
Equity Risk Premium: 2006 Update

by Roger J. Grabowski, ASA

Are you aware of recent research questioning the use of those realized equity premiums as an estimate of the equity risk premium (ERP)?^{1,2} Or do you simply choose to ignore the research?

ERP is a forward-looking concept. ERP is an expectation as of the valuation date for which no “market quotes” are observable. While you can observe premiums realized over time by referring to historical data, such calculated premiums serve only as estimates for the *expected* ERP. If we are to truly mimic the market, then our goal should be to estimate the true expected ERP as of the valuation date. To do that you need to look beyond the realized premiums.

While there is no one universally accepted standard for estimating ERP, you need to be aware of recent research and not blindly continue using the historical realized equity premiums reported in the *SBBI Yearbook*. The methods used can be broadly categorized into one of two approaches: the Realized Return or *ex post* approach and the Forward-looking or *ex ante* approach.

Ex Post Approach

The realized return approach employs the premium that investors have, on the average, realized over some historical holding period (historical realized premium). The underlying theory is that the past provides an indicator of how the market will behave in the future, and investors’ expectations are influenced by the historical performance of the market. If periodic (say, monthly) returns are serially independent (i.e., not correlated) and if expected returns are stable through time, the arithmetic average of historical returns provides an unbiased estimate of expected future returns. A more indirect justification for use of the historical approach is the contention that, for whatever reason, securities in the past have been priced in such a way as to earn the returns observed. By using the historical realized premium in applying the income approach to valuation

¹ Readers interested in more detailed information on the ERP issue are invited to attend the American Society of Appraisers’ Center for Advanced Business Valuation Studies Cost of Capital course and to read Grabowski and King, Chapter 1, “Equity Risk Premium” in *The Handbook of Business Valuation and Intellectual Property Analysis*, (McGraw-Hill, 2004); “Equity Risk Premium: What Valuation Consultants Need to Know About Current Research” *Valuation Strategies* (Sept/Oct 2003); “Equity Risk Premium: What Valuation Consultants Need to Know About Current Research – 2005 Update” *Valuation Strategies* (Sept/Oct 2005); “Equity Risk Premium – What is the Current Evidence”, *Business Valuation Review* (Fall 2005)

² The equity risk premium (ERP) (sometimes referred to as the market risk premium) is defined as the extra return (over the expected yield on government securities) that investors expect to receive from an investment in a diversified portfolio of common stocks. $ERP = R_m - R_f$ where R_m is the expected return on a fully diversified portfolio of equity securities and R_f is the rate of return expected on an investment free of default risk.

(i.e., in the discounted cash flow valuation method), one may, to some extent, replicate this level of pricing.

Academics often formulate their research in terms of the equity risk premium relative to Treasury bills. But the variability of Treasury bill returns is such that one can hardly consider them riskless. Further we are generally valuing closely held businesses. Those investments are generally thought of as long-term and long-term government bonds are the benchmark security we use in developing discount rates. Therefore, in this article we have reported the research results in terms of the premium over long-term government bonds in calculating the historical realized premium.³

In applying the realized return method, the analyst selects the number of years of historical return data to include in the average. One school of thought holds that the future is best estimated using a very long horizon of past returns. Another school of thought holds that the future is best measured by the (relatively) recent past. These differences in opinion result in disagreement as to the number of years to include in the average.

While the *SBBI Yearbook*⁴ contains summaries of returns on U.S. stocks and bonds derived from data accumulated by the Center for Research in Security Prices (CRSP) at the University of Chicago since 1926, good stock market data is available back to 1871, and less reliable data is available from various sources back to the end of the eighteenth century. Data for yields on government bonds is also available for these periods.⁵ Exhibit 1 displays realized average annual premiums of

³ In applying the ERP in, say, the CAPM, one must use the return on a risk-free security with a term (maturity) consistent with the benchmark security used in developing the ERP. For example, this article measures ERP in terms of the premium over that of long-term government bonds. In CAPM, $k_e = R_f + (\text{Beta} \times \text{ERP})$. The R_f used as of the valuation date should be the yield on a long-term government bond because the data cited herein has been developed comparing equity returns to the income return (i.e., the yield promised at issue date) of long-term government bonds.

⁴ *Stocks, Bonds, Bills and Inflation Valuation Edition 2006 Yearbook* (Ibbotson Associates, 2006)

⁵ See Fisher and Lorie, “Rates of Return on Investments in Common Stocks,” 37–1 *Journal of Business* (1964); Wilson and Jones, “A Comparison of Annual Stock Market Returns: 1871–1925 with 1926–1985,” 60–2 *Journal of Business* 1 (1987); Schwert, “Indexes of Common Stock Returns from 1802 to 1987,” 60–3 *Journal of Business* 239 (1990); Ibbotson and Brinson, *Global Investing* (McGraw-Hill, 1993); Wilson and Jones, “An Analysis of the S&P 500 Index and Cowles’s Extensions: Price Indexes and Stock Returns, 1870–1999,” 75–3 *Journal of Business* 505 (2002); Wright, “Measures of Stock Market Value and Returns for the US Nonfinancial Corporate Sector, 1900–2000,” working paper, 2/1/02.; Goetzmann, Ibbotson and Peng, “A new historical database for the NYSE 1815 to 1925: Performance and Predictability”, *Journal of Financial Markets* 4 (2001) 1–32; Dimson, Marsh and Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* (Princeton University Press, 2002) with annual updates of their Global Returns database for seventeen countries including the U.S. available at www.ibbotson.com.

Exhibit 1

Historical Realized Equity Risk Premiums: Stock Market Returns vs. Treasury Bonds (Income Returns)

Period	Arithmetic (%)	Geometric (%)
20 years (since 1986)	6.4	5.1
30 years (since 1976)	6.0	4.9
40 years (since 1966)	4.2	2.9
50 years (since 1956)	5.0	3.8
80 years (since 1926)	7.1	5.2
106 years (since 1900)	6.7	4.9
134 years (since 1872)	5.9	4.3
208 years (since 1798)	5.1	3.6

stock market returns (relative to the income return on long-term government bonds) for alternative periods through 2005.

The historical realized premium is measured by comparing the stock market returns realized during the period to the income return on bonds. While the stock market return is not known when investing at the beginning of the period, the rate of interest promised on a long-term government bond is known in terms of the yield to maturity. Therefore, analysts measure the stock market returns realized over the expected returns on bonds. An investor makes a decision to invest in the stock market today by comparing the expected return from that investment to the return on a benchmark security (in this case the long-term government bond) given the rate of return today on that benchmark security. The realized return approach is based on the expectation that history will repeat itself and such a premium return will again be realized (on the average) in the future.

Selection of the Observation Period

The historical realized premium derived from realized returns is sensitive to the period chosen for the average. For example, if one includes in the average only observed premiums in the immediate past period, that *ex post* premium may be the inverse of the *ex ante* estimate analysts are looking to develop. Almost all practitioners who use historical data focus on a longer-run view of historical returns. But selection of the period over which to measure those returns is key.

The selection of 1926 as a starting point is a happenstance of the arbitrary selection of that date by the founders of the CRSP database. The average calculated using 1926 return data as a beginning point may be too heavily influenced by the unusually low interest rates during the 1930s to mid-1950s. Some observers have suggested that the period, which includes the 1930s, 1940s, and the immediate post-World War II boom period may have exhibited an unusually high average

Exhibit 2

Historical Realized Returns: Relative Volatility of Stock Returns to Bond Returns

	Realized Equity Risk premiums over Treasury Bond Income Returns Nominal (i.e., without inflation removed)	
	1926–1957	1958–2005
Arithmetic averages (%)	9.5	5.4
Geometric average (%)	6.6	4.2
Standard Deviations		
Stock Market annual returns (%)	24.8	16.7
Long-term Treasury Bond		
Income Returns (%)	0.5	2.4
Total Returns (%)	4.9	11.0
Ratio of Equity to Bond		
Total Return Volatility	5.1	1.5

Source: Ibbotson Associates' data; calculations by author.

realized return premium. If we disaggregate the 80 years reported in the *SBBI Yearbook* into two sub-periods, the first covering the periods before and after the mid-1950s, we get the following comparative figures for stock and bond returns as shown in Exhibit 2.

The period since the mid-1950s has been characterized by a more stable stock market and a more volatile bond market compared to the earlier period. Interest rates have become more volatile in the later period.⁶ The effect is amplified in the volatility of bond total returns.⁷ This data indicates that the *relative* risk of stocks versus bonds is lower today which indicates that the equity risk premium is likely lower today. Thus, the historical arithmetic average realized premium reported in the *SBBI Yearbook* as measured from 1926 likely overstates expected returns as of 2006.

If the average expected return on stocks has changed through time, averages of realized returns using the longest available data become questionable. A short-run horizon may give a better estimate if changes in economic conditions have created a different expected return environment than that of more remote past periods. For example, why not use the average realized return over the past 20-year period? A drawback of using averages over shorter periods is that they are susceptible to large errors in measuring the true ERP due to high volatility of annual stock returns. Also, the average of the realized

⁶ As reflected in Ibbotson Associates' Long-term Treasury Bond Income Return statistics.

⁷ As reflected in Ibbotson Associates' Long-term Treasury Bond Total Returns which include the capital gains and losses associated with interest rate fluctuations.

premiums over the past 20 years may overstate today's expected returns due to the general downward movement of interest rates since 1981.

Even using long-term observations, the volatility of annual stock returns is high. For example, the standard deviation of the realized average return for the entire 80-year period 1926–2005 is approximately 20%. Even assuming that the 80-year average gives an unbiased estimate, a 95% confidence interval for the unobserved true ERP still spans a range of approximately 2.7% to 11.5%.

Which Average—Arithmetic or Geometric?

Realized return premiums measured using geometric (compound) averages are always less than those using the arithmetic average. The choice between which average to use remains a matter of disagreement among practitioners. The arithmetic average receives the most support in the literature,⁸ other authors recommend a geometric average,⁹ and still others support something in between.¹⁰ The use of the arithmetic average relies on the assumption that (1) market returns are serially independent (not correlated) and (2) the distribution of market returns is stable (not time-varying). Under these assumptions, an arithmetic average gives an unbiased estimate of expected future returns. Empirical studies generally indicate a fairly low degree of serial correlation, supporting use of the arithmetic average. Moreover, the more observations, the more accurate the estimate will be.

But even if one agrees that stock returns are serially independent, the arithmetic average of one-year realized premiums may not be the best estimate of future premiums. Textbook models of stock returns (e.g., CAPM) are generally single period models that estimate returns over unspecified investment horizons. As the investment horizon increases, the arithmetic average of realized premiums decreases asymptotically to the geometric average of the entire realized premium series. As a result, some recommend using the mid-point of the arithmetic average

of one-year realized premiums and the geometric average of the entire realized premium series as the best estimate of the future premiums when one is using historical realized premiums as the basis for their future ERP estimate.¹¹

Expected ERP versus Realized Equity Premiums

Much has recently been written comparing the realized returns as reported in sources such as the *SBB* *Yearbook* with the ERP that must have been expected by investors given the underlying economics of publicly traded companies (i.e., expected growth in earnings or expected growth in dividends) and the underlying economics of the economy (i.e., expected growth in Gross Domestic Product). Such studies conclude that investors could not have expected as large an ERP as the equity premiums actually realized.

Roger Ibbotson and Peng Chen report on their study of estimated forward looking long-term sustainable equity returns and expected ERPs.¹² They first analyzed historical equity returns by decomposing returns into factors including inflation, earnings, dividends, price-to-earnings ratio, dividend-payout ratio, book value, return on equity, and gross domestic product per capita. They forecast what could have been expected as an ERP through “supply side” models built from historical data. In the most recent update to this study reported in the *SBB* *Yearbook*, Ibbotson Associates determined that the long-term ERP that could have been expected given the underlying economics was approximately 6.3% on an arithmetic basis (4.2% on a geometric basis) compared to the historical realized risk premium of 7.1% on an arithmetic basis (5.2% on a geometric basis). The greater-than-expected historical realized equity returns were caused by an unexpected increase in market multiples relative to economic fundamentals (i.e., decline in the discount rates).

What caused the decline in discount rates that led to the unexpected capital gain? The marginal income tax rate declined (the marginal tax rate on corporate distributions averaged 43% in the 1955–1962 period and averaged only 17% in the 1987–2000 period), and equity investments could not be held “tax free” in 1962. By 2000 however, equity investment could be held “tax deferred” in defined benefit and contribution pension plans and in individual retirement accounts. The decrease in income tax rates on corporate distributions and the inflow of retirement plan investment capital into equity

⁸ E.g., Kaplan, “Why the Expected Rate of Return is an Arithmetic Average,” 14–3 *Business Valuation Review* 126, (September 1995); *Stocks, Bonds, Bills and Inflation Valuation Edition 2005 Yearbook*, (Ibbotson Associates, 2005) pp 75–77; Kritzman, “What Practitioners Need to Know About Future Value,” 50–3 *Financial Analysts Journal* 12 (May/June 1994); Bodie, Kane, and Marcus, *Investments* (Richard D. Irwin, Inc., 1989) p. 720.

⁹ E.g., Damodaran, *Investment Valuation, 2nd ed.* (John Wiley & Sons, Inc., 2002) p. 161.

¹⁰ Copeland, Koller and Murrin, *Valuation: Measuring and Managing the Value of Companies, 3rd ed.* (John Wiley & Sons, Inc., 2000) p. 218; Koller, Goedhart and Wessels, *Valuation: Measuring and Managing the Value of Companies, 4th ed.* (John Wiley & Sons, Inc., 2005), p. 299–302; Cornell, *The Equity Risk Premium* (John Wiley & Sons, Inc., 1999) p. 36; Julius, “Market Returns in Rolling Multi-Year Holding Periods: An Alternative Interpretation to Ibbotson Data,” 15–2 *Business Valuation Review* 57 (June 1996).

¹¹ Note 10, *supra*.

¹² Ibbotson and Chen, “Long-Run Stock Returns, Participating in the Real Economy,” 591 *Financial Analysts Journal* 88 (January/February 2003) updated in *Stocks, Bonds, Bills and Inflation, Valuation Edition 2006 Yearbook* (Ibbotson Associates, 2006) p 98.

investments combined to lower discount rates and increase market multiples relative to economic fundamentals.¹³

Assuming that investors did not expect such changes, the true ERP during this period has been less than the historical realized premium calculated as the arithmetic average of excess returns realized since 1926. Further, assuming that the likelihood of changes in such factors being repeated are remote and investors do not expect another such decline in discount rates, the true ERP as of today can also be expected to be less than the historical realized premium.

Ex Ante Approaches

Merrill Lynch publishes “bottom-up” expected return estimates for the S&P 500 stock index derived from averaging return estimates for stocks in the S&P 500. While Merrill Lynch does not cover every company in the S&P 500 index, it does cover a high percentage of the companies as measured in market value terms. Merrill Lynch uses a multi-stage dividend discount model (DDM) to calculate expected returns for several hundred companies using projections from its own securities analysts. The resulting data is published monthly in the Merrill Lynch publication *Quantitative Profiles*. The Merrill Lynch expected return estimates have indicated an implied ERP ranging from 3% to 7% in recent years (approximately 6.6% at the end of 2005), with an average over the last 15 years of approximately 4.6%.¹⁴

Graham and Harvey report the results from a series of surveys of chief financial officers of U.S. corporations conducted from mid-2000 to the end of 2005. They report that the range of ERP given a ten-year investment horizon was 3.6% to 4.7% (premium over ten-year

Treasury bonds). The most recent survey reports an ERP given a ten-year investment horizon was 4.7% on an arithmetic average basis (2.4% on a geometric average basis).¹⁵

Elroy Dimson, Paul Marsh and Mike Staunton studied the realized equity returns and historical equity premiums for 17 countries (including the U.S.) from 1900 to the end of 2005.¹⁶

These authors report that the historical equity premiums have been 6.5% on an arithmetic basis (4.6% on a geometric basis) for the U.S. (in excess of the total return on bonds) and 5.2% on an arithmetic basis (4.0% on a geometric basis) for the total of the 17 countries.

They observe larger equity returns earned in the second half of the 20th century compared to the first half due to (1) corporate cash flows growing faster than investors anticipated fueled by rapid technological change and unprecedented growth in productivity and efficiency, (2) transaction and monitoring costs falling over the course of the century, (3) inflation rates generally declining over the final two decades of the century and the resulting increase in real interest rates, and (4) required rates of return on equity declining due to diminished business and investment risks. They conclude that the observed increase in the overall price-to-dividend ratio during the century is attributable to the long-term decrease in the required risk premium and that the decrease will not continue into the future. The authors note that:

Further adjustments should almost certainly be made to historical risk premiums to reflect long-term changes in capital market conditions. Since, in most countries corporate cash flows historically exceeded investors’ expectations, a further downward adjustment is in order.

They conclude that a downward adjustment in the expected ERP compared to the historical equity premiums due to the increase in price/dividend ratio is reasonable. Further, they conclude that a further downward adjustment in the expected ERP of approximately 50 to 100 basis points is plausible if one assumes that the current level of dividend yield will continue (versus the greater historical average yield).

Removing the historical increase in the price/dividend ratio and adjusting the historical average dividend yield to today’s dividend yield results in an expected equity premium (relative to bonds) of approximately 4.8% - 5.3% on an arithmetic basis (2.8% - 3.3% on a geometric basis) for the U.S. and 3.5% - 4.0% on an arithmetic

¹³ McGrattan and Prescott, “Is the Market Overvalued?” *Federal Reserve Bank of Minneapolis Quarterly Review* (24,2000) and “Taxes, Regulations and Asset Prices,” Federal Reserve Bank of Minneapolis working paper 610 (July, 2001).

¹⁴ Use of analyst projections leads one to the literature on analyst projection bias (i.e., are analyst forecasts overly optimistic?). For example, see Ramnath, Rock and Stone, “Value Line and I/B/E/S earnings forecasts”, working paper (Nov 2001). Those authors reports the results of projected earnings amounts, rather than growth rates (they use the I/B/E/S longterm growth rate to project the EPS four years into the future, and compares this with the actual EPS four years in the future. The results indicate that I/B/E/S mean forecast error in year 4 EPS is negative. This can be translated into a preliminary typical growth rate adjustment for say a projected 15% growth rate follows: $((1.15^4)(1-.0545))^{.25} - 1 = 13.4\%$, implying a ratio of actual to forecast of $.134/.15 = .89$. This would imply that equity risk premium forecasts using analyst forecasts are biased high. See also, Bonini, Zanetti and Bianchini, “Target Price Accuracy in Equity Research”, working paper (Jan 2006).

¹⁵ Graham and Harvey, “Expectations of Equity Risk Premia, Volatility and Asymmetry from a Corporate Finance Perspective,” National Bureau of Economic Research working paper, December 2001, updated quarterly by *Duke CFO Outlook Survey* (www.cfosurvey.org); “The Equity Risk Premium in January 2006: Evidence from the Global CFO Outlook Survey”, Dec 19, 2005.

¹⁶ Dimson, Marsh and Staunton, “Global Evidence on the Equity Premium,” 15–4 *The Journal of Applied Corporate Finance* (Summer 2003); “The Worldwide Equity Premium: A Smaller Puzzle”, April 7, 2006; *The Global Investment Returns Yearbook 2006* (ABN-AMRO/ London Business School, 2006)

basis (2.4% - 2.9% on a geometric basis) for a world index (denominated in U.S. dollars for 17 countries).¹⁷

The *SBBI Yearbook* reports on an update to the work authored by Roger Ibbotson and Peng Chen, forecasting ERP based on the contribution of earnings growth to price to earnings ratio growth and on growth in per capital gross domestic product (a “supply side” approach).¹⁸ They remove the increase in historical returns due to the overall increase in price-to-earnings ratio from 1926 to 2005 resulting in an estimate of ERP at the end of 2005 of approximately 6.3% on an arithmetic basis (4.2% on a geometric basis).

William Goetzmann and Roger Ibbotson commenting on the supply side approach of estimating expected risk premiums note:

These forecasts tend to give somewhat lower forecasts than historical risk premiums, primarily because part of the total returns of the stock market have come from price-earnings ratio expansion. This expansion is not predicted to continue indefinitely, and should logically be removed from the expected risk premium.¹⁹

Tim Koller, Marc Goedhart, and David Wessels conclude on their assessment of the research and evidence:

Although many in the finance profession disagree about how to measure the (ERP), we believe 4.5 to 5.5 percent is the appropriate range.²⁰

Conclusion

Estimating the ERP is one of the most important issues when you estimate the cost of capital of the subject business. One needs to consider a variety of alternative sources including examining realized returns over various periods and employing forward-looking estimates such as those implied from projections of future prices, dividends, and earnings.

What is a reasonable estimate of ERP in 2006? While giving consideration to long-run historical arithmetic averages realized returns, this author concludes that the post-1925 historical arithmetic average of one-year real-

ized premiums as reported in the *SBBI Yearbook* results in an expected ERP estimate that is too high. I come to that conclusion based on the works of various researchers (e.g., Dimson, Marsh and Staunton, Goetzmann and Ibbotson) and current market expectations (e.g., survey of chief financial officers).

Some appraisers express dismay over the necessity of considering a forward ERP since that would require changing their current “cookbook” practice of relying exclusively on the post-1925 historical arithmetic average of one-year realized premiums reported in the *SBBI Yearbook* as their estimate of the ERP. My reply – valuation is a forward-looking concept, not an exercise in mechanical application of formulas. Correct valuation requires applying value drivers reflected in today’s market pricing. Our role is to mimic the market. In the experience of this author, one often cannot match current market pricing for equities using the post-1925 historical arithmetic average of one-year realized premiums as the basis for developing discount rates. The entire appraisal process is based on applying reasoned judgment to the evidence derived from economic, financial and other information and arriving at a well reasoned opinion of value. Estimating the ERP is no different. I challenge all appraisers to look at the evidence.

After considering the evidence, any reasonable long-term estimate of the *normal* ERP as of 2006 should be in the range of 3.5% to 6%.²¹

Roger Grabowski is a Managing Director of Duff & Phelps LLC in Chicago, IL. This author wants to thank Ryan Brown and David Turney of Duff and Phelps and my former colleague, David King, for their assistance. But I accept full responsibility for the final form of the paper. Moreover, this work should not be construed as representing the official organization position of any organization.

¹⁷ Based on this author’s converting premium over total returns on bonds as reported by Dimson, Marsh and Staunton, removing the impact of the growth in price-dividend ratios from the geometric average historical premium, reducing the historical average dividend yield to a current dividend yield and converting to an approximate arithmetic average.

One method of converting the geometric average into an arithmetic average is to assume the returns are independently log-normally distributed over time. Then the arithmetic and geometric averages approximately follow the relationship: Arithmetic average of returns for the period = Geometric average of returns for the period + (variance of returns for the period/2).

¹⁸ Note 12, *supra*; Ibbotson, “Equity Risk Premium Forum,” AIMR, 11/8/01, pp. 100–104, 108.

¹⁹ Goetzmann and Ibbotson, “History and the Equity Risk Premium”, Yale ICF Working Paper No. 05–04 (April 2005), p 8.

²⁰ Note 10, *supra*: Koller et al., p 306.

²¹ Where in this range is the current ERP? Research has shown that ERP is cyclical during the business cycle. When the economy is near or in recession (and reflected in relatively recent low returns on stocks), the *conditional* ERP is more likely at the higher end of the range. When the economy improves (with expectations of improvements reflected in higher stock returns), the *conditional* ERP moves toward the mid-point of the range. When the economy is near its peak (and reflected in relatively recent high stock returns), the *conditional* ERP is more likely at the lower end of the range. This author will let the reader decide where his valuation date lies in the business cycle.