

C A M B R I D G E A S S O C I A T E S L L C

EQUITY MARKET TIMING,
EQUITY MARKET VALUATION
AND MOMENTUM INVESTING

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Equity Market Timing

Users of this term often fail to realize that it has multiple meanings, which can lead to misinterpretation and confusion. The "strong" or most draconian version is the practice of moving 100% into or out of equities on the basis of signals from technical or fundamental indicators of the equity market's direction.

This includes both short-term trend indicators (e.g., 30-day moving average) that could result in daily or weekly switches between equities and T-bills (for which one would use equity index futures for reasons of cost and timely execution), or long-term fundamental indicators that might dictate shifts only every few years or even decades.

Although we have always asserted the *theoretical* possibility that such market timing *could* add value, relative to the maintenance of a constant, long-term allocation to equities, we have also noted that the odds against consistent success appear to be extremely high, and consequently have argued forcefully against attempts to time the market in any of the various ways advocated by proponents.

A "weaker" form of market timing is the raising and lowering of one's allocation to equities, within a predetermined range, on the basis of fundamental market valuations. An investor making such shorter-term shifts within the context of a long-term policy portfolio allocation is not necessarily attempting to forecast returns, but may simply be seeking to maintain a relatively constant level of risk. When valuation indicators suggest that equity market risk is high, the allocation is reduced below the long-term mean, and when valuation indicators suggest that equity market risk is low, the allocation is raised above the long-term mean. Historically, we have noted that investors attempting to adjust their equity allocations on the basis of fundamental valuation indicators are unlikely to achieve higher returns over the long term, because they will probably miss both the best and the worst periods for equity market returns (see our annual report, *U.S. Historical Capital Market Valuations*).

A variant on this approach is to pay attention to current market valuations only when one has substantial amounts of new cash to invest (or is starting from scratch with an all-cash portfolio to be invested for long-term purposes). Proponents of this view argue that if the new cash is immediately invested according to policy target allocations at a time when equity market risk is high, the risk of the total portfolio will be skewed above the level of risk designed in the policy portfolio. Consequently, a better approach is to deploy the new money into equities gradually, over time (i.e., average in), or to maintain equity exposure at the bottom end of a range.

Opinions differ on the question of whether investors should engage in *any* form of short-term asset allocation. One camp argues that investors' attempts to raise or lower the equity allocation within a relatively broad range (e.g., 80% to 40%) are likely to result in lower returns because the tendency will be to make exactly the *wrong* decisions—raising the allocation most aggressively at bull market peaks and reducing it most decisively at bear market troughs. Far better, therefore, to establish appropriate long-term policy allocations and then rebalance to those targets through thick and thin—whether with existing holdings or new money, makes no difference. Rebalancing, of course, is a shadowy form of market timing, in that it requires the sale of equities when they have appreciated more than other holdings, and the purchase of equities when they have performed relatively poorly. Although motivated solely by a desire to maintain the risk-return characteristics associated with a particular asset allocation, rather than by any explicit or implicit attempt to forecast returns, rebalancing is predicated on the assumption that leaning into the wind keeps the ship on an even keel, which may be seen as a very diluted form of market timing.

A second camp argues that rebalancing to policy target allocations might be the best approach in the best of all possible utopias, but that in the real world investors' appetite for risk swells during bull markets and evaporates in bear markets, with the result that so-called "long-term policy" allocations to equities will be far higher at the tail-end of bull markets than investors can truly tolerate, resulting in their bailing out in panic after the market has gone south, when they should actually be raising allocations. The provision of ranges, argues this camp, inhibits such investors from reducing the equity allocation below a prescribed minimum, so that they will participate at least to some extent in the subsequent recovery. In practice, these two approaches may not result in very different outcomes if the bottom of Institution A's range turns out to correspond more-or-less to the revised policy allocation adopted by Institution B after it discovers it had over-estimated its tolerance for a bear market.

Those most antagonistic to any whiff of market timing—however diluted—may advocate yet another approach, which is to establish long-term policy allocations and then simply leave them alone, allowing market forces to dictate the portfolio's exposures to the various asset classes, and intervening only to ensure that the allocation to bonds does not slide below some predetermined minimum. Although portfolio allocations will deviate substantially from those of the long-term policy for extended periods, the assumption implicit in this approach is that the mean-reverting, self-correcting nature of the capital markets will eventually bring allocations back in line. For example, there may be an extended period during which U.S. equities perform far better than non-U.S. equities, but this will eventually result in the latter being more attractively valued than the former, and so at some point the tide will turn, resulting in non-U.S. equities outperforming. However, investors should *not* assume they can second-guess the markets, anticipating these ebbs and flows, since any such attempts at market timing are doomed to failure.

It is worth noting, in conclusion, that a long-running debate for and against market timing continues to thrive in both the popular and the academic financial press. Bull markets tend to stimulate "proof" of the folly of market timing, and the longer and stronger the bull market, the greater the number of converts to this view (the most recent bull market provides a pre-eminent example—everyone now "knows" you should buy-and-hold rather than try to time the market). In contrast, long bear markets win converts to the view that investors should always be on the lookout for avalanches and should seek appropriate shelter.

Equity Market Valuation

There are as many equity market valuation tools as leaves on the trees, each designed to provide a specific kind of information. Here we outline only two.

Dividend Discount Models

The premise of dividend discount models is that the "fair value" of an equity (or equity market) can be determined by calculating the present value of future cash flows the investment will generate. To compute this number, one needs an assumption about future dividend growth (earnings growth may also be used), the interest rate at which these future cash flows will be discounted, and an equity risk premium. The output of such models is extremely sensitive to changes in any of these inputs, which makes the results highly susceptible to shifts in prevailing interest rates, mis-specification of the equity risk premium, and revisions of growth estimates.

As a consequence, one investment bank's dividend discount model may indicate that an equity market is slightly undervalued while another's model shows it to be significantly overvalued. This could occur because the one firm is using five-year Treasury note interest rates as its discount factor and an equity risk premium assumption of 2%, while the other is using long-term corporate bond interest rates as its discount factor, and assumes an equity risk premium of 3.0%.

So, are dividend discount models useless? No, but investors do need to understand how and when they provide meaningful insights into market value, as opposed to empty noise. In our own dividend discount model, we use long-term interest rates as the discount factor, because we have found that the equity market fair value generated by this approach best matches actual market values. Nevertheless, we would note that the model's indication of fair value for, say, the S&P 500 often deviates substantially and for extended periods from the actual market value. Moreover, such deviations from fair value need not

be resolved by a rise or decline in equity market prices—they can also be resolved by rising or falling interest rates or by changes in the estimated earnings (or dividend) growth rate.

Dividend discount models are most sensitive to changes in discount rate assumptions, particularly when interest rates are relatively low (see Exhibit 1). In a low interest rate environment, use of intermediate instead of long-term rates, or a disagreement as small as 50 basis points over the appropriate equity risk premium, can result in significant differences in market valuations. For example, in a simple "two stage" model,¹ the current price-to-fair value ratio of the S&P 500 increases from 1.65 to 1.94 if one increases the discount rate assumption from 7.5% to 8.0%.

Similarly, the higher the earnings growth estimate and the lower the discount rate, the more sensitive is the model's measure of fair value to changes in the earnings growth assumptions (see Exhibit 2). In our simple model, for example, an increase in the long-term earnings growth assumption from 3.0% to 3.5% results in an increase in fair value of \$45, or 8%, assuming an 8% discount rate, while the same change in earnings growth assuming a 10% discount rate results in an increase in fair value of \$18, or 5%.

It should be apparent that investors attempting to raise and lower their equity allocations on the basis of dividend discount models are unlikely to achieve satisfactory results. For a start, different versions of this approach produce quite different results, which are unpredictably more or less informative at different times—and so which should one rely on? Secondly, the sensitivity of such models to shifts in the key input variables can result in substantial shifts in "fair value" over relatively short periods of time. Finally, investors following the dictates of such models are particularly vulnerable to a situation in which interest rates fall sharply in correct anticipation of economic contraction and declining corporate profitability, before this is recognized in analysts' revisions to earnings growth estimates, with the result that equities appear very cheap (as a result of a lower interest rate discount factor), just before prices decline in advance of collapsing earnings.

As with so many valuation indicators, the worth of dividend discount models is more in the questions they raise than in the answers they provide. Why is this model's version of fair value dramatically higher or lower than the market's actual price? What has caused that model to assign a fair value 25% higher than this time last year—is this primarily attributable to lower interest rates or higher earnings estimates? How do different analysts determine the appropriate equity risk premium? How much is the difference in their models' outputs determined by the differences in this one variable? The more one

¹ A two-stage model includes assumptions for two time horizons. In this case, the first horizon is the next ten years and the second is perpetuity.

knows about the construction, methodology, and historical results of a particular dividend discount model, the more useful it becomes as a barometer of current market conditions. It matters relatively little whether one agrees more or less with the way this or that model has been constructed; the value comes from understanding how a particular model tends to reflect certain kinds of shift in the markets, and therefore when one should ignore or pay attention to the signals it transmits.

Fundamental Valuations

By "fundamental valuations" we mean such traditional measures as price-earnings, price-to-cash-flow, price-to-book value, earnings yield/bond yield, dividend yield, and so on. While recognizing that these are subject to secular shifts—for example, if differential taxation of income and capital gains encourages corporations to use free cash flow to buy back shares rather than pay out cash dividends—one can nevertheless gauge in most instances whether such measures are currently abnormally high or low by historical standards.

What do high or low readings signify? For example, what (if anything) is the significance of the stock market's price-earnings multiple standing at 30 rather than at 10? Only an increased vulnerability to a substantial decline in price if corporate profits prove less robust than currently expected or if inflation rises faster than expected. Implicit in a high multiple are any number of cheerful assumptions about the prospects for corporate earnings growth, inflation, interest rates, consumer confidence, and so on. Implicit in a low multiple are any number of glum assessments of the outlook for these same variables. Consequently, if the environment proves less benign than expected, at a time when high multiples discount optimistic expectations, prices are vulnerable to a contraction as investors ratchet down these expectations; if the environment proves less malign than expected, at a time when doom and gloom are all-pervasive, one should expect stock prices to rally as investors revise their expectations upwards.

Note the emphasis on the conditional tense—absent a reversal in investors' expectations and psychology, there is no reason whatsoever to expect that equity prices should not continue to advance despite a high multiple, or continue to decline in price despite a low multiple. The former is exactly what happened in the last few years of the 1990s: although U.S. equities were already selling at relatively high valuations, by historical standards, reflecting general optimism about the outlook for inflation, interest rates, and earnings, the stock market and the stock market's p/e ratio both rose very considerably in the period 1996-99 because underlying conditions (i.e., inflation, earnings, and interest rates) proved even better than anticipated. That is, no reversal occurred; on the contrary, conditions were so perfect for equity investing that investors' modest optimism gradually mutated into a conviction that fundamental valuations had lost all relevance, and no price was too high to pay for certain kinds of stocks.

Expressed another way, when the stock market's fundamental valuations are unusually stretched—as they have been in recent years—the market has an increased propensity to catch the economic equivalent of the flu, should the virus happen to circulate this year. If no virus shows up, there is no reason for the market to get sick, despite its increased vulnerability. So far (or at least until very recently), the environment has remained extraordinarily healthy, with no sign of economic flu (except for a scare in 1998—but the virus remained overseas), but this does not change the fact of the market's extraordinary susceptibility to any serious reversal of the exceptionally favorable conditions that have driven the bull market.

What, then, is the point of assessing such so-called fundamental valuations if they don't tell investors whether equities will perform well or badly? The answer has everything to do with risk control and nothing to do with forecasting returns. On the basis of all available historical evidence, we do not believe anyone can forecast returns. Indeed, a common denominator among several of the most successful equity investors (e.g., Warren Buffett or Peter Lynch), is a refusal to spend any time considering the matter at all—their constant mantra is that investing is all about identifying good companies competing successfully in good, steady businesses. Period.

However, just as long/short hedge fund managers attempt to control portfolio risk (in the short term) by dialing up and down their net equity exposure, so some investors may want to do so over a longer time horizon, by reducing net equity exposure when fundamental valuations indicate that market risk is unusually high, or to increase it when market risk seems unusually low (even Warren Buffett does this, despite his protestations against forecasting). For those seeking to maintain a constant policy allocation to equities, regardless of valuations (an approach we happily endorse), an awareness of current valuations in relation to market history may serve as a useful antidote to the universal (but illogical) propensity to incur *more* equity market risk just because equities have performed well in recent years, and *less* equity market risk just because they have done poorly.

In addition, investors wondering how best to deploy new investment capital, or over what time horizon to implement a newly constructed portfolio, might consider current market valuations as a guide to relative prices among various asset classes. High prices today do not mean prices cannot go higher tomorrow—since this is tantamount to forecasting returns, we can only repeat that neither we nor anyone else can predict this. However, the return one receives on an investment for a given holding period is simply a function of the difference between what one has paid at purchase and what one receives at sale, plus interim cash distributions. Consequently, the higher the price paid, in relation to the earnings power of the investment over time, the greater the potential for poor returns. So, for example, if one buys a stock at 70x expected earnings, because one expects future earnings to grow at 35% annually, and regards a price-earnings growth rate of 2:1 as reasonable, one runs the risk that earnings only grow at 30% annually (a stupendous rate by historical standards over any period greater than a few years), leading

investors to sell the stock down to 60x earnings, to maintain the same price-earnings growth ratio. Of course, if earnings prove greater than 35% annually, or look to be sustainable over a longer period than previously expected, investors may decide that a price-earnings growth ratio of 3:1 is more appropriate, resulting in substantial price appreciation.

Ultimately, the central point about both dividend discount valuation models and fundamental valuation analyses is that investors' decisions about investing in specific stocks, or stock markets, should be strongly influenced, if not absolutely determined, by some assessment of the current price in relation to expected earnings. To dismiss such measures as irrelevant is de facto to embrace price momentum investing, which is essentially a trend following approach that extrapolates recent price movement into the immediate future, without regard to longer-term or fundamental considerations. On the other hand, to assume that all investors are rational automatons seeking to maximize their utility functions on the basis of careful discounted cash-flow analysis (as do most analytic models of markets), is obviously fatuous, since investment decisions are and always have been subject to the irrational, emotional pull of hope, greed and fear.

Momentum Investing

Given a sum of money to invest in equities over a six-month time horizon, with an objective of maximizing return, one would be well advised to concentrate on those stocks with the strongest recent price momentum. This is because momentum investing works, in the short run. That is, in any randomly selected period of a few months, what has gone up tends, on average, to keep going up, and what has gone down, down. Given the right conditions, a few months can turn into a few years, as investor enthusiasm creates a virtuous cycle focused on some particular financial sector (e.g., technology stocks) with prices being driven ever higher as rising prices attract more money to the sector, which results in higher prices, which attracts more money to the sector, which results in higher prices, and so on.

Even the terminally enumerate recognize, however, that this cannot persist indefinitely—that there must be some price at which the next-in-line buyer will balk. As recent history has shown, however, in a buying frenzy (or bubble) that price is always astronomically higher than can ever be justified by any valuation analysis of the sort outlined above. The irony of the recent dot.com frenzy, of course, was that because companies with no earnings are by definition beyond the pale of conventional valuation analysis, there was no constraint on their stock price rise, whereas the stock prices of those companies with earnings were constrained by their susceptibility to discounted cash-flow reckoning.

For longer-term investors, the momentum approach has two serious drawbacks: the first is that momentum is only apparent after the fact; that is, by the time a stock (or asset class or market) has clearly established upward momentum, it may have already risen a good deal in price, and may have become relatively expensive from the perspective of fundamental valuation. Consequently, momentum investors are at risk of buying high and selling low, because reversals are completely unpredictable and obviously inflict the greatest damage on those who buy/sell what has appreciated/depreciated most extensively during the previous move. The second is that momentum investing does not seem to work over the long term. How can that be, since the long term is composed of pieces of the short term over which momentum investing generally does work? The reason is that although momentum investing generally works over short periods, it doesn't *always* work, and in those periods when the tide turns, and momentum suddenly starts flowing the other way, the momentum investors' gains are often obliterated by unusually severe losses. Think of the losses incurred by those who piled into real estate in 1988, after a decade of strong returns to that asset class; or those who piled into emerging market funds early in 1994, or into technology stock funds earlier this year.

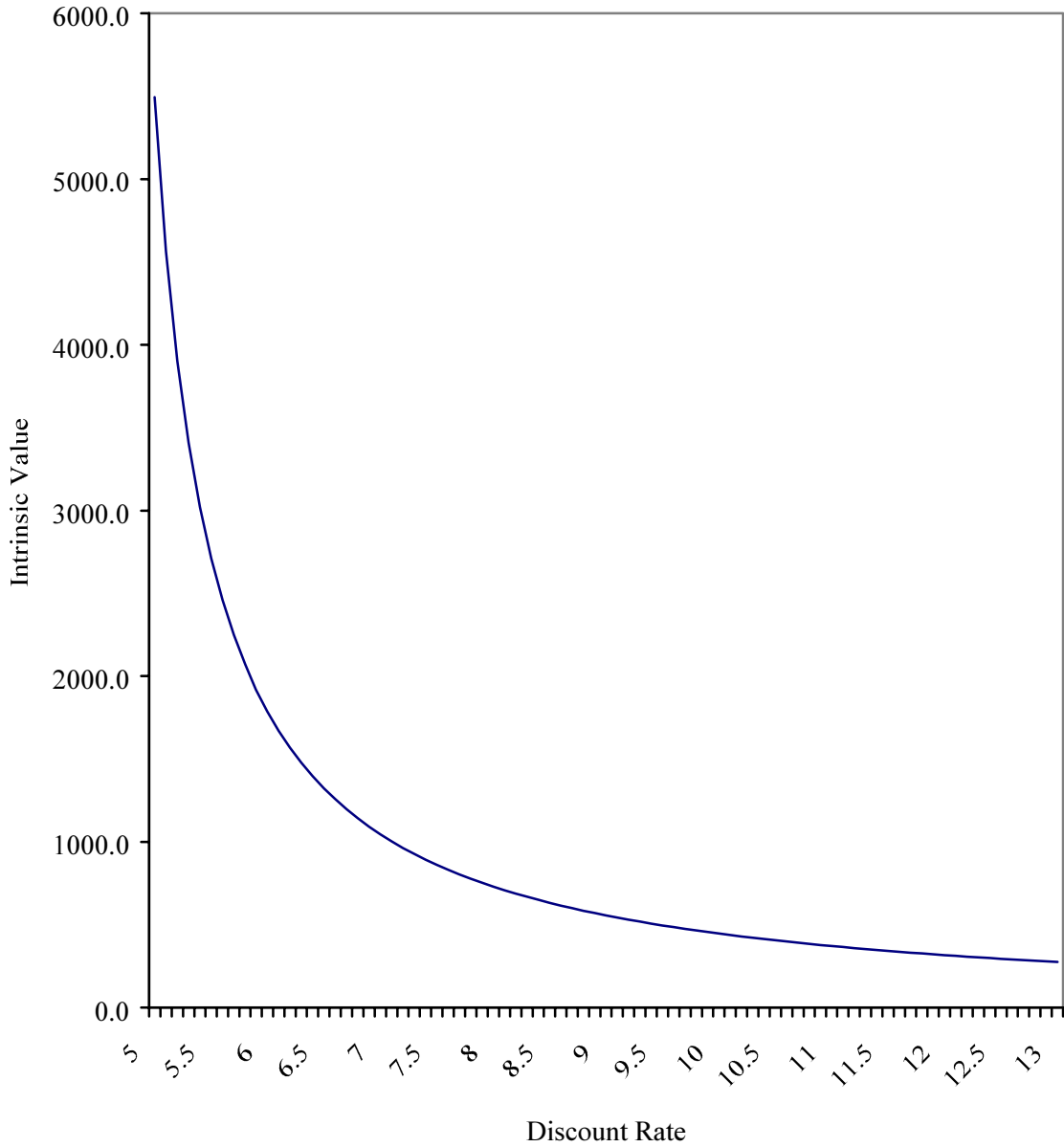
This is not to say that momentum investing cannot be successful. To succeed, however, such investors must typically adopt a relatively short-term, trading approach (as, for example, many hedge funds do), seeking to identify emerging trends early, and willing to jump off the train as soon as momentum appears in danger of reversing. This is more like trading futures than long-term equity investing, which makes it extremely unlikely that endowment funds, managed by investment committees meeting quarterly, are likely to have any success pursuing such strategies—except through experienced momentum managers (e.g., hedge funds) to whom they have delegated some portion of the equity portfolio. Even among professional money managers, however, we find very few that have achieved success with momentum as the cornerstone of their investment approach.

So is momentum irrelevant to long-term investors? Not at all. Just as investors should consider fundamental valuations when they are engaged in making new commitments, or assessing current asset allocations, so they should consider momentum. Although we do not subscribe to the view that markets are perfectly rational pricing mechanisms, we also believe that prices for financial assets do not rise and fall arbitrarily—fundamental economic conditions always play a key role in price setting, even if they are not exclusive determinants of price. Consequently, investors ignore price momentum at their peril, and by doing so implicitly assume they have superior knowledge, foresight, and expertise than the market as a whole, which is a dangerous arrogance if pushed too far. Thus, even when an asset class appears cheap, on the basis of fundamental valuations, one should hesitate to invest heavily if price momentum is strongly negative—better to accumulate gradually, perhaps accelerating purchases on evidence (which is never conclusive) that the negative momentum is exhausted. Should one actually wait for evidence of reversal? That is, for some evidence of positive momentum? This has some appeal, but one should also recognize

that the greater informational efficiency of the contemporary investment environment has resulted in more rapid bandwagon effects, in which momentum investors seem to jump on any sector that evinces positive momentum, driving prices dramatically higher in a few days or weeks. It remains to be seen whether this effect will survive a prolonged bear market and general disenchantment with equity investing; however, greater informational efficiency, which has had the effect of reducing investors' time horizons, certainly seems here to stay. In general, however, we would think it imprudent to delay implementing an allocation to an asset class to which a long-term commitment has been made simply because it has already risen somewhat in price after a period of decline.

Exhibit 1

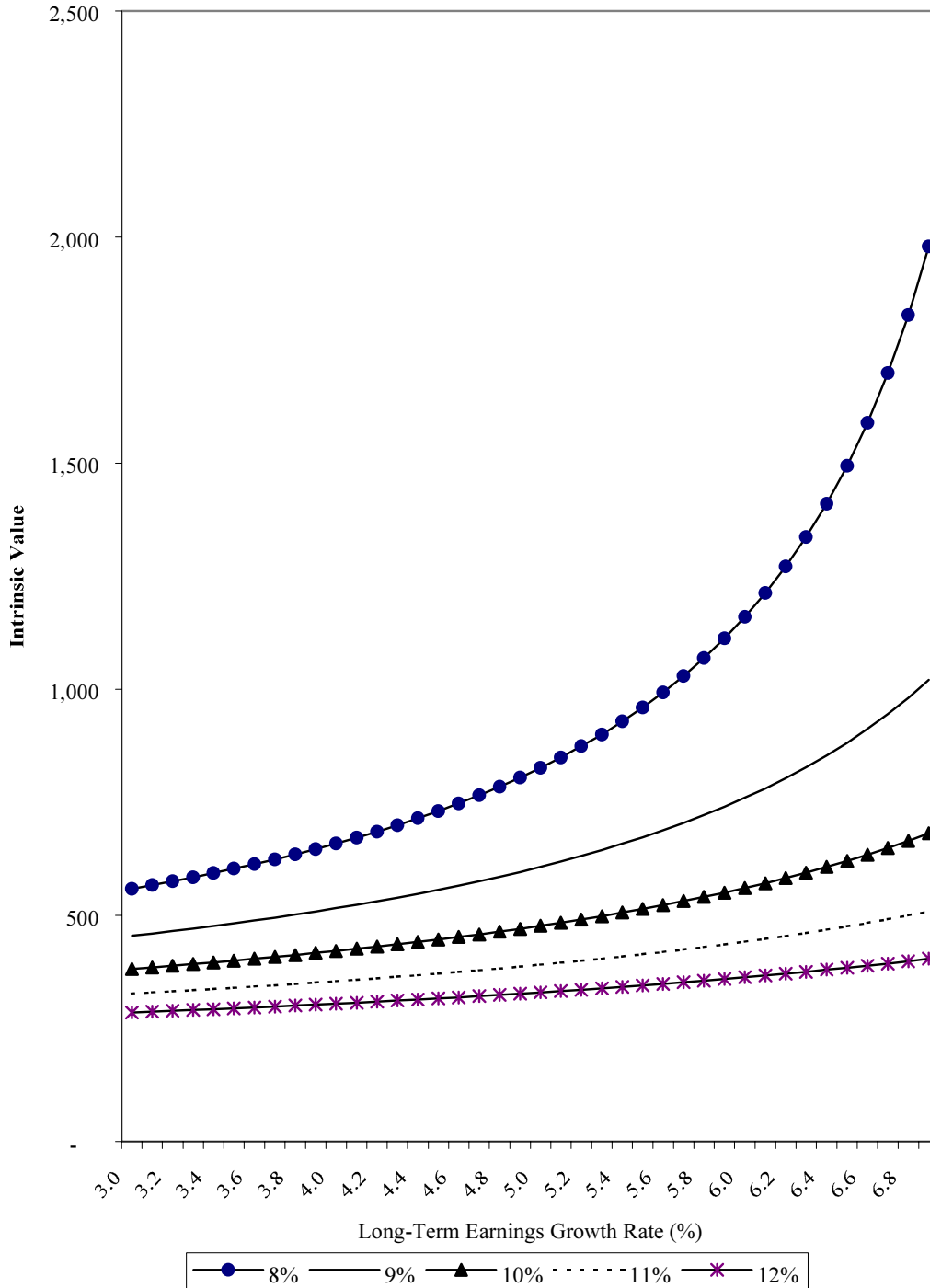
S&P 500 PRICE-TO-FAIR VALUE UNDER VARIOUS DISCOUNT RATE ASSUMPTIONS



Source: Cambridge Associates Dividend Discount Model.

Exhibit 2

S&P 500 INTRINSIC VALUE UNDER VARIOUS DISCOUNT RATE AND LONG-TERM EARNINGS GROWTH RATE ASSUMPTIONS



Source: Cambridge Associates Dividend Discount Model.