DUFF & PHELPS

Client Alert

March 20, 2013

Duff & Phelps Decreases U.S. Equity Risk Premium Recommendation to 5.0%, Effective February 28, 2013

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Executive Summary

Executive Summary

Duff & Phelps Decreases U.S. Equity Risk Premium Recommendation to 5.0%, Effective February 28, 2013

- Equity Risk Premium: Decreased from 5.5% to 5.0%
- Risk-Free Rate: 4.0% (normalized)
- Base U.S. Cost of Equity Capital: 9.0% (4.0% + 5.0%)

5.0%

The Duff & Phelps U.S. Equity Risk Premium Recommendation effective February 28, 2013

The Equity Risk Premium (ERP) is a key input used to calculate the cost of capital within the context of the Capital Asset Pricing Model (CAPM) and other models.[1, 2] The ERP is used as a building block when estimating the cost of capital (i.e., "discount rate", "expected return", "required return"), and is an essential ingredient in any business valuation, project evaluation, and the overall pricing of risk. Duff & Phelps regularly reviews fluctuations in global economic and financial conditions that warrant periodic reassessments of the ERP.

Based on current market conditions, Duff & Phelps is decreasing its U.S. ERP recommendation from 5.5% to 5.0% when developing discount rates as of February 28, 2013 and thereafter until such time that evidence indicates equity risk in financial markets has materially changed and new guidance is issued.

4.0%

The Duff & Phelps concluded normalized risk-free rate, effective February 28, 2013

Duff & Phelps developed its current ERP recommendation in conjunction with a "normalized" 20-year yield on U.S. government bonds of 4.0% as a proxy for the risk-free rate (Rf) implying a 9.0% (4.0% + 5.0%) "base" U.S. cost of equity capital estimate at the end of February 2013.[3] The use of the spot yield-to-maturity of 2.7% as of February 28, 2013 would result in an overall discount rate that is likely inappropriately low vis-à-vis the risks currently facing investors.[4]

Duff & Phelps last changed its U.S. ERP recommendation on January 15, 2012. On that date, our recommendation was lowered to 5.5% (from 6.0%) in response to evidence that suggested a *reduced* level of risk in financial markets relative to the heightened uncertainty seen in the second half of 2011. Since January 15, 2012, while the evidence is somewhat mixed, we see further indications that equity risk in

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[1] The equity risk premium (ERP), sometimes referred to as the "market" risk premium, is defined as the return investors expect as compensation for assuming the additional risk associated with an investment in a diversified portfolio of common stocks *in excess* of the return they would expect from an investment in risk-free securities.

[2] The cost of capital is the expected rate of return required in order to attract funds to a particular investment.

[3] A risk-free rate is the return available on a security that the market generally regards as free of the risk of default. We discuss the background for using a normalized risk-free rate and our concluded normalized risk-free rate on page 9.

[4] The 20-year constant-maturity U.S. Treasury yield was 2.71%, as of February 28, 2013. Source: Board of Governors of the Federal Reserve System website at: http://www.federalreserve.gov/releases/h15/data.htm.

financial markets has declined. Table 1 summarizes the factors considered in our ERP recommendation.[5]

Table 1: Factors Considered in ERP Recommendation

Factor	Change	Effect on ERP
U.S. Equity Markets	↑	↓
Implied Equity Volatility	↓	↓
Corporate Spreads	↓	↓
Employment Environment	↔	↔
Consumer and Business Sentiment	↔	↔
Historical and Forecasted Real GDP Growth	↔	↔
Sovereign Credit Ratings	↓	↑
Damodaran Implied ERP Model	↓	↓
Default Spread Model	↓	↓

Taking these factors together, we find support for lowering our ERP recommendation relative to our previous recommendation.[6]

TO BE CLEAR:

- The Duff & Phelps U.S. ERP recommendation as of February 28, 2013 (and thereafter, until further notice) is 5.0%, matched with a normalized risk-free rate of 4.0%. This implies a 9.0% (4.0% + 5.0%) "base" U.S. cost of equity capital estimate as of February 28, 2013.

- Many valuations are done as of year's end. The Duff & Phelps U.S. ERP recommendation for use with December 31, 2012 valuations is 5.5%, matched with a normalized risk-free rate of 4.0%. This implies a 9.5% (4.0% + 5.5%) "base" U.S. cost of equity capital estimate as of December 31, 2012.

[5] Each of the factors in Table 1 is discussed in greater detail herein.

[6] The Duff & Phelps ERP estimate is made in relation to a risk-free rate (either "spot" or "normalized"). A "normalized" risk-free rate can be developed using longer-term averages of Treasury bond yields and the build-up framework outlined in the section herein *"The Duff & Phelps ERP Recommendation is made in Conjunction with an Assessment of the Risk-Free Rate"* on page 9.

Section 02

Overview of Duff & Phelps ERP Methodology

Overview of Duff & Phelps ERP Methodology

A Two-Dimensional Process

There is no single universally accepted methodology for estimating the ERP; consequently there is wide diversity in practice among academics and financial advisors with regards to ERP estimates. For this reason, Duff & Phelps employs a two-dimensional process that takes into account a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.

First, a reasonable range of normal or unconditional ERP is established. Second, based on current economic conditions, we estimate where in the range the true ERP likely lies (top, bottom, or middle).

Long-term research indicates that the ERP is cyclical.[7] We use the term *normal*, or *unconditional* ERP to mean the long-term average ERP without regard to current market conditions. This concept differs from the *conditional* ERP, which reflects current economic conditions.[8] The "unconditional" ERP range versus a "conditional" ERP is further distinguished as follows:

"What is the range?"

- **Unconditional ERP Range** – The objective is to establish a reasonable range for a normal or unconditional ERP that can be expected over an entire business cycle. Based on an analysis of academic and financial literature and various empirical studies, we have concluded that a reasonable long-term estimate of the normal or unconditional ERP for the U.S. is in the range of 3.5% to 6.0%.[9]

"Where are we in the range?"

- **Conditional ERP** – The objective is to determine where within the unconditional ERP range the conditional ERP should be, based on current economic conditions. Research has shown that ERP fluctuates during the business cycle. When the economy is near (or in) a recession, the conditional ERP is at the higher end of the normal, or unconditional ERP range. As the economy improves, the conditional ERP moves back toward the middle of the range and at the peak of an economic expansion, the conditional ERP approaches the lower end of the range.

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[7] See for example John Cochrane's "Discount Rates. American Finance Association Presidential Address" on January 8, 2011, where he presents research findings on the cyclicality of discount rates in general.

[8] The "conditional" ERP is the ERP estimate published by Duff & Phelps as the "Duff & Phelps Recommended ERP".

[9] See Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Applications and Examples*, Fourth Edition, Chapter 9,"Equity Risk Premium", pages 115−158 for a detailed discussion of the ERP.

Section 03

Estimating the Risk-Free Rate

Estimating the Risk-Free Rate

The Duff & Phelps ERP Recommendation is made in Conjunction with an Assessment of the Risk-Free Rate

All ERP estimates are, by definition, made in relation to a risk-free rate. In other words, the ERP is defined as the return investors expect as compensation for assuming the additional risk associated with an investment in a diversified portfolio of common stocks in excess of the return they would expect from an investment in risk-free securities. A risk-free rate is the return available on a security that the market generally regards as free of the risk of default.

The risk-free rate serves as a building block for many of the cost of capital models (e.g., the build-up method, the capital asset pricing model (CAPM), the Fama-French 3-factor model, etc.). For example, the basics of a simple build-up method begin with adding the expected ERP to the selected risk-free rate. The basics of the CAPM begin with adding the ERP multiplied by a coefficient (in this case, the coefficient is commonly referred to as *beta*) to the selected risk-free rate. The Fama-French 3-factor model also begins by adding three risk factors multiplied by their respective coefficients to the selected risk-free rate.

The risk-free rate serves as a scaling mechanism when estimating the cost of equity capital by using one of the commonly applied methods. During periods of increased inflation expectations, risk-free rates increase, thereby increasing the expected returns indicated by the models. Similarly, during periods of decreased inflation expectations, risk-free rates decrease, thereby decreasing the expected returns indicated by the models.

For a valuation denominated in U.S. dollars (USD), analysts have typically used the valuation date yield-to-maturity on U.S. government securities as the risk-free rate. They choose U.S. government obligations of short-term, intermediate-term or long-term maturities to match the timing of expected cash flows and the data used to estimate the ERP.

In valuing going-concern businesses and long-term investments made by businesses, practitioners have generally used yields on long-term U.S. government bonds as the risk-free security and estimated the ERP in relation to yields on long-term U.S. government bonds. The convention of using a long-term yield represented a realistic, simplifying assumption when valuing a business or long-term investment where: (1) the net cash flows are expected to be realized over an indefinite period of time as there is no expected maturity to a business; and (2) the yield on long-term risk-free bonds are intended to reflect the average yield expected over the long-term maturity.

Most business investments have long durations and suffer from a reinvestment risk comparable to that of long-term U.S. government bonds. Buying a business or making a capital investment in a business are long-term investments. Even if the current investor has a relatively short expected holding period, the next investor will "step into his shoes" as owner of a long-term investment. That is, the expected terminal value at the end of the short expected holding period will reflect the long term maturity of the investment at that point.

The two most commonly used risk-free bond maturities are the 10- and 20-year. When selecting which risk-free rate to use, the analyst must match the ERP estimate to the benchmark maturity used in estimating that ERP. In theory the risk-free rate should be equal to the average of expected short-term risk-free rates over the investment period adjusted for inflation uncertainty and reinvestment risk that is typically observed in long maturity bonds compared to short maturity bonds.

But beginning with the financial crisis of 2008 (the "Crisis") analysts have had to reexamine whether the "spot" rate is still a reliable building block upon which to base their cost of equity capital estimates. In the next section, we discuss the potential problems of simply continuing to use the spot yield as the risk-free rate without any further adjustments.

Risk-Free Rates: Flights to Quality, Monetary Interventions, and Potential Normalization

In developing our current U.S. ERP recommendation, Duff & Phelps matched this ERP with a "normalized" 20-year yield on U.S. government bonds of 4.0% as a proxy for the risk-free rate (R_f). Many market participants will agree that nominal U.S. government bond yields in recent periods have been artificially low. A recent *Financial Times* article stated that:[10]

> "The Fed, the biggest buyer in the market, has been the driver of artificially low Treasury yields. Lackluster economic growth, accompanied by the recent gridlock in Washington over the fiscal cliff, have also kept yields low." *[emphasis added]*

The onset of the Crisis marked the beginning of a period when yields have been pushed to historically low levels. For example, at the end of 2008, 20-year Treasury yields fell to approximately 3.1% (see Graph 1).[11]

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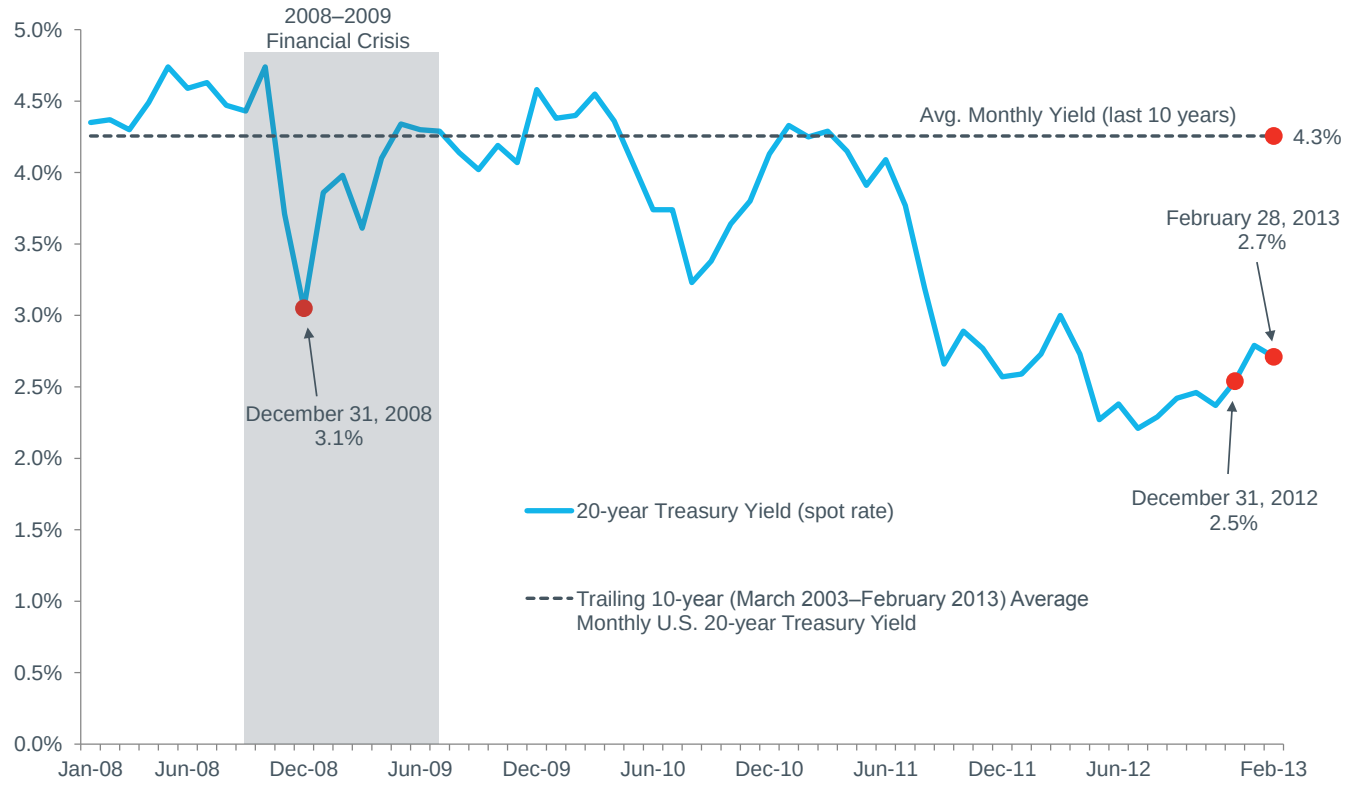
[10] Mackenzie, Michael, "Fed injects new sell-off risk into Treasuries", *FT.com*, January 8, 2013.

[11] Source of underlying data: Board of Governors of the Federal Reserve System website at: http://www.federalreserve.gov/releases/h15/data.htm, 20-year U.S. Treasury series. Yields are daily yields reported at month-end.

Graph 1: Monthly U.S. 20-year Treasury Yield (spot rate); Trailing 10-year (March 2003–February 2013) Average Monthly U.S. 20-year Treasury Yield

January 2008–February 2013



This in itself may not have been all that remarkable – financial crises are often accompanied by a flight to quality. During these times, investors look for places to park funds in securities they consider free from risk of loss of principal, and certain government-issued bonds (i.e., “sovereign” bonds) have historically been regarded as a relative safe haven in times of economic uncertainty. U.S. government securities (alongside various others) were likely perceived as one of the best available alternatives at the time. Investors looking for safety could migrate to other currencies (e.g., the Swiss franc), but these simply do not have the volume or liquidity to absorb the amount of funds seeking a safe haven.

The dramatic decreases in yields during the Crisis were arguably driven in large part by flight to quality issues. However, policies adopted by the United States' Federal Reserve Bank (the "Fed") and other countries' central banks in subsequent periods have continued to include the purchase of large sums of mid-term and longer-term bonds. The intent of these non-traditional quantitative easing ("QE") measures was not only to support the economy, but also to drive down long-term interest rates, thereby creating the incentive for investors to move to other riskier asset classes.[12]

In the announcement of its third round of QE measures ("QE3") on September 13, 2012, Fed chairman, Ben Bernanke, reaffirmed the Fed's intent to continue to use its monetary tools to keep interest rates low:[13]

> "…the tools we have involve affecting financial asset prices ... To the extent that home prices begin to rise, consumers will feel wealthier, they'll feel more disposed to spend ... So house prices is one vehicle. Stock prices – many people own stocks directly or indirectly ... and if people feel that their financial situation is better because their 401(k) looks better or for whatever reason, their house is worth more, they are more willing to go out and spend, and that's going to provide the demand that firms need in order to be willing to hire and to invest."

These QE programs implemented by central banks (used in conjunction with a variety of communication tools) depress yields on government bonds, likely artificially. One can even argue that in more recent periods these interventions are at times the *main* driver of lower yields, rather than just a *contributing* factor.

In a 2012 speech at the St Louis Federal Reserve, Mohamed A El-Erian, CEO and co-CIO of PIMCO, addressed (among other issues) the effect that central bank interventions are having on markets (given their "size and scope"), saying:

> "…the result is artificial pricing, lower liquidity and a more cumbersome price discovery process". El-Erian went on to say "…sustainability for investors is more a function of being pulled into an investment due to its inherent attractiveness rather than being pushed into it by central banks' artificial manipulation of relative prices "[14] *[emphasis added]*.

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[12] See for example the Federal Open Market Committee's press release on September 21, 2011 announcing "Operation Twist": "This program *should put downward pressure* on longer-term interest rates and help make broader financial conditions more accommodative" *[emphasis added]*. Source: http://www.federalreserve.gov/newsevents/press/monetary/20110921a.htm.

[13] Source: http://www.federalreserve.gov/mediacenter/files/FOMCpresconf20120913.pdf.

[14] Dr.El-Erian made these remarks in a speech given at the Homer Jones Memorial Lecture at the Federal Reserve Bank of St. Louis on April 11, 2012.

Since the onset of the Crisis and the large-scale monetary interventions that followed, yields of the 20-year U.S. Treasury bonds have been significantly lower than both longer-term and shorter-term average monthly yields (see Graph 1).

In addition to comparing current 20-year U.S. Treasury yields to longer-term *averages*, one could also compare current month-end yields to month-end yields seen in the past.

2.5%

In 10 of the 15 months from December 2011 to February 2013, 20-year U.S. Treasury rates have been below 2.5% at month's end

For example, in 10 of the 15 months from December 2011 to February 2013, 20-year U.S. Treasury rates have been *below* 2.5% at month's end. By way of comparison, prior to December 2011 one would have to go back to August 1951 (60 years) to see a 20-year rate below 2.5%.[15]

Moreover, of the 148 months from August 1951 (and prior) that had a 20-year rate below 2.5%, all of these occurred between January 1939 and August 1951, with a majority of *these* occurring during another period in which interest rates were kept artificially low by governmental action: the 1942–1951 "WWII Interest Rate Bias" years. During this period, the Federal Reserve publically committed itself to maintaining an interest rate ceiling on government debt, both long-term and short-term, to support World War II financing. The Fed continued with this policy through March 1951 for fear of returning to the high unemployment of the Great Depression, as well as due to restrictions imposed by the U.S. Treasury Department.

3.1%

Long-term (20-year) Treasury yields, end of December 2008, after averaging approximately 4.5% during the 11 months from January to November 2008

Further analysis corroborates that Treasury rates in the period following the Crisis are likely unusually low. As previously noted, long-term (20-year) Treasury yields declined to approximately 3.1% at the end of December 2008, after averaging approximately 4.5% during the 11 months from January to November 2008. This was approximately a 31% decline in yields (3.1% ÷ 4.5% - 1).

For context, we examined *each* of the periods from January 1926 through February 2013 to compare a given month's 20-year Treasury yield to the average of the 11 months' yields that preceded it.[16] The results of this analysis are illustrated in Graph 2.[17]

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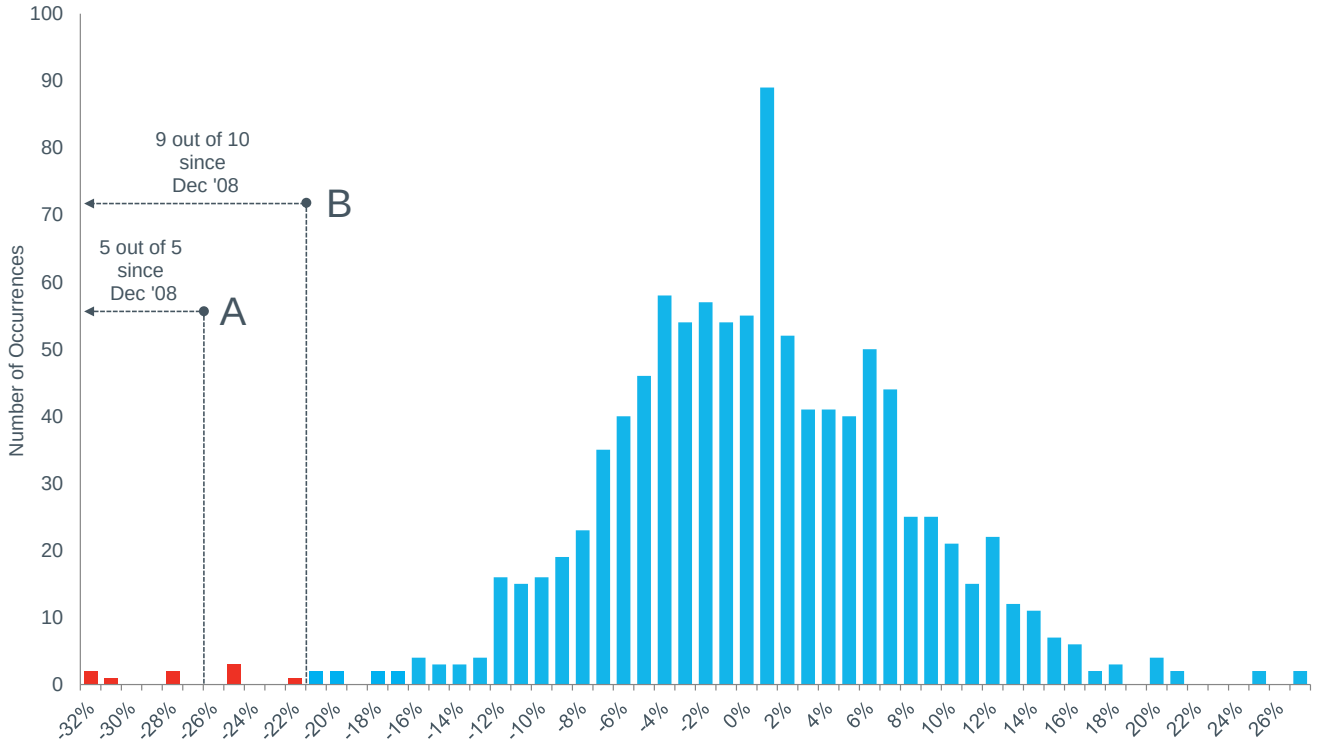
[15] Source of underlying data: Morningstar EnCorr Analyzer, 20-year U.S. Treasury Yield series. Yields reported at month-end.

[16] Over the time horizon January 1926 to February 2013, there were 1,035 months for which this analysis was possible. Source of underlying data: Morningstar EnCorr, *SBBI* US Long-Term Government Yield series. Yields reported at month-end.

[17] There are a number of ways to gauge whether the behavior of U.S. Treasury yields since December 2008 was out of the ordinary; this is but a single method of doing so. These events are not entirely independent; for example the 31% decline to 3.1% in December 2008 is also reflected in the following months' moving averages contributing to the recent concentration of declines.

Graph 2: Histogram of Percent Change in Month's-end Yield, as Compared to Preceding 11 Months' Average Yield January 1926–February 2013



Graph 2 illustrates that many of the largest declines in yields (at least those measured in this fashion) have occurred since December 2008. For example, the left "tail" of Graph 2 includes the most severe declines of 20-year Treasury yields over the January 1926–February 2013 time horizon (87+ years total). From point A (and to the left), five out of five times in which the percentage change in yields of at least -28% occurred since December 2008. From point B (and to the left), 9 out of 10 times in which the percentage change in yields of at least -22% happened since December 2008. This analysis suggests that since the Crisis, the declines in long-term Treasury yields are unusual.

The potential for *artificially* low yields during periods of "flight to quality" (when investors may be *less* concerned about yield, and are likely *more* focused on capital preservation) and/or high levels of central bank intervention has compelled valuation professionals to reevaluate the methods they have traditionally used to estimate cost of capital.

To be clear, in most circumstances one would prefer to use the "spot" U.S. Treasury yield available in the market as a proxy for the U.S. risk-free rate. However, during times of flight to quality and/or high levels of central bank intervention, the use of lower observed Treasury yields would imply a lower cost of capital (all other factors held the same) that is likely inappropriately low vis-à-vis the risks currently facing investors. This is just the opposite of what one would expect in times of relative distress, and therefore a "normalization" adjustment may be considered appropriate.[18] By "normalization" we mean estimating a rate that more likely reflects the sustainable average return of long-term Treasuries.

Methods to Estimate a Normalized Risk-Free Rate

During periods in which risk-free rates appear to be abnormally low due to flight to quality or other issues (e.g. massive monetary interventions), Duff & Phelps recommends normalizing the risk-free rate. Normalization can be accomplished in a number of ways.

One possible normalization method consists of calculating trailing averages of yields-to-maturity on long-term government securities over various periods. For example, looking at Graph 1, one can observe the calculated 10-year trailing average of 4.3% using 20-year U.S. Treasury yields.[19] As always, an issue with using historical averages is selecting an appropriate comparison period that can be used as a reasonable proxy for the future.

Another normalization method is to incorporate one of the various possible "build-up" methods. All build-up methods are based upon two fundamental relationships for nominal interest rates: (1) the relationship between nominal and real interest rates; and (2) the relationship between short and long-term horizons.

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[18] To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, download a free copy of *"Developing the Cost of Equity Capital: Risk-Free Rate and ERP During Periods of 'Flight to Quality'"*, August 2011, by Roger J. Grabowski at www.DuffandPhelps.com/CostofCapital.

[19] An even longer-term perspective is provided by the monthly average of the *SBBI* US Long-Term Government Yield series from January 1926–February 2013 (87+ years), which is 5.24%. Source of underlying data: Morningstar Analyzer.

Nominal vs. Real Interest Rates

The first relationship extends the work introduced by academic Irving Fisher.[20] The "Fisher equation", a tenet of corporate finance, states in general terms that in equilibrium the nominal yield on a bond is equal to its real yield plus a compensation for inflation:

(1 + Nominal Interest Rate) = (1 + Real Interest Rate) x (1 + Expected Inflation)

[equation 1]

This relationship is often expressed using the following linear approximation:

Nominal Interest Rate ≈ Real Interest Rate + Expected Inflation

[equation 2]

This approximation is fairly accurate, as long as real interest rates and inflation remain relatively low.

This relationship is quite easy to understand if one is only looking at a *short-term* time frame, where expectations of inflation are more easily predicted. However, when looking at *longer-term* interest rates, which we typically do when valuing businesses and long-term investments made by businesses, two additional risk factors are introduced (both of which increase as maturity length increases). First, there is the risk that the price of a bond will change due to unexpected changes in interest rates. This could happen due to a variety of reasons, such as unexpected changes in inflation (this risk is embodied in the so called "inflation risk premium"), or an increase in default risk.[21] Second, there is the uncertainty as to the rate that will be available to reinvest "coupon" payments and/or principle, due to unexpected changes in market rates (i.e., "reinvestment risk").[22]

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[20] Fisher, Irving. 1930. *The Theory of Interest*. New York: Macmillan, which built on his work presented in 1896 as "Appreciation and Interest." *Publications of the American Economic Association*, First Series, 11(4): 1–110 [331– 442]. These publications have been reprinted in a series of volumes entitled *The Works of Irving Fisher* (Fisher, 1997), Ed. William J. Barber. London: Pickering and Chatto.

[21] To be clear, in the context of risk-free rates, default risk does not get incorporated into the estimated yield. By definition, the risk-free rate is free of default risk.

[22] Risks having to do with holding longer-term bonds versus holding shorter-term bonds are labeled as "horizon premium" in some sources such as the Ibbotson *Stocks, Bonds Bills and Inflation* (*SBBI) Valuation Yearbook* (Morningstar, Chicago). It is also known by others (e.g. academics) as a "term premium".

Estimating the Real Risk-Free Rate

Because our objective is to estimate the cost of equity to be used when valuing going-concern businesses, we are mostly interested in longer-term expected returns. Duff & Phelps focuses on a 20-year maturity when estimating the normalized risk-free rate and the underlying components that should drive yields of that maturity.

Some academic studies have suggested the *long-term* real risk-free rate to be somewhere in the range of 1.3% to 2.0% based on the study of inflation swap rates and/or yields on long-term U.S. Treasury Inflation-Protected Securities (TIPS).[23, 24, 25]

TIPS are marketable securities whose principal is adjusted relative to changes in the Consumer Price Index (CPI).[26] TIPS represent the return of the equivalent maturity Treasury security (in nominal terms), *except* for the inflation component. In an established market, the nominal yield of *long-term* (e.g. 20-year) inflation-indexed securities, such as TIPS, will capture the "real" rate and a "horizon" premium.[27]

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[23] Haubrich, Joseph, George Pennacchi, and Peter Ritchken. "Inflation Expectations, Real Rates, and Risk Premia: Evidence from Inflation Swaps." *Review of Financial Studies* (2012) 25 (5): 1588-1629.

[24] Ang, Andrew, and Gerrt Bekaert. "The Term Structure of Real Rates and Expected Inflation." *The Journal of Finance*, Vol. LXIII, No. 2, April 2008.

[25] Grishchenko, Olesya V., and Jing-zhi Huang "Inflation Risk Premium: Evidence from the TIPS Market." *Finance and Economics Discussion Series Working Paper 2012-06.* Board of Governors of the Federal Reserve System.

[26] The Consumer Price Index is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services, and is commonly used as a measure of "inflation".

[27] Inflation-indexed bonds have been available in the U.S. since 1997. Various academic studies show that when TIPs were first created in the U.S., a large liquidity premium was demanded by investors. Some studies indicate that TIPS liquidity premiums were fairly high (1.0%-2.0 %) when TIPS were first introduced, were on a downward trajectory until around 2004, and have stayed at a relatively low level (lower than 50 basis points) from 2005 onwards. For a discussion of liquidity premiums embedded in TIPS yields, see for example: (i) D'Amico, S., D. H. Kim, and M. Wei. "Tips from TIPS: The Informational Content of Treasury Inflation-Protected Security Prices." Federal Reserve Board's *Finance and Economics Discussion Series*, no. 2010-19, June; (ii) Dudley, W., J. Roush, and M. Ezer (2009). "The case for TIPS: an examination of the costs and benefits." *FRBNY Economic Policy Review* Volume 15, Number 1, 1-17; and (iii) Andonov, Aleksandar, Florian Bardong, and Thorsten Lehnert. "TIPS, Inflation Expectations, and the Financial Crisis." *Financial Analysts Journal*. Vol. 66, No. 6, 2010.

From a practical standpoint, we also look at the average yield on long-term TIPS and use these as a proxy for the long-term real rate. Daily, weekly, and monthly TIPS yields are available from the Fed's website for various maturities. Data on 20-year TIPS yields are available from July 2004–present.[28] The average monthly 20-year TIPS yield over this period is 1.8%.[29]

Based on academic study findings, and on average long-term TIPS yields, a reasonable estimate representing the *long-term real rate* is therefore within the range of 1.3% to 2.0%.

Expected Inflation

Nominal interest rates incorporate not just inflation expectations, but also compensation for bearing inflation risk. In other words, inflation compensation economically consists of two components: expected inflation plus an inflation risk premium.[30]

Several academic studies have attempted to estimate the inflation risk premium component, but this is a complex task. First of all, most believe there is indeed an inflation risk premium and it can be rather large in certain time periods (reaching as high as 2% for a 10-year horizon). However, it is not necessarily positive at all times. [31, 32]

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[28] Board of Governors of the Federal Reserve System at http://www.federalreserve.gov/releases/h15/data.htm.

[29] This analysis was based on data through February 28, 2013.

[30] The inflation risk premium reflects the risk that the rate of inflation will differ from the generally expected inflation. An alternative way to think about this is that the inflation risk premium is related to the dispersion of forecasts of market participants around the expected future inflation rate. The greater the dispersion, the greater the uncertainty, the higher the premium demanded by investors to compensate for this risk.

[31] Grishchenko, Olesya V., and Jing-zhi Huang "Inflation Risk Premium: Evidence from the TIPS Market." *Finance and Economics Discussion Series Working Paper 2012-06.* Board of Governors of the Federal Reserve System.

[32] Bekaert, Geert and Xiaozheng Wang, "Inflation Risk and the Inflation Risk Premium," *Economic Policy*, Vol. 25, Issue 64, pp. 755-806, October 2010.

Nevertheless, recent measures of inflation risk premiums appear to indicate a decline of this component over time in explaining yields on long-term U.S. government securities. One of the explanations for this trend is that since inflation has stayed low, market participants became more confident in the Fed's abilities to manage inflation. Accordingly, the inflation risk premium that investors have demanded for protection has diminished somewhat over time.[33] However, this could change significantly if confidence in the central bank's ability to control inflation is shaken.

In practice, changes in the inflation risk premium may be difficult to distinguish from changes in expected inflation. This has led some researchers to assume that the inflation risk premium is equal to zero.[34] In addition, researchers who attempted to measure inflation risk premium suggest it is rather small in recent years (below 50 basis points), particularly when appropriately netted against illiquidity premiums present in the TIPS yields.[35]

In this current analysis, Duff & Phelps assumes the inflation risk premium on a long-term government security to be *de minimis,* or not distinguishable from expected inflation forecasts. Should inflation expectations rise, accompanied with a higher degree of uncertainty, we would revisit this assumption.

This leaves us with expected inflation as the last input to estimate. Monetary policymakers and academics have been monitoring several measures of market expectations of future inflation.[36] One of these studies has examined various methods for forecasting inflation over the period 1952–2004 and found that surveys significantly outperform other forecasting methods.[37]

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[33] See for example, Dudley, W., J. Roush, and M. Ezer (2009). "The case for TIPS: an examination of the costs and benefits." FRBNY *Economic Policy Review,* Volume 15, Number 1, 1-17; or Haubrich, Joseph, George Pennacchi, and Peter Ritchken. "Inflation Expectations, Real Rates, and Risk Premia: Evidence from Inflation Swaps." *Review of Financial Studies* (2012) 25 (5): 1588-1629.

[34] Andonov, Aleksandar, Bardong, Florian and Lehnert, Thorsten, "TIPS, Inflation Expectations, and the Financial Crisis". Financial Analysts Journal, Vol. 66, No. 6, 2010.

[35] See for example, Dudley, W., J. Roush, and M. Ezer (2009). "The case for TIPS: an examination of the costs and benefits". FRBNY *Economic Policy Review,* Volume 15, Number 1, 1-17; or Grishchenko, Olesya V., and Jing-zhi Huang "Inflation Risk Premium: Evidence from the TIPS Market." *Finance and Economics Discussion Series Working Paper 2012-06.* Board of Governors of the Federal Reserve System.

[36] One of these measures, the breakeven inflation, is based on the differential between nominal and TIPS yields with equivalent maturity. However, several studies have documented that the breakeven inflation has not been a good predictor for inflation expectations. The differential between nominal and real rates is not only complicated by a liquidity premium, but also by the potential presence of the inflation risk premium, with both of these premiums varying through time.

[37] Ang, A., G. Bekaert, and M. Wei. "Do macro variables, asset markets, or surveys forecast inflation better*?" Journal of Monetary Economics.* 54, 1163-1212.

In the U.S., there are a number of well-established surveys providing consensus estimates for expected inflation. A summary of recent longer term U.S. inflation consensus estimates is provided in Table 2. [38]

Table 2: Long-term Expected Inflation Estimates

Source	Estimate (%)
Livingston Survey (Federal Reserve Bank of Philadelphia)	2.5
Survey of Professional Forecasters (Federal Reserve Bank of Philadelphia)	2.3
Cleveland Federal Reserve	1.8
Blue Chip Financial Forecasts	2.4
University of Michigan Survey 5-10 Year Ahead Inflation Expectations	3.0
Range of Expected Inflation Forecasts	1.8% – 3.0%

Bringing it all together

Combining the range of long-term real rates (1.3% to 2.0%) and the range of expected inflation forecasts (1.8% to 3.0%) gives us an *estimated* normalized risk-free rate that falls in the range of 3.1% to 5.0%

The midpoint of the estimated normalized risk-free rate range using the simple buildup method employed in this example is 4.1% (3.1% + 5.0%) / 2.

[38] Sources of information in Table 2: *"The Livingston Survey: December 2012"*, Federal Reserve Bank of Philadelphia (December 9, 2012); *"Survey of Professional Forecasters: First Quarter 2013"*, Federal Reserve Bank of Philadelphia (February 15, 2013); Federal Reserve Bank of Cleveland (estimates as of January 2013); *"Blue Chip Financial Forecasts"* Vol. 31, No. 12 (December 1, 2012); FRED® Economic Data – Federal Reserve Bank of St. Louis (estimates as of February 28, 2013).

4.0%

The Duff & Phelps concluded normalized risk-free rate, effective February 28, 2013

Considering longer-term averages of Treasury bond yields, and the build-up framework outlined above, Duff & Phelps has currently concluded on a 4.0% "normalized" risk free rate in developing its U.S. ERP (as compared to the 2.7% "spot rate"). The 4.0% normalized risk-free rate should be used in conjunction with the 5.0% ERP recommendation outlined herein, implying a 9.0% (4.0% + 5.0%) base cost of equity capital for the U.S. as of February 28, 2013.

Adjustments to the ERP or to the risk-free rate are, in principal, a response to the same underlying concerns and should result in broadly similar costs of capital. Adjusting the risk-free rate in conjunction with the ERP is only one of the alternatives available when estimating the cost of equity capital.

For example, one could use a spot yield for the risk-free rate, but *increase* the equity risk premium to account for higher (systematic) risk. If the analyst chooses to use the spot yield in estimating the cost of capital during periods when those yields are less than "normal", the analyst must use an estimated ERP that is *matched* to (or implied by) those *below-normal* yields. Alternatively, if the analyst chooses to use a normalized risk-free rate in estimating the cost of capital, the analyst must again use an estimated ERP that is *matched* to those *normalized* yields.

Duff & Phelps currently recommends a normalized risk-free rate because we do not believe the current long-term rates in U.S. government bonds represents the most probable estimate of the average of short-term risk-free rates that will be experienced over the next 10 to 20 years.

Normalizing the risk-free rate is likely a more direct (and more easily implemented) analysis than adjusting the equity risk premium due to a *temporary* reduction in the yields on risk-free securities, while *longer-term* trends may be more appropriately reflected in the equity risk premium.

Section 04

Basis for U.S. ERP Recommendation as of February 28, 2013

Basis for U.S. Recommended ERP as of February 28, 2013

Prior ERP Recommendations

ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or ex post approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP.

To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.

Alternatively, the analyst can derive forward-looking estimates for the ERP from sources such as: (i) data on the underlying expectations of growth in corporate earnings and dividends; (ii) projections of specific analysts as to dividends and future stock prices; or (iii) surveys (an ex ante approach). The goal of these approaches is to estimate the true expected ERP as of the valuation date.

Duff & Phelps recognizes that making any ERP estimate requires a great degree of judgment. In arriving at our recommended ERP, we weigh both economic and financial markets evidence. We choose to change our recommendations when the preponderance of evidence indicates a change is justified. We try to avoid making a change in one month to only find the evidence reversing itself the following month.

As previously indicated, based on the analysis of academic and financial literature and various empirical studies, we have concluded that a reasonable long-term estimate of the normal or unconditional U.S. ERP is in the range of 3.5% to 6.0%.

Based on economic and financial market conditions during the Crisis in late 2008 and early 2009, the Duff & Phelps U.S. ERP estimate was increased from 5.0% to 6.0% (see Table 3 for Duff & Phelps' U.S. ERP guidance and corresponding risk-free rates from January 2008 to present).

From 5.5% to 5.0%

The change in the Duff & Phelps recommended U.S. Equity Risk Premium from January 15, 2012 to February 28, 2013

As markets began to stabilize following the Crisis, we decreased our U.S. ERP estimate on December 1, 2009 to 5.5%. Since that date (with the exception of the period from September 30, 2011 through January 14, 2012 when increased levels of risk in financial markets caused an increase in our ERP recommendation to 6.0%) our recommendation had remained stable at 5.5%.[39]

As previously stated, our current ERP recommendation is to be used in conjunction with a *normalized* risk-free rate of 4.0%, our estimate for a longer-term sustainable risk-free rate. Combining our selection of risk free rate and our analysis of recent economic and financial market conditions (further described below), we are now updating our estimated *conditional* ERP.

Specifically, Duff & Phelps is lowering its recommended U.S. ERP to 5.0% (while maintaining a *normalized* risk-free rate of 4.0%) when developing discount rates as of February 28, 2013 and thereafter, until further guidance is issued.

[39] Factors that increased uncertainty in 2011, and prompted an increase in the Duff & Phelps U.S. ERP recommendation from September 30, 2011 through January 14, 2012 included: a perceived slowdown in the recovery of the U.S. and other advanced economies; a growing skepticism about various governments' ability to stabilize their public debt; doubts about the continued viability of the Euro (the common currency of the European Union); the U.S. Congress' prolonged stalemate in raising the U.S. debt ceiling; and S&P's historic decision on August 15, 2011 to downgrade the U.S. sovereign debt rating from AAA to AA+.

Table 3: Duff & Phelps Recommended U.S. ERP and Corresponding Risk Free Rates
January 2008–Present

	Duff & Phelps Recommended ERP	*Risk Free Rate*
Current ERP Guidance ✓ February 28, 2013 – UNTIL FURTHER NOTICE	5.0%	4.0% Normalized 20-year Treasury yield *
Year-end 2012 Guidance ⊙ December 31, 2012	5.5%	4.0% Normalized 20-year Treasury yield *
Change in ERP Guidance January 15, 2012 – February 27, 2013	5.5%	4.0% Normalized 20-year Treasury yield *
Change in ERP Guidance September 30, 2011 – January 14, 2012	6.0%	4.0% Normalized 20-year Treasury yield *
July 1, 2011 – September 29, 2011	5.5%	4.0% Normalized 20-year Treasury yield *
June 1, 2011 – June 30, 2011	5.5%	Spot 20-year Treasury Yield
May 1, 2011 – May 31, 2011	5.5%	4.0% Normalized 20-year Treasury yield *
December 1, 2010 – April 30, 2011	5.5%	Spot 20-year Treasury Yield
June 1, 2010 – November 30, 2010	5.5%	4.0% Normalized 20-year Treasury yield *
Change in ERP Guidance December 1, 2009 – May 31, 2010	5.5%	Spot 20-year Treasury Yield
June 1, 2009 – November 30, 2009	6.0%	Spot 20-year Treasury Yield
November 1, 2008 – May 31, 2009	6.0%	4.5% Normalized 20-year Treasury yield *
Change in ERP Guidance October 27, 2008 – October 31, 2008	6.0%	Spot 20-year Treasury Yield
January 1, 2008 – October 26, 2008	5.0%	Spot 20-year Treasury Yield

* Normalized in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

Current Financial Market Conditions

The last time Duff & Phelps changed its U.S. ERP recommendation was on January 15, 2012 (from 6.0% to 5.5%). To some extent aggregate risks in U.S. markets as of February 28, 2013 appear to have diminished relative to January 15, 2012.

U.S. Equity Markets

Since January 15, 2012, major U.S. equity indices have risen significantly. Through February 28, 2013, the S&P 500 Index, Dow 30 Index, and NASDAQ Index have risen 17.5%, 13.1%, and 16.6%, respectively.[40]

Implied Equity Volatility

Implied equity volatility, as measured by the Chicago Board Options Exchange (CBOE) "VIX" Index (see Graph 3), has been termed a "fear index" as it can be a gauge of investor apprehension.[41] Implied equity volatility declined from 23.4 at year-end 2011 to 18.0 at year-end 2012. For comparative purposes, the VIX Index peaked at 48.0 in August 2011 in the midst of the 2011 debt ceiling debate and Standard & Poor's (S&P) downgrade of the U.S. sovereign rating from AAA to AA+.

VIX Index level of 12.3

February 19, 2013 level was the lowest in almost 6 years

The VIX index was at 20.9 on January 15, 2012, the date of the previous change in Duff & Phelps' U.S. ERP recommendation. Risk perceptions (as measured by VIX) declined even further over the last several months, with the index closing at a level of 15.5 on February 28, 2013. In fact, as recently as February 19, the VIX reached a level of 12.3. The last time the VIX index reached such a low level was April 2007, prior to when the U.S. sub-prime mortgage crisis of 2007 started impacting financial markets and taking a toll on the economy.[42]

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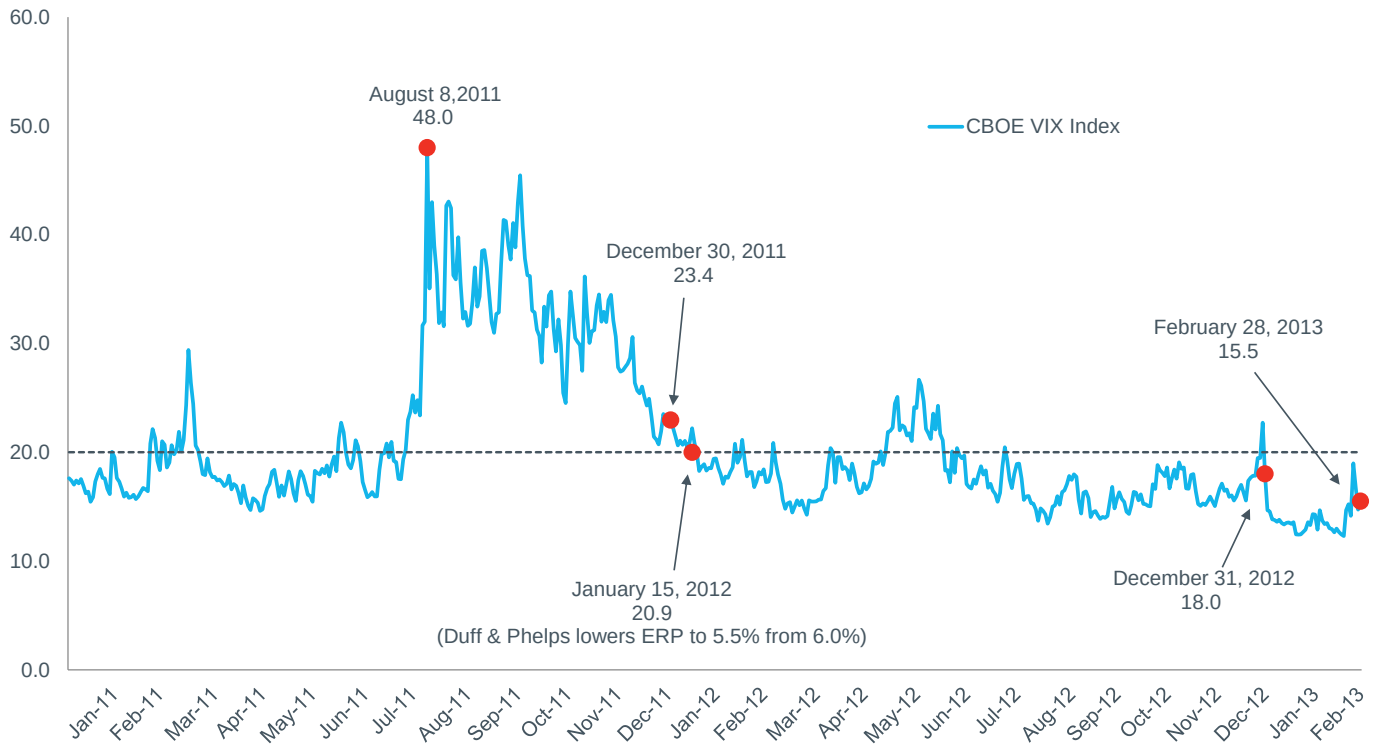
[40] Source of underlying data: S&P Capital IQ.

[41] Source of underlying data: S&P Capital IQ.

[42] For a timeline of the sub-prime mortgage crisis, see for example "The Subprime Lending Crisis: Causes and Effects of the Mortgage Meltdown" (2008) by Katalina M. Bianco, J.D. This document can be accessed here: http://www.business.cch.com/bankingfinance/focus/news/Subprime_WP_rev.pdf.

Note that the 2007 U.S. sub-prime mortgage crisis is distinct from (although precursor to) the wider-spread global financial crisis that started in late 2008.

Graph 3: Chicago Board Options Exchange (CBOE) "VIX" Index
January 1, 2011–February 28, 2013



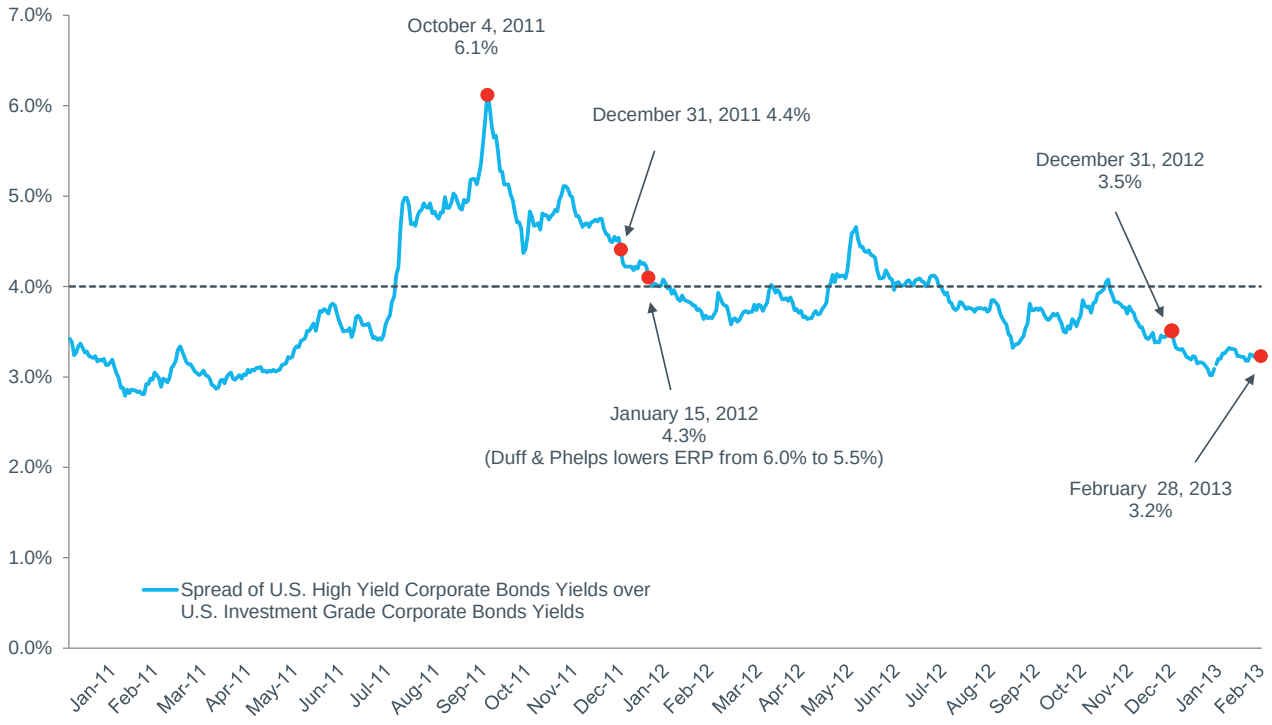
This does not necessarily imply that investors perceive a lack of meaningful risks in equity markets. Many analysts have noted a disconnect between the seemingly reduced sense of investor apprehension, as indicated by the VIX index, and the continued problems in the "real economy" as we discuss below. The financial system is flooded with excess liquidity provided by current monetary policies of central banks around the world and many analysts believe this is driving the rise in the equity markets.

Corporate Spreads

Corporate bond credit spreads can be a useful indicator of markets' perception of risk, and thus can also be a gauge of investor fear (wider spreads tend to go hand in hand with greater investor fear, and vice-versa). During 2012, the spread in U.S. corporate yields of high yield over investment grade bonds narrowed substantially, from 4.4% at year-end 2011 to 3.5% at year-end 2012 (see Graph 4).[43] Spreads narrowed even further in the beginning of this year, reaching 3.2% on February 28, 2013.

By contrast, corporate credit spreads peaked at 6.1% on October 4, 2011 during the 2011 debt ceiling debate and S&P downgrade of U.S. credit from AAA to AA+. Also for comparative purposes, corporate spreads were at 4.3% on January 15, 2012, the date of the previous change in Duff & Phelps' U.S. ERP recommendation (to 5.5% from 6.0%).[44]

Graph 4: Spread of U.S. High Yield Corporate Bond Yields over U.S. Investment Grade Corporate Bond Yields
January 2011 – February 2013



[43] It is not uncommon for fixed income analysts to look at the relative fluctuation in credit spreads. A decrease from 4.4% to 3.5%, represents a relative decline of 20.5% = (3.5% / 4.4%) – 1.

[44] Corporate spreads were at 4.28% on January 13, 2012, the most recent trading day prior to January 15, 2012.

Since the last time Duff & Phelps changed its U.S. ERP recommendation on January 15, 2012, corporate credit spreads have narrowed by 24.5% through February 28, 2013 (on a relative basis).[45]

Once again, the excess liquidity created by current monetary policies of the Fed and other central banks seems to be the catalyst for the narrowing of credit spreads. The search for yield has led investors to purchase sizable amounts of high yield (i.e., "junk") bonds, which in turn has led to a further decline in yields for this asset class.[46, 47] In some sense, the Fed policies are reducing investors' risk aversion and inducing them to invest in higher risk asset classes.

Current Economic Conditions

When evaluating current economic conditions we have considered the following indicators: (1) the employment environment; (2) consumer and business sentiment; (3) historical and forecasted real gross domestic product (GDP) growth; and (4) global sovereign credit ratings.

A recent New York Times article suggests that the Fed has exercised more influence over economic growth and the level of employment in recent years than any other government entity.[48] Through traditional tools and unconventional monetary policy measures, the Fed has used its power to change interest rates and purchase vast amounts of financial assets in its effort to support the financial system and the U.S. economy.

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[45] The 24.5% relative spread decline was calculated as follows: (February 28, 2013 Spread) / (January 13, 2012 Spread) – 1 = (3.23% / 4.28%) – 1 = -24.5%.

[46] Bond yields move in the opposite direction of bond prices. All else equal, an increase in demand for bonds leads to an increase in prices and, therefore, a decline in yields. The decline in spreads is even more impressive, when taking into consideration that corporate debt issuers have been rushing into the market to lock the incredibly low rates, thereby increasing the supply of junk bonds.

[47] See "Exotic, but Dangerous; Pitfalls Abound as Investors Chase Yield in Far-Flung Places", *Wall Street Journal*, January 1, 2013 http://online.wsj.com/article/SB10001424127887323635504578213722680412376.html.

[48] "Federal Reserve (The Fed)." NYTimes.com., Updated Dec. 12, 2012. Last Accessed: Feb.15, 2013. http://topics.nytimes.com/top/reference/timestopics/organizations/f/federal_reserve_system/index.html.

Employment Environment

The Fed has a dual mandate, which its website defines as "conducting the nation's monetary policy by influencing money and credit conditions in the economy in pursuit of full employment and stable prices".[49]

However, prior to the onset of the Crisis, the Fed had been reluctant to mention employment as a separate policy objective. Rather, the preferred approach was to state that maximum employment could best be achieved by achieving price stability.[50]

This reluctance changed in December 2008, when the Fed included for the first time in its policy statement the term "maximum employment" as an objective. In December 2012, the Fed took one step further by targeting a specific unemployment rate of 6.5% as a threshold to start raising interest rates, provided that inflation stays below 2.5%: [51]

> "To support continued progress toward maximum employment and price stability, ... the Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least *as long as the unemployment rate remains above 6-1/2 percent*, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored." *[emphasis added]*

The goal of this may be to offer reassurance that rates will remain low for as long as the economy remains weak (i.e., unemployment above 6.5%). The question remains as to when the U.S. economy is expected to reach this unemployment rate level. The Fed believes that low levels of interest rates are likely to be warranted at least through mid-2015.

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[49] Source: http://www.federalreserve.gov/faqs/about_12594.htm.

[50] Thornton, Daniel L. "The Dual Mandate: Has the Fed Changed Its Objective?" *Federal Reserve Bank of St. Louis Review*, March/April 2012, 94(2), pp. 117-33.

[51] "Federal Reserve issues FOMC statement" December 12, 2012. http://www.federalreserve.gov/newsevents/press/monetary/2012monetary.htm.

Following the height of the Crisis in 2008 and 2009, when approximately 8.7 million jobs were lost in aggregate, the number of new nonfarm payroll jobs has stabilized in positive territory. In 2011 and 2012, nonfarm jobs were added at a monthly average rate of 175,000 (2.1 million ÷ 12 months) in 2011 and 181,000 (2.2 million ÷ 12 months) in 2012.[52] Analysts' estimates vary as to how many new jobs are needed each month to bring about a decline in the unemployment rate, but somewhere within the range of 100,000 to 300,000 seems to be necessary.[53]

In 2012, the official U.S. unemployment rate (U-3) declined from 8.5% in December 2011 to 7.8% in December 2012. By the end of February 2013, the U-3 rate again ticked down slightly to 7.7%.[54]

A broader measure of the U.S. unemployment rate that includes "persons marginally attached to the labor force" (U-6) also declined from 15.2% to 14.4% in 2012. By the end of February 2013, the U-6 rate again ticked down slightly to 14.3%.[55]

However, the "civilian labor force participation rate" also declined from 64.0% in December 2011 to 63.6% in December 2012, suggesting that the decrease in the unemployment rate was (at least in part) due to an increase in people that have become discouraged and no longer are actively seeking employment (see Graph 5). By the end of February 2013, this rate declined again slightly to 63.5%.[56]

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[52] Differences are due to rounding. Monthly average of 181,000 in 2012 was based on 2.17 million payrolls ÷ 12 months.

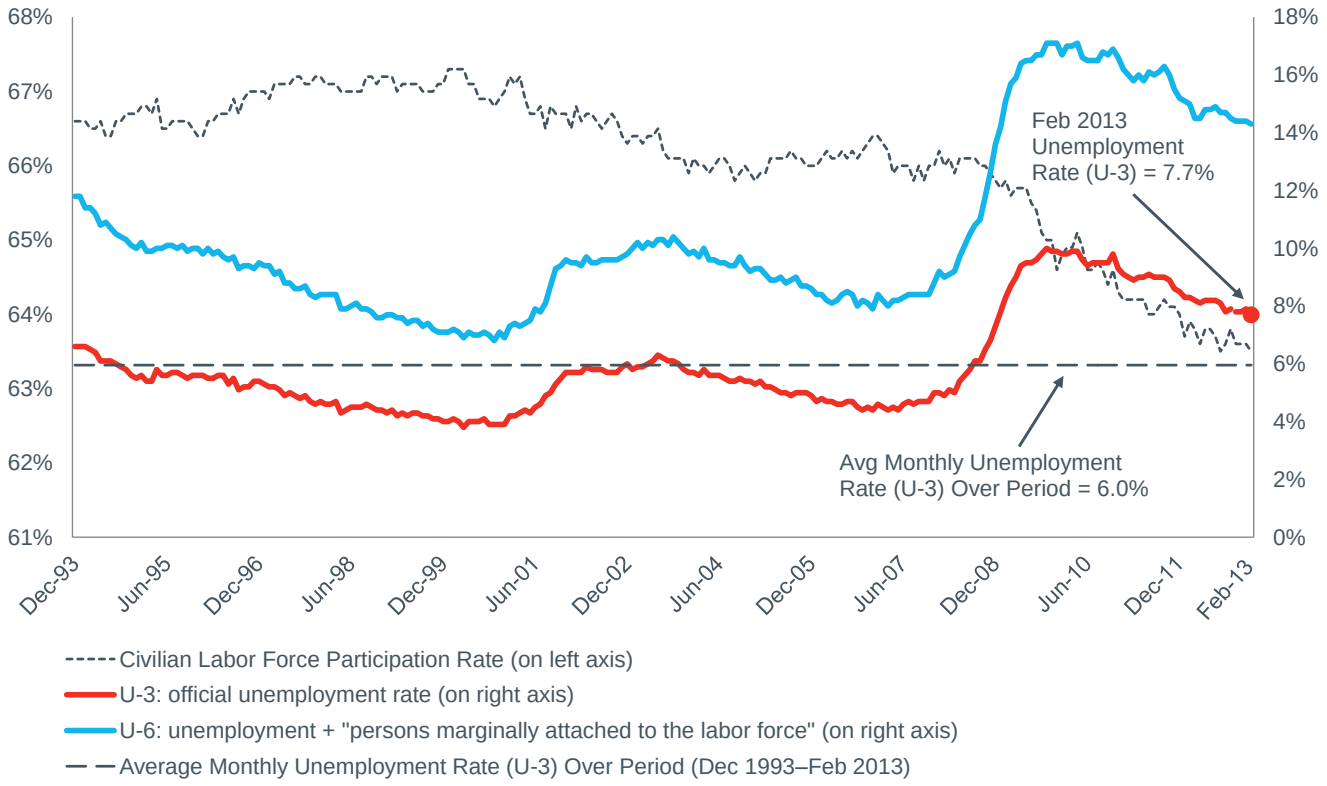
[53] See for example: S&P Capital IQ Lookout Report "Jobs, Conspiracy Theories, And The True State Of The U.S. Economy", October 12, 2012, and "How Many Jobs Should We Be Adding Each Month?", Catherine Rampell, *New York Times Economix Blog* at http://economix.blogs.nytimes.com/2011/05/06/how-many-jobs-should-we-be-adding-each-month/.

[54] The U-3 unemployment rate is defined as "total unemployed, as a percent of the civilian labor force".

[55] The U-6 unemployment rate is defined as "Total unemployed, plus all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force."

[56] The civilian labor participation rate is defined as the "labor force as a percent of the civilian noninstitutional population".

Graph 5: U.S. Official Unemployment Rate (U-3); Unemployment Including "persons marginally attached to the labor force" (U-6); Civilian Labor Force Participation Rate
December 1993–February 2013



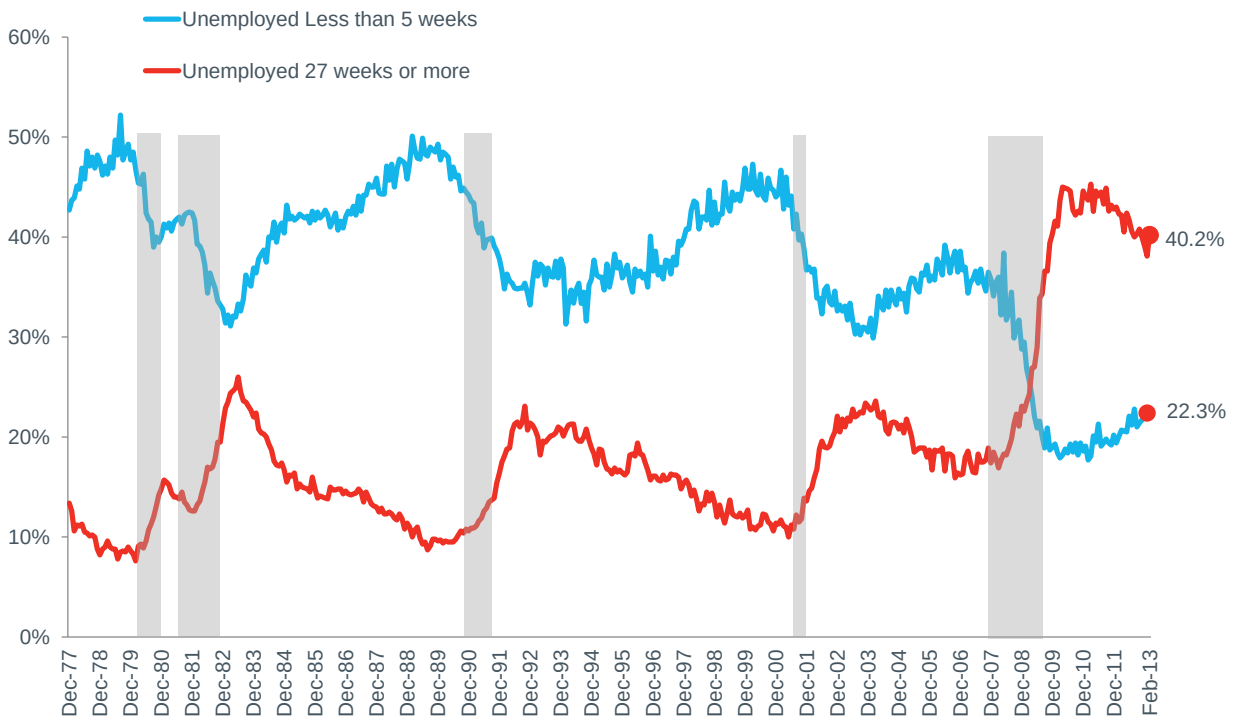
Additionally, despite the improvement seen in U-3 unemployment during 2012, the February 2013 rate (7.7%) was still significantly greater than the average monthly unemployment rate (6.0%) over the 20-year time period examined in Graph 5.[57]

[57] Source of underlying data used in Graph 5: U.S. Department of Labor, Bureau of Labor Statistics (BLS). Whereas U-3 unemployment data is available back to January 1948, "U-6" unemployment data is available only from January 1994.

An aspect of the current employment environment that differs from other recent recessionary periods is the number of long-term unemployed (unemployed for 27 weeks or more). As illustrated in Graph 6, in the four prior recessionary periods since 1980 (the gray shaded areas), the number of shorter-term unemployed (unemployed for less than 5 weeks) was significantly greater than the number of longer-term unemployed.[58, 59]

In the most recent recession, however, this relationship is reversed – the number of longer-term unemployed is significantly *greater* than the number of shorter-term unemployed. This pattern persists even after the latest recession officially ended in June 2009.[60]

Graph 6: Longer-term Unemployment and Shorter-term Unemployment Over Time (recessionary periods shaded in gray) December 1977–February 2013



[58] Sources of underlying data in Graph 6: Unemployment Statistics: U.S. Bureau of Labor Statistics (BLS); recession begin/end date information: the National Bureau of Economic Research (NBER).

[59] Not shown in Graph 6: the percentage of unemployed for 5–14 weeks and 15–26 weeks.

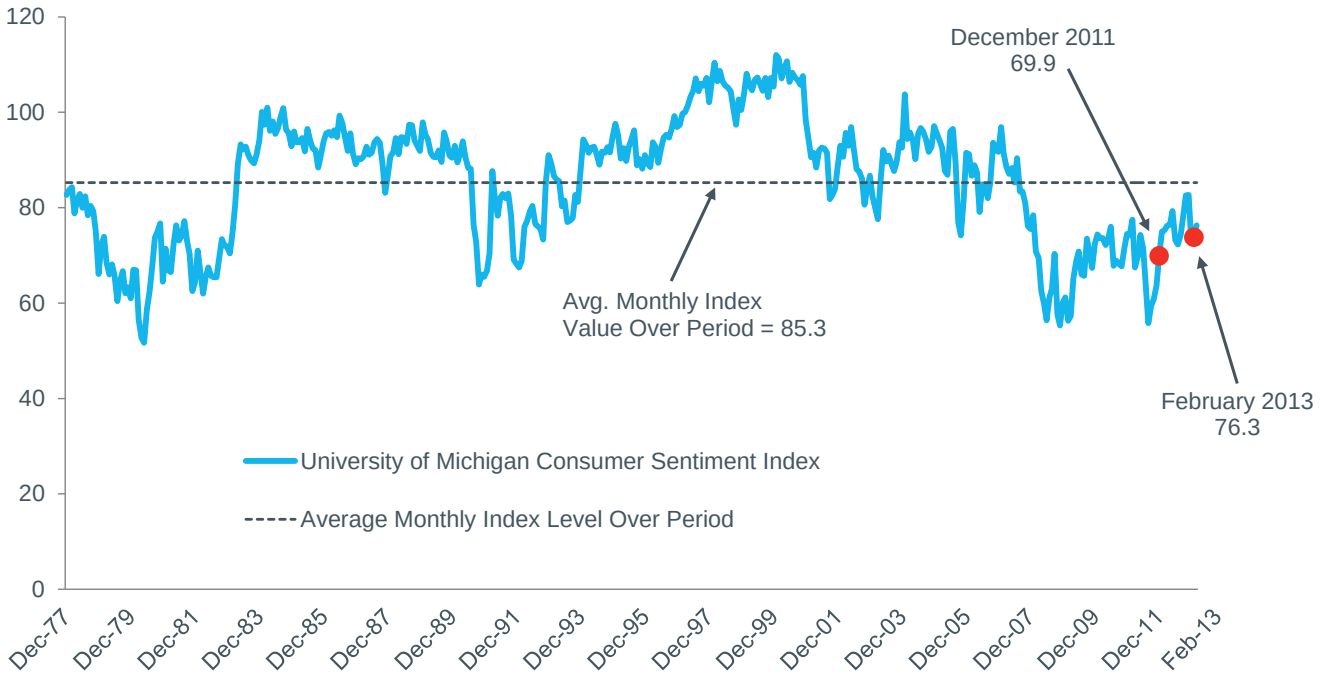
[60] According to the National Bureau of Economic Research (NBER), the latest recession began in December 2007 and ended in June 2009. For more information, visit www.nber.org.

Consumer and Business Sentiment

Consumer and business sentiment surveys attempt to gauge how optimistic (or pessimistic) consumers and business people are about the future. All things held the same, the greater the optimism, the better economic prospects may be (and vice versa) – consumers will tend to spend more and businesses will tend to increase capital expenditures and hiring.

Graph 7 displays the University of Michigan Consumer Sentiment Index over time.[61] Consumer sentiment increased marginally from 69.9 in December 2011 to 72.9 in December 2012. The index has continued to improve through February 2013 (76.3), although this is still considerably lower than the average monthly index level (85.3) over the 35-year plus time period shown.

Graph 7: University of Michigan Consumer Sentiment Index 1978–2013



[61] Source of underlying data used in Graph 7: FRED® Economic Data – Federal Reserve Bank of St. Louis.

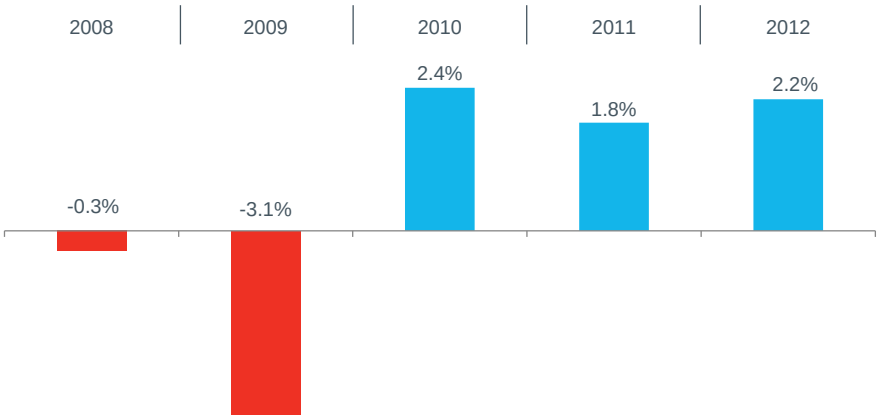
According to the National Federation of Independent Business (NFIB) Research Foundation, its seasonally adjusted small business "Optimism Index" declined from 93.8 in December 2011 to 88.0 in December 2012. By the end of February 2013, this index again improved slightly to 90.8.[62] This number remains significantly below the index average since 1986 (98.1).

In its "Survey of Business Confidence" for the week of February 18th, 2013 Moody's Analytics reported that business confidence rose to its highest level in almost two years. In spite of the bright spot, the report indicated that "expectations regarding the economy's prospects into the summer remain weak. Sentiment is consistent with an economy that is growing at the low end of its potential".[63]

Historical and Forecasted Real GDP Growth

The U.S. economy is continuing to recover from one of its worst recessions in history. As measured by the change in real GDP, the U.S. economy contracted in 2008 and 2009, the height of Crisis, but has been expanding since 2010 (see Graph 8).[64]

Graph 8: U.S. Real Gross Domestic Product (GDP) Growth 2008–2012



[62] "Small Business Confidence Improves a Bit But Is No Sign of a Surge in Confidence", March 2013. http://www.nfib.com/.

[63] "Moody's Analytics Survey of Business Confidence", February 25, 2013: https://www.economy.com/default.asp.

[64] Source of underlying data used in Graph 8: U.S. Department of Commerce Bureau of Economic Analysis: http://www.bea.gov.

Many economists do not expect this trend to change materially in 2013. Table 4 provides a summary of various real U.S. GDP growth estimates for 2013.[65]

Table 4: 2013 U.S. Real GDP Forecasts

2013 Real GDP Forecasts	Forecast (%)
The Livingston Survey	2.1
Survey of Professional Forecasters (SPF)	1.9
Blue Chip Economic Indicators	1.9
Consensus Economics	1.9
Bloomberg U.S. Economic Forecasts	1.8
Average	1.9%

The current recovery falls short of the rebound observed in other post-World War II recessions. Real GDP growth in the year following the recessions of 1957–58, 1973–75, and 1981–82 was on average 5.7%. The three-year period that followed those same recessions registered an average real GDP growth of 4.8%. In contrast, during the three-year period 2010–2012, the U.S. economy grew on average by 2.1%.

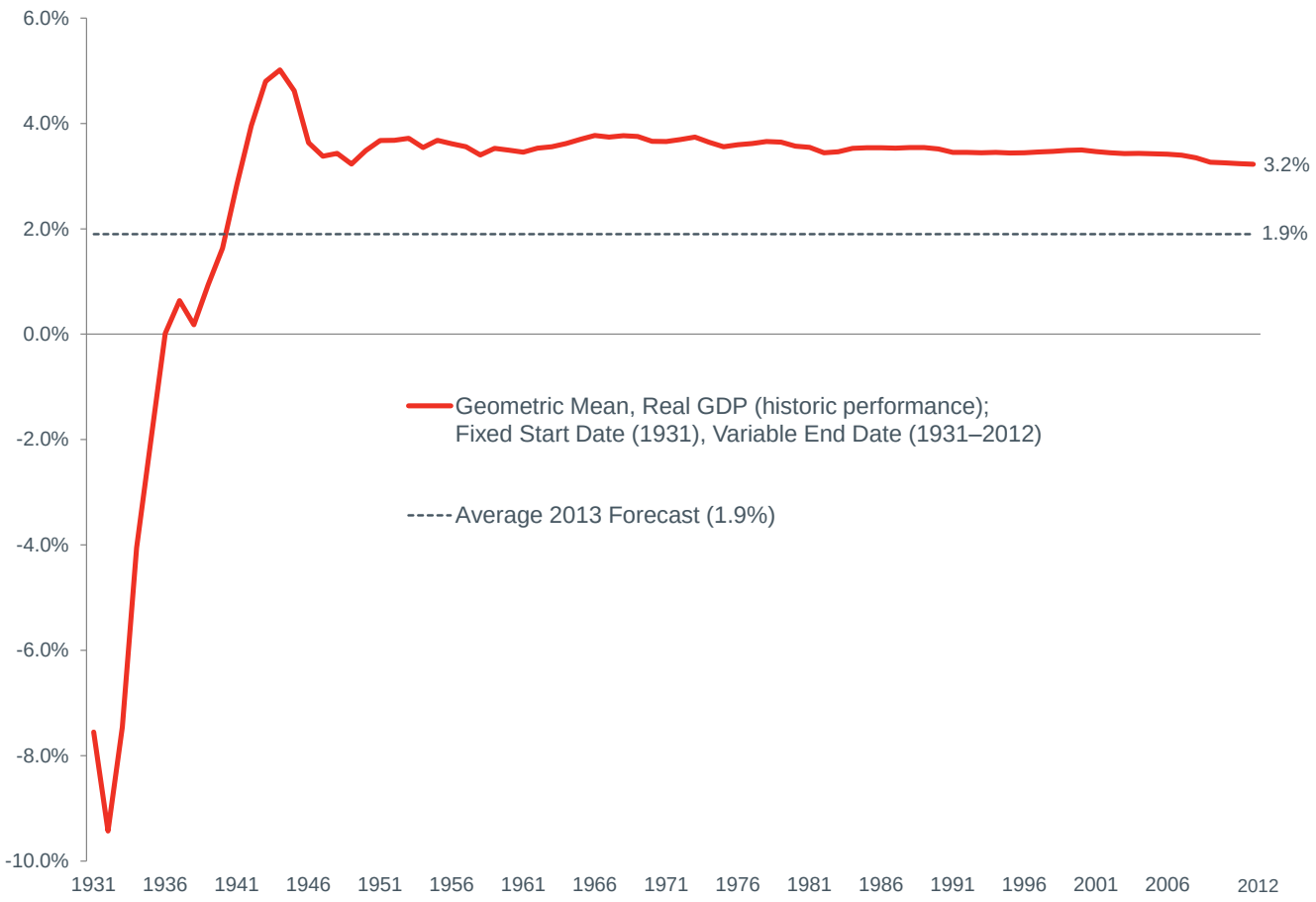
While the U.S. economy has been expanding after 2009, it continues to grow at a moderate pace. The annual real GDP growth rates in the 2010–2012 period (see Graph 8), and the average forecasted 2013 rate of 1.9% (see Table 4), are both significantly below long-term performance of the U.S. economy (see Graph 9)[66]

[65] Sources of information in Table 4: *"Survey of Professional Forecasters: First Quarter 2013"*, Federal Reserve Bank of Philadelphia (February 15, 2013); *"The Livingston Survey: December 2012"*, Federal Reserve Bank of Philadelphia (December 9, 2012); *"Blue Chip Economic Indicators"* Vol. 38, No. 2 (February 10, 2013); *"Consensus Forecast – USA"*, Consensus Economics (February 11, 2013); Bloomberg L.P. U.S. Real GDP Forecast Survey. February 2013. Bloomberg terminal.

[66] Source of underlying data used in Graph 9: U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

In Graph 9, the solid red line represents the long-term annual performance of the U.S. economy, as measured by growth in real GDP. On the far left side of the graph, the first data point is the performance of the economy in 1931, the second data point (moving to the right) is the performance of the economy over the period 1931–1932, and then 1931–1933, etc., until the final data point on (the far right) is the performance of the U.S. economy over the period 1931–2012 (3.2%, annually).

Graph 9: Real GDP Growth, Historic Performance versus Average 2013 Real GDP Growth Forecast (1.9%) 1931–2012



In the fourth quarter of 2012, U.S. growth in real GDP was 0.1%. This feeble rate of growth may indicate that current circumstances are still uncertain. On the positive side, consumer spending, which represents about 70% of the U.S. economy, may be showing some resilience. Real personal consumption expenditures increased 2.1% in the fourth quarter. Business investment also saw solid gains. This may suggest that investors are shrugging off the dismal fourth quarter growth as temporary.

Uncertainty and indecision in regards to the willingness of the United States Congress and the President to address long-term fiscal issues may remain a drag on the U.S. recovery. However, some analysts suggest that the nearer-term impact of the political indecision on some of the fiscal issues of early 2013 (e.g., the so-called "fiscal cliff" and the "sequester") may not be large enough to *derail* the recovery, although the lack of resolution of these issues may slow it down.[67]

50%

The proportion of S&P sovereign credit rating downgrades since December 2011 for nations in the Eurozone + UK

Sovereign Credit Ratings

Spillover effects from a possible further weakening of Eurozone economies could also be a significant risk factor in 2013. Approximately half of the European nations' sovereign risk ratings presented below were downgraded in 2012 and early 2013. (see Table 5a and Table 5b).[68]

[67] See for example, Standard & Poor's "Global Credit Portal – RatingsDirect – Economic Research: U.S. Economic Forecast: Like A Box Of Chocolates", February 19, 2013.

[68] Source of data in Tables 5a and 5b: Standard & Poor's Global Credit Portal.

Table 5a: S&P Credit Ratings of Eurozone Countries and the U.K.
December 2011 versus February 28, 2013

European Countries	S&P Credit Rating as of Dec 31, 2011	S&P Credit Rating as of February 28, 2013	Change
Austria	AAA	AA+	↓
Belgium	AA	AA	–
Cyprus	BBB	CCC+	↓
Estonia	AA-	AA-	–
Finland	AAA	AAA	–
France	AAA	AA+	↓
Germany	AAA	AAA	–
Greece	CC	B-	↑
Ireland	BBB+	BBB+	–
Italy	A	BBB+	↓
Luxembourg	AAA	AAA	–
Malta	A	BBB+	↓
Netherlands	AAA	AAA	–
Portugal	BBB-	BB	↓
Slovakia	A+	A	↓
Slovenia	AA-	A-	↓
Spain	AA-	BBB-	↓
United Kingdom	AAA	AAA	–

Table 5b: Summary of Changes of S&P Credit Ratings for Eurozone Countries and the U.K.
December 2011 versus February 2013

Summary of Changes in Ratings	Count	Percentage of Total
Number of Upgrades (↑)	1	6%
Number of No Changes (–)	8	44%
Number of Downgrades (↓)	9	50%
Total	18	100%

In the U.S., Congress' stalemate in raising the U.S. debt ceiling culminated in S&P's historic decision in August 2011 to downgrade the U.S. sovereign debt rating from AAA to AA+. The other two major rating agencies, Moody's and Fitch did not follow suit.

However, in the absence of Washington addressing current fiscal issues in a meaningful way, speculation has increased that U.S. sovereign credit could be downgraded by other rating agencies.

On January 2, 2013, S&P said that "While Congressional compromise designed to avoid the "fiscal cliff" may support the still-fragile U.S. economic rebound, the compromise doesn't affect our view of the country's credit outlook, given that we believe yesterday's agreement does little to place the U.S.'s medium-term public finances on a more sustainable footing."

On January 10, 2013, Moody's said that the fiscal cliff deal passed on January 1 does not deliver "meaningful improvement" and that "direct effect on U.S. government creditworthiness is marginal". Moody's also said that "…further measures that bring about a downward debt trajectory will likely be needed to support the government's creditworthiness."

And on January 15, 2013, Fitch Ratings said, "In the absence of an agreed and credible medium-term deficit reduction plan that would be consistent with sustaining the economic recovery and restoring confidence in the long-run sustainability of U.S. public finances, the current Negative Outlook on the 'AAA' rating is likely to be resolved with a downgrade later this year even if another debt ceiling crisis is averted."

Additional Considerations

In addition to the general economic factors and financial market conditions described above, Duff & Phelps monitors other indicators that may provide a more quantitative view of where we are within the range of reasonable long-term estimates for the U.S. ERP.

We are currently using the following two models as corroborating evidence to the factors we described above:

- **Damodaran Implied ERP Model** − Professor Aswath Damodaran calculates implied ERP estimates for the S&P 500 and publishes his estimates on his website.[69] Damodaran estimates an implied ERP by first

[69] The description of the Damodaran methodology herein is largely based on Chapter 9 of *Cost of Capital – Applications and Examples*, Fourth Edition, by Shannon Pratt and Roger Grabowski. Additional information and data is available at Professor Damodaran's website at http://pages.stern.nyu.edu/~adamodar/

solving for the discount rate that equates the current S&P 500 index level with his estimates of cash distributions (dividends and stock buybacks) in future years. He then subtracts the current yield on 10-year U.S. government bonds.

At the end of September 2011 the ERP implied by this model approached levels not seen since February 2009. However, in the months following September 2011, the ERP implied by this model has generally decreased. At the end of December 2012, the arithmetic-average ERP implied by this model ranged from 5.04% to 5.26%.[70] At the end of February 2013 this declined to a range between 4.76% and 4.98%

[**Note**: Appendix A summarizes the U.S. ERP implied by the Damodaran model since December 31, 2008.]

- **Default Spread Model –** The Default Spread Model is based on the premise that the long term average ERP (the unconditional ERP) is constant and deviations from that average over an economic cycle can be measured by reference to deviations from the long term average of the default spread (Baa - Aaa).[71] At the end of both December 2012 and February 2013, the conditional ERP calculated using this model was 5.23% and 5.24%, respectively. This model notably removes the risk-free rate itself as an input in the estimation of ERP. However, the ERP estimate resulting from the Default Spread Model is still interpreted as an estimate of the relative return of stocks in excess of risk-free securities.

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[70] These figures are presented after Duff & Phelps adjustments. The ERP estimates (based on this model) that Professor Damodaran publishes are *geometric* average ERP in terms of a 10-year U.S. Government bond. Damodaran calculates his ERP based on a range of varying assumptions, but the two main "headline" ERP estimates utilize: 1.) the average annual cash flow yield (dividends + stock buybacks) of S&P 500 constituent companies from the prior 10 years, and 2.) use the average of the previous 12 months' cash flow yield of S&P 500 constituent companies. Duff & Phelps first converts both of Damodaran's published geometric ERP estimates to an equivalent estimate in terms of normalized yields on 20-year U.S. government bonds and then converts the geometric ERP estimates to their *arithmetic* average equivalents.

[71] The Default Spread Model presented herein is based on Jagannathan, Ravi, and Wang, Zhenyu," The Conditional CAPM and the Cross-Section of Expected Returns," *The Journal of Finance*, Volume 51, Issue 1, March 1996: 3-53. See also Elton, Edwin J. and Gruber, Martin J., Agrawal, Deepak, and Mann, Christopher "Is There a Risk Premium in Corporate bonds?", Working Paper, http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.201.2928. See also: "A Practical Method for Measuring Conditional Equity Risk Premium; the Default Spread Model", by Michael Dobner, ASA (accepted for publication in *Business Valuation Review*). Dobner uses the spread of high-grade corporates against U.S. Treasuries while we use (as did Jagannathan, Ravi, and Wang) the spread of high-grade corporates against lesser grade corporates. We have adopted Dobner's naming conventions for the inputs ($CERP_t$, UCERP, DS_t, LTADS). Corporate bond series used in analysis herein: Barclays US Corp Baa Long Yld USD (Yield) and Barclays US Corp Aaa Long Yld USD (Yield); Source: Morningstar EnCorr.

The formula for the Default Spread Model is straightforward:

$$CERP_t = UCERP + (DS_t - LTADS_t)$$

[equation 3]

Where:

$CERP_t$ = Conditional ERP at time t

UCERP = Unconditional ERP

DS_t = Default spread at time t

$LTADS_t$ = Long term historical average of default spread at time t

[Note: Appendix B summarizes the conditional U.S. ERP (CERP) implied by the Default Spread Model since December 31, 2008.]

While these additional models may be useful in suggesting the direction of changes in the conditional ERP, they are, like *all* methods of estimating the ERP, imperfect. Both the Damodaran model and the default spread model utilize assumptions that are subjective in nature. For example, the Damodaran model assumes a long-term growth rate for dividends and buybacks that is largely a matter of judgment. Likewise, in the default spread model, the changes in spread are applied to a "benchmark" ERP estimate; the choice of that benchmark ERP is largely a matter of judgment.

Again, the inherent “imperfection” of any single ERP estimation model is precisely why we choose to take into account a *broad* range of economic information and *multiple* ERP estimation methodologies to arrive at our conditional ERP recommendation.

Section 05

Conclusion

Conclusion

Duff & Phelps U.S. Equity Risk Premium and Risk-Free Rate Guidance as of February 28, 2013

- Equity Risk Premium: Decrease from 5.5% to 5.0%
- Risk-Free Rate: 4.0% (normalized)
- Base U.S. Cost of Equity Capital: 9.0% (4.0% + 5.0%)

Based on the foregoing, we find evidence to adjust our ERP recommendation relative to our previous guidance issued on January 15, 2012, when the U.S. ERP was adjusted downward (from 6.0% to 5.5%). Since January 15, 2012, while the evidence is somewhat mixed, we see some indications that equity risk in financial markets has declined (Table 6 below).[72]

Table 6: Factors Considered in ERP Recommendation

Factor	Change	Effect on ERP
U.S. Equity Markets	↑	↓
Implied Equity Volatility	↓	↓
Corporate Spreads	↓	↓
Employment Environment	↔	↔
Consumer and Business Sentiment	↔	↔
Historical and Forecasted Real GDP Growth	↔	↔
Sovereign Credit Ratings	↓	↑
Damodaran Implied ERP Model	↓	↓
Default Spread Model	↓	↓

[72] Table 6 is identical to Table 1 (see "Executive Summary"). The factors listed in Table 6 are the factors that were considered the most relevant at the end of February 2013. The factors that Duff & Phelps considers in its monthly review of its ERP recommendation can vary, depending on the economic situation at the time.

Recent economic indicators point to a positive, yet below-pace, recovery of the U.S. economy, with risks of a double-dip recession tempered. Markets reacted positively to these trends in 2012 and early 2013, with broad equity indices (e.g. S&P 500) rising, market volatility declining, and credit spreads of U.S. high-yield over U.S. investment grade corporate bonds narrowing substantially.

Consumer and business sentiment increased slightly in 2012, and improved further in early 2013, but overall sentiment remains below average. The employment environment shows some signs of stabilization, but the unemployment rate and long-term unemployment remain stubbornly elevated. Spillover effects from a possible worsening of the Eurozone sovereign credit crisis and possible further weakening of Eurozone economies are also significant risk factors. In the absence of Washington addressing long-term budgetary issues in a meaningful way, speculation has increased that U.S. sovereign credit could be downgraded by two major rating agencies. Duff & Phelps also monitors two additional "implied ERP" models which indicated a slightly lower ERP at the end of February 2013 (see Appendices A and B).

Ultimately, the quantitative easing measures undertaken by the Fed to stimulate the economy appear to be the catalyst for the current appetite for risk seen in financial markets. Significant risks remain in the U.S. economy but for the time being investors appear to be more confident in equity markets.

Taken together, we find support for lowering our ERP recommendation relative to our previous recommendation.

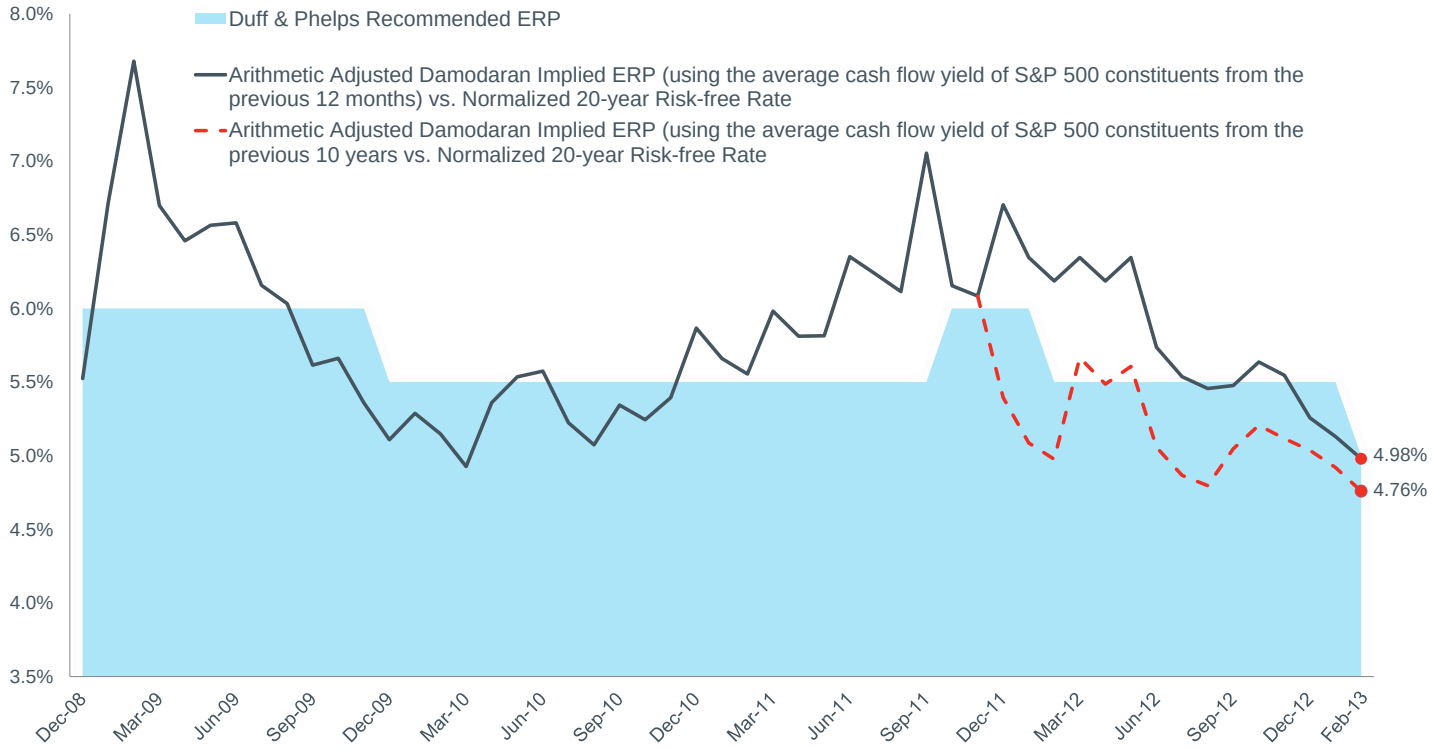
Accordingly, Duff & Phelps recommends a U.S. Equity Risk Premium of 5.0% when developing discount rates as of February 28, 2013 and thereafter, until further guidance is issued.

This recommendation is to be used in conjunction with a normalized risk-free rate of 4.0%. *Normalized* in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

Section 06

Appendices

Appendix A – Damodaran Implied ERP Model



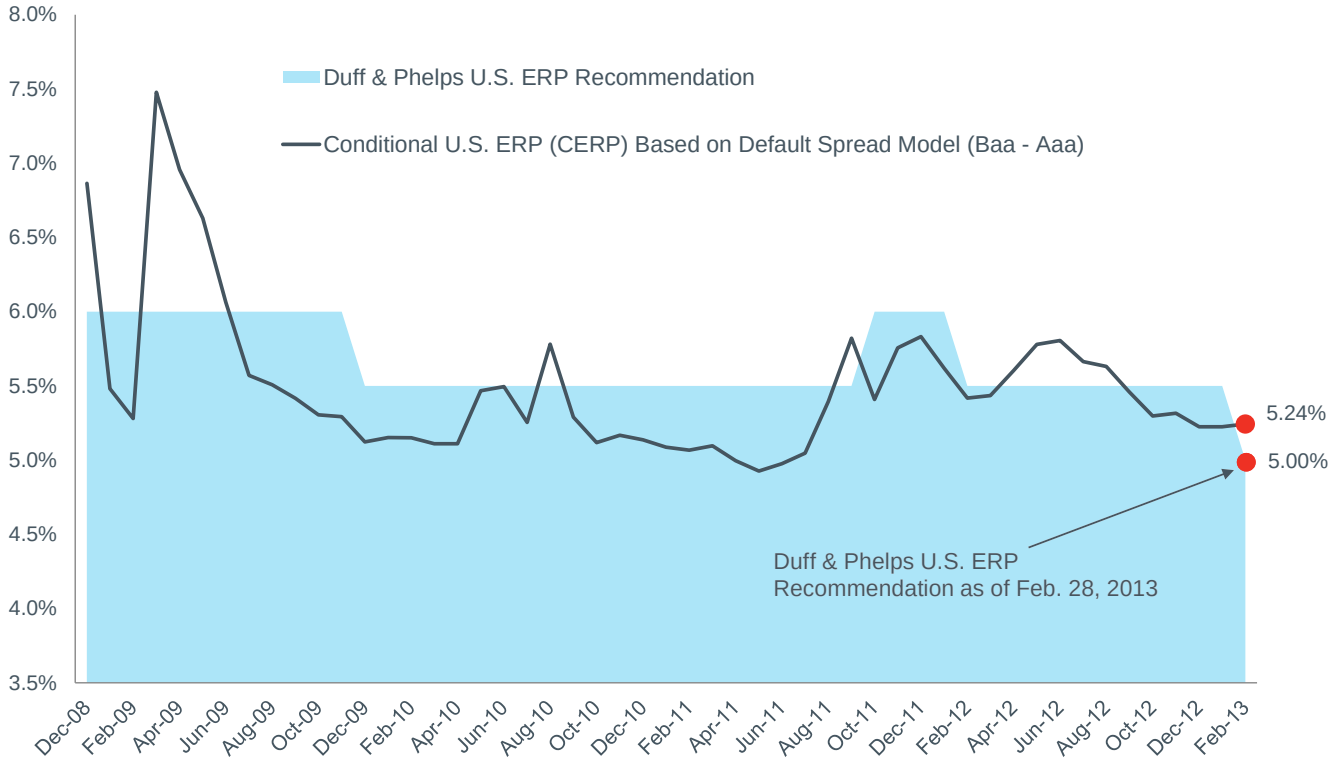
Additional Indicators: The Damodaran Implied ERP Model

The graph illustrates the Damodaran Implied U.S. ERP model over the time period December 2008 through February 2013 (estimated using a "normalized" 20-year U.S. Treasury yield) as compared to the Duff & Phelps U.S. ERP recommendation.

- At the end of February 2013, the U.S. ERP implied by the Damodaran Model was 4.98% using the average cash flow yield of S&P 500 constituents from the *previous 12 months*, and a normalized 4.0% risk free rate.
- At the end of February 2013, the U.S. ERP implied by the Damodaran Model was 4.76% using the average cash flow yield of S&P 500 constituents from the *previous 10 years*, and a normalized 4.0% risk free rate.

Duff & Phelps regularly reviews fluctuations in global economic and financial conditions that warrant periodic reassessments of ERP. As of February 28, 2013, Duff & Phelps' U.S. ERP recommendation is 5.0%, used in conjunction with a 4.0% normalized risk-free rate.

Appendix B – Default Spread Model



Additional Indicators: The Default Spread Model

The graph illustrates the Default Spread Model used to estimate a conditional U.S. ERP (CERP) over the time period December 2008 through February 2013 as compared to the Duff & Phelps U.S. ERP recommendation. This model notably removes the risk-free rate itself as an *input* in in the estimation of ERP. However, the ERP estimate resulting from the Default Spread Model is still interpreted as an estimate of the relative return of stocks *in excess* of risk-free securities.

- At the end of December 2012 and February 2013, the U.S. ERP implied by the Default Spread Model was 5.23% and 5.24%, respectively.

Duff & Phelps regularly reviews fluctuations in global economic and financial conditions that warrant periodic reassessments of ERP. As of February 28, 2013, Duff & Phelps' U.S. ERP recommendation is 5.0%, used in conjunction with a 4.0% normalized risk-free rate.

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