



AN ANATOMY OF THE ORIGINS OF NEGATIVE BOND-CDS BASIS

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Abstract The bond-CDS basis trade is an investment in a bond with a simultaneous hedge of all “hedgeable” risks, to wit: potential FX risk is hedged via FX derivatives, interest rate risk is hedged via interest rate swaps, and credit risk is hedged via CDSs (the abbreviation CDS stands for Credit Default Swap). It can be an attractive source of income, as it has low volatility, low risk in general if managed conservatively, and very low correlation with the rest of the market. If the return of such position is larger than the benchmark interest rate, one speaks of a negative basis trade, and this excess return can have multiple origins. The present article provides a generic classification of the various explanations for the existence of negative basis, and demonstrates some of them with actual trading examples.

1 Introduction The negative basis is a spread on top of a reference interest rate that can be earned seemingly “risk-free” when buying a bond and hedging away credit risk via CDS (and additionally hedging FX and interest rate risk with respective derivatives). Background on the measurement of the negative basis is provided in Bernhart, Mai (2016); Mai (2019). On a first naive glimpse, one would assume that negative basis is a phenomenon that should almost never be observed, because arbitrage theory suggests that every rational investor immediately jumps on the (arbitrage) opportunity to earn “risk-free” money until the negative basis disappears. Indeed, negative basis is the exception rather than the rule, and negative basis trades with hefty returns form their own niche market segment. The “absence of risk” in existing negative basis opportunities clearly depends on the definition of risk. Negative basis opportunities can be classified into different categories with respective risk profiles, and the present article aims to provide an overview of these. Classifying the origins of the negative basis trading opportunities according to these categories helps one to judge on their attractiveness.

2 Easygoing sources We classify a source of negative basis as “easygoing” if the only risk associated with it is mark-to-market risk. This means that the entry point into the position might not be optimal, but if it is held until maturity (or until a credit event) the return on investment will certainly be equal to the benchmark interest rate plus the negative basis that has been observed at trade inception. These explanations for the negative basis are the ones that negative basis traders like, because the only aspect to take care of is to monitor the negative basis and buy the position when the negative basis is sufficiently high (and sell when the negative basis is low) in order to maximize their target return. It is essentially their



daily business to trade the negative basis range, and they have the option to hold the trade until maturity in case the negative basis does not tighten up early. In the following, we describe three different explanations for the emergence of “easygoing” negative basis.

2.1 Liquidity supply in distress One of the most typical occurrences for highly attractive negative basis investments arises if a company faces financial distress. While the company’s bond price falls sharply and the CDS price rises, the basis package - consisting of both bond and CDS - sometimes drops significantly, and a negative basis investor might buy this package. In such a situation the negative basis investor often acts as a liquidity provider by (i) providing exit liquidity to forced bond sellers and (ii) providing leverage to aggressive distress investors seeking to play the rebound. A paradigm real world trading example is provided by a senior floating rate note issued by Credit Suisse Group AG before it was taken over by UBS in March 2023, as will briefly be recalled. The bond with ISIN CH0591979635 issued by Credit Suisse Group AG in 2021 pays quarterly Euribor plus 100 bps margin, and has maturity in January 2026. The appropriate CDS on Credit Suisse Group AG with maturity in March 2026 has fixed rate equal to 100 bps. The nominal-matched package of bond and CDS thus pays quarterly Euribor, since the margin of the bond and CDS coupon cancel each other. A package price below par thus corresponds to negative basis (with Euribor as reference rate), since the difference between par and the package price can be earned on top of Euribor, either until maturity or until a potential credit event. With the Credit Suisse financial turmoil evolving already in 2022, the negative basis emerged and has already been very attractive by the end of 2022 at levels between 150 and 200 bps, see Figure 1. It has reached its peak in mid-March during the week before the takeover by UBS has been decided, when it climbed to insane levels well above 350 bps (intraday the package was printed even in the low 90s at approximately 600 bps negative basis). Note that the package has been free of default risk at all times, so a package price in the low 90s in mid-March is totally unsubstantiated from a fundamental credit risk point of view. The mechanics that have driven this wild price move are summarized as follows:

- The **bond** has been held by many yield-seeking credit investors that manage highly diversified portfolios, like large insurance companies and pension funds. When uncertainty about the solvency of Credit Suisse became public, many of these holders decided to sell their stake. This has led to massive bond supply since the end of 2022, peaking in mid-March, when the bond price was in the low 70s. The major reason to sell for these investors was a reduction of risk rather than a directional view. They simply had to reduce their (large) holdings in order to comply with internal risk limits, so essentially became forced sellers.
- Some specialized and aggressive investors, like hedge funds for instance, have analyzed the situation and decided to bet



on a rebound of the bonds. Instead of buying the bonds in the low 70s, they purposely decided to sell **CDS** in the low 20s. On first glimpse, this appears irrational, since a rebound gain from 70 to 100 in the bond exceeds a rebound trade from 20 to 0 in the CDS. However, buying the bond requires cash, whereas selling the CDS at positive upfront requires no cash. Consequently, a highly convinced, aggressive investor preferred to play the rebound by selling CDS at 20 with a nominal that is a multiple of his cash holdings, thus creating an extreme upside via high leverage (gaining 20 points multiple times is better than gaining 30 points once).

- The negative basis investor acted as an intermediary between the forced bond sellers and the aggressive CDS sellers. By buying the **package** of bond and CDS he provided exit liquidity to the forced sellers, and he provided the aggressive investors with the possibility to install their leverage trades by buying the CDS.

It is educational to understand how each involved party profited from the described situation: the forced seller received exit liquidity, the aggressive investor received leverage for a high-conviction trade, and the negative basis investor received an attractive intermediary premium in terms of an attractive negative basis. Taking into account that the transactions from bond and CDS sellers to negative basis investors go through brokers and market makers with non-negligible bid-ask spreads, there is even a fourth party involved with a big win. Summarizing, this is an extreme example for a win-win-win-win situation that would fit well in an introductory university lecture on business administration to demonstrate positive effects of financial markets and derivative contracts.

This Credit Suisse example clearly has been quite extreme and the negative basis measurement is particularly easy to understand, due to the fact that the bond pays Euribor plus a margin that equals the fixed CDS coupon rate. However, the described motivations of all involved parties is very similar also in other situations of financial distress, and the Credit Suisse case is not special in this regard, even though it has been an extreme and popular case. Consequently, we purposely chose this example to demonstrate the typical mechanics of a negative basis trade that is triggered by financial distress.

2.2 Illiquidity premium

Another common source of negative basis is a premium that can be earned on a bond in case it is highly illiquid. Such illiquid bonds are often held by very few investors with the intention to keep them until maturity. Sometimes these bonds are even issued with a special feature, like a certain interest rate structure, that is desired by a certain large bond investor, who absorbs the lion's share of the nominal already at issue date. It is therefore not untypical that the total nominal of such bond issues is rather small. These bonds do not really trade, i.e. there is not really a liquid market for them. Occasionally, there is a reason for one of the holders to sell a significant part of her holdings, opposed to her initial intention. To provide an example, due to rising in-

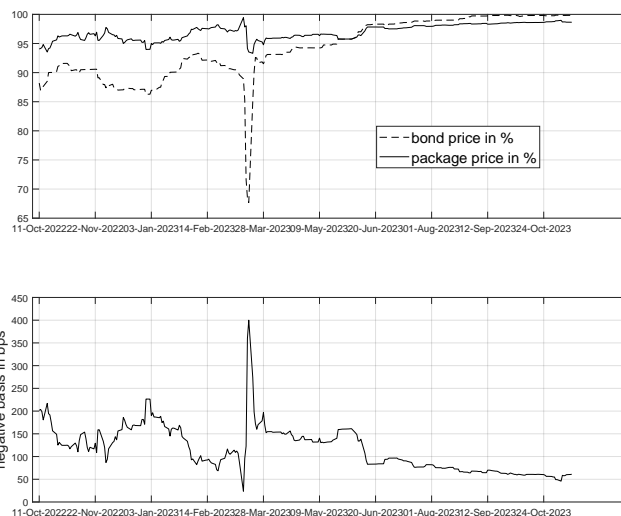


Figure 1: Top: The price for the Credit Suisse bond with ISIN CH0591979635 from November 2022 until November 2023, as well as the price for the package consisting of this bond together with nominal-matched CDS protection. Bottom: The negative basis implied by the observed prices for bond and CDS.

Interest rates in 2022 many insurance companies suffered mark-to-market losses in their long-duration assets. On top of that some suffered mark-to-market losses on derivative contracts like cross currency swaps. In order to comply with their collateral obligations on the latter derivatives, some were forced to liquidate positions, and sometimes decided for one of the aforementioned illiquid bonds. In such a situation, the price of the bond is lower than the price of more liquid bonds with comparable profile by the same issuer. This is simply due to the fact that a potential buyer demands a significant illiquidity premium. The CDS prices instead typically refer to the more liquid bonds, so that negative basis emerges.

A negative basis package arising from this source inherits the illiquidity from its bond leg. Consequently, there is only a small probability that this basis package can be sold at prices with significantly tighter negative basis in the future. If the illiquidity premium is large enough so that the negative basis carry alone is an attractive income, it might nevertheless be a worthwhile trade for the negative basis investor in her portfolio's hold-to-maturity bucket.

2.3 Market segmentation An explanation that is partly related to the aforementioned ones, but still with a somewhat more general quality, is market segmentation. By this terminology we mean that sometimes the investor base in the bond market is very different from the investor base in the CDS market. An example is a rating downgrade, which forces certain large bond holders to sell their holdings, with bond spread widening overshooting the CDS spread widening due to



sudden, massive bond supply which the market cannot absorb at once. The paradigm example for this situation was the Euro crisis, when countries like Italy, Greece and Portugal lost their AAA-rating and insurance companies were forced to sell bonds due to regulatory demands. Another example arises from credit-linked notes that banks sell to their retail clients as an investment. Sometimes, these retail clients (due to a lack of experience) are happy with a significantly lower yield than the credit spread implied by the respective CDS. The bank may then earn the difference between retail yield and CDS spread by selling CDS in the market (for instance to a negative basis investor), and simultaneously buying protection through credit-linked notes from the retail clients. If the bank has access to large retail demand, it may offer the CDS in the market at a discount to the bond spreads, and negative basis emerges. In principle, this is a very similar source of negative basis as the one outlined in paragraph 2.1, but the trigger for the emergence is not financial distress of the reference entity. In contrast, often retail clients like rather solid risk like senior financials or IG industrials.

Finally, since it is topical, let us highlight a further example in some detail, which is slightly more technical but also fitting into the category of market segmentation. Consider a credit investor who seeks to buy senior bonds of a European bank. This investor has the choice between bonds with different currency denomination, we consider EUR and USD. In order to appropriately compare the investment in EUR- and USD-bonds, we assume that both have the identical maturity (at least approximately). Further, in order to appropriately take into account the different currencies, we assume that an investment into the USD bond comes equipped with USD funding via a cross currency swap. This means the investor only has EUR at hand, and in order to buy the USD bond he receives USD through a cross currency swap in which he delivers EUR. In addition, for both the EUR and the USD negative basis investments, interest rate swaps are in place that essentially swap the fixed bond coupons into EUR and USD floating rate legs. Summarizing, with these FX and interest rate hedges in place, both “packages” can be considered EUR floating rate notes, whose essential difference is their price. Equivalently, when equipped with an additional CDS hedge, which costs the same for both bonds, the investor might compare their negative basis measurement. Interestingly, in the end of 2022 a significant discrepancy between the EUR and USD negative basis has emerged, which is demonstrated in Figure 2 for two exemplary bonds issued by the Italian bank Intesa Sanpaolo SpA. The two bonds have identical seniority and very similar maturity, the major difference is their currency denomination (EUR versus USD). Figure 2 shows that the USD negative basis is almost always larger than the EUR negative basis. Furthermore, since the end of 2022 this discrepancy between USD and EUR has become quite huge historically, even exceeding the difference during the Covid-crash in 2020, when it also displays a peak. Again, it is important to note that there is no meaningful difference in terms of credit risk between the two currencies, so what else can be the reason for this phenomenon?

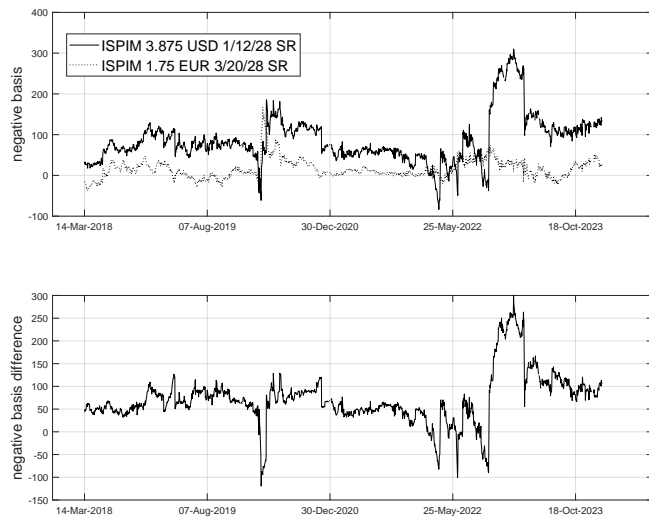


Figure 2: Negative basis for two bonds issued by Intesa Sanpaolo SpA (ISPIM). Their seniority is both Senior Preferred, and both mature in the first quarter of 2028 (January versus March). Major difference is their currency denomination.

The reason is that Intesa Sanpaolo SpA (ISPIM) has to issue USD bonds in order to fund itself USD and please its USD investor base. Since the Federal Reserve in the US rose interest rates more aggressively than its European counterpart in 2022, the ECB, the USD funding has become more difficult for ISPIM. This is because the USD investor base has more attractive money market alternatives. This effect has not only been observed for ISPIM, but also for other European banks like Unicredit, Deutsche Bank, HSBC, Standard Chartered, and Barclays. It is interesting that the investors that buy the respective EUR bonds do not switch into the higher-yielding USD-equivalents, causing this discrepancy between USD and EUR negative basis to disappear. A plausible explanation is market segmentation: many EUR investors are simply not capable, or not allowed by their mandate, to buy the USD bonds. This “home bias” effect may explain why the USD negative basis is always larger than the EUR negative basis, but still the extreme peak by the end of 2022 was a historically unique opportunity for negative basis investors.

3 Challenging sources

In contrast to an easygoing source of negative basis, we classify it as “challenging” if there is a possibility that the position suffers a persistent loss, not only a mark-to-market loss that can be sit out. These explanations are challenging to the investor because ideally they should be ruled out. At the very least, they should be handled with deliberation, meaning that the investor consciously decides that the size of the negative basis is an appropriately lucrative compensation for taking the respective risk. It is important that these risks are never overlooked!



3.1 Call or extension risk Sometimes a bond prospectus grants its issuer the right to redeem the bond early at some specified early redemption price (one says the issuer has a *call right*). In contrast, the CDS does not grant the protection buyer the right to alter the maturity of the contract. This causes an economic discrepancy between bond and CDS which might be a source for negative basis. While a call usually induces a gain on the bond position, it can be good, neutral or bad for the negative basis package, depending on the situation. If the company has other CDS-eligible debt outstanding whose maturity is shorter than the negative basis investor's CDS maturity, the CDS price often remains relatively stable, and the bond gain due to the call implies a gain also on the negative basis package. The CDS can then be sold in the market and the negative basis investment ends with a gain due to the call. The situation can be different if the redeemed bond is short-dated and called with the intention to roll existing debt into a longer maturity. This may lead to a steepening of the CDS curve, with the front-end collapsing. In other words, since the market believes that after the debt roll a default in short-term is unlikely, the short-dated CDS loses value. This value loss might be compensated by the bond gain, but it can also imply a loss of the basis package, depending on the specific case. The worst case is a so-called *orphaning*, which happens if the issuing entity becomes empty with the bond redemption, for instance because the company decides to issue new debt out of another entity or re-finances by other means (e.g. via equity). In this case the CDS becomes worthless.

While call risk can be painful for a negative basis investor, the maximal downside implied by this risk is an orphaning event and can be computed exactly in advance. Consequently, one may compute this maximal downside figure, compute the negative basis, and then decide whether the negative basis that can be earned is an adequate compensation for taking the call risk. We provide an example to demonstrate this with a negative basis position in Stonegate Pub Financing. Stonegate has a floating rate note with maturity in July 2025 outstanding, which pays quarterly Euribor plus 5.75% and costs 97% at the beginning of April 2024. The maturity-matched CDS with maturity in September 2025 comes at a price of -2% and has a 5% fixed coupon. Obviously, this package at a price of 95% ($95 = 97 - 2$) implies negative basis, since it pays 75 bps plus the 5 missing points to par (on top of Euribor) over the remaining lifetime of ~ 1.5 years. However, the issuer has the right to redeem the bond at par at any time, and it is a valid possibility that an orphaning event occurs. In this case, the bond would experience a gain of 3 points from 97% to the redemption price of 100%. But the CDS becomes worthless, which means that it trades down to approximately $-7.5\% = -1.5 \times 5\%$, so suffers a loss of -5.5% . Consequently, an orphaning event implies a package loss of -2.5% ($-2.5 = -5.5 + 3$). Figure 3 visualizes the risk profile of this negative basis.

The red dotted line equals the current dirty market price of the package, i.e. the aforementioned 95% plus (bond and CDS) accrued. The black line indicates the net present value of the pack-

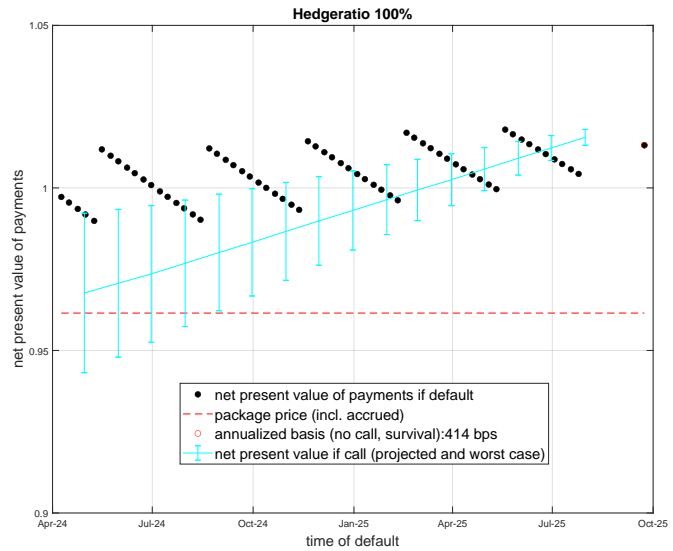


Figure 3: Illustration of the risk profile for a negative basis position in Stonegate.

age in dependence on the timing of a hypothetical credit event, the respective dates being depicted on the x -axis. Since the package trades well below par and one receives par in case of a credit event, the black line lies well above the red dotted line, so a credit event would be very favorable for this position. The lower end of the blue area gives the value of the negative basis package in case the bond is called and the CDS becomes worthless (orphaning). The aforementioned -2.5% loss in this case are observed if the orphaning happens immediately. If time passes by and the orphaning happens later, this is favorable for the position, since it consumes a carry gain until then, which alleviates the loss. The upper end of the blue area gives the value of the negative basis package if the bond gets called and the CDS price remains unaffected by that. This could happen, for instance, if the company re-finances the bond with a new issue out of the same legal entity. Summarizing, Figure 3 is helpful to visualize the risk-return profile of the position. Whether one considers this a good trade or not ultimately depends on one's subjective opinion how likely a soon orphaning event occurs. Finally, if one believes in an early redemption of the bond at some call date, and if one shuns the associated call risk, an obvious trade idea is to buy CDS protection with maturity only covering the call date, but not the bond's maturity date. With such a trade, the call risk is gone, but flipped into extension risk. Now the major risk is that the bond does not get called (like one would have expected) but instead one is left without CDS protection after the call. Hence, one must buy further protection at the then prevailing market price, which might possibly be expensive. In fact, it is likely expensive at that date, because the reason for not calling the bond might be bad credit conditions of the company. Thus, a conservative negative basis investor usually shuns CDS hedges on a specific call date. However, there are examples



for which an early redemption call is very likely, and thus the hedge on a call date can be adequate. One particular example are senior non-preferred bonds by European banks, which fall into the issuing bank's so-called MREL portfolio. MREL stands for Minimum Requirement for Own Funds and Eligible Liabilitys. In order to strengthen the financial system European regulators demand that banks issue a certain amount of debt which can be bailed in if a bankruptcy occurs, so acts as a buffer for more senior liabilities (like customer deposits, for instance). Senior non-preferred bonds typically belong to the MREL portfolio, but in order to be eligible for the MREL portfolio the remaining maturity of the bond has to be at least one year. As a consequence, one year before such bond's maturity the bank is usually granted a call right in the bond prospectus, so that the bank can redeem the bond and replace it with a new longer-dated issue that is MREL-eligible again. Since outstanding senior non-preferred debt that is not MREL-eligible is typically unfavorable funding for the bank, it is the rule rather than the exception that such bonds are called (and replaced with new issues).

3.2 Counterparty default risk The negative basis investor buys CDS protection on a certain reference entity from a counterparty, which is usually a large bank like Deutsche Bank, Goldman Sachs, JP Morgan, or the like. In the case of a credit event with respect to the reference entity, this CDS seller is obliged to make a compensation payment to the insurance buyer (negative basis investor). But what if the CDS counterparty is insolvent just in that moment? This insolvency risk of the CDS counterparty in principle implies that CDS insurance is not 100%, and it is thus plausible that it is cheap relative to the bond, implying negative basis. In principle, this risk is present in all derivatives, also in interest rate and cross currency swaps. In order to minimize counterparty default risk, the cautious negative basis investor only trades collateralized derivatives. This means that he enters a Credit Support Annex (CSA) with every counterparty. This CSA is a bilateral contract between both parties, in which they commit themselves to posting collateral to each other in case of mark-to-market movements. Concretely, if a derivative contract experiences a mark-to-market price move exceeding a specified minimum transfer amount, the counterparty in whose favor the derivative price has moved receives cash by the other counterparty on a collateral account. These collateral accounts thus guarantee that the current market price of the derivative is actually available at the time point of insolvency of the counterparty. The remaining risk that reference entity and counterparty default at the same point in time is sometimes called *gap risk*, since it is caused by the time gaps between the collateral account balancing dates (typically daily). In most cases this gap risk is negligibly small, so that it does not really account for a source of negative basis. With daily collateral account balancing in place, gap risk is an academic risk rather than a practical one.

3.3 Legal risk The most critical risk in a negative basis position is that the CDS insurance does not fully compensate for all experienced losses



a bond causes in a credit event. Generally speaking, this means that the CDS insurance is not 100% adequate for the bond that is hedged with it. If this is the case, we say that there is *legal risk* in the negative basis, because the hole in the CDS protection is caused by discrepancies between the legal documents that underlie CDS and bond. If one buys a negative basis package with significant legal risk, it is clear that it can yield an attractive negative basis, because the latter is a premium that is earned for taking the legal risk, in fact compensating for a prevailing tail risk. A negative basis investor usually seeks to rule out such legal risk in general, which presupposes that he understands precisely the legal mechanics of the CDS. In some situations, however, it can also be the case that there are differing opinions on the legal documents, and one negative basis investor might find the negative basis a quite attractive compensation for certain legal risk that he thinks is rather small, while another negative basis investor has the opposite opinion. In other words, the market for such negative basis packages is then actually a market for trading such legal opinions.

What is a typical legal risk in a negative basis position? A typical legal risk arises if the bond document specifies a so-called Collective Action Clause, which allows a majority of the bond holders to change the prospectus to the disadvantage of a minority. For instance, it may specify that if 90% of all holders accept a reduction of the bond nominal, then the remaining 10% must take that for granted as well. If a company faces financial distress and can convince 90% of the holders to accept such haircut in order to prevent bankruptcy (with potentially much larger losses), this clearly implies a loss on the bond. For the negative basis investor it usually makes no sense to agree to such haircuts, because the induced loss in the bond is only compensated by the CDS in case of a credit event, which needs not always be triggered in such situations. Whereas large majorities are rather hard to find in most situations, for smaller bond issues they can sometimes be found, and the negative basis investor must have an eye on the bond's holder structure, ideally holding a blocking stake himself. Another legal risk arises if the bond issuing entity is not the same as the CDS reference entity. For instance, it is not uncommon that companies establish separate entities with the sole purpose of issuing bonds, due to tax reasons or the like. In this situation it is common, but not always the case, that the bond prospectus explicitly formulates that the parent company, on which the CDS refers, guarantees the bond payments. A negative basis investor must make sure that such guarantee language is in place.

4 Summary We have presented six different explanations for the existence of negative basis, three of which we classified as “easygoing” and three of which as “challenging”. By this our intention was to organize different types of negative basis, and some are clearly preferred over others, since some can more easily be dealt with than others. In any case, a negative basis investor needs to be aware of all possible explanations in order to be able to make a decision on whether or not an observed negative basis figure is an attractive compensation for the risk involved in the trade.



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