The Giliberto-Levy Commercial Mortgage Performance Index

A performance benchmark for investments in private-market real estate debt.

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Executive Summary

This paper describes the characteristics and history of the Giliberto-Levy Commercial Mortgage Performance Index. As its name implies, the Index tracks investment results produced by private market debt investments in commercial real estate within the United States. With marked-to-market standards becoming more universal, we think the Index, which incorporates a consistent pricing model for investments that traditionally have not been marked to market, offers useful insights for investors, consultants, regulators, risk managers and others.

We begin by providing a background and profile of the Index. In brief, the Index is comprised of commercial mortgages made and held by institutional lenders on their balance sheets. Underlying collateral comprises commercial real estate spanning all major property types as well as other property sectors such as lodging and mixed-use. Importantly, the Index contains total return performance for more than 28,000 loan groups totaling more than $600 billion over time.

The paper next discusses each main stage of the index construction process: (1) data collection; (2) loan pricing; (3) credit loss allocation and (4) return calculation.

In the last part of the paper, select historical performance is analyzed. Key findings include:

• The Index has posted an 8.7% total return on an annualized basis since its inception in Q1 1972.
• Index volatility is comparable to that exhibited by indexes of publicly traded fixed income.
• The Index is, not surprisingly, highly positively correlated with other fixed income indexes.
• Unlike appraisal-based indexes of private-market real estate equity, the Index does not have significant serial correlation. Consequently, its measured volatility does not need to be adjusted for smoothing or other artifacts produced by “non-trading” of the Index constituents.

Going forward, we will continue to update key findings and monitor trends. Additionally, we constantly strive to enhance the Index by increasing its coverage. Although the Index currently is limited to senior loans originated in the U.S., we seek to expand its coverage to include both non-US investments and subordinated debt instruments. Our ultimate goal is to enhance the transparency of the commercial mortgage market by providing investors reliable information that would otherwise be elusive in a predominantly private market.
About the Giliberto-Levy Commercial Mortgage Performance Index

The Giliberto-Levy Commercial Mortgage Performance Index (“G-L Index” or “GLCMPI”) measures the investment performance of select private-market investments in commercial real estate debt. Specifically, the Index tracks fixed-rate, fixed-term senior loans that are made by and held in the investment portfolios (“on balance sheet”) of institutional lenders such as life insurance companies and pension funds.

The initial version of the Index was described in “A Performance Benchmark for Commercial Mortgages,” which appeared in the Spring 1997 issue of Real Estate Finance (REF). The Index has evolved in the intervening years. This paper describes the Index’s current construction and pricing methodology and provides updated performance statistics.

G-L Index within the real estate capital markets

The Index was first produced in 1993. We created it to fill a gap in the measurement of commercial real estate’s investment performance. Figure 1 illustrates where the G-L Index fits within a quadrant view of real estate capital markets. Of course, in 1993 commercial mortgage-backed securities (CMBS) indexes did not exist, and real estate investment trust (REIT) and other property share indexes had relatively small market capitalizations.

Our aim was to provide a total rate of return that tracked income, price movements and credit effects. Such a measure would be comparable to stock and fixed-income indexes and could be used for performance measurement, return attribution and asset allocation. We recognized, however, that the private debt quadrant encompasses a wide variety of credit-market instruments, including fixed and floating rate loans on existing buildings, construction loans, lines of credit and various forms of subordinated debt. We chose to focus on fixed-rate senior loans on existing buildings. This was primarily motivated by data available in 1993.

In addition, we restricted the Index to loans that were originated by lenders to be held on their balance sheets, i.e., so-called “portfolio” loans. (We should point out that the term “portfolio loan” also is applied to a loan that has been made on a portfolio of assets. To avoid confusion, we’ll stick with the term balance sheet loans.) In contrast, loans originated by securitization conduits are outside the Index’s purview.

Index calculation methodology has not changed since publication of the 1997 REF paper. As you might expect, we have refined and updated techniques we use to re-value loans each period. We believe this has resulted in an even more reliable benchmark.

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Figure 1. Indexing the Commercial Real Estate Market
How we construct the Index

Data Sources

As described in the REF article, GLCMPI in its early years used information published by the American Council of Life Insurance (ACLI) as its primary source for loan origination information. We did not have access to individual loan data. Each Index entry we created from ACLI data represented a cohort of similar, but not identical loans. We combined this with monthly pricing information captured in the Barron’s/John B. Levy & Co. National Mortgage Survey. (This Survey, which tracked indicative mortgage yields, was discontinued in 2006.)

At the beginning of 2003, we stopped using ACLI as a primary data source. We replaced it with proprietary data collected by John B. Levy & Co., Inc. (the “Loan Survey”). Survey participants are primarily life insurance companies. In contrast to ACLI cohort data, the Loan Survey provides granular loan information, including amount, coupon rate, property type, loan-to-value ratio (LTV) and debt-service coverage (DSC). (To protect confidentiality no loan-specific identifying information is retained in the Index).

The Loan Survey has provided data on more than 14,000 individual loans totaling more than $200 billion of lending activity since we started using it for the Index. As of March 31, 2012, of the nearly 16,000 database loans, fully 78% of the entries are from the Loan Survey; the percentage based on market value is higher at 83%. Over time, ACLI entries will drop out of the Index. Of course, performance results produced by all cohorts and loans remain in the historical Index database.

Figure 2 provides a profile of the Index as of March 31, 2012.

[Figure showing property type distribution]

- $188 billion market capitalization
- Over 15,900 loans
- Average coupon rate: 5.95%
- Average remaining term: 5.6 years
- Duration: 3.7 years
- Average book loan-to-value ratio: 56%
- Average marked-to-market loan-to-value ratio: 59%
- Average discount rate or market yield: 4.06%
Index Inclusion Criteria

As mentioned previously, the G-L Index only includes fixed-rate, fixed-term loans that are originated to be held on a lender’s balance sheet. In addition, to be eligible for the Index, a loan must meet these criteria:

1. Made on a property in the United States;
2. Is a senior whole loan: no subordinated debt such as mezzanine loans, B notes, etc. Pari passu participations are, however, eligible;
3. Is a “permanent” loan on an existing structure: no construction loans, no bridge loans, no credit lines;
4. May not have equity participation features, such as an equity “kicker.”

Pricing Methodology

The heart of the GLCMPI is a proprietary pricing matrix that we recalculate every month using the latest Loan Survey data. This matrix allows us to mark to market every loan in the Index using current pricing information.

The starting point for building the pricing matrix is to determine how a “standardized loan” was priced at the end of the month. In reality, there is no such animal: loans are heterogeneous. That said, a standardized loan in our terminology is one with a ten-year term to maturity, made on one of the four major property sectors (office, industrial, retail and multifamily residential) with a 60% to 65% LTV at origination.

We estimate the price of such a standardized loan using Loan Survey data. The price is calculated as a spread over the ten year U.S. Treasury note yield.

After establishing this baseline spread, we fill in the pricing matrix by measuring spread variation produced by differences in the following factors:

1. Property sector
2. LTV and DSC ratio (credit spread curve)
3. Term to maturity (spread curve)
4. Loan size
5. Amortization
6. Loan made on a single asset or a group of assets

A key aspect of pricing is that these factors can and often do vary month to month. For example, in some months we may not discern a meaningful loan-size effect. Sometimes the spread term to maturity shows little variation: the spread curve is flat. At other times, the curve can be quite pronounced. A good example of the latter is the steep Treasury yield curve environment of 2011. For much of the year, five-year loans carried a 50-basis-point (bp) spread premium to ten-year loans that were otherwise identical; three-year loans showed a 100-bp spread increment.

Return Calculation

After each loan is marked to market at month end, we calculate its return. The monthly return formula is straightforward:

Total Return = (Ending Market Value + Cash Received – Beginning Market Value) / Beginning Market Value

Cash Received may include any of the following: (1) regular payments of interest and loan principal; (2) balloon payments at loan maturity; and (3) cash received from loan termination prior to maturity (foreclosures, early payoffs, etc.). Importantly, interest and principal that is not paid due to a loan being tagged as delinquent has an immediate effect on cash flow. (Loans are “tagged” through our credit loss process, which is outlined below.)
The headline Index and any sub-indexes or stratifications are computed as weighted averages of individual loan returns using each loan’s beginning of period marked-to-market value as its weight.

The 1997 REF article contains additional information about return calculations. (Please note that the original article refers to a model portfolio. That term is no longer appropriate because the Index is and has been based on detailed loan data for nearly a decade.)

**Credit Losses**

The Loan Survey provides granular data on loan characteristics at origination. However, the survey currently does not receive periodic updates on previously originated loans. As a result, we use a proprietary model to estimate credit losses.

Our model allocates losses across loans within the Index database. The theory is that losses are more likely to occur, not surprisingly, on loans that have experienced significant declines in value and/or debt service coverage. Therefore, we update this information for each loan every quarter using IPD and NCREIF data. As a result, each loan’s loss propensity may change for better or worse.

Historically, we developed these results using ACLI aggregate data on delinquency rates, foreclosure incidence and loss severity. These data roughly corresponded to the ACLI loan origination information.

With the change to survey data that we initiated in 2003, these statistics now are derived from several sources. Our main approach is to use CMBS data to calibrate our estimates. A benefit is that CMBS data are available on a very timely basis.

Of course, we acknowledge potentially significant differences between balance-sheet loans in the Index and conduit loans in CMBS. As a result, we adjust for relevant differences between the Index’s loans and those that underpin CMBS. These factors would include LTVs and DSCRs, property type, vintage year, etc. We have checked our loss model against several actual portfolios. Our credit loss estimates line up well with these portfolios, supporting our approach.

We recognize that modeled losses are not ideal, but returns with zero credit losses would not be credible! (A version of the Index without credit losses is available.)

Specific model details are a trade secret. Those interested in further study may consult the monograph *Estimating a Commercial Mortgage Default Function* (Walter Barnes and Michael Giliberto, 1994) and the references therein.

**Other Index Construction Considerations**

New loans enter the Index with a one-month lag; for example, a loan originated in March will first appear in the Index in April. We do this because loans are rate locked continuously throughout a month and loan coupon rates reflect both spread and Treasury yields on that day. Since our pricing occurs at month end, some loans may enter the Index with a premium or discount valuation reflecting differences between coupon rates at origination and pricing yields at month end.

An alternative would be to assume such loans are properly valued at par (no premium or discount) on origination date. However, we would then have to address a hodgepodge of initial return periods shorter than a full calendar month. In addition, our procedure eliminates possible distorting effects from loans that were rate locked earlier, i.e., under different capital markets pricing, than dates reported in the survey.

We chain link monthly returns to produce quarterly, annual and multi-year returns. As a result, the Index is a standard time-weighted return series and is fully comparable to indexes such as the Standard & Poor’s 500, various Barclays Capital fixed-income indexes and IPD Property Indexes.

While the Index process generates monthly returns, our production cycle is quarterly. Consequently, Index releases appear toward the end of the month following the close of each calendar quarter. (Access to monthly returns is available via custom queries and database licenses.)
Historically, our headline Index was the so-called Aggregate Index, which is a market-value weighted blend of the four major property sectors. In 2011 we started using the Total Index, which adds lodging, mixed use and miscellaneous other (storage, parking, etc.) sectors, as the main reported return. We continue to calculate and publish the Aggregate Index.

**Historical Performance**

The earliest loan data in the Index are from 1965. The first Index returns were calculated for Q1 1972. As a result, the Index’s initial release in 1993 already had more than 20 years of historical performance data. We like to think it was useful from “day one” because it offered results that included multiple business cycles and encompassed significant commercial real estate dislocations in the 1973-1975 period and at the end of the 1980s, which preceded the 1990 recession and attendant real estate debacle.

One might conclude from Figure 3 that private-market commercial mortgage performance has been rather unexciting: returns over horizons of one, five, ten and even twenty years are fairly tightly clustered. The three-year horizon exhibits a higher return because it captures the rebound from the 2007-2009 financial crisis. The five-year horizon, on the other hand, includes both large downward value adjustments from the crisis as well as the capital market recovery reflected in the three-year return.

Not surprisingly, time series returns show more volatility (see Figure 4).
What underlies the volatility? Much of it arises from movements in Treasury yields. Figure 5 plots the quarterly return posted by the GLCMPI (on the vertical axis) as a function of the change in yield on the 10-year U.S. Treasury note (on the horizontal axis).

Movement in the ten-year yield, according to the R2 statistic, explains more than half (0.55) the variation in Index total return. This is a simple yet powerful illustration that the GLCMPI responds as one would expect: increases (decreases) in interest rates generally produce lower (higher) total return on GLCMPI. Importantly, in Figure 5 we did not control for differing durations between the Index and the 10-year Treasury, nor did we back out the effect of credit-spread changes, which also affect Index total return.

Figure 5 contains a few significant outliers, data points that lie far from the regression line shown in the chart. Absent these extreme outliers, the R2 would be higher.

Each outlier generally has a “story.” The most notable is for the circled data point, which is perhaps the most influential outlier. It represents Q4 2008, probably the darkest period of the financial crisis. Normally a large decline in the Treasury yield – it fell by 1.6% from the end of Q3 to the end of Q4 -- would have produced significant positive Index returns. All other quarters in which the Treasury yield fell by 1.6% or more corresponded with positive Index returns.

However, in Q4 2008 investors sought safety in Treasuries, pushing yields down, while shedding nearly all risk exposures – if they could! In the private commercial mortgage market there was a huge increase in credit spreads, which swamped what would normally have been a favorable movement in Treasury yields. The combined net effect was a nearly 200-bp increase in the yield or discount rate for a standardized GLCMPI loan. Naturally, that produced a substantial negative mark to market. Indicating how significant this one outlier is, we found that replacing the actual Index return for this quarter with its long-term average improved the regression’s R2 from 0.55 to 0.65.

We think the Index’s result in this extraordinary period provides a meaningful example of the validity of its mark to market process. What is especially telling is that there was no significant lag between the private-market GLCMPI and public debt value changes. This stands in contrast to a visible lag between equity REIT share price movements and adjustments to the price component of private-market equity real estate indexes. We don’t mean this as a knock on such indexes: their construction inherently causes them to lag the “spot” property market.
Performance Compared With Other Asset Classes

The chart in Figure 6 shows annualized long term performance compared with the IPD U.S. Quarterly Property Index. The table in Figure 6 includes other asset classes.

The chart of longer-term return and risk in Figure 7 shows a classic and expected pattern: over long horizons investors receive larger returns for taking on investment categories with higher risk. (The NPI return volatility has been adjusted to take into account its high period-to-period correlation.)

**Figure 6. Total Returns as of December 31, 2011**
**Using annualized total returns**

![Graph showing total returns](image)

**Source:** Barclays Capital, BLS, IPD, S&P, Giliberto-Levy Index

**Figure 7. Long-term Return and Risk**
**Using quarterly total returns from Q1 1978 through Q4 2011**

![Graph showing return and risk](image)

**Sources:** Federal Reserve Board, Barclays, NAREIT, NCREF, S&P and Giliberto-Levy Index
**Statistical Properties**

*Correlation patterns:* As one would expect, given the correlation between Treasury yield changes and GLC MPI total returns shown in Figure 5, GLC MPI is also highly positively correlated with fixed-income indexes, such as Barclays Capital Government/Credit Index. The Index also has statistically significant positive correlations with stocks and equity REITs. While the (negative) correlation between inflation (CPI) and GLC MPI is marginally significant, it’s worth noting that it is directionally the same as the CPI’s statistically significant correlation with Barclays bond index.

*First-order Autocorrelation:* It’s well known that private-market investment performance measures often have a high degree of correlation in returns from period to period (autocorrelation). This has been extensively documented in the academic real estate literature and has also been seen in various hedge-fund sectors and private equity.

The GLC MPI does not have significant autocorrelation. In fact, its first-order autocorrelation is statistically indistinguishable from zero, similar to most public market indexes (see Figure 9).

As a result, the annualized volatility of the GLC MPI does not need to be adjusted, unlike indexes that exhibit significant positive autocorrelation.
Concluding thoughts

When we first produced the GLCMPI the commercial mortgage market was primarily a buy-and-hold market. Valuation was usually held at book value unless and until impairment caused a specific reserve to be established or a reduction in principal was required for a loan. (Lenders maintained loss reserves for an overall book of loans, knowing that some would eventually run into credit problems.)

Since then, the world has edged closer to mark-to-market valuation standards. For example, Solvency II requires European life insurance companies to adopt mark-to-market valuations in 2014.

Regulators and auditors often “like” to see mark-to-market results even when these valuations are not mandated for financial statements.

Against this backdrop, we believe the GLCMPI provides a great source of information on how mark to market would have worked for balance-sheet mortgage lenders had mark to market been the standard over time.

More importantly, the Index shows that it is possible to devise a reliable and consistent pricing approach that can be applied to infrequently traded commercial mortgage whole loans.

That said, we believe the Index can be improved and extended. We already mentioned that thorough, factual information about loan defaults remains elusive. Incorporating this would enhance the Index and, perhaps more importantly, provide a basis for better information to establish loss reserves and risk-based capital standards for private mortgages.

Subordinated debt proliferated in the last cycle. Anecdotal performance information exists, and there are ongoing efforts to track information about sales of such instruments. To our knowledge, however, there is not yet a systematic dataset that fosters performance measurement. As a result, institutional investors likely are hesitant to re-enter that arena with large capital commitments until they have greater confidence that they understand risks and returns.

Lastly, but definitely not least, our Index only tracks the U.S. That leaves a lot of ground to cover.
Appendix: U.S. Commercial Mortgage Market

Commercial properties and multifamily residential structures had outstanding mortgage debt of more than three trillion dollars as of the fourth quarter of 2011, according to the Federal Reserve Board of Governors. Commercial mortgages are major asset holdings for commercial banks, life insurance companies and thrift institutions.

As Figure A1 shows, the banking sector is the largest holder of these assets. The federal government is a major participant in the multifamily market, accounting for about 50% of the total dollar amount of outstanding loans. Excluding government (see the rightmost bar in Figure A1), other major holders are commercial mortgage-backed securities (CMBS) and insurance companies.

Many types of entities, including banks and insurance companies, hold CMBS bonds. In the Federal Reserve data shown in Figure A1, CMBS figures are not apportioned to various types of holders. As a result, the shares held by banks and insurance companies reflect balance sheet loans that are not securitized; the actual exposure of such firms to commercial mortgage debt likely is greater due to their holdings of CMBS.

GLCMPI Share of Market

Life insurance companies and pension funds hold loans that are in the Index. According to Federal Reserve Board data, these investors held about $331 billion of commercial and multifamily loans at year-end 2011. Fed data uses book values, not marked to market values. The Index’s book value, the sum of the outstanding balances on all loans, on December 31, 2011 was $179 billion. Consequently, the Index measures about 54% of the total commercial mortgage holdings of these investors.

However, some of the investors’ mortgage holdings fall outside the scope of the Index; for example, subordinate debt. As a result, the Index captures a larger share of the target investments, but we can’t quantify this precisely. Say, for example, conventional senior loans form 90% of total commercial mortgages held by these entities, then the Index’s share of the relevant “universe” rises to about 60%.
About Us

Michael Giliberto

A well-known industry research analyst and leading portfolio manager, Giliberto heads a real estate consulting business, S. Michael Giliberto & Co., Inc., and is an adjunct professor at Columbia University's Graduate School of Business. From 1996 until 2010, he was a managing director responsible for real estate multi-strategy products at JP Morgan, overseeing portfolios totaling $30 billion in gross assets. In 1993, he co-created the Giliberto-Levy Index with John B Levy. Giliberto had also been head of real estate research at Lehman Brothers and Salomon Brothers and was previously a business management professor at Southern Methodist University. He holds the Counselor of Real Estate designation and is a Fellow of the Royal Institution of Chartered Surveyors.

John B. Levy & Company

John B. Levy & Company is a real estate banking firm that offers a wide array of financial, investment and advisory services for complex real estate ventures. Because of the close-knit relationships developed with major institutional real estate sources over the last 20 years, the firm is able to provide clients access to capital from a wide range of sources, each with its own unique terms and financing. For further information, visit www.jblevyco.com.

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