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This is the first in what we hope will be a series of commentaries that we write from time to time for friends of the D. E. Shaw group. We hope you find it helpful, and we encourage you to forward to us suggestions for improvements or future topics.

The Basis Monster That Ate Wall Street

The "Cash-Synthetic" Basis Has Moved in Dramatic Ways, Creating Risk . . . and Opportunity

THE DIFFERENCE, or "basis," between cash financial instruments and their synthetic, derivative-based equivalents was once a matter of interest mainly to financial professionals involved in structured credit funds. But during the financial crisis of the past year, cash-synthetic basis has become so volatile and so pervasive across a number of credit instruments that many have taken to referring to it simply as "the basis," even though there are many other common forms of basis in financial markets. (We similarly use this shorthand in this commentary.) Cash-synthetic basis has achieved this notoriety for three main reasons: (1) it's a nearly universal risk factor—even investors that have no exposure to synthetic instruments are effectively exposed to one leg of the risk factor; (2) its recent price movement has been massive; and (3) exposure to cash-synthetic basis is very difficult to hedge.

How should investors incorporate cash-synthetic basis analysis in their evaluation of such unsettled financial markets? Observers of credit markets have recently seen basis trades that, by historical standards, appear at first glance to be enormously attractive. But are we seeing fundamental mispricings of credit, or something else altogether?

We thought it might be helpful to share our views on these and related questions. The first section of this commentary outlines how we evaluate the broader risk factors that largely determine our exposure to cash-synthetic basis. Subsequent sections delve into a few specific trades for illustrative purposes, and explain how we attempt to value different forms of cash-synthetic basis. For simplicity, we're limiting the discussion to the relationship between cash bonds and related credit default swaps ("CDS") and interest-rate swaps. Although there are many other forms of synthetic credit exposures, CDS and interest-rate swaps are the most well-developed and common forms.

Cash-Synthetic Basis: The Underlying Risk Factors

Let's begin with a basic definition of cash-synthetic basis in the credit space: it's the measure of the difference between spreads on derivative credit instruments[1] and spreads on closely matched (in terms of issuer and maturity) cash bonds.[2] Simply put:

cash-synthetic basis = derivative spread – bond spread

The basis is said to be "positive" when the bond spread is tighter than the synthetic spread, meaning that the bond risk is priced more expensively than the related synthetic risk. "Negative basis," which is what we see on average in current markets, is the inverse condition, when the derivative spread is tighter than the bond spread, meaning that the bond risk is cheaper than the synthetic risk. Although the values of cash bonds and CDS are subject to certain asymmetries (the factors causing those asymmetries are discussed later in this commentary), the basis between a cash instrument and its synthetic equivalent generally should be quite tight in strictly fundamental terms. After all, the values of the two instruments converge in the two most important circumstances: a default (when one instrument can literally be converted into the other) and at maturity (when both instruments cease to exist at a basis of zero in price terms). That said, during the credit meltdown of the past year, we have witnessed incredibly large swings in cash-synthetic basis. Figure 1 shows cash-CDS basis for the J.P. Morgan High-Grade Corporate Bond Index ("investment-grade index") and the J.P. Morgan High-Yield Corporate Bond Index ("high-yield index") over the past four years.

Before looking more closely at some examples of cash-synthetic basis, let's step back and consider some of the risk factors that should be kept firmly in mind when trying to understand how the basis functions. Two factors are particularly important: the terms and availability of financing and the positioning of levered market participants.

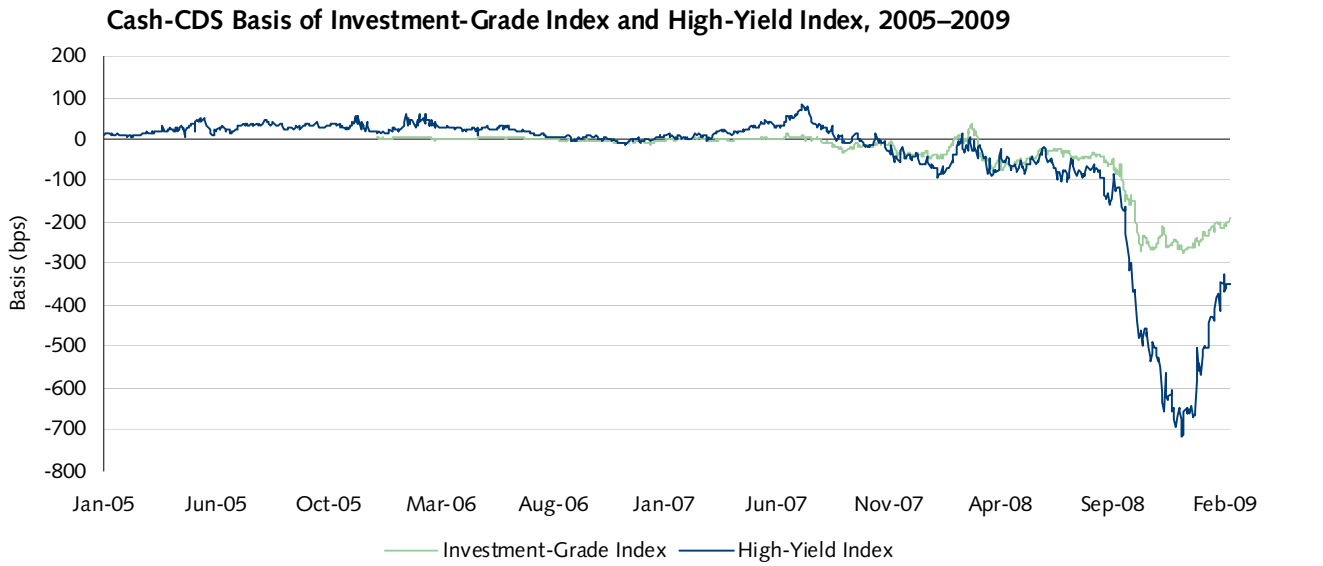

Figure 1 *Source:* J.P. Morgan

Terms and Availability of Financing

The terms and availability of financing (which are perhaps best understood as two sides of the same coin) are a primary determinant of the level of the cash-synthetic basis. When looking broadly at credit markets, demand for cash instruments comes from both levered and unlevered investors. For levered investors, demand for cash instruments is partly a function of the terms and availability

[1] The use of "spread" is a bit of a misnomer in the context of credit derivatives. It's the industry term for referring to what is in fact not a spread over anything, but instead is the coupon rate paid to the party providing the credit protection. We use the term here in keeping with this convention.

[2] The details of the calculation of a cash instrument's spread are very important for trading, but for the sake of brevity we omit them here.

of financing. When financing becomes more expensive or more scarce, aggregate demand for cash instruments decreases, which drives the basis in a negative direction. The important terms in any financing are: (1) the initial margin required on the financing, and perceptions of how margin levels may change in the future (given that long-term assets are often funded with short-term liabilities which are then "rolled"), (2) the term over which counterparties are willing to extend the financing, (3) the conditions under which that financing may be terminated, (4) the rate that is charged for the financing, and (5) the term and financing rate on borrowed securities if the cash instrument is held short. While each of these drivers needs to be considered individually, it's reasonable to consider them in the aggregate for analytic purposes. This is mainly because they're generally correlated with each other—as overall financing tightens, they all tend to deteriorate from the financing customer's standpoint, and as it expands, they all tend to improve. In addition to these financing terms, the availability of financing also depends on the number of market participants that have access to financing and the fact that lenders can increase or decrease the availability of financing based on perceptions of counterparty risk.

Positioning of Levered Players

Levered players include hedge funds, to be sure, but it's important to note that banks and dealers are generally considered the quintessential large and heavily levered holders of cash-synthetic basis risk. Banks and dealers extend credit and other capital to clients, sell off some portion of the risk, and hedge their remaining exposures through various means, including synthetically via CDS on single names and indexes. And in nearly all cases, they do this using significantly more leverage than most hedge funds. (Recently, capital losses, bond rating agency pressures, investor pressures, and changes in the regulatory environment all have led banks and dealers to reduce their leverage. In 2008, this process contributed significantly to the kind of liquidation scenario described in more detail below.)

One way of interpreting changes in cash-synthetic basis over the past year is that the reduced availability of financing simply caused the basis to move from one equilibrium state to another by lowering demand for cash instruments. But it seems to us that the pricing of the basis has gone beyond equilibrium. Why has it done so? We believe the answer relates to the initial positioning and subsequent deleveraging of levered market participants. As the crisis began, many levered investors were predominantly positioned long cash instruments.[3] When the availability of financing decreased, many banks, hedge funds, and other investors were forced to deleverage rapidly. The cumulative impact of the trading costs or "slippage" these levered hands incurred in the process drove cash-synthetic basis more negative than justified solely by the fundamentals. Under a different set of circumstances, it's possible that the positioning and trading activity of levered players could have driven the basis more *positive* for a group of cash instruments—for example, if those players were mostly *short* (rather than long) a certain group of cash instruments and then had to reduce position size. (See our discussion of Berkshire Hathaway in the next section for a specific example of the basis going more positive.)

Of course, the value and even the sign of the cash-synthetic basis vary over time. If obliged to guess prior to the present financial crisis, most market participants probably would have ventured that a basis position that was long the cash instrument actually would have *outperformed* (that is, the basis would have become more positive) in a crisis, as worried investors would be expected to buy protection in the form of CDS, thereby pushing credit spreads on CDS wider than those on the underlying cash bonds. A research report issued by Lehman Brothers in August 2005, for example, noted that "hedging demand amid increased market volatility … kept CDS spreads wider relative to cash."[4] But events have unfolded very differently in this crisis. While the long cash/short synthetic bases of a few issuers may have outperformed, that's not been the case for the majority of issuers during this now protracted financial crisis, and a decision to put on long cash/short derivative trades as a rough form of crisis insurance would not have worked out very well.

What's critical here is that the two risk factors most responsible for driving cash-synthetic basis—namely, the availability of financing and the positioning (long or short cash relative to synthetic) of levered players—are quite

[3] This "long cash" bias among levered players is a normal condition for several reasons too complicated to detail here, but which include: (1) many of the perceived market inefficiencies that levered players seek to exploit relate to more "off-the-run" instruments (which often are cash instruments), while synthetic instruments are mostly based on more plain vanilla products; (2) synthetic short positions are less margin intensive than are cash short positions; (3) financing costs and loss of borrow on synthetic shorts are, at least superficially, less problematic than on cash shorts; and (4) an investor seeking to profit by buying at a discount in the primary market and selling later in the secondary market will be structurally long cash instruments.

[4] Lehman Brothers, "CDS Basis Update: Positive Basis Opportunities," August 24, 2005.

inconveniently also two of the least desirable risk factors for a levered investment vehicle like most hedge funds. Those factors' combined impact literally describes the terms of a classic common-investor liquidation crisis. By incurring heavy exposure to financing risk and the portfolios of other levered investors, a levered hedge fund is effectively selling a gigantic put option on its ability to finance its own positions. Moreover, this put option has characteristics that greatly increase the probability that the option will move in the money at the worst possible moment. If a levered investor suddenly finds itself facing heavy losses, it's not a stretch to suppose that, at the same time and for largely the same reasons, that investor's equity capital base is under pressure from redemptions, its financing position is weakening because of a credit crunch, and other similarly positioned investors are liquidating. Worse still, all of these phenomena tend to self-reinforce in pernicious ways. In such circumstances, it's imprudent to count on financing and trading counterparties to provide help because, as already noted, they're likely to be deleveraging at the same time.

We generally attach a very negative value to this common-investor liquidation risk given that:

- it can pose an existential threat to many hedge funds;
- it's a risk that's common to a variety of investment strategies and thus requires constant diligence to size at an acceptable level, particularly because the various forms of common-investor risk tend to become highly correlated in a liquidity crisis; and
- it's an exposure that's relatively easy for the underlying investors in hedge funds to obtain at low cost, if they want it.

We try to generate profits by focusing on the highest value-added alpha we can find, rather than by accumulating exposure to potentially destructive risk factors simply because they may be easy to find and implement. (In fact, it's the very ease of obtaining some factors that makes them so potentially troublesome.) In that vein, let's now turn to how we evaluate specific cash-synthetic basis trading opportunities.

Evaluating Cash-Synthetic Basis Trades

Every day we manage portfolios that explicitly or implicitly have this form of cash-synthetic basis risk, and in some cases we have an actual view, as a profit-seeking, "alpha" matter, on the size and direction of that basis. In that respect, cash-synthetic basis creates something of a dilemma. As noted in the previous section, basis trades potentially expose levered funds to some highly lethal forms of risk. But the difference in pricing between cash instruments and their synthetic equivalents may itself be a sign of profitable trading opportunities. How can we capitalize on these situations while remaining vigilant as risk managers?

Evaluating the risk/return characteristics of cash-synthetic basis trades is very difficult because the initial positioning and trading activity of levered market participants plays such a large role in determining that basis. The positioning and behavior of levered players can cause basis to vary (even in sign) from one asset to another, even when those instruments are otherwise quite similar. As a result, aggregate data on the market positioning and recent trading activity of those players is extremely valuable information. Unfortunately, this information is generally unavailable. While we can and do attempt to collect market color and believe that we generally have relatively good intelligence about the positioning of other levered players, given the somewhat translucent nature of the system we all operate in—neither perfectly transparent nor perfectly opaque—that information cannot be gathered with sufficient consistency or rigor to serve by itself as a valid foundation for price forecasting.

Even under the best of circumstances, attempting to generate alpha in cash-synthetic trades may be fundamentally at odds with efforts to control the attendant risk. If cash bond A trades with a basis of -400 basis points ("bps") and a different bond B of similar credit quality trades with a basis of -50 bps, an investor might be tempted to believe that the following trade would yield 350 bps of alpha (before any leverage is applied) while remaining neutral to cash-synthetic basis: go long cash bond A and buy CDS protection on A, and short cash bond B and sell CDS protection on B. But the idea that you've controlled risk by remaining neutral to cash-synthetic basis turns out to be an illusion. While, technically, both the A and B legs of the trade have the same PV01[5] exposure to the difference between each of A's and B's cash-synthetic credit spreads (*i.e.,* exposure to a one basis-point change in the difference between the two credit spreads), they may in practice have

[5] PV01 is the present value impact of a one basis-point move in an interest rate or credit spread.

very different betas to the cash-synthetic basis risk factor, with possibly unhappy near-term consequences for the investor making this trade. For example, the investor might be unpleasantly surprised to observe that the basis level of -50 bps in its short cash bond B position remains unchanged (or, worse still, even goes positive) while the -400 bps of basis in its long cash bond A position, which might be wide simply *because* it's commonly held by a number of hedge funds, simultaneously blows out to -800 bps because of liquidation pressures. This sort of thing can and does happen as a result of the technical forces created by whomever happens to be selling, and the reasons behind their transactions.

While technical pressures obviously affect many market dynamics, we believe they are unusually profound in the case of cash-synthetic basis risk. Unlike stocks and other instruments that are driven at least in part by market "fundamentals," basis is driven almost purely by technical factors. This makes life complicated. With respect to most other forms of risk, we can often preserve alpha *and* mitigate exposure to a risk factor by entering into multiple trades, each of which not only has expected alpha but also has, for risk management purposes, risk exposure that at least partially offsets the exposures of the other trades. But that isn't so easily accomplished in the case of the cash-synthetic mismatch. In fact, any attempt to do so could just as easily increase risk as decrease it. Thus, we often view the best course of action as simply refraining from getting too big in cash-synthetic trades in the aggregate.

Consider the cash-synthetic basis of bonds issued by Berkshire Hathaway Inc. ("BRK"). During June and July of 2008, those bonds typically traded with a basis of less than +50 bps. But in subsequent months, a combination of two conditions drove the basis more positive. The primary cause of the widening of this basis was that BRK, owing to its AAA credit rating and skillful negotiation of derivative contracts, almost never needs to post variation margin on its existing derivative trades. When the value of these trades swings in favor of BRK's counterparties, those counterparties take on credit exposure to BRK equal to the amount that the position had effectively moved in the money. As this situation worsens, BRK's counterparties seek to hedge their contingent counterparty credit exposure by buying CDS protection on BRK, a relatively more efficient hedging method that allows duration and other features to be more accurately matched. In the fall of 2008, this hedging activity widened BRK CDS spreads to nearly +500 bps. The secondary cause of the widening of the BRK basis was that cash investors, while certainly anxious to free up liquidity in their portfolios generally, typically held on to their BRK bonds. Given BRK's AAA rating and perceived status as a defensive play in the corporate debt market, cash investors remained for the most part quite comfortable with BRK credit, as reflected by the bonds' relatively tight credit spread (not basis) of approximately +150 bps. So, with levered investors essentially uninvolved in the credit, BRK bonds traded with significantly narrower spreads than the CDS, resulting in a widening of the cash-synthetic basis from +50 to +350 bps between July and November 2008 (and more recently as well). If we compare the cash-synthetic basis of BRK's bonds to the investment-grade index at the same point in time, we find that the cash-CDS basis of that index typically traded at around -30 bps in June and July and then fell below -200 bps in November. Other AAA defensive credits, such as GE Capital Corp. ("GE"), performed similarly to BRK during this period, which supports our thesis that the basis of the debt of AAA-rated companies exhibits similar characteristics for the two reasons cited in this paragraph. Figure 2 shows the cash-CDS basis of the investment-grade index, BRK, and GE over the past four years.

After the recent violent swings in basis, it could be argued that the best way to hedge basis risk is to "overhedge" beta by hedging, for example, the long market value of a portfolio of cash instruments with a somewhat larger short synthetic index position. We question that view on both theoretical and empirical grounds. The theoretical underpinning for the case on overhedging beta is not clear and seems more like a clumsy overfitting of market events that transpired after Lehman Brothers' default. Moreover, one need only look back at price movements in credit markets before the summer of 2008 to see how this hedge would not have performed very well. At the beginning of 2008, credit spreads on the investment-grade index were approximately +95 bps and the cash-CDS basis was -60 bps. On March 16, the day before the rescue of Bear Stearns, spreads on that index widened to approximately +235 bps, but the cash-CDS basis moved positive to approximately +15 bps. So in this case, the "basis hedge" would have moved in the wrong direction.

While our portfolios suffered from some exposure to basis over the course of 2008, we attempted to keep that exposure within reasonable limits and refrained from making an explicit wager on that risk factor. By contrast, those who put on large

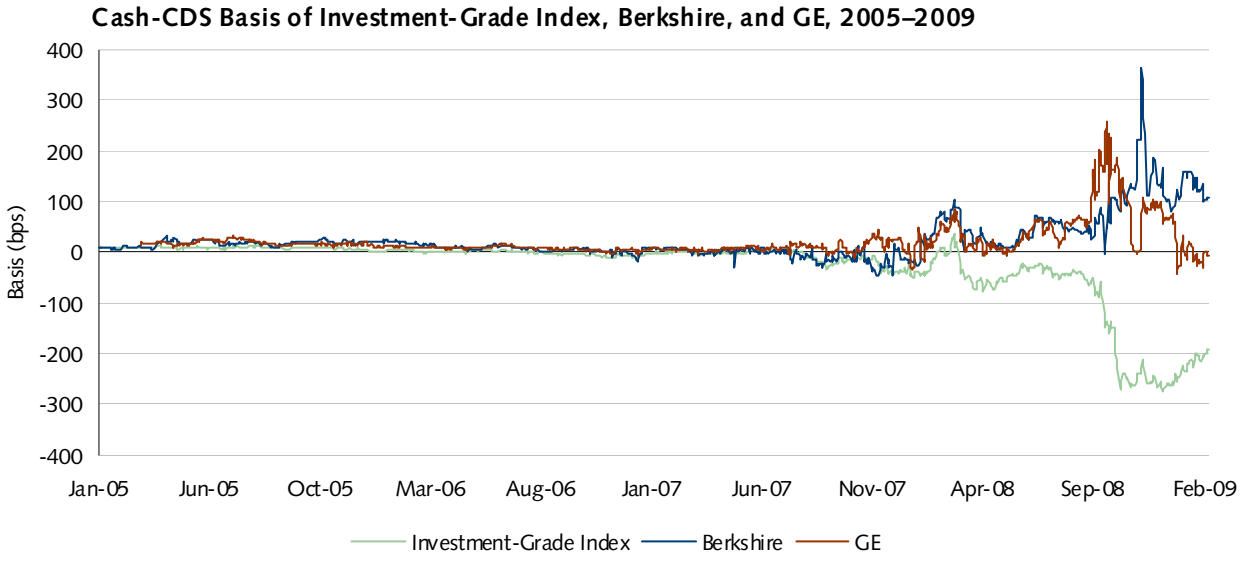

Figure 2 *Source:* J.P. Morgan

explicit basis wagers or set up basis trades as long puts to hedge other risks are now lamenting those decisions. Moreover, if credit markets were to experience a sustained rally at some point in the future, we don't believe—contrary to accepted wisdom—that cash would rebound faster than synthetic instruments. In fact, we believe that cash-synthetic basis could move even *more negative* and put yet more pressure on some levered investors.

If one does wish to pursue a given cash-synthetic basis trading opportunity, selecting cash-synthetic basis trades in a way that conserves financing is central to managing risk. In general, a manager can seek to combine several predictions of future relative price movements in various instruments, in an effort to increase the proportion of genuine manager insight relative to position size. Under normal circumstances, we have a strong preference for making investments that are expected to contain multiple sources of alpha—that's especially true when access to financing is as precious as it is now. Putting on a single trade that has the potential to pay off in several ways gives us more bang for the financing buck and can thus help us make more efficient use of a given balance sheet.

For example, taking a position in a convertible bond may allow us to put on a cash-synthetic basis trade while simultaneously exploiting alpha in the convertibility feature of the bond. A concrete example of recent vintage (from February 2009) might be Qwest Corp's 3.5% convertible that is puttable in November 2010. CDS protection on Qwest's bonds traded at +600 bps, and the straight (meaning non-convertible) bonds themselves traded at a spread of +800 basis points. But the Qwest convertible bond was even cheaper. If one priced the convertible by assuming a credit spread of +800 bps (the full spread on the cash bond), the theory price was approximately 98.5 while the market price was 91.5. So for the same amount of fund balance sheet usage, buying the convertible bond instead of the straight bond would potentially transform an annual gain of +200 bps on the basis trade into +550 bps of annual alpha (assuming a duration of two years on the convertible bond).

We believe our multi-strategy approach to investing offers certain advantages in identifying and structuring trades that layer different forms of alpha as we seek to make the most of balance-sheet resources.

How Cash-Synthetic Basis May Distort Perceptions of the Market

The signals sent by cash-synthetic basis reach the far corners of the global financial system and have a direct impact on the profits and losses of funds that mark their securities to market. Yet it may be difficult at times for observers to correctly interpret what those signals mean, simply because sometimes the basis is tangled up with other factors. The occasional conflation of mostly unrelated

phenomena can severely distort perceptions of what exactly the markets are implying about a given situation. We find the most common form of this "conflation error" is that investors simply look at the current market price of an instrument, compare it to the theory price of that instrument, and assume the difference is a fundamental mispricing, without factoring into their analysis technical, financing, or other considerations. Let's consider a couple of examples.

Some observers have claimed, for instance, that it defies logic that many U.S. Treasury bonds have higher yields than equivalent interest-rate swaps. For example, currently 12-year Treasury bonds yield about 60 bps more than equivalent swaps. Someone might thus conclude, "Debt issued by the U.S. government yields significantly more than swaps, despite the fact that swaps are based on LIBOR, which is an unsecured borrowing rate among banks—that's totally crazy!" We think a better interpretation is as follows: (1) Treasuries are indeed 40 bps better (*i.e., lower* yielding) than swaps because of better credit quality (and certain tax advantages), but (2) there's an additional 100 bps of yield in long-dated Treasuries because of an unrelated -100 bps of cash-synthetic basis in very off-the-run Treasuries (12-year high-coupon bonds in particular), resulting in Treasuries trading with yields 60 bps higher than interest-rate swaps, as previously noted. Looking at it that way renders the apparent Treasury vs. swap anomaly much less remarkable, and indeed like something that could easily become more extreme, or might move to having the opposite sign, depending on how markets evolve and how market participants are positioned and behave.

As an editorial sidebar, we note that, despite current controversies about the transparency and settlement issues surrounding CDS and other types of swap agreements, we believe that swap markets have often priced in a "truer" level of the market's fundamental view on a particular issuer's credit risk than that implied by prices of cash bonds (although we don't believe this will necessarily always be the case).

Here's a second example. In the Treasury Inflation-Protected Securities ("TIPS") market, a large cash-synthetic basis might mislead observers about the future inflation implied by the market. Consider that in November 2008, 8-year asset-swap spreads on nominal U.S. Treasuries were generally priced in the neighborhood of +70 bps (in other words, the "normal" way, with swaps yielding more than Treasuries) while 8-year asset-swap spreads on TIPS were generally in the neighborhood of -130 bps. The result was a 200-bps disparity in the cash-synthetic basis for two Treasury bonds of roughly the same maturity. On a traditional reading of the situation, future inflation expectations could be estimated by subtracting the real yield on an inflation-linked bond from the nominal yield on a nominal bond. In this case, the yield on the nominal bond was approximately 2.5% and the real yield on the inflation-linked bond was approximately 3.5%, implying a 1% annual rate of *deflation* over the next eight years. But a more refined approach would break that difference into two components: an implied annual 1% *inflation* over the subsequent eight years (given asset swaps on TIPS) and a 200-bps difference in cash-synthetic basis between nominal and inflation-linked bonds at that maturity. In fact, if we look back at the inflation-swap market at that time—a market without cash-synthetic basis—we see that 1% inflation was exactly what that market was pricing in (although that market is illiquid enough that most observers do not look to it for implied inflation). This example illustrates that understanding basis has important implications for policymakers or anyone interested in discovering what the market is implying about certain elements of the future macroeconomic landscape, in this case inflation.

Asymmetries in the Fair Value of Bonds and Credit Derivatives

We've now considered a few "real-world" cash-synthetic basis examples for general purposes. As a final exercise, let's discuss some of the more idiosyncratic elements of basis analysis. While cash bonds and synthetic instruments like CDS obviously are linked in various ways in theory, a number of interesting factors create asymmetries in practice that should be considered when estimating the fair value of either instrument.

- **Nuances of CDS contracts and cheapest-to-deliver option:** Synthetic instruments do not perfectly match related cash instruments. For example, when a credit event occurs, the buyer of CDS protection can deliver *any* of the issuer's bonds to the protection seller, not just the specific bond the buyer might have been protecting. This "cheapest-to-deliver" option is a helpful asymmetry for a negative basis position (where, by way of reminder, the investor has gone long the cash bond and shorted the synthetic). In a few real-world cases, this delivery option has proven to be very valuable. For example, when Fannie Mae and Freddie Mac were put into conservatorship by their federal regulator, the companies' bonds increased in value because of the perceived benefits of direct government support. Happily for investors with negative basis positions, the conservatorship

was deemed a credit event, meaning that not only did they receive a small payment as buyers of CDS protection, but they also could deliver the cheapest bonds into the contract, resulting in a profit on both legs of the trade. This delivery option can also be very profitably exercised in a "restructuring" in which a company is able to force material changes upon all holders of a bond or loan when the company's creditworthiness has deteriorated.

- **Rights of the cash instrument:** Whereas taking a long position in a cash instrument confers certain rights upon the owner, gaining the same exposure via CDS does not provide the same rights to the seller of protection. The owners of cash bonds or loans may be able to profit from their ability to negotiate with the issuer of the bond or loan. For example, loan holders sometimes can earn fees by waiving covenants or renewing a commitment. Investors using synthetic instruments to get the same exposure do not benefit from these events.
- **Likelihood and timing of bond default:** Because cash-synthetic basis is certain to go to zero in a default, one should, all else equal, prefer basis trades in bonds that are likely to default sooner rather than later since that will result in an earlier realization.
- **Likelihood and correlation of CDS counterparty default:** If we enter a basis trade in which we purchase a bond issued by Financial Company A and then buy CDS protection on Financial Company A from Financial Company B, we run the risk that Financial Company B will default before Financial Company A. This would cause us to lose the protection on our bond, and we likely would have lost some money on the termination event.[6] We can try to reduce this risk by buying CDS protection from the most creditworthy counterparties, avoiding a high potential correlation between the creditworthiness of the CDS counterparty and the bond issuer referenced by the CDS, and sensibly managing our exposures to counterparties.
- **Distortions of LIBOR:** Standard cash-CDS basis calculations implicitly assume that LIBOR is the appropriate risk-free rate to employ, meaning that it's the rate at which the market should discount risk-free cash flows. It's worth first pointing out that, even under normal conditions, LIBOR is not in practice a "risk-free rate," as it's the rate at which the largest banks (which are of course themselves not risk-free) lend to each other on an unsecured basis. Also, LIBOR is set via a somewhat messy polling mechanism, and it's possible that the outcome of that poll may not reflect the market's true discount rate. If LIBOR is tighter than the market's true risk-free discount rate by 100 bps, for example, that may result in standard calculations showing a negative basis of 100 bps simply because the market will use LIBOR + 100 bps when pricing a bond.
- **Duration of trade:** Generally speaking, a 10-year basis trade would be attractive at a lower spread than a 1-year basis trade because the maximum loss (*i.e.,* the bond goes to zero, and the CDS is worthless) is the same for both, and yet there is more upside in bond points if the trade normalizes (moves towards zero basis).
- **Borrow risk on bonds:** When selling bonds and selling CDS protection, a fee is paid to borrow the bond, and there is the potential to lose the borrow on the bond, both of which affect the fair value of the cash-CDS basis.

Concluding Thoughts

We hope that this commentary, though necessarily limited in scope, has shed some light on how cash-synthetic basis functions in contemporary financial markets. As a practical matter, we believe that understanding, monitoring, and potentially profiting from exposure to cash-synthetic basis requires both *depth* and *breadth* in a manager's investment capability. The ability to conduct in-depth analysis by gathering and processing data on the availability of financing, the positioning of other levered players, and asymmetries in the values of cash and synthetic instruments is clearly important. But so too is a broader understanding of whether a given basis opportunity is unusual relative only with respect to that asset class over time, or whether it also stands out at a particular moment relative to opportunities in other asset classes. We believe the D. E. Shaw group is well positioned on both counts, given our size—in terms of both assets under management and human capital—and the range of expertise that we deploy across multiple asset classes.

[6] The loss on the CDS would be limited to the amount that the CDS moves in our favor between the last time it was marked to market and when it is replaced in the market. More generally, if a large financial institution defaults, it's quite possible that other financial counterparties selling protection on that name will simultaneously go under and consequently fail to pay on the CDS contract. However, if the CDS moves against us, we must make good on the full amount, even if the counterparty has entered bankruptcy.

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