The Market for CMS-Linked Structured Notes, Part 1

By Craig McCann, Mike Yan[1]

1. Introduction

Over the past six years large brokerage firms led by Citigroup, Morgan Stanley and Goldman Sachs issued at least $5 billion of unsecured structured notes linked to constant maturity swap ("CMS") rates and sold these notes to retail investors.[2]

Most of these CMS-linked notes have coupons that depend on the difference between the CMS rate for a long maturity and the CMS rate for a shorter maturity. This difference is referred to as a "CMS spread" and is further described by the maturity of the longer and shorter swap rates. For example, the CMS 30-2 spread is the difference between the 30-year constant maturity swap rate and the 2-year constant maturity swap rate. The floating rate coupon payments and ultimate maturity payments are further conditional on returns to stock market indexes - including small cap and international stock indexes - in a non-straightforward manner.

We have published extensively on structured notes and structured CDs, highlighting the evolving complexity of products the industry chooses to issue. The CMS notes discussed in this introductory note, and in more detailed notes to follow are extraordinarily complex, combining material features of contingent STEEPENERS and Autocallable Reverse Convertibles.

2. Issuers, Issues: 2015-2020

We identify CMS-linked issuances between 2015 and 2020 based on a full-text search of all 424B2s filed with the Securities and Exchange Commission for the key word "CMS". After eliminating preliminary filings and non-CMS-linked issues we find 651 CMS-linked structured notes, issued from 2015 and 2020. See Figure 1 and Table 1.

We find fourteen issuers although the five largest volume issuers - Citigroup, Morgan Stanley, Goldman Sachs, Wells Fargo and Royal Bank of Canada – account for more than three quarters of the total dollar amount issued.

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[2] A swap rate is a fixed coupon rate to be paid over the term of a swap contract in exchange for receiving floating rate coupons based on a short term benchmark interest rate, typically one-month or three-month LIBOR. A constant maturity swap rate is the market clearing rate on newly agreed to swaps for that term.

Figure 1 CMS-Linked Notes by Issuer.

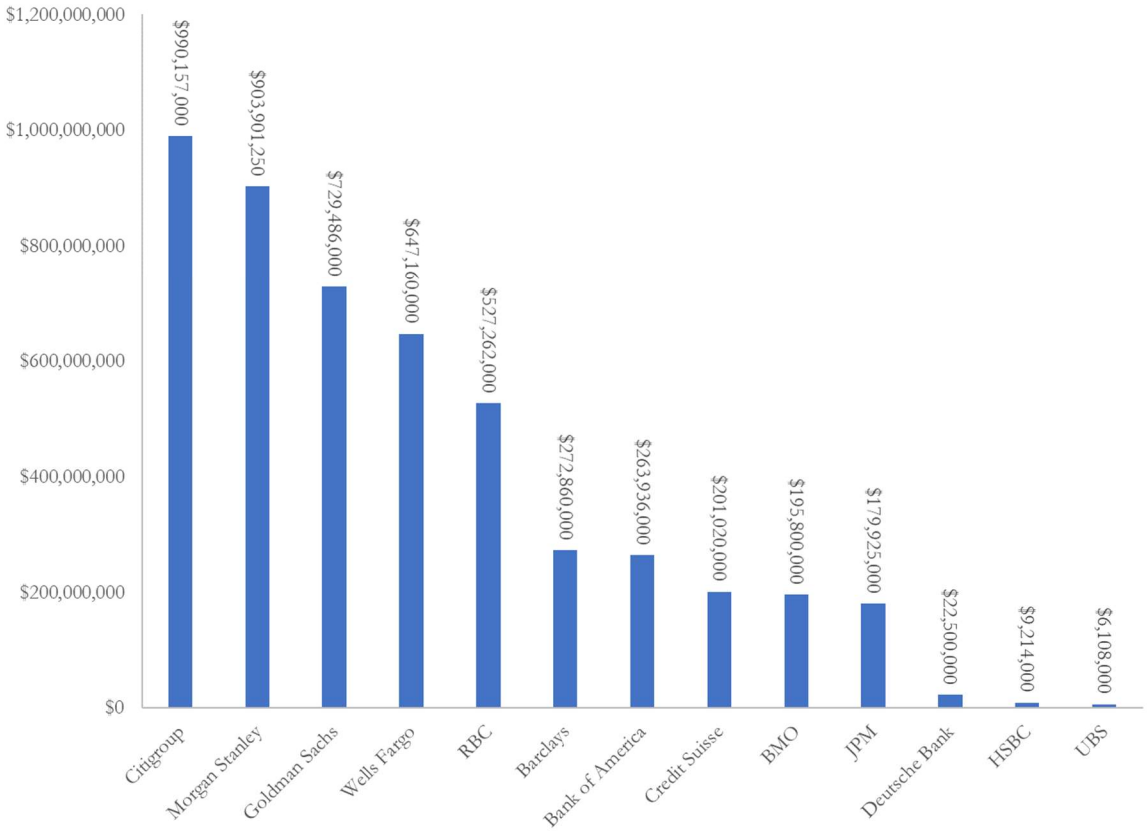

Table 1 CMS-Linked Notes by Issuer and by Year in Million(s).

Issuer	Issues	Amount	2015	2016	2017	2018	2019	2020
Citigroup	185	$990	$232	$26	$198	$333	$59	$142
Morgan Stanley	137	$904	$382	$219	$150	$137	$15	$0
Goldman Sachs	126	$729	$297	$90	$146	$121	$53	$22
Wells Fargo	54	$647	$336	$67	$58	$181	$5	$0
RBC	21	$527	$5	$0	$0	$10	$109	$404
Barclays	15	$273	$147	$1	$28	$97	$0	$0
Bank of America	33	$264	$37	$0	$27	$188	$9	$3
Credit Suisse	25	$201	$110	$50	$31	$10	$0	$0
BMO	6	$196	$5	$0	$0	$0	$0	$191
JPM	40	$180	$147	$33	$0	$0	$0	$0
Deutsche Bank	3	$23	$23	$0	$0	$0	$0	$0
HSBC	4	$9	$3	$0	$0	$6	$0	$0
UBS	$2	$6	$0	$0	$0	$0	$6	$0
Total	**651**	**$4,949**	**$1,725**	**$487**	**$637**	**$1,083**	**$256**	**$762**

3. CMS-Linked Note Types

A Basic CMS-linked Note

The simplest CMS-linked Note pays a fixed coupon for some initial period and thereafter a floating coupon rate equal to a CMS rate plus a fixed percentage and pays face value at maturity. This method of determining coupon rates implies an understanding of future changes in the level of interest rates.

Wells Fargo appears to have only issued this type of CMS-linked note, exemplified by its $100 million issuance on October 26, 2018.[3] That note is not callable and paid 5% for the first year and 10-year CMS rate plus 0.60% thereafter. The floating rate coupon paid after the first year is a function of the 10-year CMS rate but is not contingent on any other swap rate or stock index level. Wells Fargo estimated the issue-date value of these notes to be $980.24 per $1,000. The notes had only a 0.35% selling concession suggesting these were not issued for commission-based accounts.

Issuers altered this plain-vanilla CMS-linked note in multiple combinations to make the notes more complicated, more profitable for the issuer and less valuable to investors.

Coupons Determined by the Difference Between CMS Rates

Instead of depending on a single swap rate, brokerage firms determined the floating rate coupon based on the difference between two swap rates - the 10-year CMS rate and the 2-year CMS rate for example. Since the 2-year CMS rate is always positive, this "CMS spread" will always be much less than 10-year CMS rate plus 0.60% as in the Wells Fargo example note above.

Issuers partially offset the elimination of the 0.60% addition to the long CMS rate in the example above and the subtraction of the short CMS rate with a "multiplier' or "leverage factor". On these notes, the CMS spread each interest period is multiplied by this constant to determine the coupon paid for that interest period. Occasionally, the 2-year CMS rate will be greater than the 10-year CMS and the spread will be negative, so the floating rate coupon is constrained not to be negative.

By calculating floating rate coupon rates this way, issuers imply their customers understand future changes in the steepness of the term structure of interest rates.

Coupons Contingent on Stock Market Indices

[3] https://www.sec.gov/Archives/edgar/data/72971/000138713118005624/wfcri144-424b2_102318.htm

The floating rate coupon calculated as a multiple of the difference between two CMS rates with a floor at 0% is more complicated than a simple floating rate coupon tied to one CMS rate. The issuers made the calculation of the floating rate coupons much more complicated by making the floating rate coupon due also contingent on the evolution of the worst of two or more stock market indices during the note's term.

For example, the floating coupon might only be paid if the S&P 500, Russell 2000 and FTSE 100 all closed on the interest determination date above 70% of their values on the note's pricing date. Floating rate coupons missed because one of the specified stock indexes closed below this coupon threshold do not accrue – they are lost.

By calculating floating rate coupon rates in this way, issuers imply their customers understand future changes in the steepness of the term structure of interest rates and in two or more stock market indices as well as the correlation between the steepness of the term structure and the variance and covariance of the specified stock indexes.

Reverse Convertibility

Issuers grafted a reverse convertible's maturity payment onto the contingent floating rate coupons (equal to a multiple of a CMS spread) tied to the worst performing of two or more stock indexes. If over the term of the notes the worst performing specified index has declined by more than some threshold percentage amount, the maturity payment is reduced by this percentage decline. For example, if any of the S&P 500, Russell 2000 and FTSE 100 close on the maturity payment determination date less than 60% of their level on the note's pricing date, the $1,000 maturity payment is reduced by at least 40%.

By calculating the maturity payment contingent on the lowest return of two or more indexes, issuers imply their customers understand future changes in two or more stock market indices as well as the variance and covariance of the specified stock indexes.

By calculating floating rate coupon rates as a multiple of the difference between two interest rates and making any floating rate coupon payments and the ultimate maturity payment contingent on the complex interaction of two or more stock indexes, issuers ensure that retail customers cannot informatively choose between competing notes.

The CMS-linked notes have complex embedded contingent interest rate and stock index options which, when triggered, reduce coupon and maturity payments. To their detriment, investors are "short" these embedded options. Issuers specify the implicit terms of the myriad options without the potential discipline of market prices of traded options. Correctly, identifying and valuing these esoteric options is well beyond the ability of retail investors, leaving these investors at the mercy of their brokers and advisors and the notes' issuers.

Callability

Changes in the value of the CMS-linked notes are a zero-sum game because the notes are an asset of the investor and a liability of the issuer. These notes are callable. In simple terms, this feature means that in almost any situation where the notes turn out to be more valuable for investors and more costly to issuers than the issuers intended, the issuers redeem the notes and give investors their money back. Issuers let investors keep the notes only when the issuers determine the notes have become less valuable to investors and therefore less costly to the issuers.

Risks

Spot Rate Risk

The market value of CMS-Spread linked notes is sensitive to changes in the level of interest rates – specifically to shifts the swap curve. Even if the steepness of the swap curve is unchanged and so the CMS spread, higher overall interest rates imply lower note values as all future cashflows are discounted more heavily than before the swap curve shifted up. A 1%-point shift in the swap curve could result in a decline of 6% or 7% in the market value of a 10-year CMS-linked note, without any changes in the CMS spread, the level or volatility of the stock market or the credit worthiness of the issuer.

Term Structure Risk

The market value of CMS-Spread linked notes is sensitive to changes the steepness of the swap curve. In recent years the CMS spreads have been very low and issuers have increased the multiplier used to determine the floating coupon rate from 6 or 8 to 30, 40, even 50. With such high multipliers, a very small decrease in the CMS spread can drop the coupon effectively to zero. Moreover, a very small increase in the swap spread causes the floating rate to hit the interest cap for extended periods of time, encouraging issuers to call the notes unless the stock market indices had dropped substantially putting the coupon payments and maturity payment in doubt.

Equity Market Risk

The floating rate coupons and maturity payments are contingent on stock market indices not dropping more than a prespecified amount over the term of the note. While many stock market indices – the S&P 500 and the Russell 1000 - are highly correlated, issuers strategically chose indexes – the S&P 500, Russell 2000, and Euro Stoxx Banks Index for example - that are less highly correlated thereby increasing the amount of stock market risk in the CMS-linked note.

Illiquidity Risk

For most structured products there is no public secondary market and liquidity can be low over long terms to maturity, especially those 15-year notes. If redeemed earlier by the investors, the notes will be sold at a discount determined by the issuer. Even if the principal is "protected" in some cases, the market value of the notes could be significantly lower than the face value, due to various risk factors.

Credit Risk

The CMS-linked notes are unsecured debt of the issuers. Investors who buy these notes have no collateral or credit support and while defaults are rare, they happen. Also, investors typically lose substantial amounts before any default even in cases where no default ultimately occurs.

Call Risk

Adding to the extreme disadvantages investors already face, issuers layer on a "heads I win, tails you lose" option to call the notes after the short initial fixed rate coupon period. Thus, in the event the embedded short put options are far out of the money (i.e. when stock indexes all have increased substantially and therefore unlikely to ever breach the coupon or maturity thresholds and the term structure has steepened), the issuers can redeem the notes at par plus any accumulated coupon payment due.

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