

**Duration and Asset/Liability Matching Part 2**



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*In* our last issue we introduced the topics of duration and its role in asset liability matching. The key points discussed were: 1) asset liability matching is an important risk management tool for insurers; 2) portfolio duration is an important measure of the portfolios interest rate sensitivity and 3) insurers portfolios can be “immunized” by matching portfolio duration to the dura-

tion of the insurer’s liabilities.

Bond portfolio immunization has the goal of constraining the variability of assets related to liabilities, within an acceptable range thereby reducing risk. Immunization is accomplished by either shortening or lengthening the insurer’s bond portfolio duration to match the duration of their liabilities. With assets and liability durations matched, the effects of inter-

est rate changes should be minimized, if not negligible. Under current economic conditions, rising interest rates may present significant risks to the market value of the insurer’s bond portfolios without such constraints. For example, for every 1% change in interest rates, an investment portfolio with a duration of 4 years would experience an expected 4% increase or decrease in market value. An increase in in-

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**Economic Review and Outlook**

*Interest* rates have trended lower for 30 years. The globalization that led to disinflation and low interest rates could become a source of inflation and higher interest rates as the developing world demands more goods and services.

The inflation debate wears on. The federal deficit has increased by 32% in two years. There will certainly be some effect on prices. We can already see a startling jump in agricultural prices as well as industrial and commodity prices.

Right now, the beneficiaries of the current commodity inflation are farmers. The U.S. Department of Agriculture has recently said that U.S. farm income has jumped 20% in 2010, driven by increases in the price of wheat,

corn, soybeans, cattle, and hogs

Crude oil has risen over the past two years. It is global demand that is causing these rising oil prices; only the last \$15 or \$20 of the recent run-up is driven by the supply squeeze from turmoil in the Middle East and Libya.

The BP energy outlook for 2030 has been recently published and it is interesting to note a few of its findings now that oil is over \$100 per barrel. The effort to fuel the global economy in an era of unprecedented growth is a huge undertaking. The world will require nearly 40% more energy in the next 20 years. The developed world will account for just 6% of this growth; the rest will be driven by the emerging markets. Despite this growth, the study does not see energy

shortages because technology has found ways to extract more gas and oil from old fields as well as the ability to mine rich deposits that were previously inaccessible.

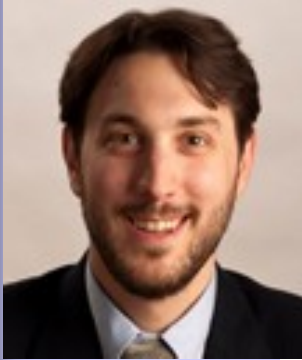
The diversification of energy sources is causing oil to lose market share. In fact, the developed world’s oil demand peaked in 2005 and by 2030, oil demand is estimated to fall to 1990 levels.

In coming years, there will be more demand for natural gas, which has become more accessible with modern technology. Non-fossil fuels like wind, hydro, and biofuel will satisfy a small but significant part of growing world energy needs. Another factor at play: economic growth requires less energy than in the past.

The latest jobs report sug-

## How Covered Calls Work

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**“...anyone considering this strategy make absolutely sure that they or their advisor understand how to optimally conduct a call writing program, as well as the tax and regulatory implications that this strategy may have for insurance portfolios.”**

*In* this current yield environment, it can be quite challenging for insurers to maintain a reasonable book yield on their portfolio. When a target yield is desired, it can become necessary to investigate creative solutions for generating portfolio income. One approach that some insurance entities use is a covered call, or buy-write strategy. Since it is important to thoroughly understand a strategy and asset class before investing, we present a brief and simple introduction to calls, with an emphasis on covered calls.

A call option is a special kind of security that grants the owner the right to buy a security on (or up to) a certain expiration date at a certain pre-specified price (called the strike price). Call options can be used in your portfolio to fill a number of different roles: they can be used as part of a levering or speculating strategy, where an investor buys call options looking to profit from the movement of a stock without having to buy the stock itself. They can also be used as part of a hedging strategy, where the investor buys call options to offset other exposure. However, this white paper is going to focus on how options are used to generate income on equity portfolios.

While there are many different strategies one can use to generate income from their portfolios using

options, the most straightforward and frequently used way is called the covered call strategy. In this strategy, the investor sells options on the stocks he or she owns. The investor collects a premium from the sale, and can sell the stock to cover the call if the stock price moves above the strike price. Essentially, the investor locks in a premium in exchange for the payoffs if the stock moves above the strike price. The lower the strike price, the higher the initial payoff.

Let's illustrate this with a real world example: Suppose your company owns some IBM and is going to write covered calls on these shares. IBM is currently trading at around \$125 a share. January call options with a strike price of \$135 are currently worth around \$3.50. If you write (sell) a call, you automatically receive \$3.50. Let's see what happens to the stock in different situations.

**Case one:** The price of IBM stays at \$125 through January. The call option expires without being executed. You keep your stock, and the \$3.50 you got for the call option. Your payoff is \$3.50.

**Case two:** The price of IBM falls to \$100 in January. The call option expires without being executed. You keep your stock (now only worth \$100), and the \$3.50 you got for the call option. Your payoff is - \$ 2 1 . 5 0 .

**Case three:** The price of

IBM rises to \$135. The holder of your call option executes it. You sell the call-owner your stock for \$135 and keep the \$3.50 you got for the call option. You have \$138.50 in cash. Your payoff is \$13.50.

**Case four:** IBM has a blowout quarter and the price rises to \$205 per share. The holder of your call option executes it. You have to sell the call-owner your stock for \$135 even though its worth \$205. You still keep the \$3.50 for the call option. You have \$138.50 in cash. Your payoff is \$13.50, but the holder of the option just made 20 times his investment.

The covered call strategy works well when stock prices stay in a relatively narrow band until the expiration date. If the stock price rises significantly higher than the strike price, the investor is better served not having sold the call option. Similarly, if the stock price falls more than the premium the investor received from selling the option, they would have been better off just exiting their position.

An investor interested in writing covered calls must also take into account the transactions costs which may be associated with their strategies, especially if they need to cover their calls; selling out and re-buying their stock positions. Depending on the broker and the size of the account, these transactions costs may considerably cut into the profitability of the strategy.

## How Covered Calls Work

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Even though it provides little downside protection, writing covered calls can be a sensible strategy for some Insurers, especially those looking to generate income on their equity portfolio. However, despite the seeming simplicity and "surefiredness" of this strategy, dealing with options always requires great

care. Options pricing is intricate, involving many factors less intuitive than strike price, and time to expiration. Furthermore, options pricing is based on Nobel Prize winning theorems, as well as equations originally developed by Albert Einstein. Needless to say, evaluating options requires considerable mathematical sophistication. While you are unlikely to cause significant

financial damage writing covered calls, failure to properly understand the complexities of options can hurt your performance considerably. Ultimately, we recommend that anyone considering this strategy make absolutely sure that they or their advisor understand how to optimally conduct a call writing program, as well as the tax and regulatory implications that

this strategy may have for insurance portfolios.

By S. Kip Astheimer



## Economic Review and Outlook

(continued from page 1)

gests that the recovery is picking up steam, but higher oil prices and the Japanese troubles will shave half a percent off projected growth. Ongoing cuts to state and local government spending will shave an additional .3% off GDP growth. Real estate continues to be a drag. The value of real estate assets fell 5% in the second half of 2010. But household mortgage debt has fallen by \$580 billion. Consumer debt has fallen as well as households continue to pay off credit card debt. Household balance sheets are getting stronger, which will help consumer spending.

The resilience of the U.S. stock market is a testament to the strength of the global economy. The first quarter of 2011 has come to a close leaving little doubt that the U.S. economic recovery is on firm ground and sustainable. The economy grew at a 3.1% annualized rate during the fourth quarter of 2010 from 2.6% the previ-

ous quarter. GDP for the year 2010 rose 2.9% following a decline of -2.6% for the year 2009. Consumer and business spending both continue to show increasing growth. The ISM manufacturing index is now at its highest level in nearly seven years.

The improved economic picture is reflected in rising interest rates. Rates have been climbing upward since year end, with the exception of two flights to quality during the quarter due to instability surrounding Libya and the tragedy of the Japanese earthquake and tsunami. Once the potential impacts of those events on the U.S. and global economy were assessed, rates began their upward ascent again. Interest rates rose modestly throughout the curve, increasing 22 basis points in the 2-year Treasury to .82% and 18 bps in the ten year Treasury to 3.47%

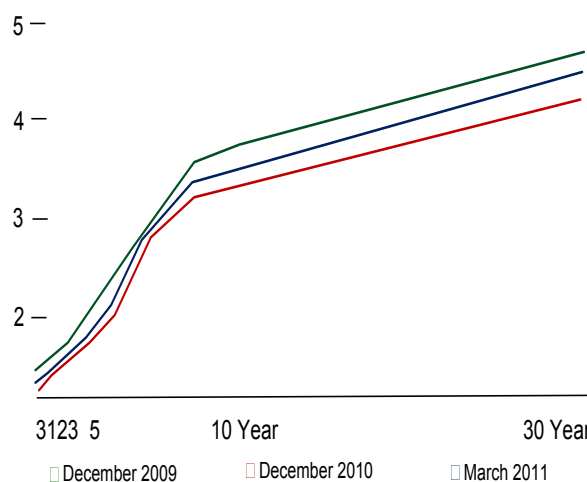
The Federal Reserve acknowledged the strengthening economy in its March FOMC meeting, yet issued a statement that monetary policy will continue to be accommodative and the

0 - .25% target will remain for an extended period due to excess capacity utilization rates and subdued inflation. Higher oil and commodity prices are expected to be transitory.

Federal Reserve Bank presidents, however, are

should begin in the near future or next year. Some Fed governors and bank presidents call for the Fed to abandon the remainder of its quantitative easing program while others believe accommodation should remain in place until 2012.

U.S. Treasury Yield Curve



beginning to digress on whether withdrawal of the accommodative policy

Source: The Federal Reserve Board

The Barclays Aggregate Bond Index return for the first quarter of 2011 was minimal at .42%, weighted down by rising interest rates and negative returns to Treas-

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**Deborah S. Kidd, CFA**, is a Senior Vice President of Boyd Watterson Asset Management CFA, CFA Institute; BA, Ursuline College; Fixed Income Strategist and Portfolio Manager. Joined Boyd in 1990 and became a Portfolio Analyst in 1993. Vice President of the CFA Society of Cleveland and a member of the CFA Institute. Ms. Kidd has 18 years of experience working in the investment industry.

**“The improved economic picture is reflected in rising interest rates. Rates have been climbing upward since year end...”**

## Economic Review and Outlook (continued from page 1)

uries. Despite the intermittent flights to quality, Treasuries underperformed all other sectors of the bond market.

Among investment grade securities, financial corporates significantly outperformed industrials and utilities, as well as mortgage-backed securities and agencies. High yield securities and commercial mortgage-backed securities once again posted very strong returns. For much of the past year, lower quality securities outperformed high quality securities as the economic recovery gained traction and investors reached for additional yield.

During the quarter we maintained our strategy of over-

continue to provide attractive income opportunities. The majority of our high yield exposure is concentrated in shorter maturities to provide income with limited risk.

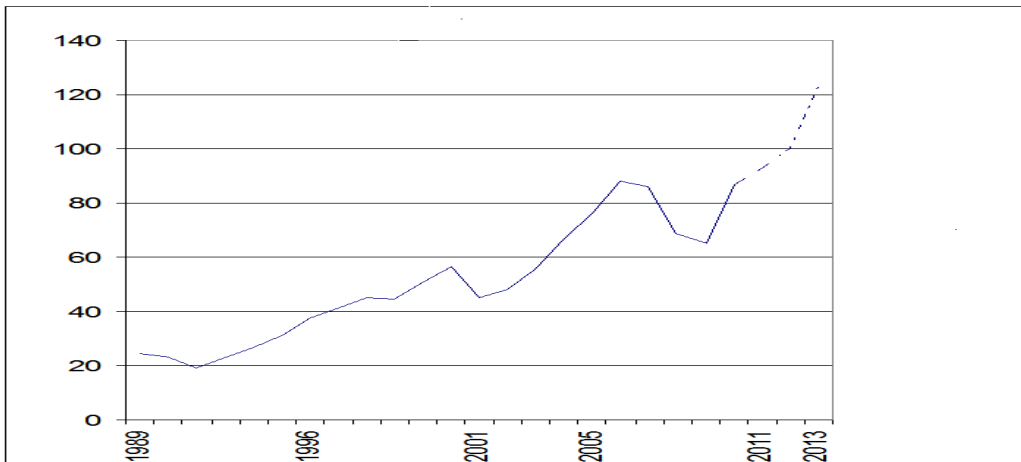
The portfolio strategy currently favors a bullet structure with an overweighting in intermediate-term maturities such as three-to-seven year notes. The duration of the portfolios was slightly short versus the benchmark during the quarter.

Our outlook calls for continued strength in the U.S. economic recovery, though the economy is not without downside risks. We expect interest rates to continue rising modestly. Unemployment is expected to remain high

expected high volatility and further rising rates we are currently taking a neutral to slightly short duration stance relative to the benchmark.

We are now two years into a bull market, aided by an improving domestic economy and strong corporate earnings. Annualized growth for U.S. GDP is estimated to come in at 3.5% for the first half of the year. Global GDP growth will likely hit 5%. (Average world GDP growth has been 3.4% over the past two decades.)

Emerging markets are providing a huge tailwind for U.S. business. Retail sales have been strong, consumer credit defaults are declining, industrial production is up and



weighting corporates relative to Treasuries. We increased portfolio exposure to financials and reduced exposure to agencies and industrial corporates that had become relatively expensive. We believe the demand for yield over Treasuries and agencies will remain strong in this low interest rate environment and that credit securities, particularly high yield issues, should

throughout the remainder of the year but may continue edging lower. Inflation is unlikely to be a problem in the foreseeable future due to substantial excess capacity in the economy.

We expect interest rates to be volatile in the near term due to geopolitical instabilities and to rise and fall depending upon economic and employment news. In anticipation of

inflation, at least as measured by the government, is low. Household net worth rose \$2.1 trillion in the fourth quarter. Personal income continues to grow steadily. Changes to economic predictions are more likely to be positive than negative in coming years.

S&P earnings have bounced back resoundingly. Earnings for 2010 will be higher than

## Economic Review and Outlook

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for both 2008 and 2009, but will not reach the previous earnings peak of 2006. This year is a different story; estimated earnings for 2011 are for nearly \$93 per share, exceeding the prior peak by 5%. Where might S&P earnings go in this economic cycle? Judging from past cycles depicted in the chart, S&P earnings for this economic cycle could reach \$140 per share. The bullish U.S. stock market is more re-

flective of economic activity around the globe rather than domestically. The earnings growth that will drive U.S. stocks is now coming from mostly outside of this country. The world is at the start of another potentially enormous

wave of capital investment, driven primarily by emerging markets.

A McKinsey study concludes that by 2020 global investment demand could reach levels equal to the

postwar rebuilding of Europe and Japan.

In contrast to past bull markets, we are in an uncertain and skeptical bull market, and when it comes to capital markets, fear is a healthy thing.

BWAM Forecast	2010	Q1 2011	Q2 2011	2011
U.S. Real GDP	2.9%	1.9%	3.0%	2.9%
Inflation (Core PCE deflator)	1.1%	1.1%	1.2%	1.6%
Unemployment	9.6%	8.8%	8.7%	8.7%
Federal Funds Rate	0.14%	0.14%	.20%	.50%

## Duration and Asset/Liability

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interest rates, the most likely occurrence in our current economic environment, would tend to increase liabilities at a time when assets are decreasing creating a potentially perilous situation. Immunization allows us to moderate this divergence, or mismatch, in assets and liabilities. Asset/liability matching helps align the durations to constrain the effects of interest rate changes on the balance sheet to improve the insurer's financial stability in a changing economic environment.

However, calculating the portfolio's duration involves both art and science. Therefore immunizing a portfolio is a difficult task for investment managers. In fact, portfolio duration is really only an estimate since its calculation requires "normal" market conditions. Duration measurements also prove more accurate when the prices of similar types of bonds are

being compared. If normal yield relationships, like those between Treasuries and investment-grade corporate are "tight", say within two percentage points, duration calculations are fairly accurate. Calculating "spread duration" can help improve the accuracy and predictive value of the portfolio duration calculation when spreads are wider. However, under unusual market conditions, like those of recent years, the predictive value of the duration calculation will be diminished.

Additional challenges to the predictive power of a portfolio duration calculation are related to the fact that this calculation is simply the weighted average of the durations of its underlying bonds. This weighted average smoothes out the variation in weights and maturities of the underlying bonds. Should the portfolio contain bonds with very different weights and maturities, the degree of market value impact predicted, for given changes in

interest rates, becomes less accurate.

The expected level of immunization achieved through matching asset and liability durations assumes parallel shifts in the yield-curve. That is, bonds of various maturities responding on a uniform relative basis to changes in interest rates. Unfortunately, often the yield-curve changes shape rather than shifting up or down in the same uniform curve shape. Steepness or flatness of the yield-curve, or parts of the yield-curve, has an adverse affect on the degree of immunization achieved. The "optionality" of individual bonds, which produces convexity, also alters the expected behavior of bond prices as interest rates change.

Notwithstanding the limitations inherent in calculating bond and portfolio durations, asset liability matching remains a very important role for controlling portfolio risk and for minimizing adverse

financial impacts to insurance companies. With inflationary pressures rising and current interest rates at historic lows, interest rates are certain to play an important, if not threatening, role in challenging bond portfolio managers. Some insurance asset managers are positioning client portfolios very conservatively to reduce market value risk as interest rates rise. Rather than matching the portfolio duration to the liability duration, these managers are "shortening" the portfolio duration as a further hedge against rising rates. This strategy is not without risks of its own since income/yield will be forfeited until such time as interest rates rise. Predicting the timing and magnitude of interest rate changes is seldom suggested by any profound professional money managers. However closely monitoring and adjusting portfolio duration as it relates to insurer's liabilities and risk tolerance is all the more important as the bond market faces anticipated headwinds. **CET**

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## Up Coming Events



- **The Bermuda Captive Annual Conference** will be on June 5 through June 8 at the Fairmount Southampton Resort in Bermuda

- **The VCIA Annual Conference** will be August 9 through August 11 at the Sheraton Hotel and Conference Center in Burlington, VT.

- **The NAMIC Annual Conference** will be September 18-21 at the JW Marriott Indianapolis, IN.

Carl Terzer will be a conference delegate at these upcoming events.

**Hope to see you soon!**

**In the News.....**

**Also, please visit our website to read a recent editorial contribution submitted to CICR by Carl Terzer. This article is on page 10 of the publication and found in our archives at:**

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