

STATE STREET'S  
FINANCIAL DIGEST OF SECURITIES LENDING

# SECURITIES LENDING AND THE ASSET/LIABILITY CONCEPT

*State Street's Financial Digest of Securities Lending* explores the key principles and practices central to understanding the complex dynamics of a securities lending program. This *Digest* is offered as part of our commitment to maintaining an open dialog with our clients and the financial industry. We welcome your comments and feedback at [sf\\_info@statestreet.com](mailto:sf_info@statestreet.com).

## ARTICLE ONE

*The asset/liability concept forms the framework for the risk and return management process within securities lending. This first article in "State Street's Financial Digest of Securities Lending" briefly explores the underlying concepts and gives an example of the type of unique reporting State Street provides to its clients.*

The goal of the return management process is to maximize earnings in the context of an acceptable level of risk. Risk in this case can be defined as the volatility of returns. Investors will generally seek returns that do not vary much around the average — or expected — return, while attempting to avoid negative returns. Though the process of managing returns involves a number of disciplines within securities lending, it is the asset/liability management function that sits at the focal point of this process.

To begin to understand the asset/liability process in securities lending, let's first look at it in the context of a traditional bank, where its application is more intuitive. Commercial/consumer lending banks are in the business of making loans (e.g., auto, mortgage, business) — the assets. These loans can either be fixed-rate or variable-rate. They can mature on a demand basis or over a number of years. Banks finance these loans through deposits or other funding sources (e.g., bonds) — the liabilities. Earnings are generated by the difference between the interest rate earned on the assets (loans) and the rate paid on the liabilities (deposits).

Defaults aside, the greatest risk to the bank's earnings stream is the compression of spread that can occur between the rate earned, for example, on multi-year fixed rate loans and the rate paid for short-term deposits. The possibility also exists that the spread can become negative. In other words, the bank will lose money. This can and will happen in a rapidly rising interest rate environment.

How can the bank manage its earnings stream? The approach with the least risk would be to match the term of the loan with the term of the deposit so that the spread between the two rates is fixed. Alternative approaches include keeping the length of the fixed-rate loans short, making only variable rate loans, or obtaining fixed-rate financing, such as selling certificates of deposit. Of course, the process is far more complex and involves the use of a variety of methodologies, including interest rate forecasting, scenario analysis and stress-testing.

There is a direct analogy between the previous example and securities lending. The bank's loans are analogous to the securities held in the collateral reinvestment funds. Each security earns a specific yield or has a pre-defined yield structure (for instance, floating-rate securities) and also has a specified term to maturity or expected maturity. The bank's deposits, or other financing vehicles, are akin to the loans made to a borrower. Each loan pays a yield, or rebate rate, and is transacted on an open basis or for a specified term.

	Traditional Bank	Securities Lender
Assets	Mortgage Loans	Reinvestment Securities
Liabilities	Deposits	Securities Loans

In a traditional bank, loans are the earning assets. In securities lending, loans finance the earning assets, which are the reinvestment securities.

Broadly speaking, the process of managing the earnings stream within securities lending is similar in concept to that described for the traditional bank. Beyond this, the maintenance of *portfolio* value is a key consideration within securities lending, not only on a stand-alone basis, but particularly with respect to how it relates to the future earnings stream.

Let's begin by discussing what is meant by *portfolio* and how this concept fits within the asset/liability management process.

### THE THREE PORTFOLIOS CONCEPT

- > The **collateral reinvestment portfolio** (the asset portfolio) consists of a set of securities, each with a specified yield (or yield formula) and expected term to maturity. The investor is *long* this portfolio, as the portfolio is the receiver of the yield.
- > The **funding portfolio** (the liability portfolio) consists of a set of securities, each with a specified cost — also referred to as the rebate rate — and term to maturity, whether overnight or a return date agreed upon at the time the loan is initiated. The investor is *short* this portfolio, as the portfolio is the payer of the yield.
- > The **integrated portfolio** represents the combination of the funding and reinvestment portfolios. Through its analysis, a practitioner can quantify the offsets (hedges) that exist in the portfolio as well as the residual risk.

To be long a fixed-income portfolio means that as market interest rates move lower, the portfolio increases in value; conversely, when rates move higher, the portfolio decreases in value. To be short a fixed-income portfolio means that as market interest rates move lower, the portfolio decreases in value; similarly, when rates move higher, the portfolio increases in value.

To clarify, to be long a fixed-income portfolio when interest rates move lower means that the portfolio holdings are receiving interest at a higher relative rate than currently available in the market. This portfolio has a market value above par. When a portfolio is held short and market rates move lower, the issuer is paying interest at a higher relative rate than if the securities in that portfolio had been *issued* at the present time. This portfolio has a market value below par. To summarize:

	Long/Short Portfolio	Rates Move Up	Rates Move Down
Value of Reinvestment Portfolio (asset)	Long	Decreases	Increases
Value of Funding Portfolio (liability)	Short	Increases	Decreases

A statistic known as *duration* succinctly describes the sensitivity of a portfolio's value to changes in interest rates. Duration is the weighted-average maturity of a bond's promised cash flows. It is equivalent to maturity in the case of a security that has a fixed term and a single payout. The closer a portfolio is to an overnight (one-day) weighted-average duration, the less the portfolio will reflect the impact of interest rate changes. The value of an overnight portfolio will not be impacted by these rate changes, as its yield is adjusted daily to reflect current market rates.

When interest rates move lower, securities lending professionals generally think that it is a good thing. Under the assumptions that the reinvestment portfolio has a longer duration than the funding portfolio, and that some portion of the portfolio is purchased in a market in which the expectation of declining interest rates is not fully reflected in the yield of the reinvestment securities, the reinvestment portfolio will benefit from its higher than market rate yielding securities until they mature and new lower yielding securities are purchased.

Let's look at the mechanics of the asset/liability process by constructing a simple integrated portfolio:

#### PORTFOLIO SAMPLE ONE

	Size	Duration	Rate
Securities Loan	-\$1,000,000	1 month	3.00%
Reinvestment Security	\$1,000,000	1 month	3.50%

Negative sign indicates short position.

It is relatively easy to recognize that the portfolio has a locked-in spread of .50%, irrespective of how interest rates move. In this case, the short and the long position are matched in size and duration and thus any change in underlying rates will affect each equally and thus result in no net change.

Now consider this portfolio:

#### PORTFOLIO SAMPLE TWO

	Size	Duration	Rate
Securities Loan	-\$1,000,000	1 month	3.00%
Beginning of Month 2	-\$1,000,000	1 month	?
Reinvestment Security	\$1,000,000	2 months	3.50%

As shown, the duration of the reinvestment portfolio is longer than that of the funding portfolio. While a 50-basis-point return is assured for the first month, the return for the second month is uncertain. An increase in interest rates will result in a decreased spread, while a decrease in interest rates will result in an increased spread.

Also note that at the inception of the transaction, the integrated portfolio is net long, so that as interest rates move higher, this portfolio will decrease in value and as interest rates move lower, this portfolio will increase in value. Tying this together, a reduction in the value of the integrated portfolio signifies decreased spread income relative to the market, while an increase in the value of the integrated portfolio signifies increased spread income relative to the market — all else being equal. This is powerful because it clearly demonstrates that changes in portfolio value portend changes in future earnings.

From this, we can infer that two key drivers of earnings and portfolio value are:

- > the structure of the portfolio itself, and
- > the future course of interest rates.

To amplify, the integrated portfolio has a certain sensitivity to interest rate changes based on the composition and interaction of the two component portfolios. This sensitivity can be measured using a weighted-average duration statistic. As noted previously, the longer the duration, the greater the sensitivity of the portfolio to interest rate changes. With risk being defined as the uncertainty of future returns, the risk in such a portfolio is a direct consequence of the portfolio's sensitivity to interest rate changes and the volatility, or variability, of these rates.

This risk can be quantified using modern portfolio theory and basic statistics, as State Street has done through its risk-adjusted performance measurement toolset for securities lending.

Presented below is a summary of risk and return information within the three portfolios construct. Of particular relevance are the integrated and component duration measures and the associated spread income generated within each of the portfolios. The summary allows one to track how changes in a portfolio's risk sensitivity, as measured by duration, as reflected by changes in a portfolio's risk ratio. This risk ratio is shown below as the *RR Analyzer Ratio*, which measures spread income per unit of risk to portfolio value.

#### RISK/RETURN SUMMARY

	September	October	November	December	Net Change
<b>COLLATERAL REINVESTMENT PORTFOLIO</b>					
Collateral Yield (%)	2.026	1.965	1.922	1.790	-0.24
less: Weighted Risk-Free Rate (%)	1.750	1.753	1.767	1.380	-0.37
Cash Collateral Spread (%)	0.275	0.212	0.155	0.410	0.13
Total Collateral Spread (%)	0.245	0.189	0.139	0.366	0.12
<b>COLLATERAL PORTFOLIO METRICS</b>					
Collateral Portfolio Risk (BPs)	25.561	16.901	24.614	20.154	-8.41
RR Analyzer Ratio	0.856	1.115	0.564	1.816	0.96
Duration Days	43	31	60	77	34.00
<b>FUNDING PORTFOLIO</b>					
Weighted Risk-Free Rate (%)	1.750	1.753	1.767	1.380	-0.37
less: Average Rebate Rate (%)	1.499	1.518	1.503	1.112	-0.39
Cash Funding Spread (%)	0.251	0.236	0.265	0.268	0.02
Total Funding Spread (%)	0.247	0.235	0.260	0.266	0.02
<b>FUNDING PORTFOLIO METRICS</b>					
Funding Portfolio Risk (BPs)	0.290	0.253	0.044	0.027	-0.26
RR Analyzer Ratio	85.052	92.986	591.836	968.411	883.36
Duration Days	6	4	2	1	-5.00
<b>INTEGRATED PORTFOLIO</b>					
Integrated or Cash Spread (%)	0.526	0.447	0.420	0.678	0.15
Total Spread (%)	0.491	0.423	0.399	0.632	0.14
<b>INTEGRATED PORTFOLIO METRICS</b>					
Integrated Portfolio Risk (BPs)	28.365	16.775	24.652	20.144	-8.22
RR Analyzer Ratio	1.733	2.505	1.617	3.137	1.40
Duration Days	6	4	2	1	-5.00

The elements that affect a portfolio's risk sensitivity will be explored in the next article.

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