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50th Anniversary Update

by Cecilia Green

Registrations are already coming in for the SOA 50th Anniversary Celebration and Annual Meeting in San Francisco October 17-20. This meeting is expected to break past annual meeting attendance records and to cause early sell-out of hotel rooms. If you have not received your preliminary program, please call (847) 706-3545. Also, if you have not reserved your hotel room, do that now, even if you have not registered yet. The main hotel is the San Francisco Marriott (415) 896-1600 and the overflow hotel is the Palace (415) 512-1111. Be sure to say you're attending the SOA meeting to get the special rate.

The Actuarial Career Information Fair is going to be held on October 20 for area high school and college students and teachers, after the annual meeting adjourns at noon. If your company can be a lunch sponsor or wants a booth or an ad in the program, please call Linda Blatchford (847) 706-3564.

Revisiting the Portfolio Efficiency of Investment in High-Return Bank Loans

by Paul J. Donahue

In his definitive article, *Corporate Loans as an Asset Class*,¹ Elliot Asarnow presented the following findings about the years 1988 through 1994.

1. Floating rate U.S. corporate loans yielded risk-adjusted returns greater than those for more "traditional" asset classes.
2. There is a low correlation of corporate loan returns with those of other major asset classes.
3. Because of (1) and (2), corporate loans displaced Treasuries and high grade corporate bonds in low to medium risk multi-asset class portfolios modeled to be mean/variance efficient.
4. The higher returns generated by active management of corporate loan portfolios shows that the corporate loan market is inefficient.²

The continuing evolution of the product mix that incorporates bank loans³ in the marketplace for investments makes it important to evaluate anew the answers to these foundational questions. The first part of this article will revisit the questions posed by Asarnow. Its concluding section will discuss new developments in the marketplace that give added relevance to a reevaluation of the contribution floating rate loans can make to the level of a portfolio's level and to the stability of the portfolio's return.

For those unfamiliar with the characteristics of the high-yielding bank loan asset class, Appendix 1 provides an introduction.

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Data

Asarnow

The data central to Asarnow's analysis was the Citibank Loan Index and the data that underlay the Index. The Citibank Loan Index contained data only for companies with public debt ratings. Asarnow's study considered the term-loan segment of the bank loan asset class. On average, the term loan subset of the Citibank Loan Index included 174 facilities representing \$39 billion in outstanding loans. The study dropped loans for which key data items were missing or of doubtful validity.⁴ The Euromoney/Loanware⁵ database supplied the key descriptive data used in the calculation of historical total returns.⁶

Since the Citibank Loan Index contained data only for companies with public debt ratings, Asarnow could identify matches with lists of defaulted companies published by Moody's or by Standard & Poor's.

Our Analysis

The demise in 1996 of the Citibank Loan Index makes unavailable the simple expedient of extending Asarnow's analysis. The only currently available surrogates for the performance of bank loans as an asset class are the Goldman Sachs/Loan Pricing Corporation Liquid Leveraged Loan Index ("the Index") and the results of bank loan mutual funds. In August 1993, the Index included 19 loans from 19 issuers with an aggregate market value of \$9.2 billion.⁷ As of November 6, 1998, the Index included 16 loans with an aggregate outstanding market value of \$5.1 billion.

The Index is undeniably thin. The designers of the Index believed that the advantages of increased accuracy and replicability outweighed the disadvantage

of a lack of comprehensiveness. The Index intends to reflect the characteristics of the most liquid performing loans in the "leveraged" (high-yielding) loan market.⁸ To be eligible, an issue must be a syndicated term, dollar-denominated, SEC-registered, commercial/industrial loan, with a minimum stated maturity of one year and a maximum maturity of twelve years and with a minimum initial size of \$100 million and a minimum size of \$25 million during the term of the loan. To distinguish "leveraged" loans from investment grade loans, a loan eligible for the Index must have a minimum initial spread over LIBOR of 150 basis points. To remain in the Index, a loan must maintain a minimum price of \$80, a surrogate for performing. A defaulting loan is removed from the Index at its then current market price, which reflects the effect of default.⁹

The Index appeared monthly beginning June 30, 1992, until December 31, 1992, and weekly thereafter.¹⁰ Index returns are a market-value weighted average of the returns for the individual securities. Total return for each security includes price change, interest accrued and principal repaid.¹¹

An alternative approach to examining results for a diversified portfolio of bank loans is to look to the results of a mutual fund or funds that invest in bank loans. In order to make valid risk/return comparisons to asset classes for which true market prices are used, the pricing for the bank loan fund or funds should strive to reflect the current market value of the underlying loans to the extent possible. As with all financial instruments with limited liquidity, there will inevitably be an element of judgment in setting market value for bank loans. However, if the fund's management does not

even attempt to price to market, but relies to a greater or lesser extent on amortized cost plus accrued interest ("book value") to strike a unit value for the fund, comparisons to financial instruments will be distorted, especially with respect to risk. Book values will be smoother than market values, and so will "book" returns, and particularly, "book" standard deviations.

Methodology

Asarnow

Asarnow made the following assumptions in order to be able to use the data available to measure bank loan performance.

1. Loans are reset every three months.
2. Since the Euromoney/Loanware database does not provide rate change data, assume the borrower chooses the lowest rate available (a "rational borrower" hypothesis.)
3. Prices used for calculation of total return are estimates based on new issue comparables.

Our Analysis

We have chosen to use the Merrill Lynch Senior Floating Rate Fund as a base on which to construct a surrogate for the performance of bank loans as an asset class. As of August 31, 1998, the Senior Floating Rate Fund was invested in 219 bank loans, compared to the 16 for the index as of November, 1998. Based on the description of the pricing practices of the mutual funds listed as bank loans funds in the *Wall Street Journal*, the Senior Floating Rate Fund is the only bank loan fund for which data is available from January 1990 onward that

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strives to “mark to market.” We noted above the thinness of the Index. That reason alone would be sufficient to reject the Index as a surrogate for performance of bank loans as an asset class.¹⁴

Use of the Merrill Lynch Fund as the base for a bank loan performance surrogate allows us to dispense with the simplifying assumptions Asarnow needed. Accrued interest reflects actual rates as determined by borrower as permitted by the contractual reset provisions. The chief benefit of use of the Senior Floating Rate Fund is that price return can be calculated based on actual prices in the secondary market rather than on hypothetical prices determined by comparison to new issues.

To move from the returns on the Merrill Lynch Senior Floating Rate Fund to returns on the underlying assets which would be more directly comparable to index yields, we have added actual management fees, as disclosed in financial statements, to the Merrill Lynch returns. We shall refer to these augmented returns as the returns on “Bank Loans,” to guard against any possible confusion between

these augmented returns and the returns an investor in the Merrill Lynch Senior Floating Rate Fund would actually have earned.

Results

Correlation of Returns

A useful rule of thumb drawn from Modern Portfolio Theory is that the addition to a portfolio of an asset with low correlation to the assets already in the portfolio reduces the volatility of that portfolio.¹⁵ If the addition of the new asset does not reduce yield, the expanded portfolio is an absolute improvement on the original portfolio (more technically, it is *pareto superior*). Additionally, given the risk/return preferences of some investors, a given reduction in volatility might be more valuable than the yield sacrificed to obtain the reduction in volatility.

Asarnow found that the correlation of total return on bank loans, as represented by the BBB-B segments of the Citibank Loan Index, with Treasuries of various maturities, with both high-grade and high-yield corporate bonds, and with the Standard and Poor’s 500 Index,

ranged from a high of .19 to a low of -.07.¹⁶ These low correlations meant that bank loans had met the first condition for qualification for addition to a broad range of portfolios.

The table below updates Asarnow’s analysis by replacing the Citibank Index by the Merrill Lynch Senior Floating Rate Fund. The period for which returns are correlated is from January 1990 to September 1998.

The correlations to Bank Loans range from highs of .44, to three-month LIBOR, and .39, to one-year Treasury notes, to a low of -.02, to the S&P 500. The correlations are relatively low even where we expect correlation, and there is essentially no correlation to stock returns.

These correlations show that the result established by Asarnow remains valid; the low correlation of bank loans to other asset classes makes them a plausible candidate for inclusion in portfolios in order to improve the risk/return efficiency of those portfolios. The next stage of the analysis requires that we consider yields.

Monthly Return Correlations

	Bank Loans	1 Yr T-Bond	5 Yr T-Bond	10 Yr T-Bond	30 Yr T-Bond	Corp. Bonds	High Yield Bonds	S&P Index	3 Month T-bill	3 Month LIBOR
Bank Loans	1.00	0.39	0.16	0.14	0.04	0.09	0.02	-0.02	0.36	0.44
1 Year	0.39	1.00	0.74	0.66	0.56	0.66	0.22	0.32	0.72	0.60
5 Year	0.16	0.74	1.00	0.96	0.90	0.94	0.30	0.41	0.29	0.13
10 Year	0.14	0.66	0.96	1.00	0.96	0.95	0.24	0.38	0.23	0.11
30 Year	0.04	0.56	0.90	0.96	1.00	0.93	0.23	0.41	0.19	0.09
Corp	0.09	0.66	0.94	0.95	0.93	1.00	0.43	0.51	0.28	0.16
High Yield	0.02	0.22	0.30	0.24	0.23	0.43	1.00	0.54	0.03	-0.03
S&P	-0.02	0.32	0.41	0.38	0.41	0.51	0.54	1.00	0.08	0.06
3 M T-bill	0.36	0.72	0.29	0.23	0.19	0.28	0.03	0.08	1.00	0.86
3 M Libor	0.44	0.60	0.13	0.11	0.09	0.16	-0.03	0.06	0.86	1.00

	Annualized Total Return	Standard Deviation		Sharpe Measure
		1/90 - 9/98	1/90 - 9/98 (if available; otherwise as available)	
		Monthly / Annually		
Lehman Corporate	9.61%	1.400/4.83		0.90
Lehman High Yield	11.77%	2.140/7.41		0.88
1 Year Treasury	5.92%	0.270/0.93		0.73
5 Year Treasury	8.21%	1.240/4.30		0.69
10 Year Treasury	9.18%	1.920/6.65		0.59
30 Year Treasury	10.79%	2.760/9.54		0.58
3 Month LIBOR	5.63%	0.120/0.42		0.94
3 Month T-Bill	5.24%	0.140/0.50		0.00
S&P 500 Index	15.85%	3.85/13.34		0.80
Bank Loans	8.45%	0.180/0.61		5.27

Comparative Yields

The table above presents the annualized total returns, the standard deviations and the Sharpe ratios for the same categories for which we examined correlations of returns on page 4.

The Sharpe Measure, which for Asset A equals (mean return for Asset A - mean return for the risk free asset) / (standard deviation for Asset A), is a widely used measure of return per unit of risk. It also reflects the risk/return characteristics of bank loans. The Sharpe ratio for Bank Loans is more than five times higher than that for the asset class with the next highest ratio, three-month LIBOR.

Over the period 1/90 to 6/98, Bank

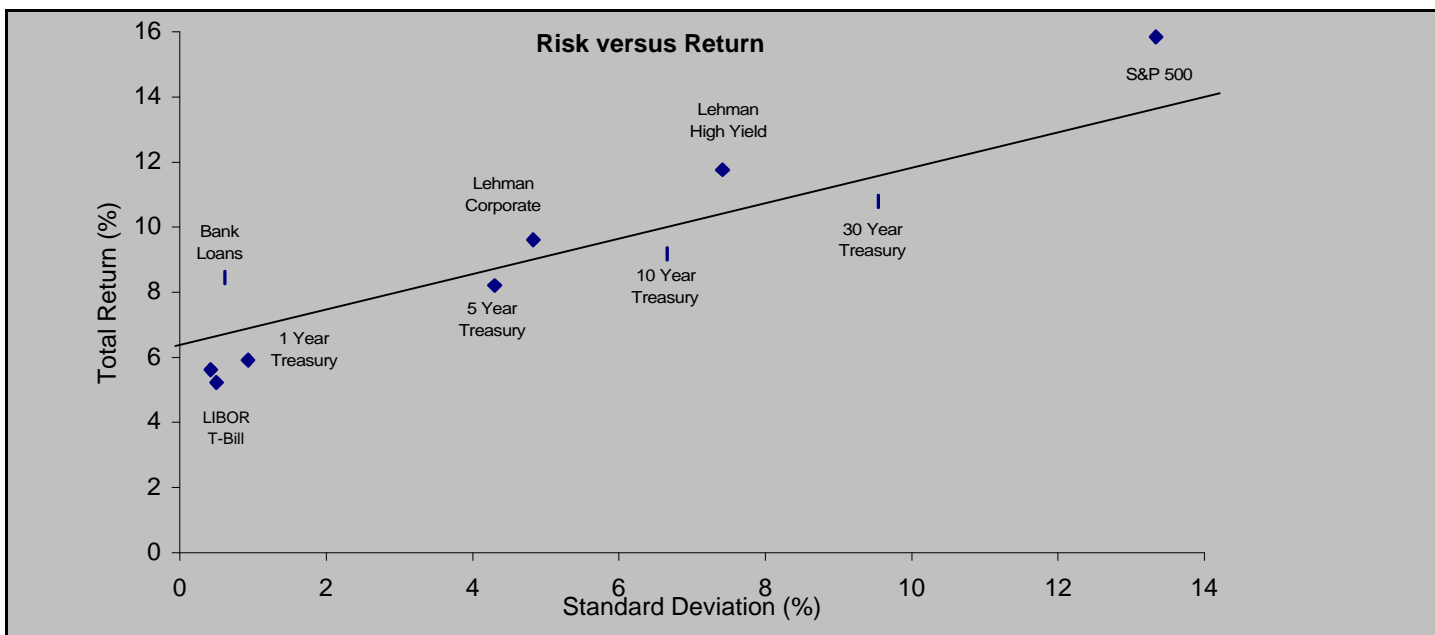
Loans' absolute return ranks above those for LIBOR, 3 month T-bills, and 1 and 5 year Treasuries, and below those for high-grade and high-yield bonds, 10 and 30 year Treasuries and the S&P 500 Index. Making a reasonable adjustment for management fees would reduce Bank Loans' return below those for the 5 year Treasuries.

Restricting the comparison to the yields considered by Asarnow, the place of bank loans in the hierarchy of returns has changed very little, the only change being that bank loan returns have dropped below those for 10 year Treasuries.

The graph below plots total return against standard deviation of total return

and includes the regression line determined by the data points. In this graph, to be below the regression line indicates that total return is greater per unit of risk than the regression line would determine. Here again, Bank Loans outperforms all other asset classes; for the degree of risk, the return exceeds that predicted by the regression line by 2%.

The graph, which makes no adjustment for management fees, shows, for example, that Bank Loans increases return while decreasing risk compared to 1 and 5 Year Treasuries, and that it offers considerable reduction of risk compared to the Lehman Corporate and 10 and 30 Year Treasuries with only a modest sacrifice of return. If we made an adjustment



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for management fees, the relationship of Bank Loans to the 5 Year Treasuries would change from one of absolute, to one of relative, advantage, for investors with even a slight degree of risk aversion.

Benefits of Active Management

Our analysis so far clearly establishes the advantages of investment in bank loans for improving the efficiency of low to moderate risk portfolios. Unfortunately, the data available does not allow us independently to weigh the advantages of active management. All recent data reflects active management.

The only reliable indication of the possible advantage of active management comes from a comparison of the return on Citibank index from 1/90 to its end in 12/96 to that of Bank Loans. The Citibank index earned 7.14%; Bank Loans 8.58%. If we were to reduce Bank Loans return by 130 basis points to approximate the difference in costs between active management and managing an index fund, Bank Loans would still have outperformed the Citibank Index by 13 basis points per year.

Investment Opportunities

Currently, retail mutual funds are a dominant force in the market for leveraged bank loans marketed to institutional investors. However, the analysis we have presented above should recommend bank loans as an asset class not only to retail investors, but to a broader range of institutions as well. Structures will certainly evolve to enable institutions to enjoy the superior return investment in bank loans offers, while accepting only the level of risk appropriate to their different situations, and with lower expenses than those incurred by mutual funds.

Collateralized Loan Obligations

A pool of bank loans can be used to support a variety of securities. One structure for which bank loans can serve as the

underlying assets are Collateralized Loan Obligations (CLOs). CLOs are typically issued by offshore Special Purpose Vehicles (SPVs) meant to isolate the operation of the structure to the extent possible from United States taxes. Buyers of the equity are often hedge funds attracted by potential returns in excess of 20% per year. A relatively small equity participation in a CLO can raise the credit quality of the fixed-income securities issued by the SPV to a level as high as AAA, while still offering returns superior to other AAA investments. Multiplying the number of tranches offers the opportunity to tailor risk/return to the needs of nearly any institutional investor.

Defined Benefit Pension Funds

Elements of different tranches of bank loan structures, or indeed investment in a pool of loans managed by a bank loan specialist, would be an appropriate investment for a defined benefit pension plan. Investment in the equity element of a structure offers the opportunity for superior returns with lower downside risk.

Insurance Companies

The risk/return characteristics of a diversified portfolio of bank loans, especially as they can be tailored through structured securities, make bank loans and bank loan structures attractive investments for insurance companies. Investment in bank loan structures' equity would be an attractive risk-reducing alternative to stocks in insurance company surplus and general accounts. An insurance company separate account might offer direct participation in a pool of diversified bank loans managed by a bank loan specialist. A separate account offering a lower level of risk could invest in senior notes in a number of bank loan structures.

Capital Accumulation Plans

A pool of bank loans could itself be the

basis for an option for participant-directed capital accumulation plans. Even direct participation offers superior return with risk characteristics appealing to the conservative investor. The senior or even the mezzanine levels of notes in a structure would be excellent investments for Stable Value Options, offering improved returns with a lower level of market value risk.

As the volume of bank loans grows, and with it the experience of the market in dealing with them and in constructing structures with elements that appeal to a wide array of investors, competition and increased administrative efficiency will make them an ever more versatile and appealing part of the capital market.

Appendix 1: High-Yielding Bank Loans

The asset class analyzed by Asarnow and reevaluated here consists largely of syndicated loans to large and mid-sized corporations. The interest rates on these loans change at periodic reset dates, most frequently quarterly, to maintain a fixed spread with respect to a reference interest rate, usually three-month LIBOR, but sometimes the prime rate, rates on certificates of deposit, or other reference rates. Spreads over the reference interest rate vary for many reasons: These loans are almost always senior obligations, and, in the case of loans with lower than investment-grade ratings, are secured.

Loans in this asset class can be either term loans or revolver loans. Term loans are fixed in amount and have fixed repayment schedules. Revolver loans are drawn against a line of credit guaranteed available until maturity. An investor earns the reference interest rate plus the fixed spread and possibly other fees on the amount of outstanding term loans and draws. On revolvers, the lender also receives a fee on any amount guaranteed available not yet drawn down.

Loans in this class generally have

stated maturities of from three to five years and an average life of three and one-half years.

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Bibliography

- 1) Elliot Asarnow, *Corporate Loans as an Asset Class*, 22:4 *The Journal of Portfolio Management* (Summer, 1996), 92 [hereinafter "Asarnow"]. Consecutive citations to material appearing on the same page of the same source have been omitted except for the last of what would otherwise have been a series.
- 2) Asarnow, 93.
- 3) The asset class which Asarnow studied, and which we are reexamining in this article, consisted of bank loans rated BBB-B in the Citibank Loan Index. In this article, we refer to that asset class simply as "bank loans."
- 4) Unfortunately, Asarnow does not provide the number of loans dropped for these reasons.
- 5) Loanware is a proprietary database covering the global loan market, including syndicated loans and related banking instruments. It is a product of Capital Data, a member of the Computasoft Group, which has a website describing the database at www.capitaldata.com.
- 6) Asarnow, 94. Supplementary data came from additional source documents, e.g. loan agreements and terms sheets; unspecified published information sources provided checks "when required." *Ibid.* Historical LIBOR, prime and CD rates, as well as average all-in required spreads, were also factors in the calculation of total return. *Ibid.*
- 7) Thomas Iben, Steven C. Miller and John E. Urban, *Fixed Income Research: Introducing the Goldman Sachs/Loan*

Pricing Corporation Liquid Leveraged Loan Index (Goldman Sachs, September, 1993) [hereinafter "Iben et al."], 2.

- 8) Iben et al., 10.
- 9) Iben et al., 12.
- 10) Iben et al., 13, Exhibit 4, note a.
- 11) *Ibid.* The Index assumes intra-week cash flows are received at the end of the period. It incorporates prepayments as soon as they are available. It does not include additional loan fees paid to investors. *Ibid.*, note 7.
- 12) Asarnow, 94.
- 13) As we shall discuss, *see below* footnote 18.
- 14) The general formula for the standard deviation of a portfolio as derived by Harry Markowitz is:

$$\sigma_{port} = \sqrt{\left(\sum_{i=1}^n w_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{j=1}^n w_i w_j Cov_{ij}, i \neq j \right)}$$

See Frank K. Reilly and Keith C. Brown, *Investment Analysis and Portfolio Management* (5th ed., 1997), p. 261. In a portfolio with numerous assets, the contribution of an individual asset's covariance with other portfolio assets generally dominates the contribution of its own variance. *Ibid.*, p. 262. Transformation of the covariance into coefficients of correlation using the definition $r_{ij} = \sigma_{ij} / \sigma_i \sigma_j$ standardizes covariance into a statistic which can vary only from -1 to 1, which makes comparison simpler. *Ibid.*, pp. 259-261.
- 15) Asarnow, 98.
- 16) The yields used in the tables and graph below are from indices with the exception of those for Bank Loans. As noted above, actual management fees, as disclosed in financial statements, have been added to returns for the Merrill

Lynch Senior Floating Rate Fund results to create a bank loan surrogate comparable, that is to say gross of management fees, to those for the indices. Funds which consist of these different asset classes would charge very different fees. As examples, the median fee for high-yield bond funds is 145 basis points. The charges for the Merrill Lynch Senior Floating Rate Fund approximate 130 basis points. Fees for money market funds approximate 50 basis points, and for an S&P Index fund, between 50 and 60 basis points.

17) Indeed, the Sharpe ratio is so high that it casts doubt on the accuracy of the standard deviation of returns. We noted above that we were choosing the Merrill Lynch Fund as a base to construct a surrogate for the bank loan asset class primarily because it espoused "mark-to-market" pricing. The extent of the discontinuity between the Sharpe ratio for Bank Loans and those for other asset classes suggests above all that Merrill's attempt to mark to market has been less than totally successful. However, even doubling the standard deviation would leave unchanged the analysis which follows.

18) As we noted above, as an index, the Leverage Liquid Loan Index must be adjudged a failure. The Index correlates negatively to LIBOR and to Bank Loans, an intuitively unacceptable result. It has only a low positive correlation, over a brief period of commonality, to the Citibank Loan Index, which was much thicker, consisting of over 170 loans.

Nevertheless, even though a failure as an index, the Index is outstanding testimony to the skill of its constructors as active managers of bank loans. The results the Index has achieved over its life compared to other fixed-income investments are extraordinary. It outperforms every other fixed-income class by substantial margins, and is close to the S&P 500.