FEDERAL RESERVE BANK
OF CHICAGO

PRODUCT SUMMARY

ASSET SWAPS

Creating Synthetic Instruments

Prepared by
The Financial Markets Unit
Supervision and Regulation

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OF CHICAGO

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Financial Markets Unit
August 1996

Product Summaries

Product summaries are produced by the Financial Markets Unit of the Supervision and Regulation Department of the Federal Reserve Bank of Chicago. Product summaries are published periodically as events warrant and are intended to further examiner understanding of the functions and risks of various financial markets products relevant to the banking industry. While not fully exhaustive of all the issues involved, the summaries provide examiners background information in a readily accessible form and serve as a foundation for any further research into a particular product or issue. Any opinions expressed are the authors' alone and do not necessarily reflect the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.

Should the reader have any questions, comments, criticisms, or suggestions for future Product Summary topics, please feel free to call any of the members of the Financial Markets Unit listed below.

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Asset Swap Fundamentals

An asset swap relates to the recomposition of a **security's** cash flows. Typical structuring may include repackaging an issue paying fixed rates into floating rates (or vice versa) or converting cash flows stated in one currency to another. Asset swaps are undertaken for a number of reasons and can fulfill various goals but, in the final analysis, swaps are undertaken to transform and improve the character of an investor's assets.

Asset swap transactions are primarily driven by an investor's need for cash flow profiles not directly attainable in the current marketplace. That lack of availability may stem from a dearth of specific instruments whose characteristics address one's intended investment objective, or a prohibition from investing in a specific instrument based on pre-existing guidelines or mandates. In order to create the desired cash flows, an existing market instrument is combined with an accompanying swap or series of swaps. The resulting *synthetic asset* portrays the unique characteristics sought by the investor.

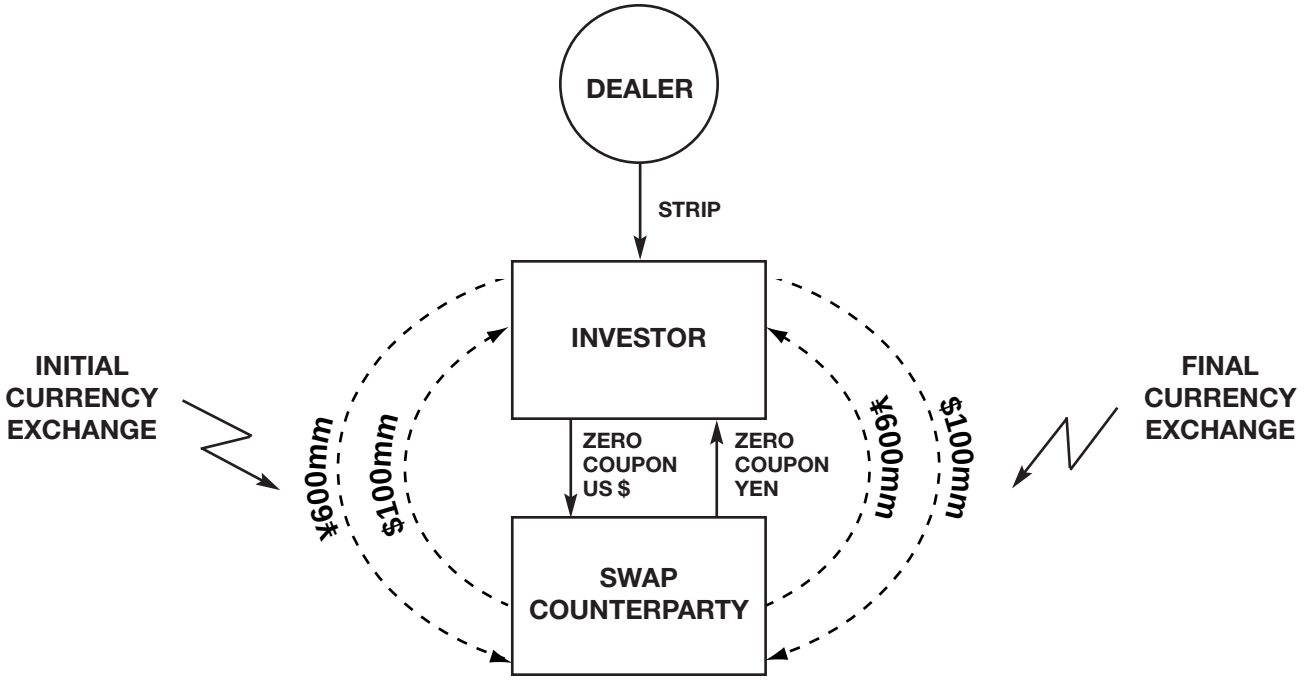
Synthetic Instruments

A synthetic security consists of a product (or set of cash flow streams) formed by decomposing the cash flows from one instrument in order to produce another distinct instrument. Those cash flow patterns are designed to replicate (or synthesize) the risk/return profile of an existing security, hence the term. Motivation may come from the fact that the net cost for creating the synthetic asset is below that of the security being replicated or, as stated, the desired profile is not available for any existing security.

When combined with an asset position, swaps can be used to replicate the cash flows associated with virtually any instrument. To illustrate, Exhibit I assumes a Japanese investor wants a zero coupon bond denominated in yen. How can this instrument be synthesized from a US Treasury backed zero, more commonly referred to as a strip? Utilizing the asset swap market, the desired exposure is created when the Japanese investor buys the Treasury strip. The investor then engages in a yen/dollar zero coupon swap[1] where the investor pays zero coupon US dollars and receives zero coupon yen. As with any cross currency swap, principal amounts are exchanged at inception and maturity. The end result to the investor is a synthetic yen pay zero coupon bond.

Zero coupon issues denominated in yen are presently not available to Japanese investors. The asset swap market offers the opportunity to "create" such a security, with attributes analogous to those available in existing markets.

Exhibit I



[1]In a zero coupon swap, no payments are made until maturity. At that time, the swap settles for one single payment.

The Role of Arbitrage

The market for synthetic securities is largely driven by the presence of arbitrage[2], the end result being the creation of an instrument whose yield is higher than an existing market security. Consider a multinational firm that is able to issue fixed rate debt in the US at 6.75%. Additionally, it can purchase floating rate foreign denominated securities that pay DEM LIBOR, and via the currency swap market, can convert the floating rate assets to fixed. If these *synthetic* fixed rate assets yield substantially more than where the firm can issue debt (taking the currency swap costs incurred into account), an arbitrage opportunity exists. The firm can issue fixed rate debt and use those proceeds to create synthetic fixed rate assets at a profit.

Availability of the underlying security is, of course, integral to the asset swap process. Moreover, market discrepancies *must* exist in the price of securities or in the relationship between the asset yield and swap prices, or both. Absent these incongruities, no arbitrage could occur, and creation of the higher yielding synthetic asset would not be possible.

Several factors give rise to these discrepancies. Regarding the price of the asset, sector imbalances can result from differences in credit criteria or security performance based on prevailing technical and/or fundamental market dynamics. The search for relative value may result in an arbitrage opportunity, as the richness/cheapness attendant to certain sectors is exploited. Effectively, one transfers a particular security from one market segment to another to equalize supply and demand at a given price.[3]

Discrepancies in the relationship between asset yields and swap prices also give rise to arbitrage plays and, by extension, synthetic issues. This occurs when asset yields gravitate to levels where, given prevailing swap market rates, a cash flow stream is created that exceeds what is available on a secondarily traded (non-synthetic) instrument. For instance, a sell-off in a particular sector or point along the curve makes certain fixed rate issues "cheap" versus prevailing swap rates. The cash flows are swapped into floating rate paper (optimally at LIBOR plus a spread), offering the investor an enhanced yield above conventional, comparable issues.

Development of the Asset Swap Market

The evolution of the asset swap market has had a profound influence on the capital markets activities of issuers, investors, and financial institutions. The breadth of the market is imperatively a function of investor motivation for synthetic assets. According to the International Swaps and Derivatives Association (ISDA), the asset swap market today totals roughly $400 billion in notional principal, merely a wave in an ocean of $11 trillion outstanding notional for the total interest rate swap market last year. Nonetheless, several unique and, especially with respect to examiners, significant factors have contributed to the market's increased and continued viability.

The origin of the asset swap market took place in the early 1980's when a significant increase in the issuance of international securities, coupled with the then thriving interest rate swap market, sharply altered the way firms engaged in capital market activities. Borrowers were able to issue securities at more attractive terms than were available from financial intermediaries. This growth in securitization spawned an increasing and diversified pool of instruments as banks discovered alternatives to more traditional loan activities in the capital markets. Additionally, investor demand for higher yielding instruments in the face of cyclically low interest rates from 1990 to 1993 acted to fuel more securitization fires.

More recently, for the past two years investors have been caught in a "debt squeeze" of sorts. Borrowers, capitalizing on market opportunities, have issued mainly fixed rate paper in an effort to lock in the prevailing lower interest rates. From an end-user perspective, buyers of that paper tend to largely be financial institutions, who in turn swap the fixed cash flows into floating rate LIBOR based cash flows. Banks need to match floating rate liabilities, and the synthetic LIBOR based instrument resulting from asset swaps serves that purpose. The increased demand for fixed rate bonds to asset swap into floating rate debt has resulted in narrower spreads to benchmark Treasuries, both domestically and in the Euromarket.[4]

[2]Arbitrage is any activity which attempts to buy a relatively underpriced item and sell a similar, relatively overpriced item, expecting to profit when prices resume a more appropriate theoretical relationship. Swap driven arbitrage transactions are motivated by the comparative advantages which swap counterparties enjoy in different debt and currency markets.

[3]Das, Satyajit, *Swap and Derivative Financing*, Probus Publishing, 1994, p. 584

[4]Gordon-Walker, Rupert, "Can the Growth Continue?", *Euromoney*, April 1996

The banking system as a whole is "enjoying" excess liquidity these days. "Loan quality is improving, non-performing loans have been written off and pressure on fees and commissions means a greater reliance on interest earning assets", notes Chris Ellerton, an analyst at SBC Warburg. Because most treasury units are cash-laden a shortage of borrowers exists, especially in the corporate lending area where floating rate assets are more the norm than the residential mortgage market. The end result is plain to see: banks are in dire need of floating rate assets and are willing to pay up for them. Enter the asset swap market.

The asset swap market creates an upper price boundary for any given security. The fact that a security's structure can be altered through the asset swap market, where that issue now becomes attractive to a *different* group of investors, places limits on that security's value. For instance, an underperforming fixed rate security is repackaged as a floating rate issue. The issue is now made available to a particular (different) investor base who prefers a security in floating rate form and, in turn, is willing to accept the issuer's credit risk. The issue's trading performance is effectively constrained by its relativity to swap market spreads.[5]

Asset Swaps and Credit Derivatives

Asset swaps, especially with respect to international capital markets, are often aligned with credit derivatives. A relationship does exist between them; indeed, one can argue that the benchmark for the fair pricing of a credit swap is the asset swap spread on a comparable issue.[6]

In a credit swap, the party who is long credit risk, or the buyer, pays a fee in the form of a continuous stream of payments to the counterparty, or seller. The seller agrees to make a payment to the buyer contingent upon the occurrence of a specific event (eg default), albeit one whose likelihood of occurrence may be more extreme than most option triggers. The credit swap's fixed leg represents the buyer's periodic fixed rate payments, while it's floating leg is represented by the seller's potential payment.

A credit swap can be comparable to the financed purchase of a security. Assume an investor buys an issue at a spread of 45 basis points above Treasuries which, on an asset swap basis, equates to LIBOR plus 25 basis points. In order to finance the bond, the investor repos the issue at LIBOR. Thus, the net benefit for the deal to the investor amounts to 25 basis points.

Both the credit and asset swap scenarios contain similarities: no net outlay of cash for the investor, and both provide a continuous stream of income to compensate for contingent risk.[7] Thus a benchmark for the fair pricing of the credit swap (ignoring counterparty credit risk) is the asset swap spread. When those spreads are wider than credit spreads, one benefits by owning the asset swap and shorting the credit swap (and vice versa). By calculating payments against LIBOR on the fixed rate leg of the asset swap, an investor is exclusively taking a credit view. One's exposure, now impervious to what happens to the price of the security, is to risk of default, which should not be taken lightly.[8]

Creating an Asset Swap

The asset swap market is nothing if not extremely versatile. The market involving securities such as structured notes has proven beneficial for investors familiar with the workings of the OTC swap and options markets. Many act as liquidity pools for dealers as these structures are reconstituted, extracting enhanced LIBOR returns in exchange for providing liquidity in the secondary market.[9]

A synthetic LIBOR based issue is the most conventional structure[10] employed using asset swaps. The key participants in this arena are commercial banks[11] who require floating rate assets which can be match funded. Growth in the market results from their continued demand for higher yielding, quality assets.

[5](Das p. 600)

[6]Masters, Blythe, "A Credit Derivatives Primer", *Derivatives Strategy*, May 1996, p.43

[7]Ibid., p.43

[8]"Hunt for Yield Focuses on LDC Paper", *Financial Products — An IFR Publication*, May 29, 1996, p.15. Counterparty credit risk will be discussed in more detail in the Examiner Guidance section of this Product Summary.

[9]Falloon, William, "Structure Shock", Risk, December 1994

[10](Das p.576)

[11]About 80% of investors in asset swaps are banks, according to Euromoney

A basic asset swap evolves in the following way:

The underlying security is purchased. The resulting synthetic package created *is based on* the characteristics of the existing issue;

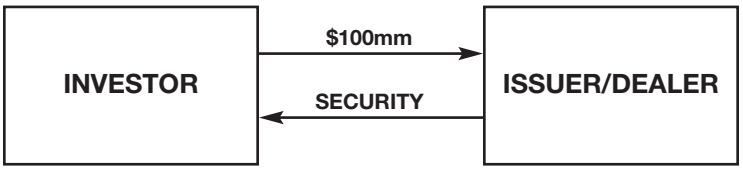
- The cash flows attendant to the underlying asset are converted, via the swap market, into a structured (synthetic) asset whose coupon and/or currency characteristics are altered;
- The investor is the beneficial owner of both the asset *and* the swap[12] . If the deal was engineered by an investment firm, the resulting synthetic asset is typically sold to an end-user investor.

Asset Swaps Containing Interest Rate Swaps

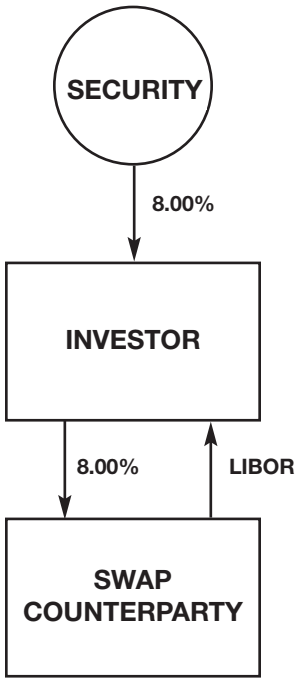
Exhibit II details a basic asset swap involving a coupon, or interest rate, swap transaction. The objective of the structure is to transform the fixed rate asset into a floating rate asset, essentially creating a "new" floating rate security based on the characteristics of the fixed rate issue. Note the investor essentially "passes through" the semi-annual 8% coupon payments received from the issuer to the swap counterparty. In exchange for those coupon payments, the swap counterparty pays the investor LIBOR, transforming the yield on its fixed rate asset into a floating rate asset.

Exhibit II

ASSET PURCHASE



COUPON PAYMENT SWAP



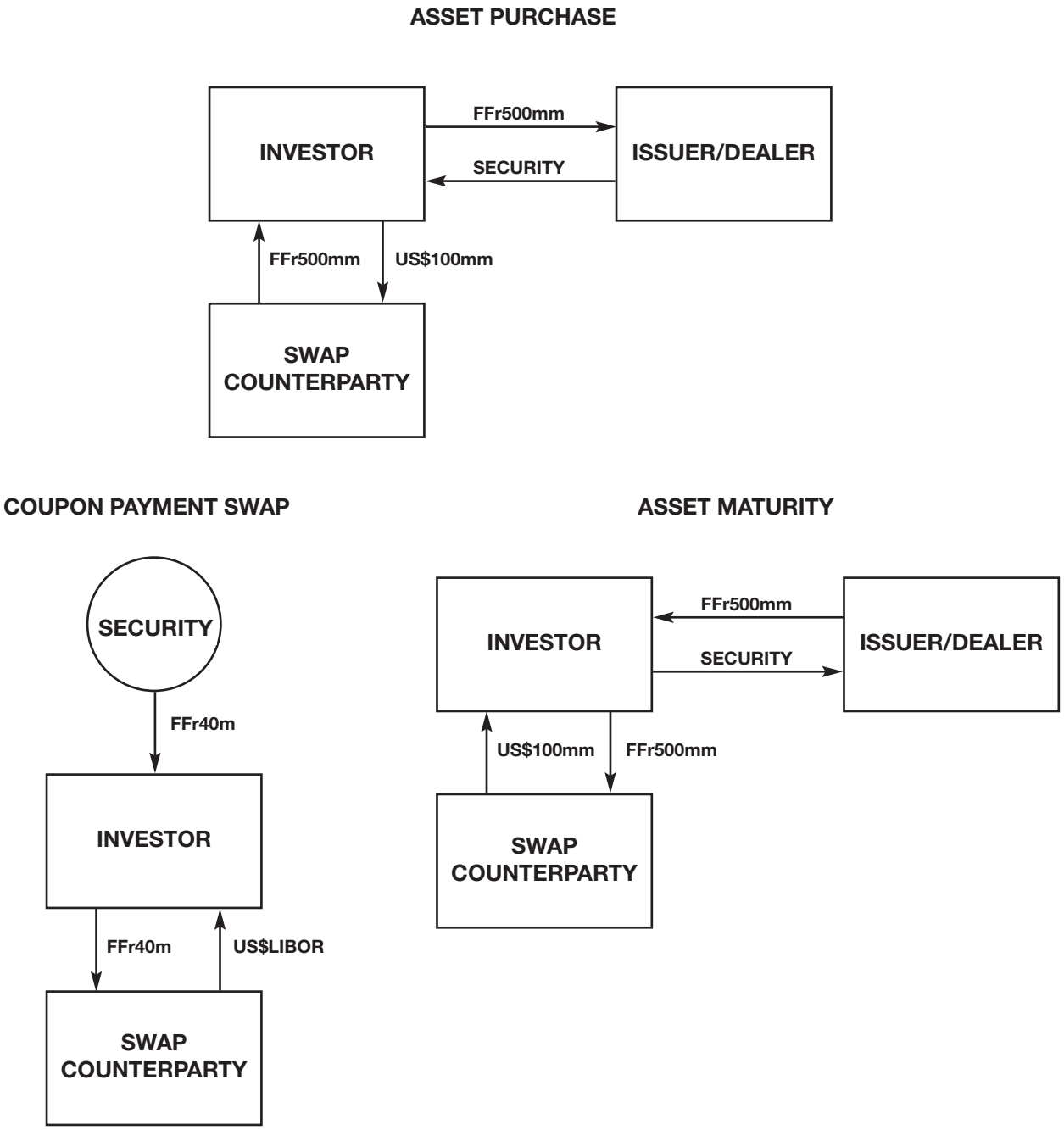
[12]Oldfield, Mark, "Only For the Sophisticated Investor", *Euromoney — International Bond Investor*, Autumn 1994

Asset Swaps Containing Currency Swaps

Exhibit III details the engineering of a basic asset swap involving a currency transformation. The underlying asset is a French franc denominated corporate bond purchased at par whose cash flows are swapped to create a synthetic US$ based floater.

While the overall composition is similar to the interest rate based swap example above, note an additional step involved in this currency asset swap. Initially, the investor converts with the swap counterparty the FFr500mm principal cost of the asset and $100mm, the investor's base currency, on the basis of the exchange rate prevailing at the inception of the swap. FFr500mm is remitted to the seller of the issue in local currency form. This converting transaction is reversed at the swap's maturity, in this case coinciding with the maturity of the asset. As a result, any currency risk attendant to the issue is eliminated from the investor's point of view. The synthetic security strictly reflects floating rate US$ cash flows created from a non US$ source.

Exhibit III



Adjustment Asset Swaps

As noted, the original asset remains on the investor's books. Recall that an asset swap *transforms the character* of an end user's assets — it does not eliminate the asset from an investor's portfolio. Consider an investor who believes that rates will rise but does not want to sell a given security. A fixed for floating asset swap know as an *adjustment swap* provides the opportunity to participate in a yield rally for a designated period of time. By setting the fixed rate payments against LIBOR at the swap's inception, the investor essentially is long an embedded hedge that lasts until the swap's maturity, regardless of the bond's performance in the secondary market. The floating rate cash flow received acts to offset the fixed rate security in a rising rate environment. Note that the swap need not be structured to coincide with an underlying asset's maturity. The fixed for floating attributes of the swap could cease, say, in year 3. The investor reacquires the initial (fixed rate) characteristics of the issue for its final two years.

Applied Engineering

Structured Notes[13]

"The minimum bid on a structured note is the asset swap price. It's not always pretty, but it is firm".
— Jacob Navon, Senior Vice President, The Boston Company

The eruption of the structured note[14] market in 1993 has had a significant influence on the proliferation of asset swaps. The incredible, and at times implausible, array of structure types came into being in response to the investment community's desire for higher returns during a sustained period of low interest rates. Issuers and (more importantly) investment dealer firms were more than willing to address this need[15] introducing investors to more attractive (and by definition riskier) securities whose cash flows were linked to, for example, the performance of the yen, the yen's relationship to the lira, and a host of other indices, currencies, or benchmarks. Investors' quest for enhanced yield caused them to adopt, in many cases, very tenuous risk/reward measures with respect to potential investment choices. Notes an unidentified dealer, "It may sound crazy coming from someone like me...but investors are crazy to do the really complex stuff unless they're capable of pricing theoretical fair values for such structures themselves. Otherwise, the investor is going to lose almost every time."[16]

Many of these structured securities, created to satisfy a perceived need at the time, deteriorated in value as a result of the rate increases in 1994. In many cases, the leverage inherent in the security worked against the investor, obliterating once attractive coupon payments.

If a note's attributes correlate with present market conditions, secondary paper will in fact trade at levels relatively close to where new issue agency debt trades. Demand for structured notes wanes *not* because an issue is "structured" but because the characteristics attendant to the note:

- *are individually tailored* to a specific investor's requirements; and/or
- are complex, hard to understand, or lacking in price transparency; and/or
- possess one-dimensional structures with very limited appeal should a market trend reverse; eg, index amortizing notes and inverse floaters tend to perform well in bull markets but poorly in bear markets.

However, even the above traits are forgiven in the secondary market *if there is current demand for this type of structure*; ie, if other investors want the bet. Thus, illiquidity in the market results **not** from the "structured" moniker attached to a bond, but because these deals were created (and designed to "outperform") under vastly different market conditions.

While an issue as a whole may be unappealing, performing an asset swap to strip out any embedded optionality and convert the cash flow streams into a synthetic fixed or floating rate issue will often make the cash flows more palatable to a broader investor base.

[13]Refer to the Product Summary entitled *Structured Notes* published by the Financial Markets Unit in November 1994 for an in-depth discussion on the topic.

[14]Volume on new issues peaked at a record $100 billion in 1993, according to *Risk* Magazine

[15]As more "exotic" structured note issues came into being (and especially in light of the Orange County debacle), much of the "bad press" centered on the (quasi-government) agencies who issued the paper. As discussed later, the impetus for the vast majority of deals in fact emanated from Wall Street.

[16]Falloon, William, "Fairway to Heaven", *Risk*, December 1993

Decomposing Structured Notes

In a basic asset swap on a structured note, the swap counterparty receives the cash flow attendant to the note and pays a LIBOR based (or fixed rate) cash flow back to the investor. The end result is that the investor is swapped out of the complex structure and into a more generic-type issue. The investor has, however, inherited counterparty credit risk by virtue of the swap. Even though the counterparty's overall credit risk may be acceptable to the investor, an analysis of the underlying structured note's components is still necessary in order to comprehensively risk assess the transaction.

Asset swap pricing initially entails decomposing and valuing the components of the note, including contingent cash flows. It conveys where those components can be "cashed out" in the market, often referred to as the *break up value* of the note. After the note is decomposed, an alternate cash flow stream is created via the asset swap market.

When structured notes are priced on an asset swap basis, the issue is analyzed based on its "*salvage value*".[17] The salvage value on most *agency* structured issues is typically LIBOR flat.[18] That is, the security (regardless of its complexity) can be swapped to LIBOR flat based cash flows, and will find a liquid and tradeable market at that generic level.

Liquidity in the structured notes market exists because every note has a salvage value. If demand for the note as a whole is weak, its cash flows can be reconstructed via the asset swap market in order to create a synthetic security. In many cases, the re-engineered security has broader investor appeal, thereby generating needed liquidity for the holder of the original issue.

Detailing the Asset Swap

Consider an FHLB-issued step-up inverse floater, indicative of the types of structures brought to market in 1993 seeking to maximize profitability for the investor in a falling rate environment. The note matures in 1998. Assume that LIBOR is 6.00%. The coupon steps-up as follows:

		Coupon Limits	
Year	Formula	Max	Min
1	5.75%	NA	NA
2	9.0% – LIBOR	9.0%	3.5%
3	10.0% – LIBOR	10.0%	3.5%
4	11.0% – LIBOR	11.0%	3.5%
5	12.0% – LIBOR	12.0%	3.5%

The note was issued in September 1993 at par. How did it fare in April 1996 as a 2½ year security both on its own and on an asset swap basis?

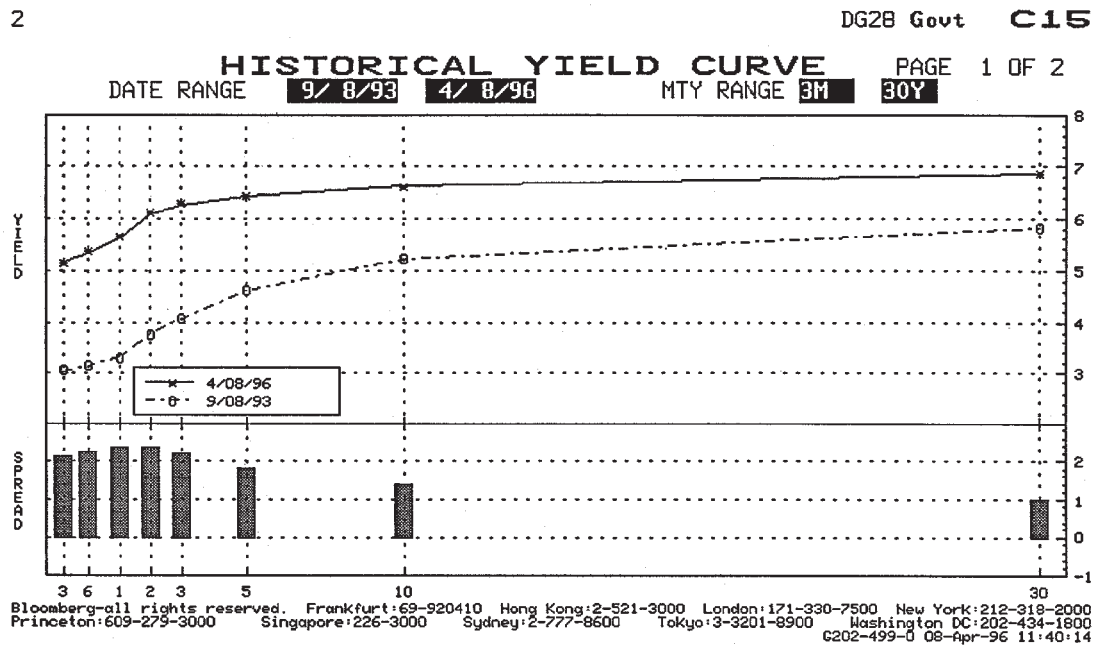
First, observe what has happened to the general level of interest rates in the 2½ year period sine the note was issued. Exhibit IV graphically portrays an increase in rates (well over 200 basis points in the 2 to 3 year sector) over the time period. It stands to reason that, *in general*, the note's value would have declined due to increases in interest rates.

Given the above analysis, there might be very little demand for this note in April of 1996. Recall that the note is effectively a 2½ year security as of that date. The current "on the run" or benchmark 2 year Treasury was yielding 5.90% and the current 3 year was yielding 6.10%. With LIBOR at 6.00%, as per the formula, the note's prevailing coupon is 4.00% for the period. With that in mind, the note's optimal value can be derived by decomposing its cash flows and performing an asset swap in order to recreate a more marketable security.

[17]Goodman, Laurie, "Anatomy of the Secondary Structured Note Market", *Derivatives Quarterly*, Fall 1995

[18]On non-agency paper, salvage value is issuer dependent, and so will vary depending on underlying's credit rating

Exhibit IV



Let's return to our assessment of the note's current market value. Given the rise in rates since issuance, what would the swaps required to convert the note to a LIBOR flat payer cost an investor today? We'll approach this process in two phases. First, consider the swaps needed to issue the note at inception. Agency issuance takes place only when the issuer is able to fund at a self imposed optimal level, typically LIBOR - 20 basis points. For instance, assume Fannie Mae needs to fund acquired mortgage assets. To that end, various vehicles (debentures, medium term notes, structured notes, foreign denominated debt, etc) can be employed. Fannie is *theoretically indifferent* as to its funding choice; the selection criteria is based on which vehicle most closely offers a duration match with the corresponding mortgage asset **and** provides them with an optimal funding rate.

During the high volume period in 1993, the motivation behind structured note issuances came in most cases from a dealer or investment firm. The characteristics of the note were generally based on client-specific parameters, which served to address or hedge a client's risk attributes. The investment firm, in turn, would seek out an agency to issue the distinctive note, simultaneously offering to swap out all attendant coupon and/or currency risk. Thus, the agency was left with a "vanilla" sub-LIBOR funding vehicle, which it compared with its other alternatives in an effort to select the optimal instrument. More recently, a process known as reverse inquiry, where the issuer approaches an investment firm with deal specific parameters and objectives, has become increasingly prevalent.

Exhibit V diagrams the asset swaps structured at the note's inception and in the current marketplace. Assume a purchase of $100mm. Being an inverse floater, the issue is considered leveraged; an investor stands to benefit more profoundly in a lower rate environment by holding this security than with a more conventional floating structure. As a result, the issuer would enter into a leveraged swap (in this case $200mm or twice the issue's notional value[19]) to hedge out of potentially high coupon payments.

Investor A purchases the note at par from the issuer, who has achieved the targeted funding of LIBOR -20 (otherwise, in all likelihood, the note would not be available). 2½ years later, Investor A seeks to sell the note. Investor B has emerged as a willing buyer...but only at the note's salvage value of LIBOR flat. What will it cost Investor B to achieve a LIBOR flat cash flow structure; by extension, what is the note worth today?

[19]Some inverse floater deals contain embedded multiples of LIBOR, affording the investor an enhanced potential for high coupon payments if rates fall. If, for example, this issue floated at 10.00% less *2 times LIBOR*, the leveraged swaps needed to decompose the security would be based on *$300mm notional* rather than $200mm.

Exhibit V

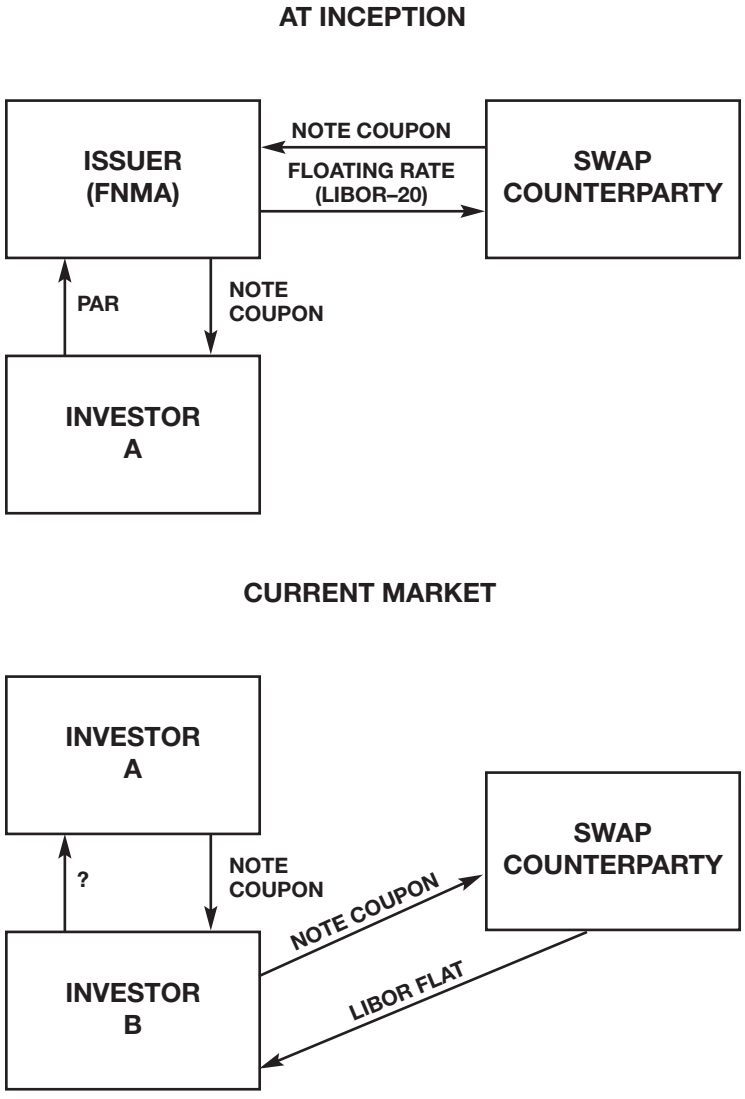


Exhibit VI

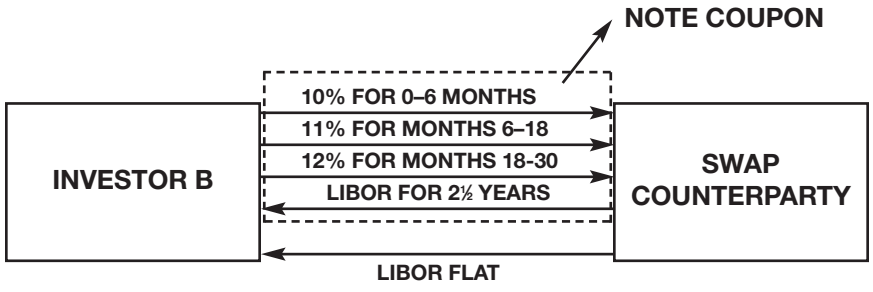


Exhibit VI capsulizes the swaps between Investor B and the swap counterparty. Note how the flows correspond to the above formula table reflecting the note's coupon. For illustrative purposes, LIBOR is assumed to increase 50 basis points each year until maturity. As further detailed in Exhibit VII, net cash flow computations will require a payment by Investor B of $5000m in order to achieve the desired LIBOR flat level. This payment translates into a 5 point price decline from par, the original issue price, to 95, the current market level.

Exhibit VII

	NOTE COUPON	LIBOR	NET CASH FLOW $
0 – 6 months	4.00%[1]	6.00%	<1000>[2]
6 – 18 months	4.50%	6.50%	<2000>
18 – 30 months	5.00 %	7.00%	<2000>
			<5000>

[1]Note Coupon Formula
10.00% – 6.00% = 4.00%
11.00% – 6.50% = 4.50%
12.00% – 7.00% = 5.00%

[2]((Note Coupon – LIBOR) ⋆ FACE) ⋆ Interest Period
((2.00%) ⋆ $100mm) ⋆ .5 = <1000> (6 month)
((2.00%) ⋆ $100mm) ⋆ 1 = <2000> (1 year)
((2.00%) ⋆ $100mm) ⋆ 1 = <2000> (1 year)

Mortgage Backed Securities

Fixed Rate Issues

The appeal of the mortgage backed securities market (MBS) lies in the availability of enhanced yields over comparable Treasury and corporate fixed income issues for the investor. That additional spread, however, does not come without a cost — namely, the added element of cash flow risk related to prepayment of principal.[20] In spite of this (or perhaps because of it), MBS can be utilized in the asset swap market.[21]

Exhibit VIII details the engineering of an MBS asset swap. A putable swap is transacted with the counterparty, which effectively allows an investor to convert a fixed rate callable bond into a floating rate security. If the bond is prepaid (effectively called), the investor can put the swap back to the provider of the option, terminating the original swap.

The market swap rate to maturity of MBS is assumed to be 7.00% in this environment. The investor's cash flows as per the swap are as follows:

Coupon on MBS:	8.50%	
Swap fixed coupon paid:		7.00%
Cost of put option:		.50
Total fixed coupon paid:	7.50%	
Net to investor:	1.00%	
Effective spread to investor:	LIBOR + 100 basis points	

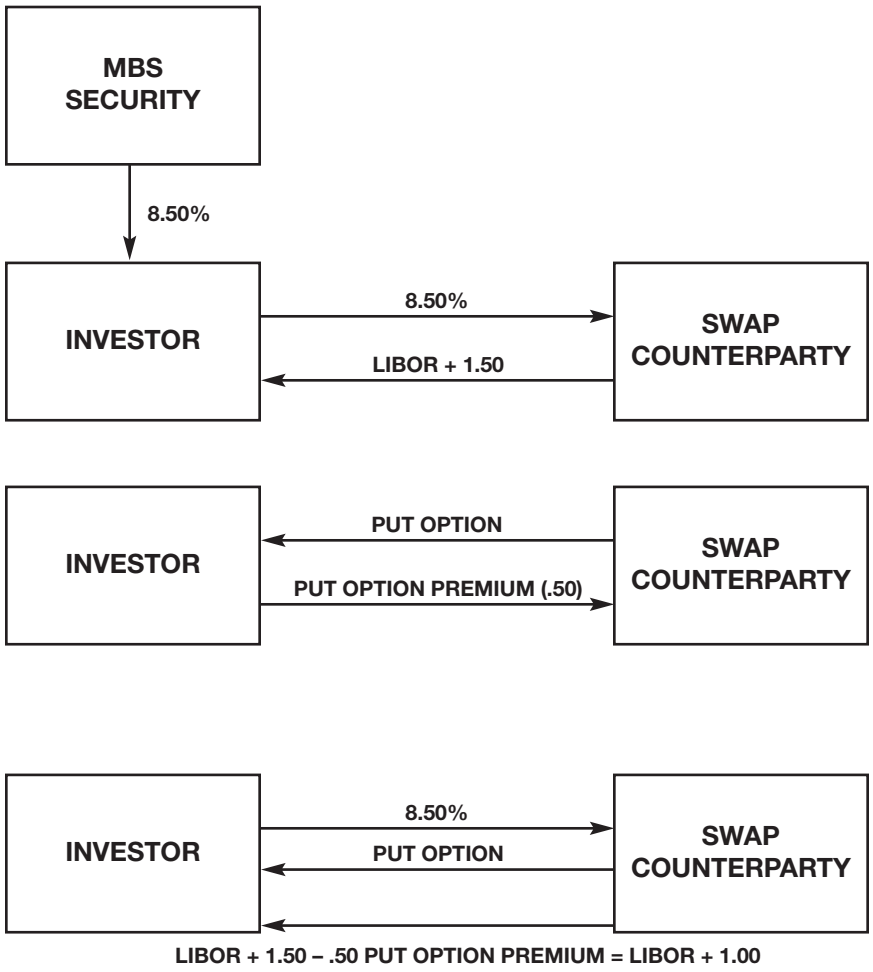
The investor essentially agrees to pay a fixed payment *plus* a fee for the put option. The combination of these payments represents some attempt to hedge the prepayment risk inherent in MBS. In return, the investor receives an above LIBOR floating rate cash flow stream *with* the option to terminate the transaction. Prepayments would act to erode (and ultimately eliminate) the net cash flow spread (1.00%) noted above.

A variation on the above structure can be employed with a CMO tranche. The investor swaps the fixed rate payments attendant to the tranche for floating rate payments *with no prepayment risk*. The swap counterparty absorbs the tranche's principal volatility (analogous to the role of a support tranche in a conventional CMO deal). In other words, duration risk of the swap transaction is borne entirely by the swap counterparty, who is compensated for it by paying a lower floating rate to the investor.

[20]Other MBS related literature published by the Financial Markets Unit includes an introduction to CMO's issued in August 1987 and, more recently, an advanced analytical Product Summary relating to CMO's released in May 1995.

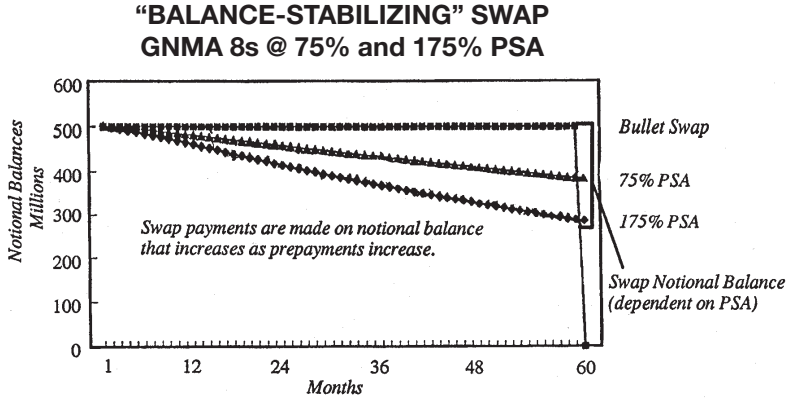
[21]The examples serve to illustrate the mechanics of such transactions. In practice, the cost to hedge the uncertainty associated with prepayment risk may prove to be quite prohibitive. Often a reference PSA level, as opposed to a continuum of potential prepayment levels, is established between the counterparties, somewhat mitigating risk and investor cost.

Exhibit VIII



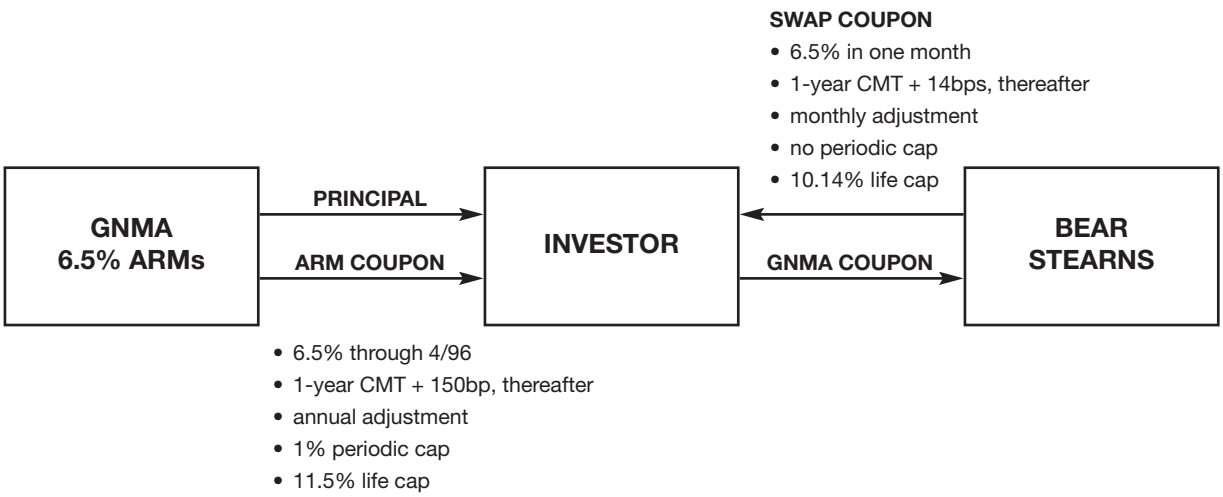
Another, somewhat tangential, illustration is the "balance stabilizing CMO swap."[22] Under this structure, the investor receives the net interest spread between the fixed rate and a floating rate (again, typically LIBOR) based on the notional balance of the swap. In this case the notional balance *increases* as prepayments occur. Thus, as rates fall, the notional balance increases along with the swap interest margin. The swap can be structured so that the increase in notional balance acts to offset the decrease in one's underlying collateral balance. Exhibit IX illustrates a balance stabilizing CMO swap.

Exhibit IX



[22]This structure and the following ARM transaction is illustrated using examples produced by Bear Stearns' Financial Analytics and Structured Transactions Group

Exhibit X



ARM Issues

The following example illustrates an asset swap transaction involving an ARM issue:

The security involved is backed by GNMA collateral with an initial coupon of 6.5% through October 1996. It resets annually thereafter, indexed to the 1 year Constant Maturity Treasury (CMT) + 150 basis points.[23] Each periodic increase is subject to a 1%, or 100 basis point, cap with a lifetime coupon cap of 11.50%.

Exhibit X diagrams the mechanics of the swap. The swap's 10 year maturity roughly coincides with the average life of generic 30 year underlying collateral. The swap counterparty receives the ARM coupon passed through from the investor. The counterparty pays to the investor a coupon structured as follows:

- After an initial coupon payment of 6.5%, subsequent payments reset *monthly* at the 1 year CMT + 14 basis points. Recall that the ARM coupon pays monthly as well, but resets *annually* at 1 year CMT + 150. The 1% periodic cap attendant to the ARM coupon is removed, and the life cap changes to 10.14% from the ARM coupon's 11.5%.

Removal of the periodic cap and the adjustment lags results in an enhanced structure as the coupon drifts towards a fully indexed state.[24] This tends to benefit the investor most in an upward sloping yield curve because while annual resets result in lags to the curve, periodic resets eliminate the lags and allow investors to more optimally participate in a rally. Somewhat mitigating this benefit is the life cap, which is reduced from 500 basis points above the initial coupon to 364, but maintains some intrinsic value nonetheless.

Special Purpose Vehicles

This section details a uniquely engineered product involving the use of asset swaps. The securitized structure, also known as a special purpose vehicle (SPV), was originally developed by Citicorp in the early 1980's. Several other firms, including Merrill Lynch, Goldman Sachs, and Morgan Stanley have since issued numerous SPV deals. Under the terms of most structures, the investment house positions itself between the issuer and the investor with respect to the cash flows attendant to the transaction. The firm accumulates the cash flows from an underlying issue, arranges the asset swap and, through a trust entity, pays an enhanced coupon rate to the investor. Enhanced cash flows have averaged 10 to 25 basis points above comparable issues.

[23]Most GNMA ARMs are indexed and structured in this fashion

[24]A fully indexed coupon results when the value of the underlying index is increased by the index spread.

A Securitized Structure

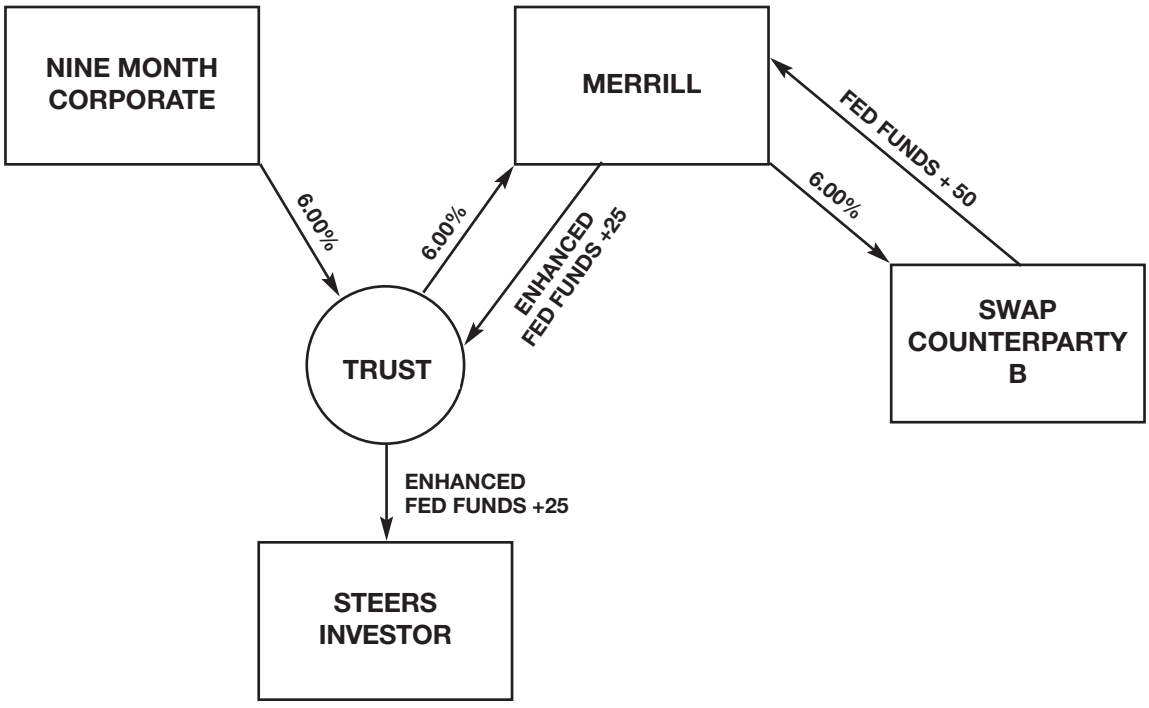
In 1990, Merrill Lynch developed a SPV which they dubbed STEERS[25] (STructured EnhancEd Return trustS). The securitized structure was created to expand the investor market for asset swaps and to provide synthetically repackaged vehicles to meet specific investor demands. An investor is thus able to capitalize on the benefits of the asset swap market, without actually engaging in a swap agreement, in one structured investment package.[26]

The asset swap and bond are packaged together within a grantor trust and sold to investors in the form of a debt unit. The trust purchases the security and simultaneously enters into an asset swap with Merrill. In practically all cases, the trust carries the same credit rating as the underlying instrument, not the swap counterparty's (Merrill's) rating. If the trust is ever terminated prematurely, the investor will receive the underlying security directly from the trustee. In the event of a swap counterparty default, the investor is entitled to timely principal and interest cash flow payments based on the terms of the underlying security, but forgoes the enhanced swapped cash flow received under the terms of the STEERS deal.

Investors realize enhanced cash flows as a result of Merrill's ability, as a dealer, to locate value in the market with respect to the underlying security. The security may be "cheap" to the market due to a complex coupon structure, cross market inefficiencies, or other characteristics that render the issue unattractive relative to existing conditions. After being paired with swaps, the cash flows are transformed into products with desired investment characteristics.

Exhibit XI diagrams a basic STEERS structure. Assume that Merrill purchases a fixed rate, nine month corporate issue paying a 6.00% coupon. The underlying name is highly sought after in the market; additionally, this firm rarely issues paper at nine months. Merrill is able to obtain attractive funding for the issuer at nine months as an incentive to do the deal. Merrill places the issue in a grantor trust, and in turn sells investors STEERS or debt units also maturing in 9 months. Merrill enters into a swap agreement with Counterparty B whereby they pay B the 6.00% coupon from the underlying, and receive a floating rate of Fed Funds + 50 basis points, resetting daily. The trust pays the STEERS investors an enhanced coupon of Fed Funds + 25 basis points, resetting daily. The investor receives the (sought after) credit rating of the issuer *and* a Fed Funds floater with a daily reset. The coupon, while enhanced from the investor's perspective, is less than what Merrill receives from B, and therein lies the profitability of the deal to Merrill.

Exhibit XI



[25]In keeping with Wall Street's penchant for acronyms, similarly developed structures go by SCRIPTS (Goldman), SETS (Morgan Stanley), TIERS (Salomon) and LASERS — Liquid Asset Swap with Enhanced Return — (Paribas).

[26]*Institutional Investor* heralded it as one of the three most noteworthy derivatives deals of 1993.

Other STEERS structures may entail the purchase of a longer term underlying issue (say 2 years) with the investor obtaining debt units with shorter term maturities (eg 3 to 6 months). Investors benefit by receiving cash flows more closely associated with longer term securities over a short period of time.

Implications for Capital Markets Participants

Issuers

One way the asset swap market has impacted issuers is in the emergence of a particular type of investor seeking to purchase credit specific securities, but in a form *other* than what is presently available in the marketplace. The asset swap market affords borrowers the potential to tap previously unavailable investor bases or undertake financing transactions which were not feasible beforehand. For instance, a sub-investment grade firm might have less than optimal access to the capital markets. This issuer is able, via the swap market, to convert its debt into a synthetic structure which would appeal to a broader investor base. As a result, the firm is able to directly bring to market a fixed rate bond issue previously not considered feasible. The costs incurred by the sub-investment firm in entering the asset swap market must, of course, be factored into the overall transaction and may indeed prove prohibitive.

Securities that offer the opportunity for arbitrage add to the potential for asset swaps. Creation of a synthetic asset should *not* be possible when instruments with similar characteristics are trading in the secondary market *unless* one can obtain a better return via the asset swap market. In this way, asset swaps uncover potential mispricings of transactions.

Investors

Investors benefit from the ability to purchase synthetic issues offering better returns than secondarily traded issues as result of the asset swap market. Additionally, investors gain access to highly customized securities which target their particular cash flow requirements.

Unlike asset swaps (with the exception of SPV's) structured notes offer many of these same attributes in a convenient, packaged trade. Investors do pay, however, for that convenience. The final price to an investor of most newly issued notes is par, but buried in that price is the investment firm's fee for structuring the deal **and** hedging its own ongoing risk (incurred from swapping the issuer out of the note's embedded options) **plus** an incentive to the issuer to accept swap counterparty risk.[27] Note these costs relate to the *issuer* and the *investment firm* underwriting the deal — embedded optionality attendant to a structured note typically advances to the investor who purchased it.

An asset swap effectively strips out a note's embedded options and transforms the coupons into streams of cash flows, either fixed or floating. Asset swap pricing values these embedded components. It portrays to the investor an *absolute level* where components of an issue can be converted into fixed or floating cash flow streams. Additionally, asset swap pricing affords an investor the ability to purchase a note strictly for its incremental yield enhancement. Underlying liquidity risk is mitigated because an analytically precise (albeit minimum) bid always exits for an issue — its asset swap price.[28]

Asset swaps are often utilized by financial institutions in asset/liability management to smooth out interim mismatches between cash flows. As securities mature and liabilities roll off, new products are required to realign any portfolio gap. It may not be feasible, however, to obtain a desired maturity in CD or note form. In this case, one can enter into an asset swap to duration match the portfolio.

Financial Institutions

Investment firms active in new issuance and secondary market trading impact, and are impacted by, the asset swap market. Revisiting the issue whose liquidity is affected by market underperformance, an asset swap allows that issuing firm to repackage the security in revised form to a more receptive investor base. A new vehicle is created by which the firm can either reduce its own portfolio risk or enhance its secondary market activity.

A security's popularity may decrease due to perceived credit quality concerns resulting in wider spreads against a targeted benchmark. As fewer and fewer dealers are willing to trade the issue, the lack of liquidity manifests itself in falling prices for the security vis-à-vis similar, more liquid secondarily traded securities.

[27]Bensman, Miriam, "How Do I Get Out of This?", *Futures*, October 1993

[28](Bensman p. 33)

The high yield on these stricken securities facilitates an asset swap transaction. A commercial bank invests in floating rate securities in order to match fund its assets. That match funding is typically done via short term money market issues pegged to LIBOR. The bank's objective is to secure a floating asset with quality attributes. A synthetic security will meet those requirements in spite of the reasons behind the underlying's negative performance in the secondary market, provided the bank is willing to accept counterparty credit risk attendant to the swaps.

Repackaging the cash flows attendant to a security to create a more attractive and tradeable instrument has not gone uncriticized in some circles. The claim that the newly created synthetic security contributes to overall market liquidity is weakened if one argues that the typical synthetic investor employs a buy and hold strategy. Continued viability of the asset swap market, in that case, becomes largely a function of security availability and swap market dynamics.

Reconstructing cash flows to create synthetic instruments has also been viewed as merely another way for dealer firms to "chalk up numbers" for peer comparison standings on new issue volume. Some even argue that a firm is able to "double dip" to position itself on the list, claiming credit for the original security issue *and* the reconstructed issue.

Examiner Guidance

The flexibility of the asset swap market as an alternate investment vehicle for sophisticated investors has been the focus of this Product Summary. As with all financial instruments, supplementary risks underlie the investment's rewarding attributes. Examiners need to be cognizant of those added risks in their efforts to gauge management's level of understanding regarding asset swaps. Examiners should discern the extent to which asset swaps are deployed in the overall context of interest rate risk management, and the suitability or appropriateness of such deployment given the institution's prevailing and prospective investment strategy.

Risk Management

As noted earlier, the investor is the beneficial owner of both the asset and the swap. As such, he incurs responsibility for managing the cash flows attendant to *both* vehicles, including periodic mark to market valuation. An investor's financial modeling environment and/or other tools utilized to assess the risk attributes of a portfolio should be robust enough to incorporate asset swap transactions. Further, accounting issues related to the treatment of swaps and the underlying instrument should be assessed by appropriate personnel prior to initiation of the transaction.

Counterparty Credit Risk

An investor is exposed to counterparty credit risk in an asset swap deal. The credit quality of the swap provider must conform to the firm's established constraints and utilization of pre-defined credit line agreements. This is especially significant as many institutions, faced with lower marginal income, may compromise credit quality guidelines and due diligence in an effort to "book the deal" Indeed, investors have, in the words of one trader, been "cheapening the value of their portfolios", ie moving farther down the credit curve in search of yield.[29] The concept is analogous to the often times inadequate level of risk assessment employed by fixed income investors during the 1991-93 bull market. Faced with very low absolute interest rate levels and stiff peer competition, many a portfolio manager failed to comprehensively analyze an "attractive" investment, and suffered the consequences when the market inevitably reversed its course.

Many larger institutions have increased their credit assessment and analysis profile with respect to asset swaps. The trading team at NatWest Capital Markets can consult one of three credit analysts positioned on the trading floor before deciding on a structure.[30] In an effort to address credit quality issues, some firms have established AAA rated derivative subsidiaries to channel swap activity through.

[29](*Financial Products*, p. 14)

[30](Gordon-Walker, p. 181)

Liquidity Risk

Liquidity risk is an area of particular significance regarding asset swaps. Due to the variety of available structures, considerable scrutiny is needed when evaluating a synthetic asset's composition. The degree of complexity associated with a structure is (typically) directly proportional to the timeliness and costs associated with liquidating the issue. Because each swap package can be broken down into its component parts, which in turn can be traded separately, there is no secondary market for asset swaps *per se*. The liquidity of the asset swap is therefore limited by the liquidity of the components.[31]

Asset swaps, despite their relatively meager standing when compared to derivatives in general, continue to play a critical role in capital markets activities, especially among financial institutions. A swaps trader in Europe calls the concept "fashionable for senior management at present." As is always the case when an idea becomes "hot" on Wall Street, there is a high degree of turnover among specialists as firms seek to bolster their desks and create a niche business. If the current prospect of higher global rates holds true, the asset swap market should stand to benefit. Investor's ongoing need for enhanced yield, coupled by a reluctance to extend duration, could target floating rate issues as their next instrument of choice. In the meantime, issuers will scramble to lock in fixed rate financing while rates are still attractive, in turn providing the securities needed for asset swaps.

Endnote

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[31](Oldfield p. 28)