DEBT VALUATIONS IN ACCORDANCE WITH FAS 157

March 2009

Background and Summary

Debt fair values are nothing new to financial reporting. They have been required for years as a FAS 107 footnote disclosure. More recently, with the introduction of FAS 157, fair values in general have received increased attention. However, the fundamental concepts of debt valuations have not changed. Only the level of detail and scrutiny that will go into validating the assumptions in those valuations has increased. To better describe Chatham's approach to debt valuations, we will review FAS 157 as it applies to debt valuations, look at the key factors affecting valuations, and review the fixed income concepts that make up our discounted cash flow valuation model for debt.

Debt Fair Values and Accounting Guidance

Statement No. 157, *Fair Value Measurements* (FAS 157) defines fair value as the price that would be received to sell an asset, or paid to transfer a liability in an orderly transaction between market participants at the measurement date (paragraph 5 of FAS 157). When there is an active market with quoted prices for the identical debt instrument being valued, the application of FAS 157's guidance is relatively straight-forward with the fair value of the instrument equal to that market price. Unfortunately, many debt instruments do not actively trade in secondary markets with quoted prices. The problem is further exacerbated by difficultly in determining just what constitutes an active market in the current credit market environment. Absent having a quoted price in an active market for the identical debt instrument being valued, the valuation of the debt instrument is predicated on what FAS 157 defines as Level 2 and Level 3 inputs. Level 2 inputs are things other than quoted prices for the identical debt instrument being valued and are observable for substantially the full term of the asset or liability. Level 2 inputs generally include interest rates and yield curves that are observable at commonly quoted intervals. Any other inputs needed to value the debt instrument that are unobservable, or not quoted or observable, for substantially the full term of the debt instrument, are considered Level 3 inputs for purpose of the valuation. Credit and interest rate spread information is generally considered unobservable.

Of particular conceptual difficultly is the requirement in FAS 157 that fair value of issued debt (borrowings) be the price that would be paid to transfer that liability to another party with similar credit risk in which the liability is assumed to continue and not to be settled. In other words, FAS 157 requires that the nonperformance risk of the liability be reflected in the value of that liability. From a conceptual standpoint, if the liability was assumed to be settled there would be no non-performance risk to consider. Nonperformance risk refers to the risk that the obligation (the liability to the counterparty) will not be fulfilled. This nonperformance risk includes the reporting entity's own credit risk, as well as changes in market credit spreads over time. Ultimately, the goal of the application of FAS 157's fair value guidance with respect to liabilities is to allow the reporting entity to reflect the relative efficiency of its ability to settle the liability using its own internal resources over the course of its settlement, not before. (paragraph C40 of FAS 157). To the extent a reporting entity could borrow debt at market rates that are more favorable than the rates they have contractually agreed to in their existing debt instruments, the company has an economic

loss and fair value loss. To the extent a reporting entity has existing debt instruments at contractual rates that are much lower than what the Company could obtain under current market conditions, the Company has an economic gain and fair value gain.

Debt Valuation Methodology

According to Brealy and Meyers in their **Principals of Corporate Finance**, the valuation of debt is simple – "you [just] take the cash flows and discount them at the opportunity cost of capital" (669). While conceptually this may be simple, determination of the discount rate(s) can be quite challenging. The opportunity cost of capital from the Brealy-Meyers definition can be broken down into a market component and a credit spread component. At Chatham, we model the contractual cash flows and the market interest rates, adjusted by the credit spread component, in order to determine the present value of all cash flows, the sum of which makes up the fair value. Our intent is to provide valuations that are methodically derived in accordance with applicable accounting standards (FAS 157) in a manner that is both consistent and auditable.

There are two main elements that go into the fair value of debt: the contractual cash flows and a risk-adjusted discount curve. The fair value of the debt is the present value of those contractual cash flows which are discounted at the current market cost of debt. Another way of considering the current cost of debt is to determine the interest rate at which this debt could be replaced (or transferred), today, given current market conditions and performance of the collateral (for secured debt).

Figure 1 below shows the different components of debt valuation and how they are used to determine the contractual cash flows and the discount curve.

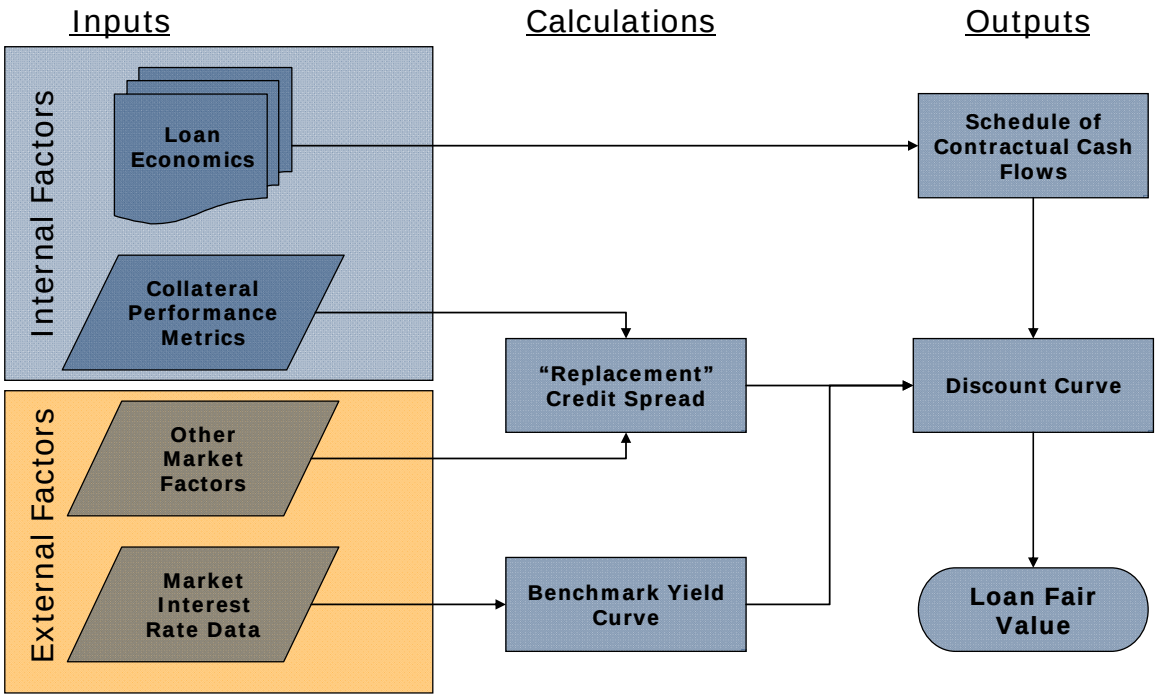

Figure 1

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As shown by the two shaded areas on the left, the fair value of a debt instrument depends on both internal and external inputs. Internal inputs include all of the contractual information as defined in the loan agreements or other key documents. They also include the performance of the collateral and sometimes the parent company, if there are guarantees. External factors are partially market driven, such as the market interest rates and other market conditions, including the risk premiums required by market participants, and partially subjective, such as credit spreads for a given entity when debt for that entity is not actively traded or credit data is not readily available.

Internal Factors

Loan Economics

While loan documents are not always the most simple to read or interpret, this is the part of the equation that is the most clearly defined. The loan documents (normally the loan agreement or promissory notes) should contain all of the key economic data that define the future cash flows for the loan. Specifically, information required to model the cash flows include:

Fixed-Rate Loans – start date, maturity date, fixed rate coupon, payment frequency, payment dates, principal amount, and any amortization information

Floating-Rate Loans – same as above, with the addition of the floating rate index and borrowing spread

Collateral Performance

When lenders originate a loan, they critically evaluate the credit of the borrower to determine an appropriate credit charge. This evaluation usually includes information such as expected loan-to-value, expected debt service coverage, expected lease-up rates and anything that would build the lender's confidence in the borrower's ability to make payments and ultimately repay the loan.

Once the loan is in place, the same factors must be considered in determining the current credit spread. If the property value has appreciated greatly, or the rented percentage of the underlying property is significantly higher than at origination, the current credit spread should be lower than at inception, all else held constant.

While it is not feasible to do a full appraisal of a property for every fair value calculation, general assumptions and information about the property or other underlying collateral (if the debt is secured) must be considered in estimating the replacement credit spread.

External Factors

Market Interest Rate Data – the Benchmark Yield Curve

The market interest rate data is normally based on a benchmark interest rate curve. This benchmark curve is usually made up of treasuries rates or swap rates and is the curve from

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which credit spreads are measured. This data is generally considered to be a Level 2 input under FAS 157's fair value hierarchy.

In an active interest rate market, bonds and swaps are trading throughout the business day. The yields on these trades make up a "term structure of interest rates" which defines where the market demands yields for bonds at different maturities and equal credit levels.

The benchmark yield curve is used to generate two curves that are critical in fixed income mathematics. These are the implied forward curve and the discount curve. These curves are generated using a "bootstrapping" process that is described in detail in any fixed income mathematics text. (Fabozzi, 121)

Discount Curve

The discount curve shows the present value, on a percentage basis, of future cash flows for any point in the future. This incorporates the full shape of the yield curve, meaning there is a different "yield" for each point in the future. While it is a common approximation to look at the maturity of a loan and interpolate treasury (or swap) yields to determine a discount rate, the only way to precisely discount all future cash flows is with a full, term-structure-determined discount curve. Figure 2 below shows the discount curve based on USD Swap rates with no adjustment for credit.

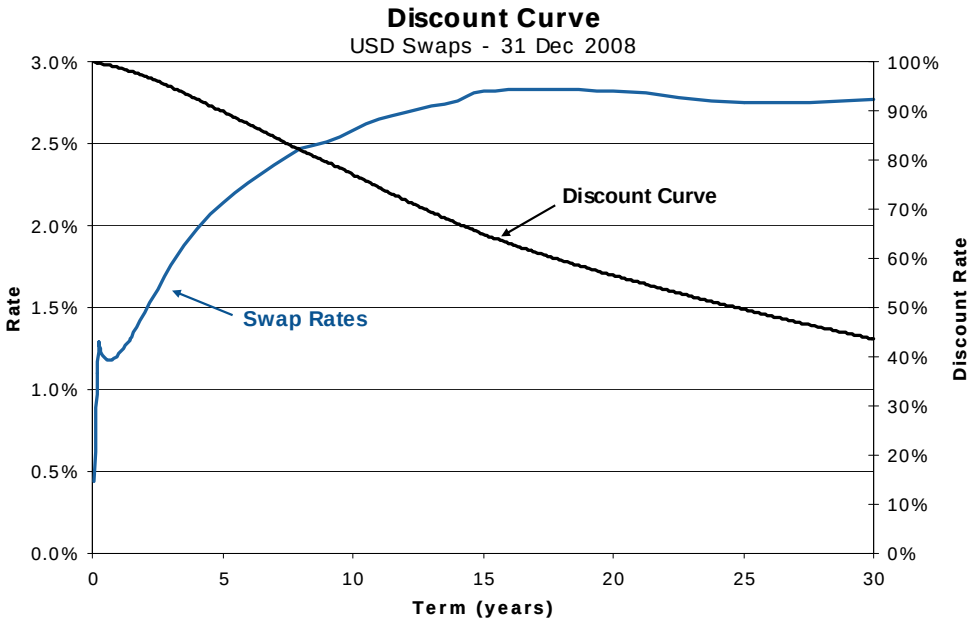

Figure 2

Implied Forward Curve

With discount rates varying based on the time to maturity, they can be used to calculate "implied forward" rates of any length (like 1 month LIBOR). For debt valuations, these are only a factor in determining the expected cash flows for floating rate loans. The term structure (through the discount curve) implies where all of the future rate settings will be for the loan. Figure 3 below shows the yield curve and implied 1 month LIBOR forward

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rates as of year end 2008. Because the yield curve is analogous to a cumulative average (or term yield) of these forward rates, any slight change in the slope of the yield curve creates wide swings in the forward rates to move that cumulative average. This is why the implied forward rates are significantly higher than the swap rates (because the curve is upward sloping) and why the implied forward curve is not as smooth as the swap curve.

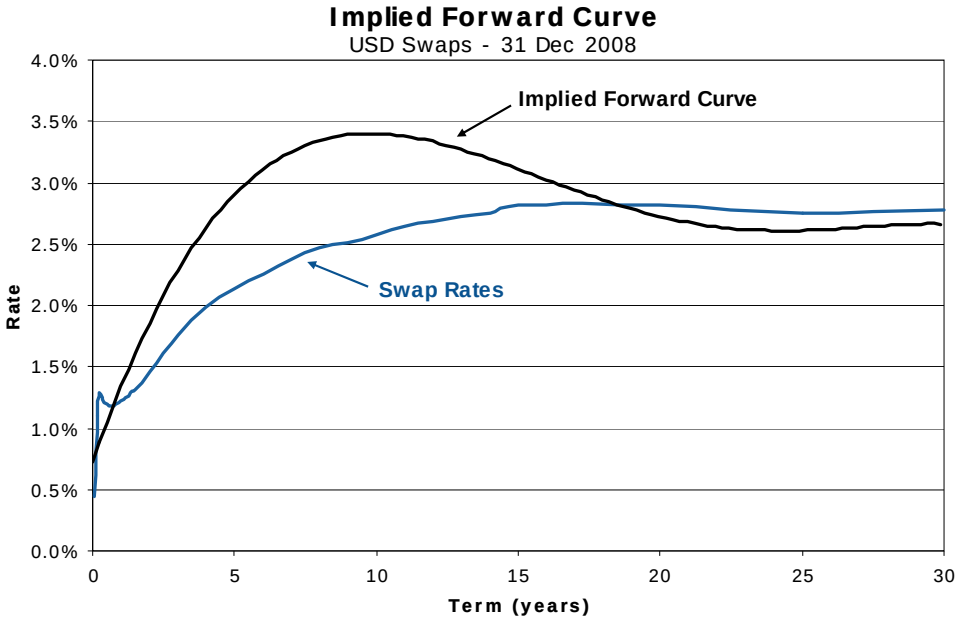

Figure 3

Of course, no one knows where interest rates will be in the future. The forward rates are where the market *implies* that rate to be, today. They are also where you could lock in that rate using interest-rate derivatives or futures contracts.

Once the implied forwards and discount rates are calculated, the rest of the debt valuation is only a matter of using the discount factors to present value the contractual cash flows.

Other Market Factors

While the interest rate markets are impacted by many different factors, they don't necessarily capture other market factors that could more directly impact the credit worthiness of a specific property or other collateral. For example, different market factors may drive down hotel occupancy rates. This would likely have a negative impact on credit spreads in the hotel segment that would not be captured by the yield curve alone. Currently, we are in one of the biggest credit crunches since the great depression, and interest rates are near or at all time lows. Considering a real estate property as the collateral for a loan, a thorough evaluation of the market, the region, the asset type and any other factors that could impact the ability to borrow against that asset must be considered in determining the current credit spread to use for fair value calculations.

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Replacement Credit Spread

As discussed above in the Collateral Performance section, the replacement credit spread is effectively the spread over the benchmark curve where a lender would replace the debt given today's market and the performance of the collateral. The credit spread is used to adjust the discount factors to accurately reflect the borrower's current credit risk.

Ideally, there is also a term-structure of credit, with different credit spreads for all different maturities. However, that is not always realistic, and a single credit spread is used and the benchmark curve is adjusted in parallel across all maturities. Since the replacement credit spread for a loan should take into account the remaining term, the parallel shock should be an accurate application of the credit risk. Given the often subjective and unobservable nature of credit spreads, these inputs are generally considered Level 3 inputs under FAS 157's fair value hierarchy.

Factors affecting Credit Spreads

Here are some factors to consider when estimating a credit spread:

- Consideration of the original borrowing spread on the debt to be valued – this is a good starting point
- Adjustment from the original spread for the changes in the following factors:
  - General market conditions
  - Credit sector spreads
  - Entity-specific credit spreads
  - Time remaining to maturity
  - Collateral or other credit enhancements (e.g., parent guarantees)
  - Any other factors
- Consideration of recent debt issuances and upcoming issuances

Key question asked: at what credit spread would this entity borrow for the remaining term of the instrument?

Example:

For example, consider a 15 year fixed-rate term loan originated 5 years ago. Let's assume the lender evaluates the credit risk and sets the fixed rate at 100 basis points over the 15 year treasury rate. At origination this is the market credit spread since the lender just made that market for that particular loan-collateral package.

Now it is five years later. What is a reasonable adjustment from the 100 basis points assessed at origination?

- General market conditions have changed significantly, and there is a significant credit crunch in all markets. (*increase in credit spread*)
- The collateral for the loan was a large housing project, and the housing market is in much worse shape than it was at inception. (*increase in credit spread*)
- Despite the terrible housing market, this particular property has 5 years of strong performance and appears to be holding up in the difficult market. (*decrease in credit spread*)

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- The loan, now, has only 10 years remaining – the shorter maturity means less credit exposure. (*typically a decrease in credit spread*)
- No change in collateral or credit enhancements (*no impact on credit spread*)
- The over all market for debt is small, creating a lack of liquidity. (*increase in credit spread – liquidity premium*)

Considering all of these factors, clearly the credit spread today will be higher than the original 100. Quantifying that difference is still a challenge. A common practice is to ask lenders, mortgage brokers, and the current lender how they would lend in the current market (if they would lend at all). Considering different maturities, LTV, regions, some lenders could give indicative ranges for current spreads. Then, all of the factors above are applied to increase/decrease those spreads to make the assumption more specific to the individual loan.

For this example, we'll assume that, weighing all of these factors, the current credit spread is 425 bps over the original spread, or 525 over treasuries. Figure 4 below shows the impact of a 350 basis point credit spread on the discount curve.

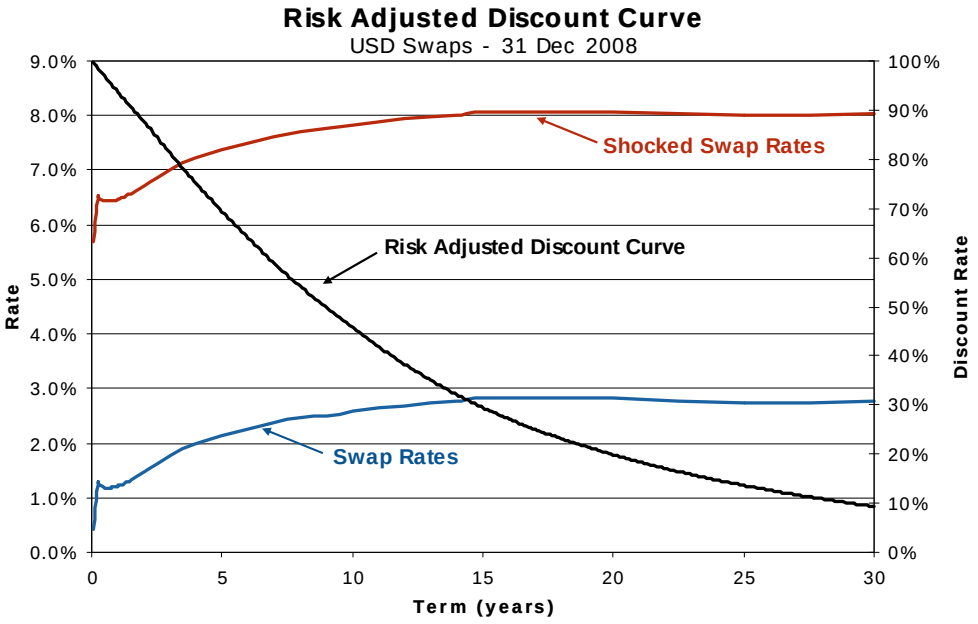

Figure 4

Notice that with the addition of the credit spread, the value of a payment 30 years from now has gone from a present value around $0.44 (see Figure 2) to only $0.09. Of course, the further out the payment, the larger the impact of the credit adjustment is on the discount factor, and therefore, the present value.

Schedule of Contractual Cash Flows

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Fixed-Rate Debt
For most fixed-rate debt, the schedule of contractual cash flows is known at origination. Any amortization or accretion of the principal balances must be considered as part of the valuation.

Floating-Rate Debt
Contractual cash flows for floating-rate debt are more difficult to estimate at a given point in time since the future rate resets are not yet known. This is what the implied forward curve described earlier is used for.

Please note: the replacement credit spread is NOT factored into the implied forward rates. Instead, the contractual borrowing spread is added to each implied forward rate for all future payments to forecast out the future payments of the loan.

Loan Fair value

Fixed-Rate Debt
With the risk-adjusted discount curve created from the benchmark yield curve plus the current credit spread, all of the contractual cash flows for the fixed-rate loan can be discounted back to the valuation date. Each individual payment is discounted based on the discount rate that corresponds to each payment date on the loan. The fair value is then the sum of those present valued payments.

Floating-Rate Debt
In the past, it has not been uncommon for people to assume their floating-rate debt to be at par. This is because, effectively, with every new floating reset, the debt is re-priced to the current market. This assumption, however, also assumes that there has been no change in the credit worthiness of the borrower. Whenever there is a significant difference between the borrowing spread and current credit spreads, floating-rate debt will no longer value at par. If the spread on the loan is significantly lower than current credit spreads for that borrower, the debt would be valued at a discount, or smaller liability to the borrower, since there is real value to having a below-market interest rate. Similarly, with a borrowing spread well above current credit spreads, the debt will value at a premium, or a larger liability to the borrower, since they are paying more than the market demands.

Effective Market Rate
We are often asked “what rate are you using to discount the cash flows?” Technically, we do not use any single rate to discount the payments. Rather, we are using the entire term structure to discount the payments, each with a discount factor appropriate for the timing of the payment. However, an effective market rate, or yield, for the loan is the single discount rate that, if used to discount all payments, would result in the same present value as the actual discount curve. Similar to swap rates, the present value of each individual payment will not be the same, but the total value will match the total present value based on the discount curve.

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Chatham Valuation Process

Each day at 4:00 p.m. Eastern time, we take a "snapshot" of the market, which includes swap rates of all different maturities, exchange rates, treasuries, LIBOR rates, etc., and call those our "close of business rates." This market data is obtained via direct feeds from Bloomberg and Reuters. We use those rates to value over 20,000 different derivative and debt positions each night for our clients.

These rates are used with the credit spreads provided by our clients to generate a unique, credit-adjusted discount curve for each loan in the system. All of the key economics for each loan, including precise payment schedules, are stored in a database. Each night, after storing the close-of-business rates, each loan is valued by discounting all of its contractual cash flows using the specific benchmark curve and credit spread for that loan.

Example:
The tables on the following page show an example schedule of contractual cash flows, discount rates, and present value for an interest-only, floating-rate loan with two years to maturity. The contractual borrowing spread is 87.5 basis points over 1 month LIBOR. The current credit spread is 350 basis points. Because the replacement credit spread is much greater than the contractual borrowing spread, the present value of those payments will be lower than the current balance of the loan, like a bond trading at a discount. If credit spreads were to drop below 87.5, then this loan would value at a premium and the value would be greater than the balance on the loan.

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Sample Present Value Calculations: Floating-Rate Loan

Maturity Date	1 November, 2010	**Valuation Date**	31 December 2008
Floating Rate Index	1 Month USD-LIBOR-BBA	**Current Principal Balance**	$65,000,000
Floating Spread	87.5 bps	**Credit Spread**	350 bps
Amortization	None	**Fair Value**	$61,966,775

Contractual Cash Flows and Discounts

Start Date	End Date	Reset Date	Payment Date	Floating Rate	Principal Balance	Principal Payment	Interest Payment	Disc. Factor	Total Payment PV
12/1/08	1/2/09	11/27/08	1/2/09	2.775%	65,000,000	-	160,333	1.000	160,333
1/2/09	2/2/09	12/30/08	2/2/09	1.323%	65,000,000	-	74,023	0.997	73,773
2/2/09	3/2/09	1/29/09	3/2/09	2.281%	65,000,000	-	115,334	0.993	114,470
3/2/09	4/1/09	2/26/09	4/1/09	2.282%	65,000,000	-	123,583	0.988	122,139
4/1/09	5/1/09	3/30/09	5/1/09	1.750%	65,000,000	-	94,807	0.985	93,346
5/1/09	6/1/09	4/29/09	6/1/09	1.698%	65,000,000	-	95,013	0.981	93,187
6/1/09	7/1/09	5/28/09	7/1/09	1.723%	65,000,000	-	93,312	0.977	91,174
7/1/09	8/3/09	6/29/09	8/3/09	1.763%	65,000,000	-	105,018	0.973	102,187
8/3/09	9/1/09	7/30/09	9/1/09	1.767%	65,000,000	-	92,546	0.970	89,724
9/1/09	10/1/09	8/27/09	10/1/09	1.814%	65,000,000	-	98,260	0.966	94,902
10/1/09	11/2/09	9/29/09	11/2/09	1.884%	65,000,000	-	108,882	0.962	104,731
11/2/09	12/1/09	10/29/09	12/1/09	1.892%	65,000,000	-	99,081	0.958	94,952
12/1/09	1/4/10	11/27/09	1/4/10	1.956%	65,000,000	-	120,085	0.954	114,576
1/4/10	2/1/10	12/30/09	2/1/10	2.043%	65,000,000	-	103,269	0.951	98,171
2/1/10	3/1/10	1/28/10	3/1/10	2.052%	65,000,000	-	103,736	0.947	98,256
3/1/10	4/1/10	2/25/10	4/1/10	2.092%	65,000,000	-	117,110	0.943	110,472
4/1/10	5/3/10	3/30/10	5/3/10	2.154%	65,000,000	-	124,473	0.939	116,921
5/3/10	6/1/10	4/29/10	6/1/10	2.162%	65,000,000	-	113,199	0.936	105,925
6/1/10	7/1/10	5/27/10	7/1/10	2.239%	65,000,000	-	121,281	0.932	113,033
7/1/10	8/2/10	6/29/10	8/2/10	2.346%	65,000,000	-	135,553	0.928	125,745
8/2/10	9/1/10	7/29/10	9/1/10	2.395%	65,000,000	-	129,721	0.924	119,801
9/1/10	10/1/10	8/27/10	10/1/10	2.436%	65,000,000	-	131,943	0.919	121,306
10/1/10	11/1/10	9/29/10	11/1/10	2.484%	65,000,000	65,000,000	139,010	0.915	59,607,651
								Total PV	**61,966,775**

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References

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Fabozzi, Frank J. **Fixed Income Mathematics.** 4th Ed. 2006, McGraw-Hill. Chapter 8 – The Yield Curve, Spot Rate and Forward Rates.

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