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Estimating the Required Return In a World of Heightened Uncertainty: Emphasizing the Equity Risk Premium

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In a World of Heightened Uncertainty

Emphasizing the Equity Risk Premium

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Financial Services Forum
College of Management
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Financial Services Forum

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INTRODUCTION

Heightened uncertainty over the past five years--due to the bursting of the NASDAQ bubble, the recession of 2001, the September 11th attacks, accounting scandals, and the oil shocks of 2005--has brought new challenges for securities analysts and portfolio managers. This observation is particularly relevant for fundamental equity managers using price relative and/or discounted cash flow (DCF) models.[1] While correctly worrying about values of cash flow input (dividends, free cash flow, economic earnings) to DCF models, portfolio managers must be especially aware of risk factors that impact the required return or discount rate, and relatedly, market valuation multiples. This discount rate concern is evident in the stock prices of several large cap, "blue-chip" companies (for examples, Coca-Cola, General Electric, Pfizer, and Wal-Mart), whose stock market performance in recent years has been flat, despite a wide variation in interest rates over the December 1999 to March 2005 period and profits and cash flows rising.[2]

We discuss how a better understanding of the discount rate and its components can be used to explain stock market conditions and to provide insight on the possible future direction of stock prices. We begin with an economic profit (EVA[3]) approach to estimating the required return in the context of an equity-risk buildup model. We then use the model to explain the sensitivity of a stock's intrinsic value to changes in the required return and how the overall equity duration effect could explain flat price performance during a period of falling (rising) equity discount rates, which impacts high quality/growth stocks more than low quality/low growth stocks. Following that, we examine the pricing role of the discount rate using empirical inputs over the December

1999 to March 2005 period. We begin the analysis with a look at pricing effects of the risk free rate over the past five years. This assessment includes a period of falling interest rates (measured by 5-year Treasury yields) from December 1999 to June 2003 to a period of rising interest rates from July 2003 to March 2005.

Next, we examine the pricing role of the equity risk premium over the tumultuous five years, namely, December 1999 to March 2005, and how it has behaved relative to the risk free rate over longer time frames. This includes a pricing assessment of (1) the base (or non-diversifiable) equity risk premium to the highest quality stocks within the U.S. equity market as reflected in the ACE50 portfolio,[4] an "approximately earnings certain portfolio of 50 high earnings quality companies" and, (2) an assessment of a company specific risk premium, which in our equity risk buildup model is driven by incremental fundamental factors (size, leverage) and economic profit volatility considerations. We then close with an overview of how an economic profit approach to securities analysis--with its three-prong focus on the return on capital (operating condition), the required return (risk profile as explained in this paper), and the capital growth rate (a reflection of future growth opportunities)--can provide insight to portfolio managers in a world of heightened risk and uncertainty.

ESTIMATING THE REQUIRED RETURN

There are several practical approaches to estimating the required return. These include the traditional CAPM, the Gordon Growth Model, APT, and the bond-yield buildup approach.[5] We use a modified discount rate approach where the risk factors are based on traditional fundamental factors such as size and leverage as well as economic profit risk

considerations. Our EVA-based, equity-risk buildup model is comprised of the sum of three elements: (1) the risk free rate of interest (5-year Treasury yield), (2) a base equity risk premium for an earnings certainty portfolio (ACE), and (3) a company specific risk premium which is driven by fundamental factors including size, leverage, and economic profit volatility.

Exhibit 1 provides a graph of how these opportunity costs join to produce an estimate of the discount rate in our equity risk buildup model. The specific points in the exhibit are required return on equity estimates as of April 1, 2005 for a universe of 500-600 large-capitalized, non-financial companies that we track at GAM USA. At that time, the risk free rate of interest (5-Yr Treasury yield) was 4.13% and the base (non-diversifiable) equity risk premium was 4.96%. These two macro forces gave a 9.09% required return for the highest quality stocks within the U.S. equity market as defined by the earnings certainty portfolio.[6]

In turn, we see that specific risk adds anywhere from 1% (for a company with a low specific risk score) to 5% (high company specific risk score) to the required return on equity for companies in the large cap universe. At a later point, we'll explain how the specific risk premium is determined in the context of fundamental factors such as size, leverage and economic profit volatility considerations. In the next sections, we'll look at how the intrinsic value of a company and its stock is impacted by variations in the actual components of the discount rate, and we'll apply the EVA-based, equity risk buildup model to a set of companies in the health care sector. We'll then close with an overview of three EVA-based elements that we believe determines "true value," namely, the return

on capital, the required return (risk profile), and the growth of invested capital relative to market implied expectations.

INTRINSIC VALUE AND THE DISCOUNT RATE

We now look at the impact of discount rate changes on intrinsic value. We'll do this in the context of a simple economic profit valuation model where firm value, V, is determined by adding the present value of economic profit (or NPV) to invested capital:

$$V = C + \text{PV of EVA}$$

$$= C + \text{NPV}$$

Based on simple valuation assumptions, Exhibit 2 shows the sensitivity of firm value and net present value to changes in the required return (assuming constancy of management and capital structure[7]). The exhibit has some interesting practical implications. First, it shows that firm value and NPV are inversely related to changes in the discount rate. When the required return rises from 10% to 11%—due to higher interest rates and/or heightened business uncertainty—the firm's intrinsic wealth (NPV) falls by 9% (actually 9.09%). Conversely, if the discount rate were to fall by 100 basis points—from 10% to 9%--then the firm's NPV rises by 11%. In turn, greater wealth effects occur if the required return were to change by a larger amount. For example, if the discount rate declines by 200 basis points then the firm's NPV would rise some 25%. At the extremes, Exhibit 2 shows that if the required return were to fall from 10% to 6% then NPV would rise by 67%, while the firm's intrinsic wealth would decline by 29% for a comparative basis point rise in the discount rate and cash flow assumption.

Second, we find that the inverse pricing relationship suggested in Exhibit 2 is stronger for high equity duration stocks versus cyclical stocks. That is, companies with high and/or fairly consistent earnings growth exhibit higher discount rate sensitivity. Cyclical companies with higher mean estimate errors related to earnings are mostly priced by earnings anticipation (profit change) versus discount rate change.[8] Consequently, cyclical stocks have relatively low discount rate sensitivity. Exhibit 3 illustrates the actual sensitivity of stock price to discount rate change for high quality companies as measured by the ACE portfolio. The inverse relationship is clearly evident starting in 1995 when the overall equity discount rate started to decline and changed by over 200 basis points. This resulted in valuation expansion as measured by the forward PE multiple. As shown, the PE multiple expanded from 1995 to the end of 1998 from 16 to almost 28. Since 1998, the equity discount rate has increased over 100 basis points despite the historically low risk free rate. This rate change resulted in a contraction in the PE multiple from 28 to 18.

Third, while major changes in the required return on a scale of 400-500 basis points as simulated in Exhibit 2 might seem unlikely for the U.S. economy, it is interesting to note that a readily available component of the discount rate, particularly the risk-free rate, did decline by this amount from December 1999 to June 2003. A relevant question then which we address is why the U.S. stock market did not enjoy a significant wealth increase based upon the predicted equity duration effect from a substantial decline in interest rates.

Towards A Fixed Income Analogy

Before proceeding, it should be noted that firm value and wealth effects shown in Exhibit 4 (a graph of simulated values shown in Exhibit 2) are interesting from a fixed income or interest rate perspective. Specifically, the behavior of the firm value (and NPV) function shown in the exhibit is similar to the duration and convexity properties of "plain vanilla" bonds. As interest rates go up in the economy--due to an unanticipated rise in inflation or an increase in credit risk spreads—bond prices go down across the board. Conversely, when interest rates go down, bond prices go up by an even greater percentage than the percentage (price) decline that occurs when rates go up, assuming no change in the firm's credit quality. This of course is due to the convexity in the price-yield relationship. By analogy, the firm's value (and stock price) should display the same kind of interest rate sensitivity as that which is evident in the pricing of fixed income securities. Taking one step further, the credit risk associated with the bond is not dissimilar to the company-specific risk premium tied to the equity.[9]

While pricing relationships between interest rates and bond prices and the required return and stock prices might seem analogous, investors must be aware of important differences. For theoretical and empirical reasons (that we emphasize later), investors must be careful not to confuse a change in bond yield (or interest rate) with a change in the required return. In principle, there are circumstances where offsetting bond and equity risk premium changes can leave the discount rate unchanged. That is, in order for the required return on equity to rise in the presence of, say, a rise in interest rates, we must presume that there is no offsetting reduction in the equity risk premium. Also, from a cost of capital perspective, we must recognize that the discount rate may be impacted by the firm's decision to finance a company with debt versus equity. This too can have a

concomitant impact on the discount rate and possibly the value of the firm and its outstanding shares.[10]

INTRINSIC VALUE AND THE RISK-FREE RATE

We now simulate the pricing effects of the two macroeconomic variables that comprise the required return, using real world data over the December 31, 1999 to April 1, 2005 period. These macroeconomic factors include the risk-free rate and the base (non-diversifiable) equity risk premium associated with the earnings certainty portfolio (ACE). Following that, we'll look at how company specific risk factors, such as size, leverage, and economic profit volatility, cause the overall discount rate (required return on equity) to differ from that which results from simply summing observed rates from the two macroeconomic variables.

Exhibit 5 shows the time series behavior of the risk-free rate (nominal and real) over the December 1999 to March 2005 period. The exhibit shows that the risk-free rate declined some 400 basis points (actually, 428bp) as 5-year Treasury yields declined from 6.36% at year-end 1999 to a low of 2.8% on June 13, 2003. Conversely, the risk-free rate rose by some 200 basis points (actually, 222bp) when 5-year Treasury yields rose from a low in June 2003 to a weekly high of 4.3% on March 25, 2005, then settling at 4.13% on April 1, 2005 (current rate as of this paper). Other things the same, the large fluctuations, from sharply falling to rising interest rates, would suggest a rather large and varying impact on stock prices from this macro factor.

Exhibit 6 shows the sensitivity of intrinsic value using data on the risk-free rate over the five years, December 31, 1999 to April 1, 2005. Not surprisingly (recall Exhibit 2), the exhibit shows that firm value rises by a large percentage, reflecting a gain of some 75% on its initial value of "200" from year-end 1999 to June 13, 2003. Since the initial NPV equals "100", this simulated rise in value can also be interpreted as a 150% gain in

wealth created by the actual decline in the risk-free rate over the three- and one-half year observation period. In turn, the exhibit shows a decline in firm value and NPV due to the upward trend in the risk-free rate from July 2003 to March, 2005. For example, Exhibit 6 shows that simulated firm value declines from a high of 349.65 on June 13, 2003 to an intrinsic value of 257.40 on April 1, 2005. Likewise, NPV peaks at 249.65 on June 13, 2003, then declines to 157.40 by April 1, 2005. Taken together, the simulated findings from actual fluctuations in the risk-free rate show that firm value rises by about 28% from December 31, 1999 to April 1, 2005, while intrinsic NPV rises by 57%. While important, we emphasize in the next section that fluctuations alone in the risk-free rate *cannot* explain the actual behavior of stock prices over the tumultuous five-year time period.

INTRINSIC VALUE AND THE BASE EQUITY RISK PREMIUM

While Fed model proponents often emphasize the link between monetary policy, interest rates, and stock prices, in actuality the relationship between stock prices and the discount rate is more complex, especially in recent years.[11] This is because the required return is also a reflection of the equity risk premium, which reflects compensation that investors require for holding risky securities.[12] On a risk scale, one can argue that the past five years has been a tumultuous one for equity investors due to the bursting of the NASDAQ bubble, the recession of 2001, the September 11th attacks, accounting scandals, and the oil shocks of 2005.

Such an event-driven period would imply a relatively high equity risk premium, although not necessarily higher than that observed during the tumultuous 1970s with negative events such oil shocks, Watergate, and a dollar crisis.[13] At the very least, we

would expect that the base equity risk premium has changed over the past five years due the combination of several unfortunate events. To examine this, Exhibit 7 shows the time series behavior of the equity risk premium on the earnings certainty portfolio (ACE) over the December 1999 to March 2005 period. The exhibit shows an overlay of the prospective equity risk premium on the nominal (and real) 5-Year Treasury rates for the five-year observation period.

Exhibit 7 shows that the risk premium to the earnings certainty portfolio was only 1.86% as of December 31, 1999. This is consistent with **"**bull market**"** commentary that investors no longer required much of a premium to hold risky stocks over bonds. Indeed, the exhibit shows that from year-end 1999 to June 2003 that a rather dramatic rise occurred in the base risk premium, running from a low of 1.86% in December 1999 to a high of 6.73% on June 13, 2003. Arguably, the rise in the base equity risk premium occurred during a period of heightened uncertainty caused by the bursting of the NASDAQ bubble, the recession of 2001, the September 11th attacks, and possibly lower nominal and real interest rates.

Exhibit 8 shows the simulated pricing effects from changes in the base equity risk premium. Specifically, the exhibit shows the simulated impact on firm value and NPV, coincident with the sharp rise in the base risk premium from December 1999 to June 2003, followed by the decline in the base risk premium from the July 2003 to March 2005 period. Notably, the exhibit shows that firm value declines from "200" at the outset to a low point of 134.50. This represents a simulated decline in firm value of 32.75% over the December 31, 1999 to June 2003 period. Meanwhile, NPV falls from "100" to a

low point of 34.5, representing a simulated decline of 65.5% over the three- and one-half year period.

Taking together the simulated pricing variation of the risk free rate shown in Exhibit 6 and the pricing effects of the base equity risk premium in Exhibit 8, we see that overall simulated changes result in a somewhat neutral impact on firm value and NPV. For example, the simulated rise in firm value of 28.7%--due to falling interest rates from December 1999 to June 2003 and then rising rates from July 2003 to March 2005--has been largely offset by the overall 23.66% decline in firm value associated with fluctuations in the base equity risk premium. Likewise, the overall simulated wealth accumulation (NPV) of 57.4% over the tumultuous five years has been largely offset by NPV decline of 47.33% due to variations in the (base) risk premium that investor require for holding an earnings certainty portfolio.

Exhibit 9 reveals why there are offsetting pricing effects. The exhibit shows an overlay of the required return on the earnings certainty portfolio (ACE**),** as the sum of the risk-free rate of interest and the base (non-diversifiable) equity risk premium. From a statistical perspective, it is interesting to note that the recent five-year correlation (December 1999 to March 2005) between 5-year Treasury yields and the base equity risk premium is strongly negative, at 0.99, while the long-term correlation (July 1975 to March 2005) between 5-year Treasury yields and the non-diversifiable risk premium is somewhat lower (in absolute value terms), at -0.81. In effect, the offsetting changes in the risk-free rate and base equity risk premium have resulted in a relatively stable (especially since mid 2002) required return series for the earnings certainty portfolio over the five-year observation period.

Specifically, the average risk-free rate over the December 31, 1999 to April 1, 2005 period was 4.17% with a standard deviation of 1.18%, while the average base equity risk premium was 4.62% with a standard deviation of 1.39%. In contrast, the average required return to the earnings certainty portfolio (ACE) was 8.79% during the tumultuous five years with a standard deviation of *only* 0.30%.Thus, the relatively flat required return series on the earnings certainty portfolio over the December 1999 to March 2005 period could in part explain why U.S. stock market performance has been rather uninspiring over the past five years, especially when the time series behavior of the risk-free rate—from a sharp fall in interest rates to a less dramatic rise --would have suggested otherwise.[14] In reality, the beneficial (detrimental) impact of falling (rising) interest rates (5-year Treasury yields) on the required return to ACE was largely offset by companion rises (declines) in the non-diversifiable component of the equity risk premium.

EARNINGS CERTAINTY PORTFOLIO: A LONG-TERM PERSPECTIVE

We now provide evidence on the long-term behavior of the base equity risk premium, risk free rate, and the required return on the earnings certainty portfolio. Exhibit 10 shows that long-term (30-year) averages of the base equity risk premium, risk free rate, and required return to ACE have been 2.85%, 7.09%, and 10.03% respectively. The latter average is higher than the discount rate observed on ACE in recent years. As noted before, the last half of the 1990's experienced a beneficial 200 basis point decline in the required return to the earnings certainty portfolio. In fact, since the market discount rate low of 7.58% occurred in December 1998, the rate has increased and has remained steady in the 9% range since mid 2002.

Exhibit 11 provides a breakout of the long-term results in five year segments and shows the median for each time period for the risk free rate, the base equity risk premium, and the discount rate for the earnings certainty portfolio (ACE). It is interesting to note that when interest rates are unusually high the equity risk premium is at the low end and sometimes negative—for examples, the two sub-periods 1980-1985 and 1985-1990. In contrast, during the most recent segment of history, period 2000-Current, interest rates are very low resulting in an unusually high base equity risk premium. Compared to the long-term 30 year median equity discount rate of 10.03%, the current and recent discount rate to ACE justifies higher valuations even with the currently high base equity risk premium. That being said, it's interesting to note that the base equity risk premium in late 2002 to mid 2003, near 6%, is similar to the high risk premium observed on ACE in 1977.

Some general comments can also be made about the level of the equity risk premium. When the equity risk premium is high or low, it is generally associated with the following conditions: [15]

Risk premium is high (over 3.5%)	Risk premium is low (under 2%)
1. Equities are undervalued	Equities are overvalued
2. Socio-Economic instability	Socio-Economic stability
3. Earnings are overstated	Earnings are understated
4. Higher inflation expectations	Price stability
5. Low nominal or real interest rates	High nominal rates or real rates

Moreover, the behavior of the base equity risk premium (one of two macro components of the discount rate) is an important and timely element when trying to explain or discern the possible future direction of stock prices. In practice, it is common to apply a fixed equity risk premium, as is implied in Fed model calculations, to equity valuation models. However, over the last five years this assumption would have resulted in an artificial decrease in the discount rate which, as we illustrated before in Exhibit 9, would have given investors incorrect signals of undervaluation. If we assume say a 4% risk premium (about mid point of low and high for the past five years) and apply the variable risk free rate from 1999 to current, the equity discount rate would have decreased from 10.36% to 8.30%, a decline of over 200 basis points. This implies that the application of a fixed equity risk premium in recent years would have resulted in faulty intrinsic value calculations, and most surely would not have explained the relatively flat stock market performance that we noted at the outset, particularly on U.S. large capitalization stocks. Hence, the simulated pricing results using the two macro-based components of the discount rate—namely, the risk free rate *and* the base equity risk premium--suggests that estimating the discount rate in a world of heightened uncertainty is an important and complex task.

ROLE OF COMPANY SPECIFIC RISK

We argue that in recent years "top down" or macro-economic forces--such as the risk-free rate of interest and the base equity risk premium (non-diversifiable component of the risk premium)—have had largely offsetting effects on the equity discount rate. This finding, which occurred during a period of increased stock market risk, highlights the

importance of estimating the company specific risk component of the equity discount rate. As noted before, we estimate the specific risk component of the required return in the context of traditional fundamental factors such as size and leverage as well as economic profit volatility.

Exhibit 12 provides a detailed look at our three-prong, equity-risk buildup model, which was introduced in Exhibit 1. The exhibit provides required return on equity estimates on April 1, 2005 for large industrial companies in nine S&P classified sectors of the economy. The "Y" axis shows the required return on equity in terms of a breakdown of the two macro variables—namely, the risk-free rate of interest and the non-diversifiable (base) equity risk premium--and a specific equity risk premium for companies in the S&P sectors. The nine S&P sectors include consumer discretionary, consumer staples, energy, healthcare, industrials, information technology, materials, telecommunications, and utilities. In turn, the "X" axis shows the specific risk score for each company tracked in the large cap universe, again, based on traditional fundamentals and EVA volatility.

Exhibit 12 is interesting in several respects. First, it shows that macro forces make up a significant component of the discount rate (required return). In fact, the risk-free rate and the base equity risk premium make up 73% of the required return on equity estimates as of April 1, 2005 for U.S. industrial companies. At that time, the risk-free rate was 4.13% while the base equity risk premium was 4.96%, implying a required return of 9.09% for the earnings certainty portfolio (ACE). Second, the exhibit shows that specific risk *does* matter for individual companies as evidenced by both the upward sloping required return line for the 500-600 industrial companies as well as the actual companies

(see ticker symbols for illustrative purposes only) shown in the exhibit from the health care sector.

On average, it appears that specific risk accounts for some 27% of the overall required return. The specific risk premiums range from about 1% for a company with a low risk profile to 5% for a company with a high risk profile. For example, Exhibit 12 shows specific risk estimates for selected companies in the healthcare sector. In this application, we see that the specific risk premium for Johnson & Johnson, a member of the ACE portfolio, is 1% (low specific risk profile) to about 3.5% for Forest Laboratories (moderate-to-above average risk profile) to a 4% specific risk premium for ImClone Systems (high risk profile).

Firm specific risk can also be implied by current market pricing. By equating the intrinsic value (using a variety of valuation models) to the current price and solving for the specific risk premium, the market-implied discount rate adjustment can be discovered. For instance, using the "G-Model,"[16] an earnings/dividend discount model, the market-implied risk premiums for the above equities are; Johnson & Johnson -15bp, Forest Laboratories 170bp, and ImClone Systems 60 bp. From this comparative analysis, one could assume that the market does not give ImClone a high enough firm specific risk adjustment. Taken together, we see in Exhibit 12 that the required return on equity (or the equity discount rate) can be decomposed into meaningful macro and micro (specific) risk forces. Consequently, it is imperative for today's equity managers to have a clear understanding of how the various components of the required return are joined, especially given the inverse relationship between discount rate components with intrinsic value, and ultimately market prices.

A CONCLUDING WORD

We believe that the required return on equity is one of three key factors that drive stock prices; and, in our view, the largest driver of stock returns and volatility in the short run.[17] In a nutshell, our fundamental selection process for distinguishing "good" companies from "bad" companies is based on (1) the return on capital, (2) the required return (risk profile as explained in this paper), and (3) the growth rate of invested capital, which points to favorable EVA growth when the return on capital is greater than the cost of capital. Exhibit 13 provides an overview of the three factors that we use to discern potential buy or sell (short) opportunities. As explained elsewhere,[18] we evaluate the stock selection implications of market implied EVA growth imbedded in stock price relative to actual growth expectations that we believe a company can realistically deliver. Finally, we believe that a disciplined EVA approach to company and security selection, where the equity discount rate incorporates a prospective risk premium and is fully recognized as one of three key drivers of stock price, is especially important in this world of heightened risk and uncertainty.

Exhibit 1: Required Return on Equity
U.S. Large Cap Industrials (April 1, 2005)

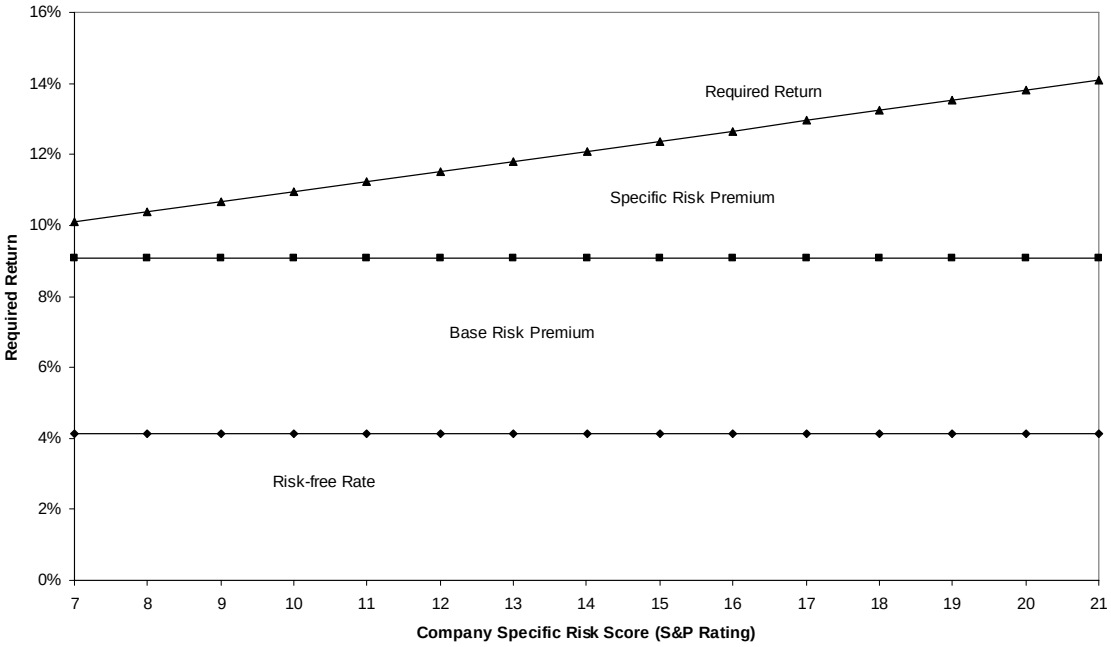


Exhibit 2: Firm Value and the Discount Rate

Discount Rate %	NOPAT	Capital Charge	EVA	Firm Value*	Book Capital	NPV**	% Change Firm Value
1	20	1	19	2000	100	1900	900
5	20	5	15	400	100	300	100
6	20	6	14	333	100	233	67
7	20	7	13	286	100	186	43
8	20	8	12	250	100	150	25
9	20	9	11	222	100	122	11
10	*20*	*10*	*10*	*200*	*100*	*100*	*0*
11	20	11	9	182	100	82	-9
12	20	12	8	167	100	67	-17
13	20	13	7	154	100	54	-23
14	20	14	6	143	100	43	-29
15	20	15	5	133	100	33	-33
20	20	20	0	100	100	0	-50

*V=NOPAT/k
**NPV=EVA/k

Exhibit 3: Forward PE vs. Equity Discount Rate

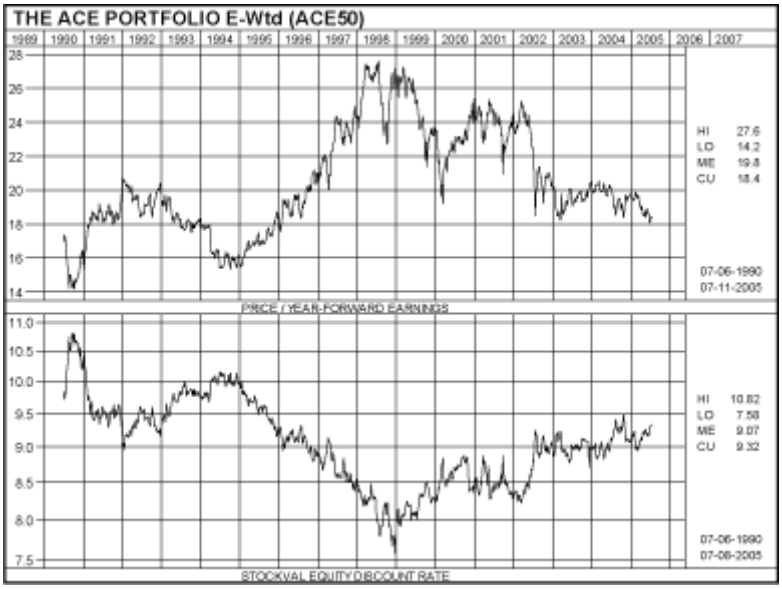


Exhibit 4
NPV and the Discount Rate

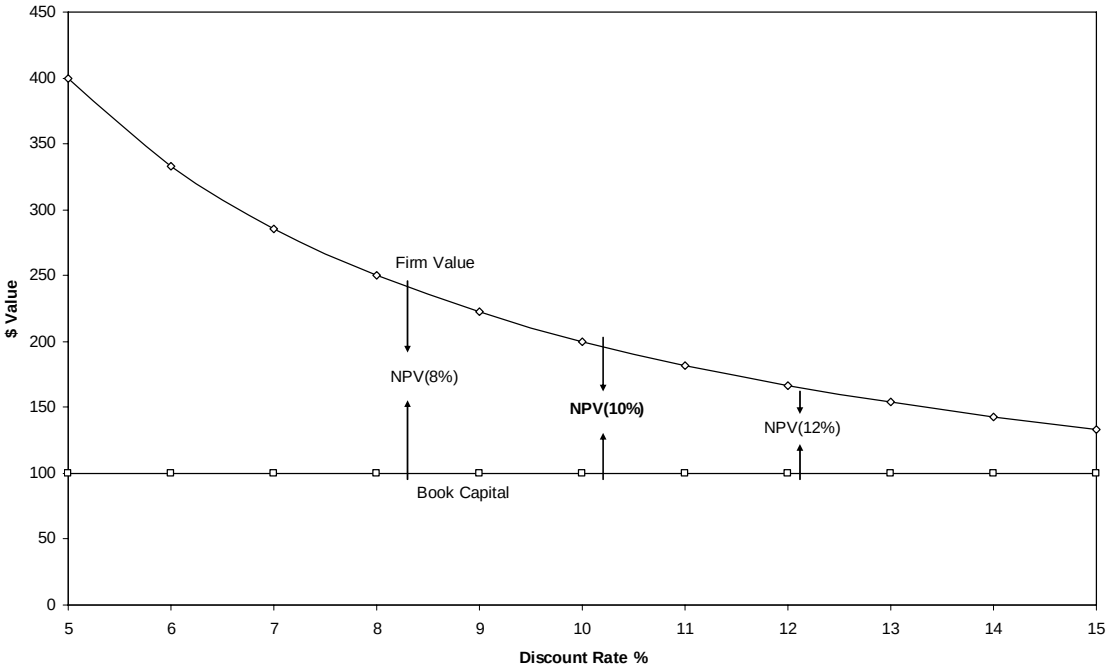


Exhibit 5: Nominal and Real Rates (5-Year Treasury): December 31, 1999 to April 1, 2005

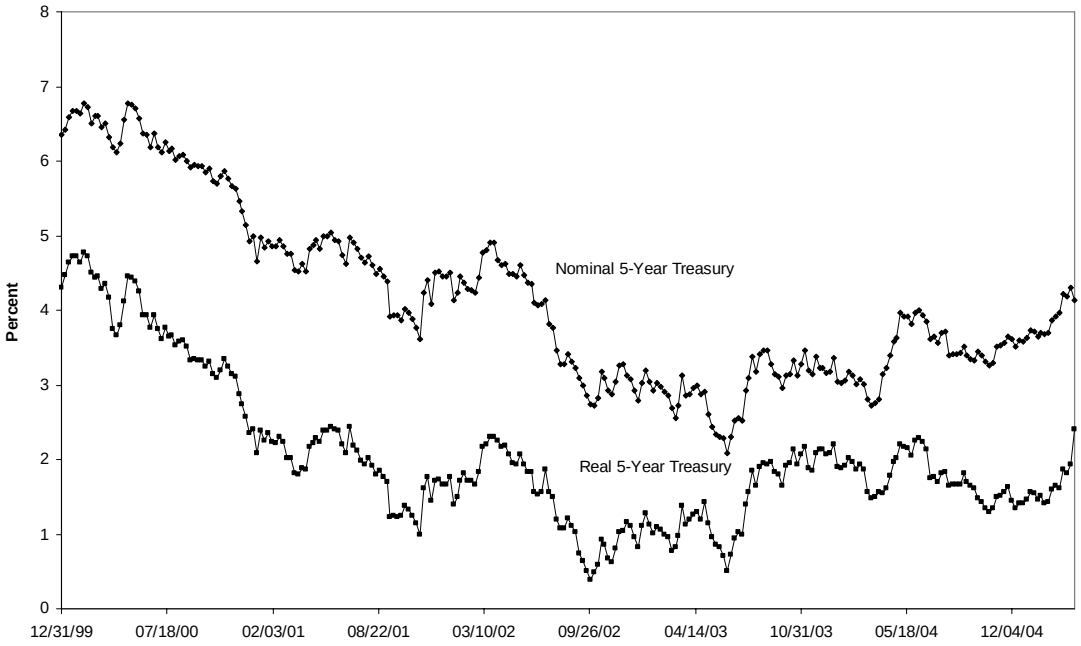


Exhibit 6: Intrinsic Value and Changes in Risk-free Rate:
December 31, 1999 to April 1, 2005

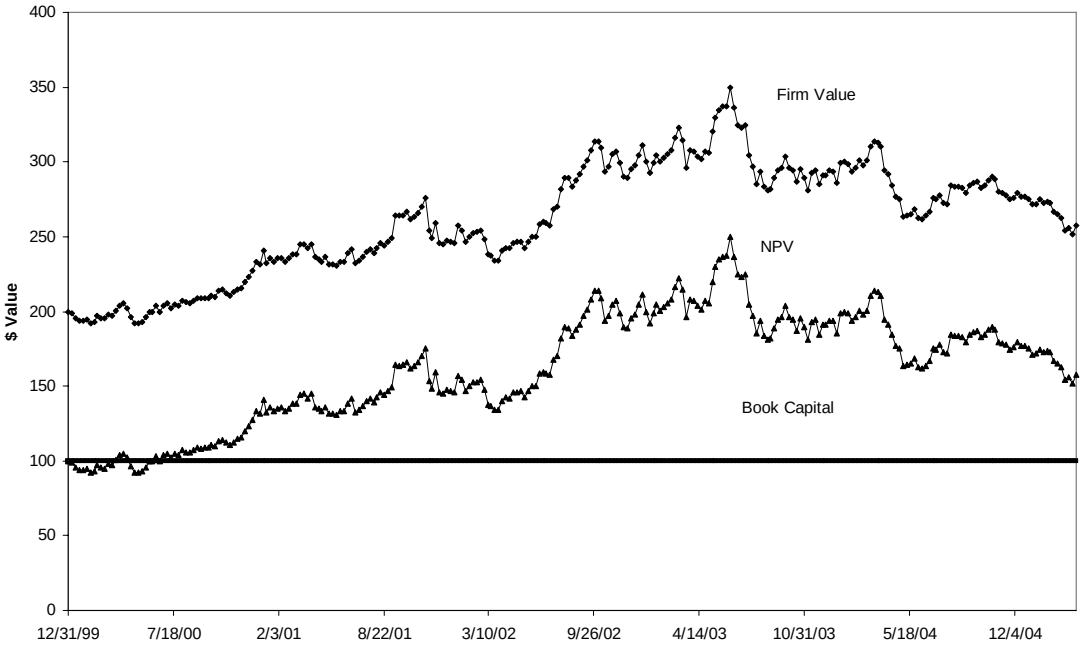


Exhibit 7
Base Equity Risk Premium, 5-Year Treasury, and 5-Year Real Rate:
12/31/99 to 4/1/05

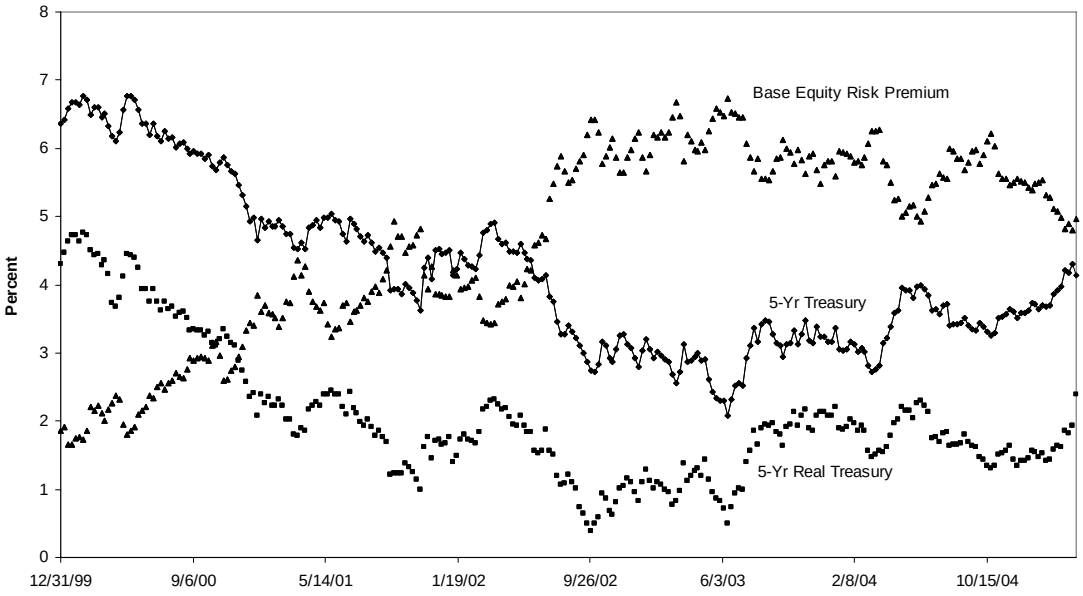


Exhibit 8: Intrinsic Value and Changes in Base ERP:
December 31, 1999 to April 1, 2005

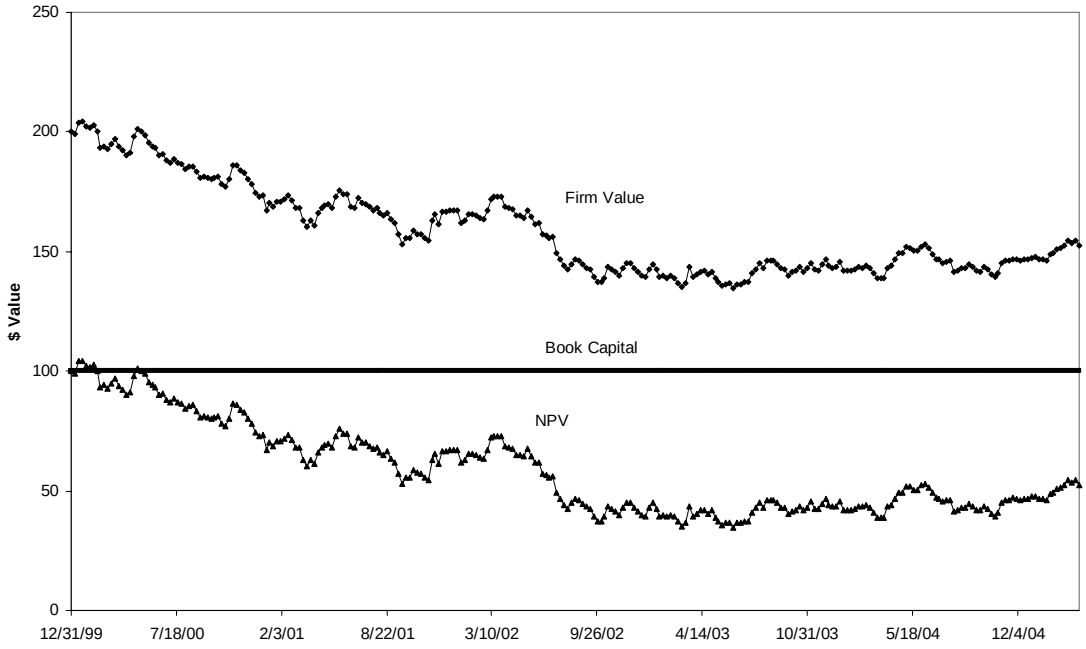


Exhibit 9
Required Return on Earnings Certainty Portfolio (ACE), Base Equity Risk Premium, 5-Year Treasury, and 5-Year Real Rate: 12/31/99 to 4/1/05

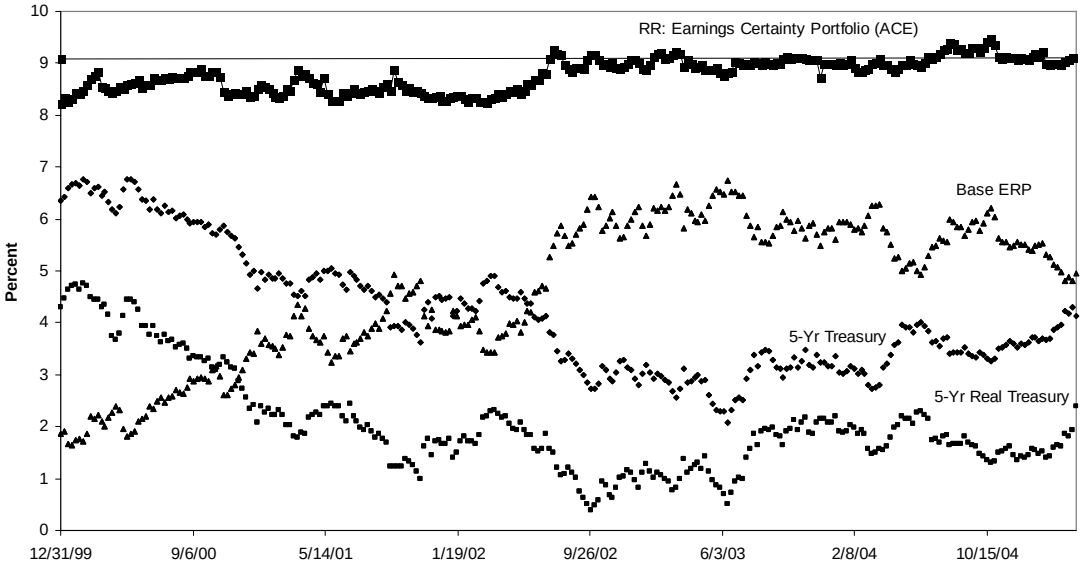


Exhibit 10: The Long-Term Experience:

Equity Risk Premium, 5-Year Treasury Yields, and Equity Discount Rate

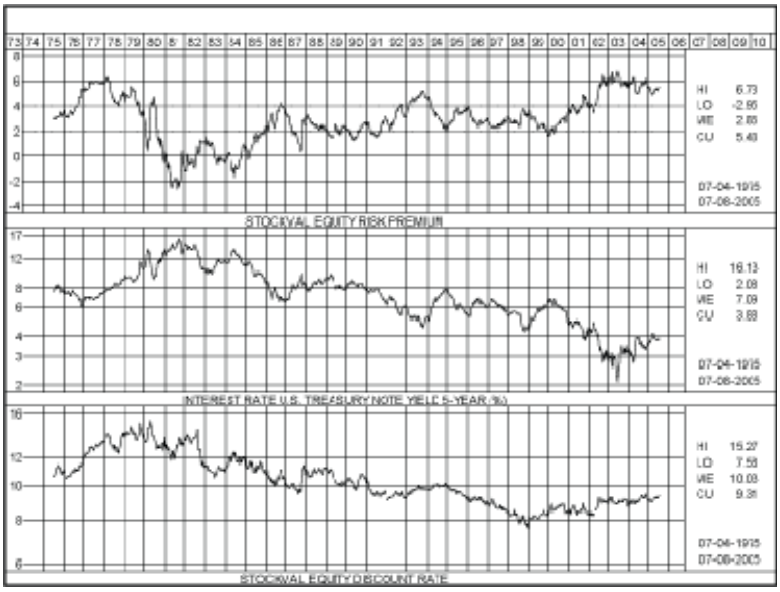


Exhibit 11

5-Year Averages: Risk-free Rate,
Base Equity Risk Premium, and Discount Rate on ACE

Median

	5-Year Treasury	Equity Risk Premium	Equity Discount Rate
1975-1979	7.68	4.65	12.65
1980-1984	12.44	-0.15	12.43
1985-1989	8.40	2.30	10.79
1990-1994	6.74	2.90	9.77
1995-1999	5.91	2.71	8.67
2000-Current	3.91	5.15	8.89

Exhibit 12: Required Return on Equity:
Selected Health Care Companies in Large Cap Universe:
April 1, 2005

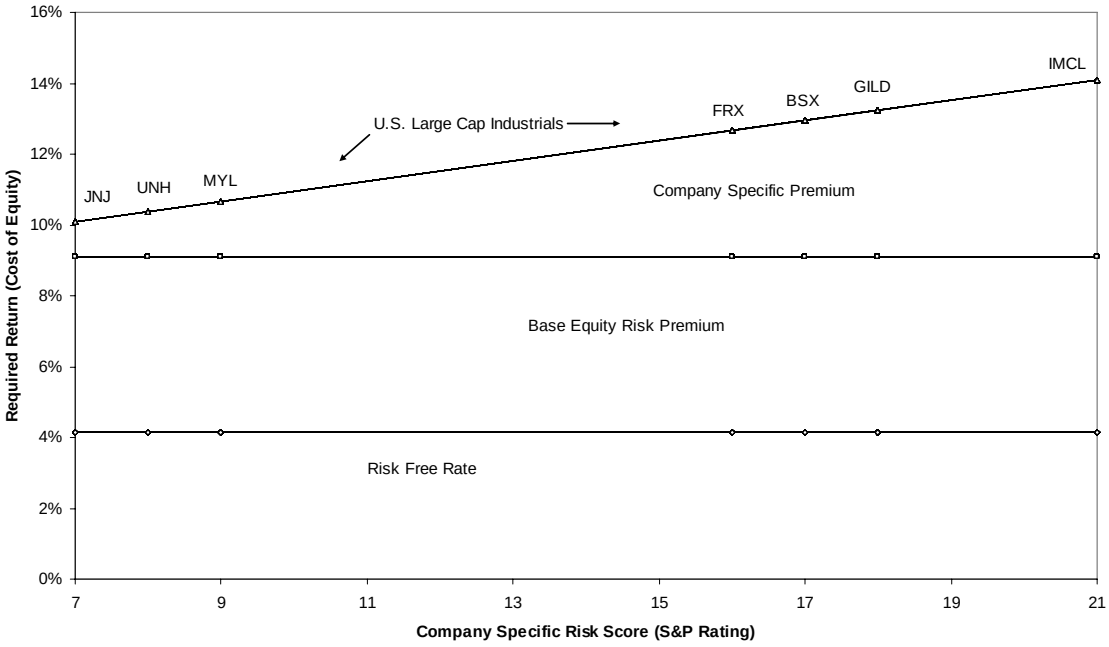
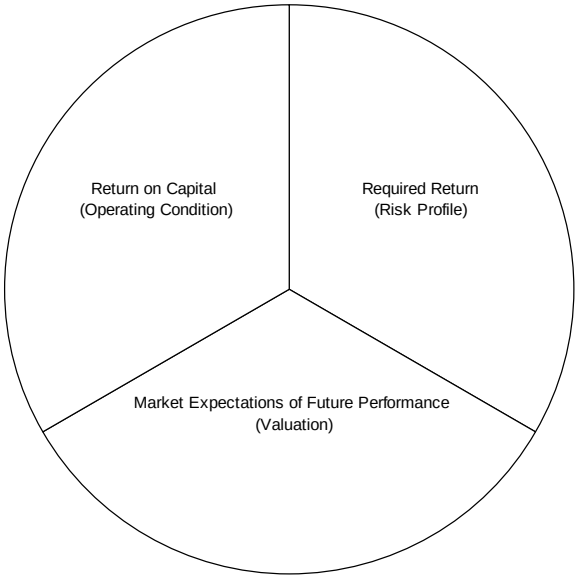


Exhibit 13
Key Elements of "True Value"



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ENDNOTES

We have received helpful comments from J. Clifford, Jeffrey McMains, and Tony Rouzzo at Reuters StockVal.

[1] A price relative model, such as price-to-earnings or price-to-book value approach to estimating stock price, is really just a multiple of earnings or book value based on a discount rate and growth factor, via, 1/(r-g).

[2] This is evidenced by the sharp decline in 5-year Treasury yields (both nominal and real) from December 1999 to June 2003, followed by a sustained rise in interest rates from July 2003 to March 2005.

[3] EVA® is a registered trademark of Stern Stewart & Co.

[4] In 1987, Jerry Gould, founder of StockVal, introduced the concept of "The ACE Portfolio" as a tool to derive an "earnings certain" equity risk premium. Gould discovered that standard equity risk premium proxies were flawed for two primary reasons: a) they were averages of historical values and thus not "forward looking"; b) earnings variability in standard market proxies skewed risk premia calculations. An indication of earnings certainty is the degree of earnings stability over the period measured. The ACE portfolio had a 2.3% mean estimate error on historical operating earnings compared to the S&P 500 Index which had a 27.8% mean estimate error. The acronym "ACE" refers to "approximate certainty equivalent", a statistical value term. See Rowberry (2002) for an application of StockVal's innovative approach to estimating the non-diversifiable component of the equity risk premium.

[5] The required return on equity is also known as the "cost of equity." See Grant (2003) or Grant and Abate (2001) for a discussion of traditional and EVA-based approaches to estimating the required return on equity.

[6] See Rowberry (2002) for ECP definitions and ACE50 portfolio construction.

[7] We assume a direct correspondence between changes in the required return on equity and the cost of capital (or *wacc*).

[8] StockVal (2000).

[9] For the layman, credit risk can be interpreted as the equity risk premium which is derived from company specific risk factors.

[10] See Grant (2003) for an EVA-based discussion of capital structure and valuation.

[11] That the link between Fed policy, interest rates, and the stock market is a tenuous one in recent years is examined in a historical context by Conover, Jensen, Johnson, and Mercer (2005)

[12] As noted, we model the equity risk premium in the context of a non-diversifiable risk premium to the highest quality stocks in the US equity market (also referred to as the base or "prospective" equity risk premium) and a company specific risk premium. In this section, we examine the non-diversifiable or base risk premium component of the required return.

[13] At later point, we'll present evidence on the long-term behavior of the base equity risk premium, noting that the relatively high risk premium observed in 1977 is about the same as that observed in late 2002 to mid 2003.

[14] As of April 30, 2005, the five-year annualized return on the S&P 500 was -2.94%.

[15] StockVal (2000).

[16] See Kitselman (2004).

[17] See, Abate (2004) or Grant and Abate (2001).

[18] See Abate, Grant, and Stewart (2004) for a recent discussion of the economic profit (EVA) approach to company and stock selection. They emphasize how EVA, with its emphasis on the fundamentals of wealth creation, can be used to define or frame equity styles.