responsibilities as improvements to schools or water treatment facilities. Other governments were trying to use derivatives to cloak their debt or budget deficits. Once they got into trouble, they became susceptible to greater dangers as they traded more complex or exotic—and riskier—derivatives to recoup their losses.

Textbook arbitrage

Governments most frequently entered into a common type of derivative transaction called a swap contract to lower expected borrowing costs. A common swap involves an exchange of a fixed stream of income for a floating stream. Municipalities got into trouble when they instead issued bonds with a variable, or floating, rate, and then entered into an interest rate swap transaction (with a dealer, usually a commercial or investment bank) to convert

Local governments on both sides of the Atlantic found themselves in a financial mess after engaging in derivatives transactions

What is a derivative?

A derivative is a financial contract whose value depends on or derives from—hence the name—an underlying reference item, such as a stock, bond, currency, or interest rate. Futures contracts, options, and swaps are among the most common types of derivatives. Some derivatives are traded on exchanges, others over the counter. They are often used to hedge risk.

the variable rate into a fixed rate—a process called synthetic fixed rate debt. That fixed rate was supposed to be lower than what the municipality would have paid had it issued a standard fixed-rate bond. Although converting a variable rate into a fixed rate was the intent, it was achieved by netting out two variable payments—between the floating rate the municipality paid on the bonds and the floating rate it received in the swap. The expected difference between the two floating rates was projected to save the municipality 0.5 to 1.5 percentage points on its debt.

This is a standard derivative strategy, long used by non-financial firms. It posed problems for municipalities when the floating rate on the municipal bonds they issued did not move in sync with the benchmark rate that determined the payments received from the swap dealers. These interest rates might track each other closely under ordinary market conditions, but diverge sharply during a crisis, when market pressures affected them differently. When the interest rates ceased moving in tandem, the netting of the two variable rates no longer resulted in the fixed-rate goal and municipalities ceased to save on their interest payments. The potential for such a negative development is called “basis” risk. Municipalities’ savings on interest rates often turned to losses as interest rate paths diverged.

Between 2002 and the end of 2007 there was a fairly reliable difference, called a spread or basis, between the London interbank offered rate (LIBOR), a commonly used benchmark for municipal bond issues, and the Securities Industry and Financial Markets Association (SIFMA) index, often used to determine the municipal swap rate. But that spread became alarmingly volatile between 2008 and March 2009

(see chart), and municipalities generally wound up paying higher—often much higher—rates than anticipated.

The situation became more complicated when the rates municipalities paid on their long-term variable rate bonds were not linked to a benchmark rate, but were set directly by the market at regular weekly or monthly auctions. In addition to a mismatch between individual market-based financing rates and benchmark interest rates, during the global financial crisis the auctions often failed, because there were no bidders for the bonds—not even the broker-dealers that had underwritten the securities. Those broker-dealers were hampered by their own shortage of capital and funding difficulties. When the auctions failed, the rates on the securities skyrocketed because of clauses in the contracts that set high penalty interest rates in the event of such a failure.

A strategy designed to save on interest costs did not adequately address basis risk—that is, that spreads might widen. The transactions followed a period of low volatility in interest rate spreads that suggested low probability of future problems. Now it is clear that the past was not a good guide for the future, and that the expected savings were not sufficient once an accurate measure of risk was taken into account.

Getting the money up front

Municipalities also used interest rate swap transactions that offered them up-front payments, which they could use to reduce debt or pay for current expenses, in return paying more than they would otherwise have had to over the term of the swap. Interest rate swaps are typically priced at par, which means that the fair market value of each side (or “leg,” in swap parlance) is the same at the outset of the deal. However if a municipal government contracts to pay a fixed-rate leg that is higher than the prevailing market rate, the dealer pays the value of those higher future payments to the local government at the outset of the deal. In municipal accounting systems that are on a cash rather than accrual basis, such a transaction would not usually be reported as a government debt even though the municipality has, in effect, borrowed. That distorts the municipality’s reported fiscal condition.

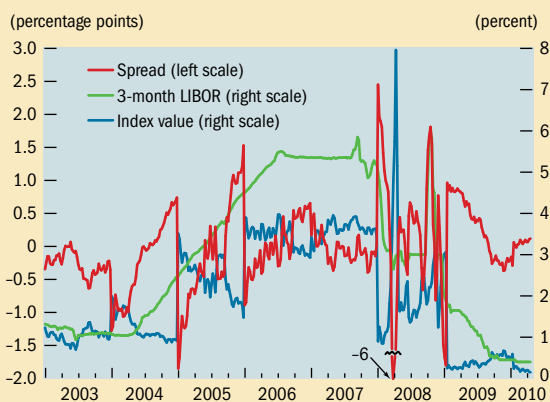
Exotic deals

The third, and sometimes most damaging, case involved more complex or exotic derivatives. Municipalities seeking to recover losses on other derivatives transactions, or merely to enhance the returns on their cash assets during a period of low interest rates, entered into derivatives transactions such as constant maturity swaps (CMS), swaptions, and snowballs. Because they were more complex and opaque, these swaps were more difficult to price and their risks were less clear. Moreover, their primary purpose usually was not to hedge risk but to generate higher income by taking on more risk. A major question is whether they were priced fairly.

A CMS is an interest rate swap in which one side’s payment is based on a short-term benchmark rate such as three-month LIBOR plus a spread and the other side pays, say, the 10-year swap rate in effect on each payment date during the life of the swap. It essentially is a bet on the slope of the yield

When rates diverge

The difference, or spread, between LIBOR and the SIFMA index was steady from 2006 to 2008 but became volatile after that, upsetting municipal securities rates based on that spread and costing local governments much money.



Sources: U.S. Federal Reserve Board and Securities Industry and Financial Markets Association.

The London interbank offered rate (LIBOR) is the rate that banks charge each other to borrow for short periods of time. It is often used as a benchmark for floating rate debts, including many obligations issued by municipalities.

The Securities Industry and Financial Markets Association (SIFMA) Index is often used as the benchmark for the variable rate paid to municipalities by dealers in interest rate swap transactions.

curve—which plots the relationship between the income an investment yields and its maturity. In normal times, yields are lower the shorter the maturity and the curve slopes upward (because of a combination of risk factors that increase over time). The key selling point for these transactions was that when the benchmark rate was high, the net payment between the two would be close to zero. If the central bank lowered short-term rates, the yield curve would likely steepen, because long-term rates would not fall as much. The swap would generate a cash flow to the municipality. But during the financial crisis both short- and long-term rates fell, and the slope of the yield curve flattened. Twenty-seven school districts in Pennsylvania alone are reported to have lost money on these types of contracts since 2006.

The losses generated by many of these derivatives trades created large problems in local governments.

A complex variation of a CMS is an exotic derivative called a snowball. Snowball investments contributed to losses in cities such as St. Etienne, France, and Pforzheim, Germany. (St. Etienne also suffered major losses on currency swaps that involved pounds sterling and Swiss francs.) These snowballs, like CMS, derived their value from the difference between long- and shorter-term interest rates. But an added mechanism required that each period's payment be no lower than the previous period's. Thus an unfavorable movement in interest rates, even if temporary, would generate a permanent increase in payments over the life of the contract—and maturities sometimes extended for decades. This is good business for the party on the winning side of the transaction—which the municipalities frequently were not.

An instance of all three problems

In the United States, Jefferson County, Alabama, managed to get ensnared in all three scenarios—trying to lower interest costs, to generate up-front payments, and to earn extra income. The county, with fewer than 700,000 people, traded 17 swaps with a combined outstanding notional value of \$5.8 billion and maturities extending up to 39 years. Not only has the county lost \$277 million on the derivatives transactions, but there are indications that excess commissions of about \$100 million were paid in conjunction with those transactions.

One of the Jefferson County swaps illustrates how complexity can create asymmetric pricing knowledge—a situation in which one side knows more than the other about the transaction—that results in a product being priced unfairly. The swap in question was designed to generate an up-front payment of \$25 million and extra income for the county, which took on additional interest rate risk to get the higher income. The swap payments, based on notional principal of \$1.88 billion, were the net difference between

the county's paying one-month LIBOR times 0.67 percent and receiving one-month LIBOR times 0.56 percent plus 0.49 percent of the principal. The formula is equivalent to the county's paying LIBOR times 0.11 percent (0.67 percent minus 0.56 percent) and receiving a fixed payment of 0.49 percent.

The terms of the agreement are expressed as percentages of interest rates, which makes the transaction harder to understand. Consider the following reverse financial engineering, which, because maturity details are not public, assumes a maturity of 10 years. The terms are identical—and the transaction is easier to understand—when the interest rates are increased 10 times and the principal is reduced by a similar amount. The payment terms can be expressed as the county's paying the difference of 1.1 times LIBOR times the \$188 million in notional principal less 4.9 percent. The standard 10-year fixed rate for a LIBOR interest rate swap in June 2004, when the deal was made, would have allowed the county to pay straight LIBOR and receive 5.23 percent of the principal. At the then-prevailing swap rate, the 1.1 times LIBOR the county paid would have been exchanged for 5.75 percent—0.85 percentage point more than the 4.90 percent it received.

The swap dealer, on the other hand, received these higher payments. After paying 4.9 percent to the county, it had a virtually risk-free return of 0.85 percent on principal of \$188 million. The present value of this return in June 2004 would have been \$125 million—allowing the dealer to pay \$25 million up front to Jefferson County and earn a profit of \$100 million. The only risk to the dealer was the “credit” risk that either Jefferson County or the counterparty to the other swap would default. The county, on the other hand, took on a large amount of interest rate risk and did so at a below-market rate of return.

This transaction illustrates how complex and nontransparent instruments traded over the counter were used in derivatives transactions with unsophisticated municipalities. It also shows how contracts can be written in ways that obscure the underlying economics.

The losses generated by many of these derivatives trades created large problems in local governments. Towns such as St. Etienne and Pforzheim and Alabama's Jefferson County had to cut spending significantly—reducing current services and delaying or curtailing public infrastructure investment, which has dampened real economic activity.

To help them avoid transactions they don't understand, municipalities should be required to consult genuinely independent third party advisors who can analyze risk and provide independent pricing. Municipalities should pay these advisors a set fee, not a percentage of the transaction. Derivatives dealers should act with fiduciary responsibility and be required to establish the suitability of trades with municipalities and ensure transactional transparency. In addition, governments' accounting rules should be updated to address the use of derivatives in municipal finance. ■

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