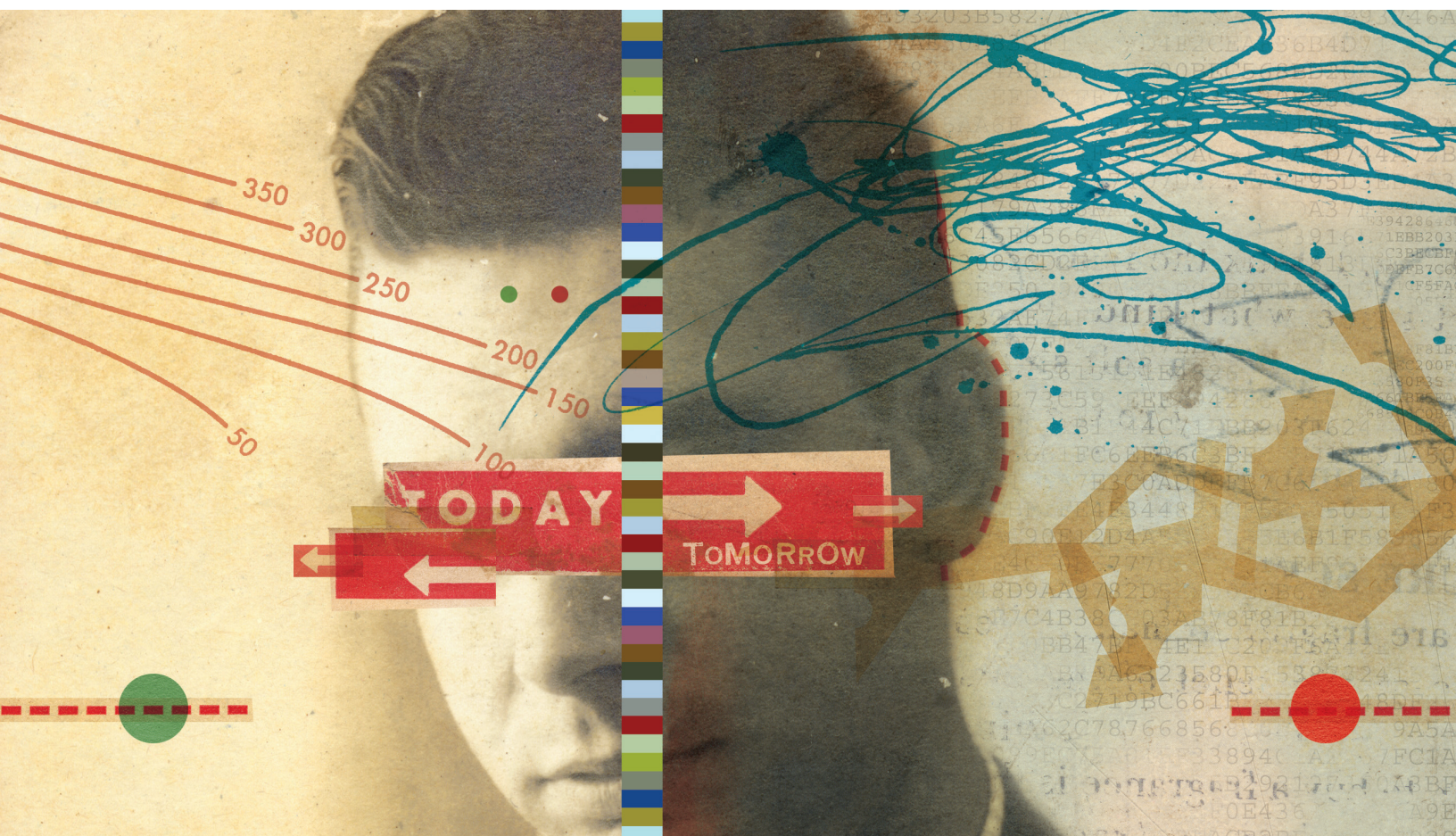


McKinsey on **Finance**



Perspectives on Corporate Finance and Strategy

Number 20, Summer
2006

Learning to let go: Making better exit decisions 1

Psychological biases can make it difficult to get out of an ailing business.

Habits of the busiest acquirers 8

M&A executives at the most successful US companies understand not only how acquisitions create value but also how to enlist the support of the organization.

Betas: Back to normal 14

Betas that were artificially low after the market bubble of the 1990s have returned to normal.

The irrational component of your stock price 17

In the short term, emotions influence market pricing. A simple model explains short-term deviations from fundamentals.

The irrational component of your **stock price**

In the short term, emotions influence market pricing. A simple model explains short-term deviations from fundamentals.

Marc H. Goedhart, Bin Jiang, and Timothy Koller

Investors, as no one should be surprised to learn, don't always act rationally. Their biases, myopia, and expectations of long-term stock performance may not systematically cause share prices to deviate from fundamentals in the long term, but in the short term they can cause shares to deviate from intrinsic valuation levels long enough for some observers to raise doubts about a company's value and strategic direction. In general, such deviations from fundamental valuation levels correct themselves quickly—in around three years for the market as a whole and, typically, much sooner for individual companies. But that's more than long enough to complicate life for managers as they struggle to make tactical decisions on matters such as the timing of mergers or the timing and quantity of equity issuances.

Ideally, if managers understand what is happening when short-term share prices are off, they will be more likely to stick to their long-term strategic plans. One way we've found to muster this perspective involves modifying a fundamental valuation model for the stock market so that the model explicitly measures the effect of investors' behavioral biases about inflation, interest rates, and earnings projections. Changing the fundamental valuation's assumptions in these areas helps managers to recognize the conditions that would be most likely

to make share prices for their company and sector, and for the stock market as a whole, deviate from fundamentals.

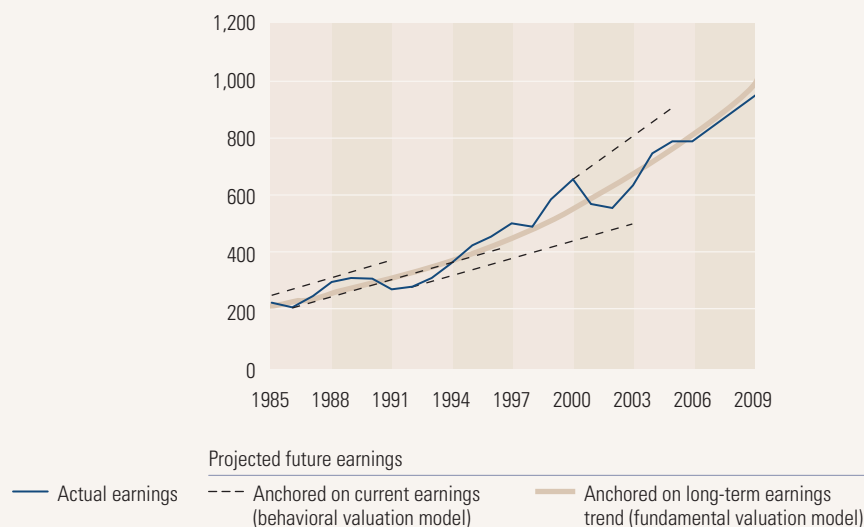
Modeling investor bias

To illustrate the short-term bias of investors, we built two models—one based on valuation fundamentals, the other reflecting the behavior of investors—of the S&P's value for the years 1965 to 2005. Both models are based on discounted cash flows, which rely on assumptions about the key drivers of value: corporate profits and inflation-adjusted profit growth, expected corporate returns on capital, the inflation-adjusted cost of capital, and expected inflation. Each model produces an estimate, based on the assumed drivers of value, of the median P/E ratio of the companies in the index for each year studied. In both models, we assumed that the expected return on capital, the long-term growth rate of corporate profits, and the inflation-adjusted cost of capital are constant during the 40-year period—an assumption consistent with the historical evidence.¹

However, the models diverge in their assumptions about inflation and the short-term trajectory of profit growth. In the fundamental model, we assume investors expect inflation that deviates from the long-term trend of 3 percent to quickly revert to that level. In the behavioral model, we

¹The median return on equity during the past 40 years was very stable, at around 13 to 14 percent. The long-term growth of corporate profits is cyclical, but the proportion of profits to GDP remains stable around an average of 6 percent. Finally, we estimated the real cost of capital: 7 percent. See, for example, Bing Cao, Bin Jiang, and Timothy Koller, "Balancing ROIC and growth to build value," *McKinsey on Finance*, Number 19, Spring 2006, pp. 12–6 (www.mckinseyquarterly.com/links/22143); and Marc H. Goedhart, Timothy M. Koller, and Zane D. Williams, "The real cost of equity," *McKinsey on Finance*, Number 5, Autumn 2002, pp. 11–5 (www.mckinseyquarterly.com/links/22144).

EXHIBIT 1

Misdirected expectationsEBITA¹ for S&P 500, \$ billion¹Earnings before interest, taxes, and amortization; excludes financial-services companies.

assume that inflation remains at a level that reflects recent history. Thus, when high inflation is cooling off, investors overestimate long-term inflation, and vice versa—an assumption that is consistent with behavioral-finance theory. Periods right after high current inflation, such as those during the late 1970s and early 1980s, translate into the behavioral model's assumptions about high long-term inflation, thereby driving P/E ratios down more than actual levels bear out.

We used a similar approach to deal with the way investors form expectations about a company's future profitability. Using the growth trajectory of actual aggregate earnings for the S&P 500 companies during the past 40 years, the fundamental valuation model applies a fairly accurate trend line to realized earnings growth and then obtains an estimate for long-term growth (Exhibit 1). In the behavioral approach, we assumed that investors take

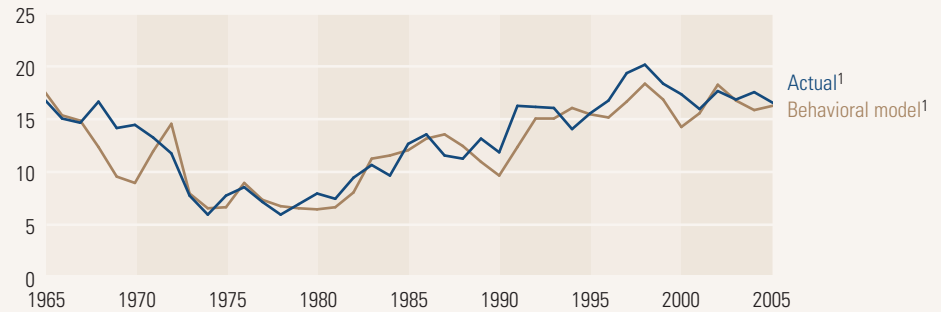
current earnings as an anchor for projecting future earnings. As a result, during earnings peaks, such as in 2000, investor expectations tend to overshoot long-term future earnings, driving P/E ratios above their intrinsic levels. When earnings are below the trend line, as in 1992, investors tend to undershoot, so P/E ratios are low as compared with intrinsic value. This assumption is consistent with what we know of analysts' earnings forecasts, which also tend to be too high when markets peak and to be too low in troughs, both for the market and for cyclical companies.

Both models converge on P/E ratios close to the long-term median of about 16. But the behavioral model, based on the investors' assumption that recent conditions will prevail over the long term, fits the actual, year-by-year P/E ratios better than the fundamental model does (Exhibit 2). In fact, when we calculate the relative

EXHIBIT 2

Modeling investor behavior

Median P/E for S&P 500



¹For correlation between actual P/E and behavioral-model P/E, $r^2 = 0.89$; r^2 is the proportion or percentage of variance explained by a regression.

differences, the P/Es from the behavioral model are mostly within 20 percent of the actual P/Es. The behavioral model reflects the importance of short-term inflation in explaining the variation of actual P/E levels over time. Changes in expectations about short-term inflation were clearly the most important drivers for changes in actual P/E levels in the 1970s and 1980s, for example.

The behavioral model fits the actual market P/Es better than the fundamental model does, explaining around 90 percent of P/E variability over time, versus 80 percent for the fundamental model. But this result does not mean that the behavioral model is superior. It is better than the fundamental model at describing the market's current P/E level—or its level in the short term. The fundamental model, in contrast, better describes where the market's P/E level *should* be, so it more accurately predicts market-pricing levels in the longer term.

In addition, the behavioral model shows how market valuations adjust to fundamen-

tals over the long term because of the cyclical pattern in inflation and earnings. Since actual earnings and inflation tend to return to long-term trends (as they have during the past 40 years), the behavioral model sooner or later reflects fundamentals, exactly as the market does.


Implications for managers

Managers and investors should not be misled. Short-term biased behavioral valuations may fit better with market P/E ratios at a given point in time, but strategic financial decisions are still best made on the assumption that the fundamental model holds true in the long term and that markets will eventually recognize long-term growth and earnings potential.

Managers making tactical decisions on the timing of equity issuances or M&A transactions, for example, may well benefit from an understanding of when and why market deviations occur. The behavioral model provides insights into why markets could deviate from fundamentals and what

conditions would make markets return to fundamentals (as happened in the 1980s, when market values moved up as short-term inflation declined).

What holds for the stock market as a whole is likely to hold for sectors and companies as well. Investors tend to anchor their expectations for growth and profitability too much in the recent past and need time to revise these expectations to reflect long-term fundamentals. In the short term the stock market could therefore overvalue (or undervalue) sectors or companies that have

experienced strong upturns (or downturns), as investors' expectations tend to overshoot (or undershoot) the fundamentals. From empirical evidence, we know that this is precisely the type of bias that shapes analysts' forecasts for companies in cyclical industries.² 

Marc Goedhart (Marc_Goedhart@McKinsey.com) is an associate principal in McKinsey's Amsterdam office, and **Bin Jiang** (Bin_Jiang@McKinsey.com) is a consultant in the New York office, where **Tim Koller** (Tim_Koller@McKinsey.com) is a partner. Copyright © 2006 McKinsey & Company. All rights reserved.

²Marc Goedhart, Tim Koller, and David Wessels, *Valuation: Measuring and Managing the Value of Companies*, fourth edition, New York: John Wiley & Sons, 2005, pp. 653–62.