
SPECIAL REPORT

TD Economics



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NEGATIVE INTEREST RATE SWAP SPREADS - IN SEARCH OF A SMOKING GUN

Highlights

- As the price of long-dated U.S. interest rate swaps dropped below their benchmark - U.S. Treasury yields - conventional financial wisdom has been challenged once again. The fundamental question of the new reality is whether risk is being priced correctly, but the deeper question is why this is happening at all.
- Regulatory changes via central clearing houses reduced counterparty risk and, therefore, warrant a compression in swap spreads. However, central clearing in itself does not eliminate other risks that might materialize in the event of a systemic shock.
- Our analysis suggests that, in addition to regulatory changes, supply-demand imbalances played an important role in driving the spreads lower. These include: changes in corporate bond issuance, preferences toward fixed-rate borrowing, and the swap market's inability and/or unwillingness to arbitrage away the perceived abnormality of negative swap spreads.
- The outlook going forward is that swap spreads will likely remain low, facilitated by the regulatory environment and structural changes to corporate bond borrowing preferences.

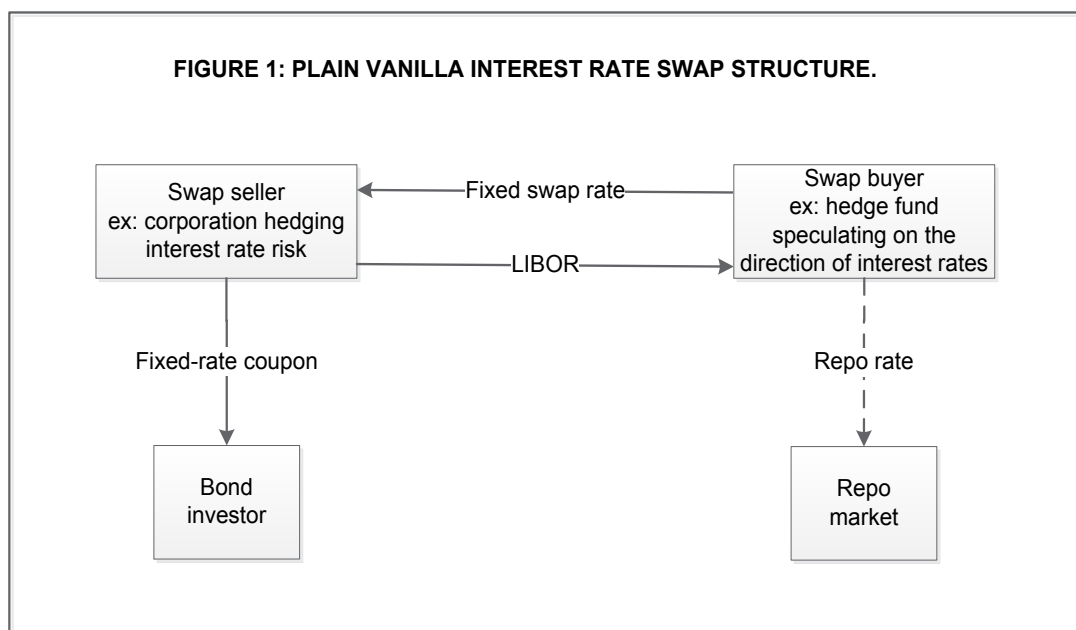
Financial markets the world over have broken new ground in recent years. Most investors are familiar with the negative rate environment that has invaded much of Europe and Japan. Conventional financial wisdom has been challenged by the fact that more than \$17 trillion in sovereign bonds are trading with negative yields. But, the challenge to financial theory doesn't end there. One of the most heavily traded financial contracts across the globe has also entered into this seemingly upside down world. Most U.S. dollar interest rate swap spreads have been negative since September 2015.

Simply put, an interest rate swap is a contract under in which two counterparties exchange a floating rate of interest for a fixed one. The pricing of that swap is typically benchmarked relative to Treasury yields, given that it would be considered the risk-free alternative of receiving the same fixed leg. At face value, having a negative spread from 5-year through to 30-year swaps implies that traders view the counterparty risk of those firms entering into these agreements to be less than that of the U.S. government. Once again, financial theory has been turned onto its head. The obvious question is whether risk is being priced correctly, but the deeper question is why this is happening at all.

Our analysis suggests that there are two primary elements at play: regulatory changes and supply-demand imbalances. These structural changes have pushed spreads to levels that imply a reduction in the perception of counterparty risk. But, in doing so, new risks may have emerged in terms of concentration and liquidity.

The Evolution of Swaps

Although the average retail investor would have little use or ability to enter into a swap contract, larger commercial investors swap financial instruments to hedge debt liabilities, manage interest rate



risk and cash flow. In addition, many banks use swaps to price loan assets, since swap rates capture the net total cost of funding and hedging, as opposed to a benchmark rate that only captures the former. As a result, the dynamics occurring within swap spreads can have a direct impact on the price of both household and business credit.

The first swap transaction was executed in 1981 between IBM and the World Bank and amounted to \$210 million. Since then, the interest rate derivatives market has grown tremendously. As of the end of June 2015, the notional outstanding amount of these instruments was estimated at \$435 trillion¹. Interest rate swaps account for 74% of this market, with one third of interest rate swaps being denominated in U.S. dollars.

Despite the market's exponential growth over 30 years, the mechanics of swaps remain the same: exchange the return of one instrument for that of another. A plain vanilla interest rate swap (still the most common) is a contract under which two counterparties exchange a floating rate of interest for a fixed one (or vice versa). The party receiving a fixed rate and paying variable is deemed to sell an interest rate swap, while the party receiving a variable rate is its buyer (see figure 1). The pricing of that swap is typically benchmarked relative to the risk-free asset of Treasury yields.

Prior to the financial crisis, in the age of bilateral agreements, swap rates were priced higher than Treasury yields to account for any uncertainty associated with the counterparty's ability to fulfill the contractual obligation over the life of the swap. Most transactions in the swap market were

completed with banks acting as intermediaries and taking on that counterparty credit risk. Therefore, a swap spread effectively accounted for the credit risk differential between banks and the U.S. Department of Treasury. These swaps were all customizable and traded over-the-counter (OTC), without regulatory oversight. With the expansion in swap market infrastructure came changes in margin requirements, but these turned out to be woefully inadequate during the financial crisis when the obscurity of counterparty credit exposure led to a complete freeze-up in credit conditions. The failure of Lehman Brothers and the fallout thereafter provided a textbook example of the long reach of counterparty risk. The post-Lehman world thus demanded more oversight in the derivatives market, with interest rate swaps being a key focus. Certainly, the narrowing in spreads since 2008 suggests that at least the perception of risk has changed significantly.

Implications of regulatory changes in the U.S. (Dodd-Frank Title VII)

In September 2009, central banks and regulators around the world pledged to "turn the page of an era of irresponsibility"² through a series of financial reforms, in part targeted at the OTC derivatives market. Originally scheduled to be completed by the end of 2012, these derivative reforms promised to improve market functioning by enforcing central clearing and exchange trading of these traditionally bilaterally-negotiated contracts. The goal was to create more standardized and transparent products. Seven years later, this enormous task has still not been achieved fully.

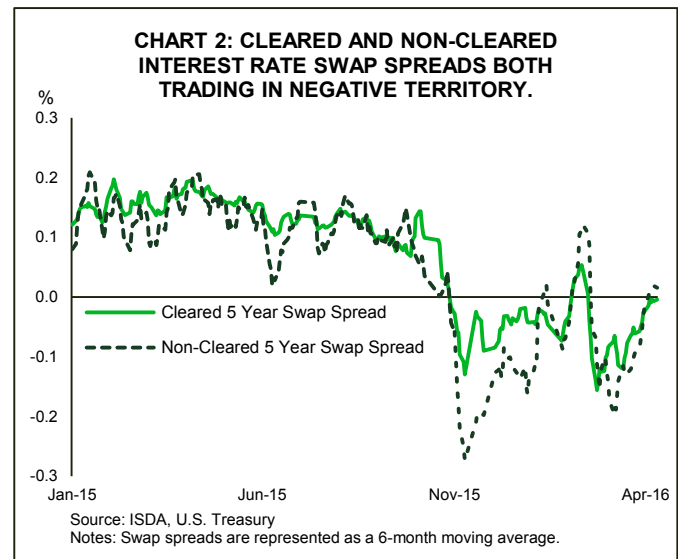
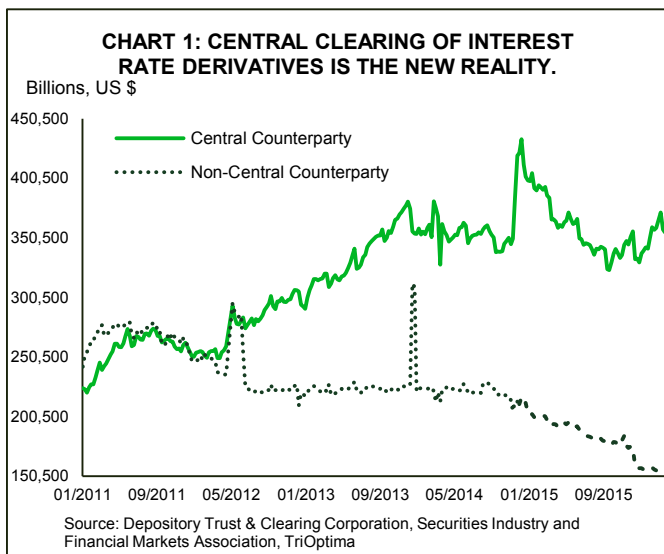
The complete set of rules has so far only been implemented in the United States³.

Overseeing the swap-related regulatory process is the U.S. Commodities Futures Trading Commission (CFTC). This body is responsible for creating rules for interest rate derivatives, including mandatory clearing requirements and exchange trading rules that took effect in 2013 (see box: swap execution facilities). While the complete removal of counterparty risk by the introduction of central clearing and execution facilities is debatable, there is evidence that central clearing played a significant role in shifting the market's perception on swap risk.

Central clearing reduced counterparty risk but has not eliminated it

Prior to central clearing, banks needed to continually assess the risk of each counterparty with which it transacted. This was an imperfect, more costly and complicated process. Central clearing transformed the complex relationship into a coordinated centralized process where the clearing house is the counterparty to each transaction. Today, the daily volume of centrally cleared interest rate derivatives is twice the size of those transacting outside this system. (see chart 1).

The view of swap counterparty risk has been changed by the new regulatory regime. Unlike bilateral OTC players, central counterparties are subject to more scrutiny in maintaining financial buffers and implementing strong risk management practices. In recognizing the potential risks of central counterparties, earlier this year, Moody's released its new methodology in determining counterparty risk ratings for bank-like institutions, including central clearing parties.



So far Moody's has granted ratings to just a few clearing counterparties. One of the major clearing houses - Depository Trust and Clearing Corporation - was rated Aaa, higher than its holding company's rating of Aa3.

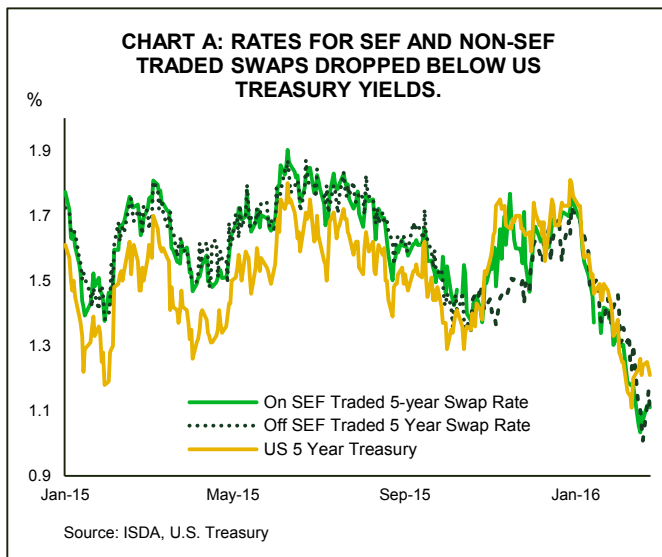
Central clearing should theoretically have helped shed light on the obscurity of the relationships between counterparties, thereby substantially reducing credit risk, and moving the scale towards Treasury-swap spread compression. However, there is evidence that improved market transparency does not, in itself, anchor swap rates lower. As chart 2 depicts, both centrally cleared and non-centrally cleared interest rate swap spreads have been trading below zero, which is a recent phenomenon only. This suggests that other factors, along with central clearing, could be playing an important role in further reduction of the spread.

Swap demand and supply imbalances

One of the major factors contributing to the negative spread is the dichotomy of buyers and sellers in the swap market stemming from structural market changes. Corporate bond issuers who utilize swaps to hedge interest payments are a central focus. Historically, the balance between fixed and floating-rate issuance among corporate borrowers has been at least fairly even. That is to say, the amount of swap buying and selling by corporations has been level. In recent years, however, the low rate environment and a trend toward simplified fixed-rate debt financing have influenced issuance preference towards longer-term fixed rates, thus turning swap buyers into sellers (see figure 1 on page 2). Chart 3 demonstrates this shift in corporate debt issuance preferences as the widening gap between fixed and floating rate issuance, which has coincided with a gradual but per-

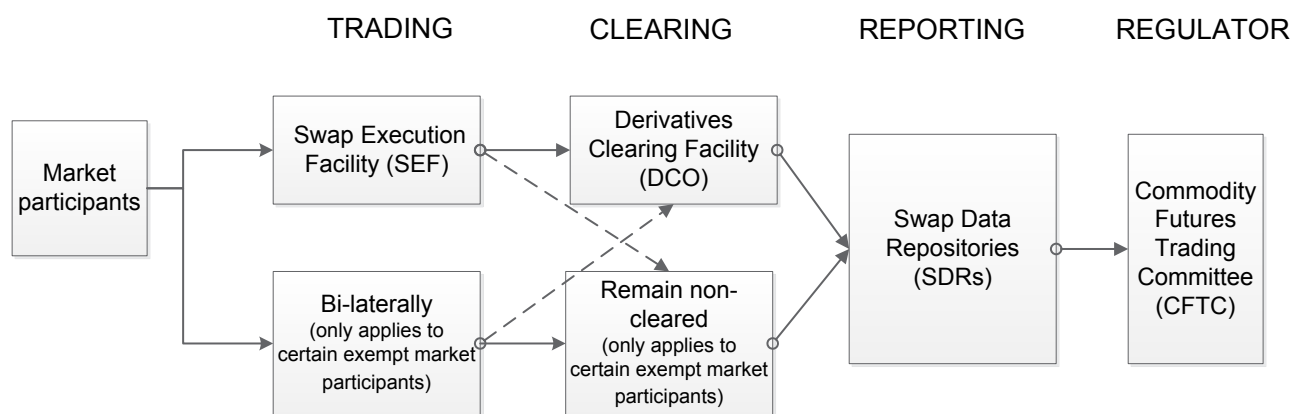
BOX: swap execution facilities.

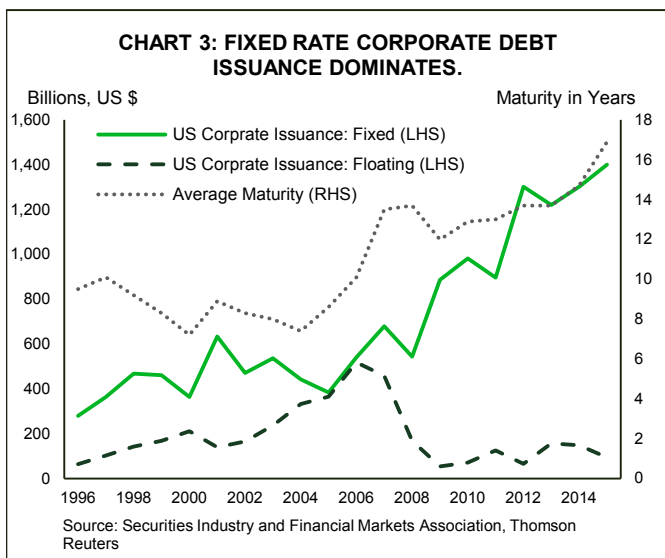
As part of the derivative reform, U.S. policymakers instituted exchange trading rules governing interest rate swaps. In short, swap transactions that are subject to clearing rules must also be executed on dedicated exchanges (see figure A). The first swap execution facilities, or SEFs, started operating at the end of 2013. Today, about 70% of all interest rates swaps is traded on SEFs, which equals to an average of approximately \$60 trillion in notional principal, daily. A recent Bank of England report suggested that trading through electronic platforms has reduced transaction costs for USD-denominated interest rate swaps by \$7-13 million daily⁴ of which 75% percent can be attributed to the inter-dealer market⁵.



While increased trade intermediation efficiencies and cost reduction should provide price improvement, it is not evident whether exchange facilitation played any significant role in the reduction of swap rates relative to Treasury yields below zero. Chart A demonstrates that interest rates of both, SEF-traded and non-SEF traded swaps have fallen below U.S. Treasury yields. This suggests that increased competition caused by electronic trade facilitation benefited parties that are exempt⁶ from clearing and electronic trading as such parties are not mandated, but have the option to trade electronically.

FIGURE A: CURRENT SWAP TRANSACTION AND REPORTING STRUCTURE





sistent increase in the average maturity of debt outstanding. This was particularly stark in the fourth quarter of 2015, as corporations rushed to lock in low rates ahead of the start of the Fed's rate hiking cycle. This gap has caused a wave of swap selling, likely putting significant pressure on the swap price and contributing to the push below Treasury yields.

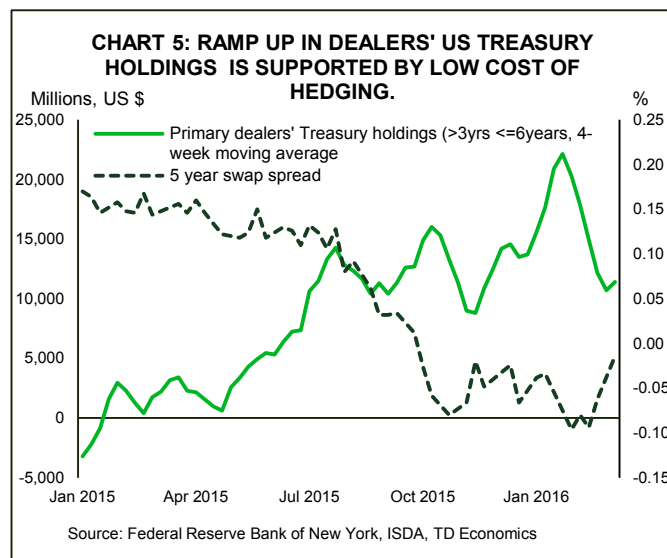
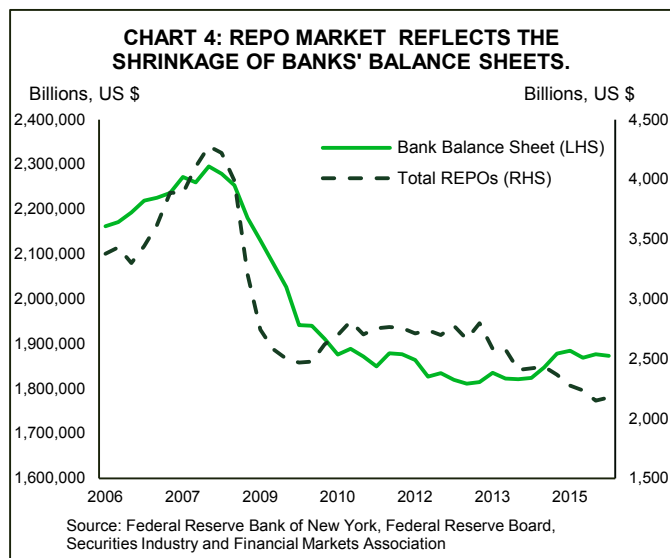
With fixed rate corporate issuance prominent, swap buyers are few and far between. Buyers of swaps (financial institutions) typically enter the agreement to hedge or speculate on rising interest rates, but in comparison to swaps, futures and options are more affordable tactical/hedging instruments. Nevertheless, if market participants perceive the negative swap spreads phenomenon as abnormal, they should have an incentive to arbitrage it away. The persistence of negative spread must therefore be explained by the swap market's inability and/or unwillingness to remove this

abnormality. One of the most obvious barriers to arbitrage is the relatively high capital commitment required to enter a swap. A swap market arbitrageur (i.e. a hedge fund) has to have access to a sufficient source of funding, typically via repo markets. However, after the financial crisis, banks have shrunk their balance sheets and reduced repo market exposure, making it harder for asset managers to obtain the level of funding required arbitrage away the negative spread. Chart 4 demonstrates the concurrent decline in banks' balance sheets and the repo market, which generally supports this view.

That leaves swap dealers (i.e. banks), who are incidentally also swap price-makers with the ability to dictate swap interest rates, to be the predominant swap buyers. In the past year, dealers' net exposure to Treasuries expanded by \$11 billion, which heightened their incentive to take the other side of the trade and increase swap buying in order to offset interest rate risk associated with holding these securities. Intuitively, this reduces banks' incentive to price swaps above Treasuries as it would be reflected in the higher cost of hedging for these players. Chart 5 depicts the negative relationship between dealers' three-to-six-year Treasury holdings and five-year swap spreads, partially corroborating the above notion.

Bottom Line

The notion that global financial markets exist within a new normal takes many forms, including swap markets. The intensification of corporate bond supply and demand imbalances instituted in the persistent low rate environment



coupled with the influence from regulatory changes have resulted in a financial anomaly that will likely persist for some time.

Although regulatory changes via the central clearing house warrant a compression in swap spreads, we should not be lulled into a false sense of security, as risks remain. Central counterparty clearing is not lacking precedent of malfunction attributable to insufficient margins or large concentration exposure. While Lehman's default was handled relatively smoothly in 2008, it is not apparent whether the existing structure of clearinghouses will be able to sustain a large financial shock. A recent BIS study assessed the changes in systemic risk due to central clearing expansion and concluded that central counterparties should be able to sustain losses in the presence of relatively small disturbances, but might fail given larger systemic shocks⁷. Furthermore, swap central clearing may have increased other types of systemic risk, such as concentration risk created by having fewer players with larger credit exposures, and liquidity risk that could arise if a clearing house has to

advance payments to multiple swap participants.

The outlook going forward is that swap spreads will likely remain low, in part facilitated by the regulatory environment. In addition, we do not see any change to the supply-demand imbalance in the market for corporate issuance. There was indeed a wave of fixed issuance in an effort to lock in low rates. But, even as the Federal Reserve begins to normalize rates over the coming years, the incentive for uncertain floating-rate issuance is likely to remain muted. This will maintain the imbalance in the number of swap sellers versus buyers. Furthermore, with increasing levels of bank holding company regulations, the ability and willingness for banks to fund via repo markets remains unlikely.

Regulations have reduced the perception of risk. That does not mean it is eliminated. Another financial stress would test this newly-minted central clearing regulatory system. With this regulatory wall in place, the trend towards fixed-rate corporate borrowing, and banks on the risk side-line, negative swap spreads may be with us for the long haul.

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End Notes:

1. Adjusted for compression but not for clearing. See BIS <http://www.bis.org/statistics/d7.pdf>
2. <http://www.g20.utoronto.ca/2009/2009communique0925.html>
3. This created fertile grounds for global swap market fragmentation.
4. <http://www.bankofengland.co.uk/research/Pages/workingpapers/2016/swp580.aspx>
5. Interdealer (dealer-to-dealer or D2D) market is where wholesale dealers have the ability to hedge risk for large size swap inventories by trading with other sophisticated market participants. Without liquid D2D the price charged to buy-side customers could be higher, which would be reflected in wider bid-ask spread.
6. Such as non-financial counter-parties.
7. http://www.bis.org/publ/qtrpdf/r_qt1512g.htm

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