

**December 16, 2003**

We compare the performance of investment strategies based on dividend yields and dividend increases. The low-yield strategy generated the strongest total returns due to more favorable company fundamentals. The high-yield strategy led to undiversified portfolios that underperformed the benchmark.

## **Dividend-based investment strategies: dividend yields vs. dividend increases**

### **Low-yield stocks were the big winners**

Using 10 years of data for firms that were in the S&P 500 at December 31, 2002, we tested the following four dividend-based investment strategies: (1) invest in firms with high yields, (2) invest in firms with low yields, (3) invest in companies with large dividend increases, and (4) invest in companies with dividend cuts. Portfolios formed using a low-yield strategy outperformed the benchmark portfolio by 3.6% annually. By contrast, the high-yield strategy led to portfolios that were undiversified and underperformed the benchmark portfolio by 6.6% annually.

### **Stocks with large dividend increases were the second best performers**

Our empirical analysis shows that stocks with large dividend increases were the second-best performers over the last decade. These stocks outperformed the benchmark portfolio by 2.4% annually in the year before the dividend increase, but underperformed the benchmark portfolio by 0.8% annually in the year after the increase. This result suggests there is value in being able to predict the increase, but none in buying the stocks after the dividend increase is announced. In our July 1<sup>st</sup> report we showed that companies with strong underlying fundamentals and cash flows are the best candidates for dividend increases. In the first three quarters of 2003 large firms had bigger dividend increases than small firms. Small firms appear to have conserved cash resources to fund their growth.

### **Sectoral composition of strategies differed**

The low-yield strategy led to a portfolio that overweighted the Information Technology and Health Care sectors and the dividend-increase strategy overweighted the Financials sector. Investors responded differently to dividend increases in different sectors. The strongest share price responses to dividend increases were in the Telecommunication Services, Consumer Staples, and Information Technology sectors.

### **Bottom line: fundamentals still matter**

Our analysis shows that stocks with low yields and high dividend increases had higher profitability (as measured by ROE) and higher expected earnings growth (as measured by earnings yields) than stocks with high yields and dividend cuts. Investment decisions based on these inputs are likely to produce superior returns to decisions based on dividend yield alone. We recommend that investors: (1) be wary of the high-yield strategy, and (2) focus on fundamentals and valuation.

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*Recent reports of interest by the Goldman Sachs US Portfolio Strategy/Accounting Group include:*

- December 11, 2003 – Issues and Outlook 2004: The next phase of the equity bull market
- December 11, 2003 – S&P 500 EPS and DPS estimates for 2003 and 2004 raised - again
- November 14, 2003 – Pension Accounting: Lower interest rates lead to higher pension expenses and GAAP obligations
- October 2003 – Investment Strategy Chartbook, Special Edition
- August 21, 2003 – Raising S&P 500 earnings estimates following another quarter of strong earnings growth; earnings quality continues to improve
- July 1, 2003 – Dividends and investing under the new tax law: focus on company performance, not dividends

## Dividend yields or dividend increases?

Given the changes in the tax law, and with dividend initiations for the S&P 500 at a 20-year high, we decided to test the performance of four dividend-based investment strategies. These strategies are based on companies' dividend yield and dividend increase characteristics. Using S&P 500 firms at December 31, 2002, we formed portfolios annually based on the four strategies. We then calculated returns for each portfolio for the 12 months before and 12 months after the portfolio's formation.

### Four dividend strategies tested

We compared the four dividend-based investment strategies to a benchmark computed by equally weighting the returns of all stocks in the sample. The average annual benchmark return was 20.1% in the 12 months prior to rebalancing and 19.9% in the 12 months following rebalancing. The four dividend-based investment strategies in the order of their performance were:

- **The low-yield strategy.** Invest in the 50 stocks with the lowest dividend yields. In years when there are more than 50 companies that pay no dividends, invest in the largest companies in this category. Investors might pursue this strategy if they think high-growth firms pay low dividends. This strategy outperformed the benchmark portfolio by 9.7% in the 12 months prior to rebalancing and by 3.6% in the year after rebalancing. **The low-yield strategy continued to be the best performer even when Information Technology firms were excluded from the sample.**
- **The dividend-increase strategy.** Invest in the 50 stocks with the largest dividend increases. Investors might pursue this strategy if they think large dividend increases are a sign of future earnings growth and management confidence in future cash generation. This strategy outperformed the benchmark portfolio by 2.4% in the 12 months prior to rebalancing and underperformed the benchmark portfolio by 0.8% in the year after.
- **The dividend-cut strategy.** Invest in the stocks with dividend cuts. (In a normal year fewer than 50 companies cut their dividends.) In theory, investors could be attracted to these firms because the reductions could signal that the firm has discovered more favorable internal investment opportunities. From a practical standpoint, however, a dividend cut is normally bad news. We include this strategy so that we can test a complete set of dividend yield and change strategies. This strategy underperformed the benchmark portfolio by 10.6% in the 12 months prior to rebalancing and by 5.9% in the year after.
- **The high-yield strategy.** Invest in the 50 stocks with the highest dividend yields. Investors may invest in these stocks if they have an income orientation. In addition, a high yield could signal that the firm has sufficient funds to pay a dividend going forward. This strategy underperformed the benchmark portfolio by 18.1% in the 12 months prior to rebalancing and by 6.6% in the year after.

## 2003 dividend strategy performance

Consistent with the longer-term results, the **low-yield strategy** continued to be the best performer through the first three quarters of 2003, outperforming the benchmark portfolio by 1.7% monthly. Surprisingly, the dividend-cut strategy was the second-best performer with an average monthly excess return of 0.4%. We attribute this result to the particular set of utility firms that dominated the returns of the dividend-cut strategy. The Goldman Sachs Utilities team believes that investors perceived these firms as potential candidates for bankruptcy filings and their share prices were therefore depressed. Investors may have interpreted the dividend cuts as a sign that the firms were taking active steps to improve their operational problems, thereby resulting in share price increases. Excluding Utilities, the dividend-cut strategy performed slightly worse than dividend-increase strategy, which is consistent with longer-term trends.

## The dividend discount model and stock prices

Before we analyze the results of the strategies, it is useful to develop a conceptual framework for thinking about how dividend decisions affect stock prices. The dividend discount model (DDM) provides such a framework. The DDM can be written as:

$$P_0 = \frac{D_1}{r - g}$$

where  $D_1$  is next period's expected dividend,  $r$  is the investor's expected return on equity capital and  $g$  is the expected growth rate in the dividend. In other words, price represents the present value of a growing perpetuity of dividend payments.

Dividends from the above expression can be further decomposed into earnings and payout ratios as follows:

$$P_0 = \frac{E_1 \times k}{r - g}$$

where  $E_1$  is next period's expected earnings and  $k$  is the payout ratio.

### The information content in dividend policy

**Firms can increase dividends for at least three different reasons.**

Let's review the disparate factors that may underlie a firm's decision to raise dividends. A dividend increase can be: (1) part of the normal growth in dividends, (2) the result of an increase in the payout ratio, or (3) a signal that the firm expects a higher growth rate in earnings. It is important to distinguish between these catalysts because each has a different implication for future profitability, and consequently for stock prices. We discuss each interpretation in more detail below.

- **Dividend increases resulting from normal growth.** When dividends increase at their normal growth rate,  $g$ , the expected increase should already be reflected in the stock's price. Consequently, there is not likely to be a significant stock market reaction to the increase.
- **Dividend increases resulting from higher payout ratios.** When dividends increase because a company raised its payout ratio,  $k$ , the numerator in the DDM increases. The effect of the increase in the numerator on stock price may be partially offset, however, by a decrease in the expected growth rate,  $g$ . In other words, investors may interpret the increase in the payout ratio to mean that the company has fewer attractive investment opportunities and that there has been a reduction in the expected earnings growth.

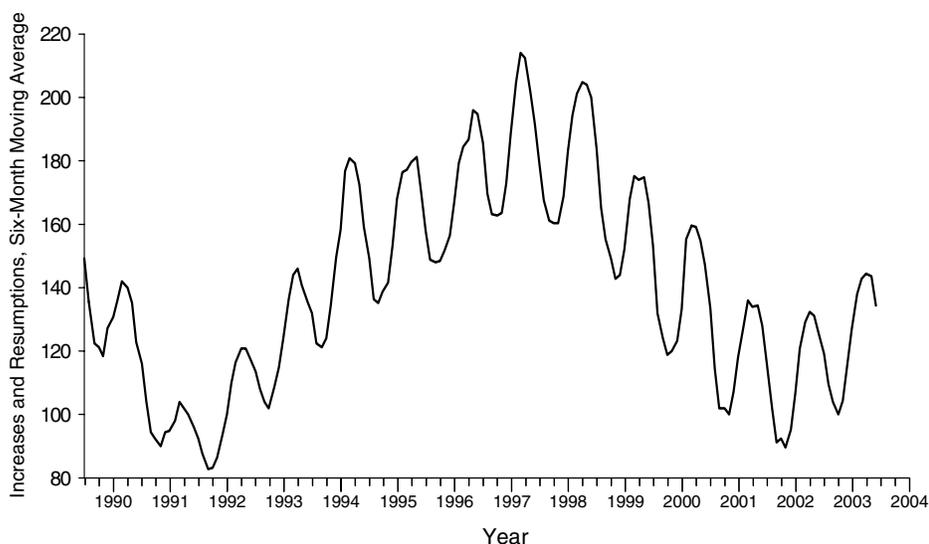
- **Dividend increases that signal an increase in expected earnings growth.** Firms can also use dividends to signal higher expected earnings growth, or that the currently high levels of profitability are sustainable. In this case the firm is not raising the payout ratio, **k**. Instead it is signaling a higher expected earnings growth rate, **g**. Such an increase could have a positive effect on stock prices. On the other hand, when dividends increase at a rate lower than **g**, investors might interpret the increase as a signal that there has been a reduction in the expected earnings growth rate. These increases could have a negative effect on stock prices.

### Dividends levels are now out of equilibrium

Investors expressed an increased interest in dividends even before changes in the tax law were announced.

When thinking about current dividend-paying behavior, it is important to consider that the starting point for firms' current decisions may not be in equilibrium. **In our July 1<sup>st</sup> report we noted that many S&P 500 companies had underpaid their potential dividends in recent years.** We identified approximately 20% of the index that potentially fall into this category. In addition, investors had previously demonstrated increased interest in receiving dividends. Consequently, firms had already begun to increase their dividends before the announced changes in the tax laws in which the tax rates on dividends were reduced to 15% from 38.6%. Exhibit 1 shows that for a large sample of roughly 7,000 firms the downward trend in dividend payments troughed in late 2001, well before the official tax law changes were announced.

**Exhibit 1: Dividend increases and resumptions**



Source: Standard & Poor's.

### Dividend increases in 2003

Using a sample of S&P 500 firms at December 31, 2002, we examined dividend initiations, increases and decreases for the first nine months of 2001, 2002, and 2003 to compare this year's dividend decisions to prior years. Exhibit 2 shows that initiations

and the average percentage increase rose sharply in 2003. As noted above, the increased initiations began earlier. The initiations were fueled by an increase in corporate cash flows, a reduction in capital expenditures, and the heightened dividend expectations of shareholders.

The data show that the average percentage increase was bigger for larger firms (i.e., above median market capitalization) than for smaller firms. The difference in the average increase for large and small firms was smaller in prior years. **This result suggests that the tax law changes had a potentially larger impact on the dividend-paying behavior of large firms and that smaller firms continue to use their resources to fund growth.**

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**Exhibit 2: 2003 dividend changes**

S&P 500 firms at December 31, 2002

	1/1/03 - 9/30/2003	1/1/02 - 9/30/2002	1/1/01 - 9/30/2001
# of firms that initiated dividends	17	4	2
# of firms that increased dividends	186	179	197
# of firms that decreased dividends	33	42	36
Average % Increase for large firms	15.6%	10.7%	12.9%
Average % Increase for small firms	12.4%	11.7%	12.0%
Average % Increase for all firms	14.0%	11.2%	12.4%

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*Source: Goldman Sachs Portfolio Strategy, Factset.*

## A test of four dividend-based investment strategies

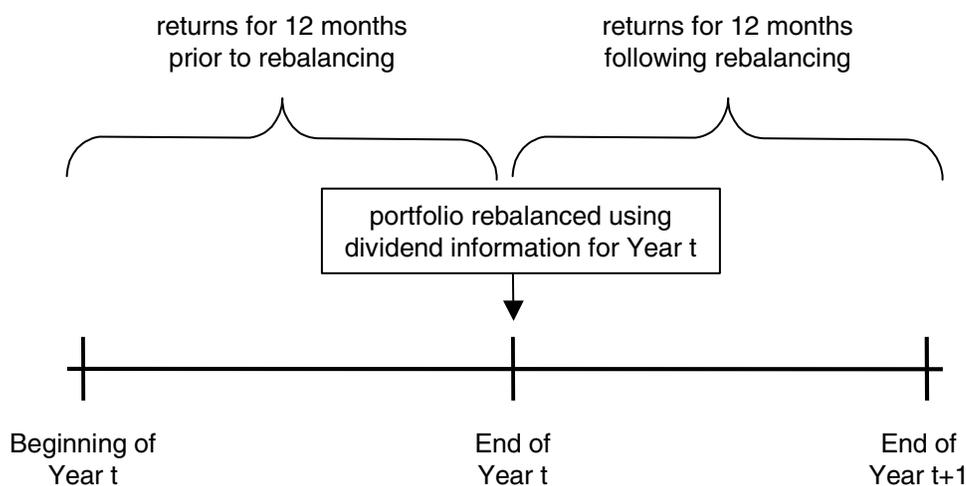
In this section we discuss our tests of the four dividend-driven investment strategies. Each strategy involves the annual rebalancing of a portfolio of stocks. We ranked each strategy based on its average annual total returns. We then compared each strategy's return to a benchmark portfolio that was comprised of an equal weighting of all stocks in the sample.

### Calculation of returns

**We examined returns before and after dividend changes.**

Exhibit 3 shows how we calculated average returns for the 12 months before and 12 months after each rebalancing. By examining the period before rebalancing we can gain insights to whether there is a benefit to being able to predict a firm's dividend characteristics because the return period begins before the dividend characteristics are known. By examining the period after rebalancing we can gain insights into whether the investment strategies would have been profitable because the portfolios were formed after the dividend characteristics were known.

**Exhibit 3: Calculation of returns before and after portfolio rebalancing**



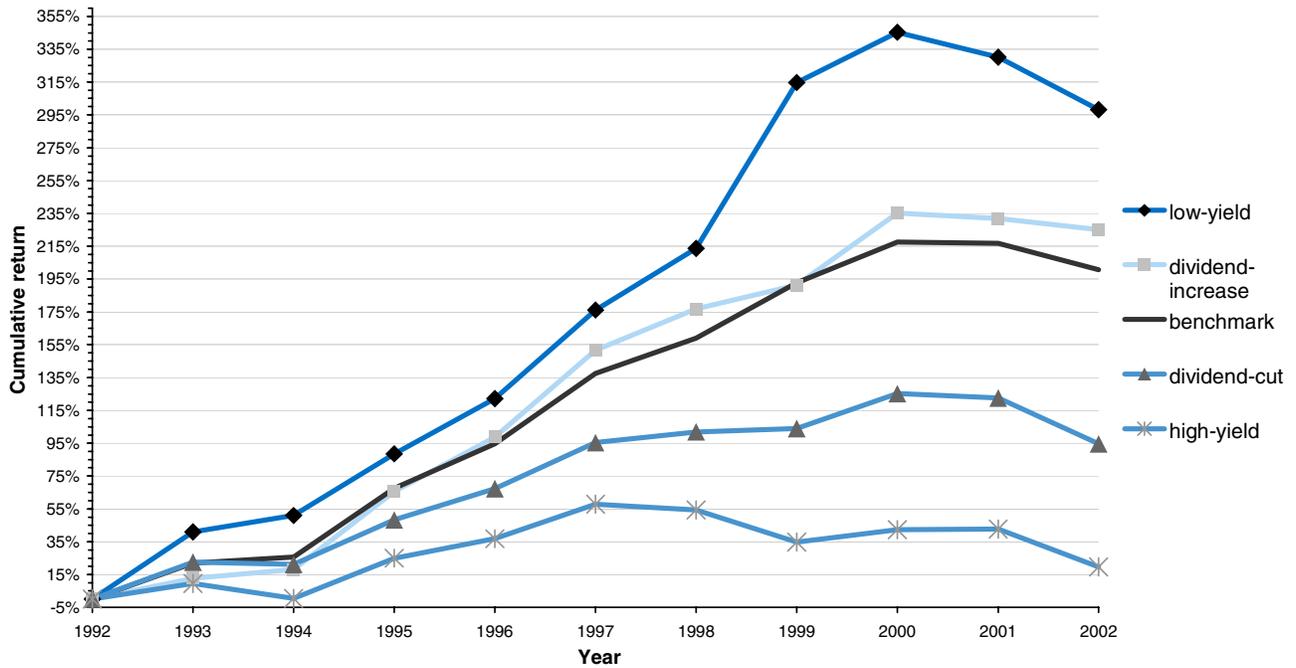
*Source: Goldman Sachs Portfolio Strategy.*

We also calculated the average relative price changes for the 12 months before and the 12 months after each rebalancing. This calculation provides insights into the proportion of returns that is explained by price changes. To the extent that price are associated with changes in underlying fundamentals, the calculation also provides some insights into the association between underlying fundamentals and dividend characteristics.

Exhibits 4 and 5 show cumulative returns for the investment strategies on a year-to-year basis. Exhibit 4 shows cumulative annual returns for the 12 months prior to rebalancing. **The data show that the low-yield strategy had the best performance for the entire sample period. In contrast, the high-yield strategy had the weakest performance.**

The dividend-increase strategy had positive cumulative returns over the sample period, but it did not cumulatively outperform the benchmark until 1996.

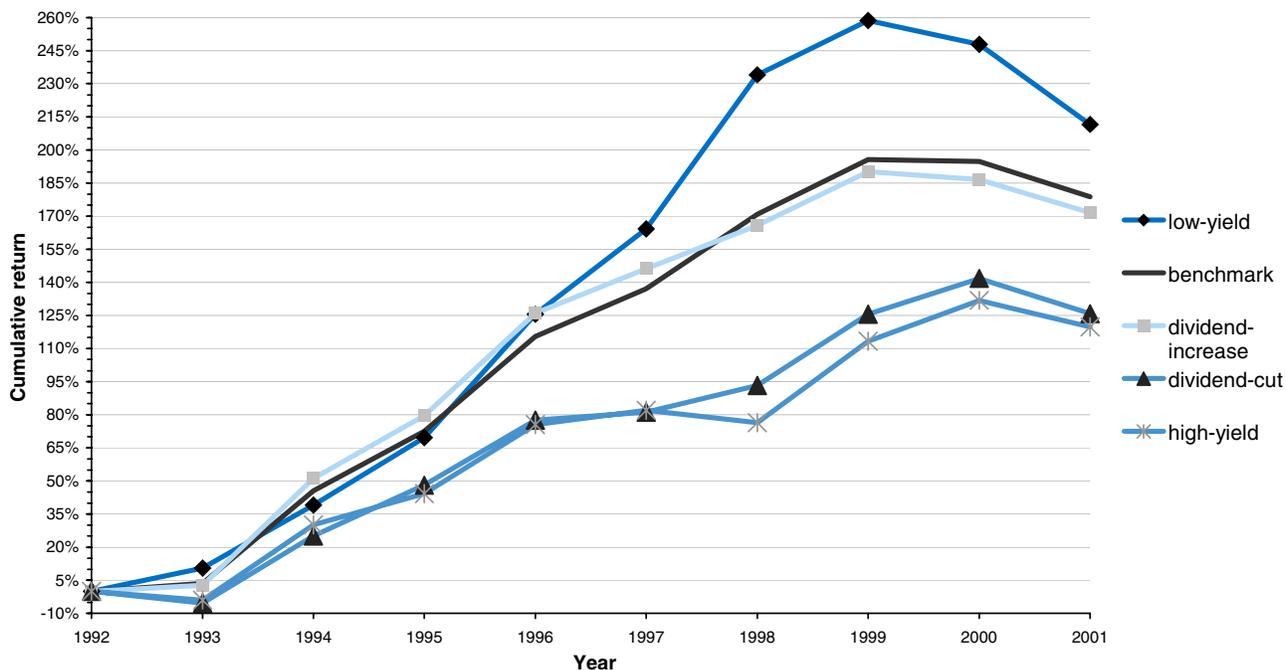
**Exhibit 4: Cumulative annual returns prior to rebalancing**  
S&P 500 firms, 1993-2002



Source: Goldman Sachs Portfolio Strategy, Factset.

Exhibit 5 shows a similar pattern exists after rebalancing. **A major difference is that after rebalancing the low-yield strategy is the only strategy that outperformed the benchmark.** In addition, cumulative returns are more tightly bunched for the dividend-cut, and high-yield strategies after rebalancing.

**Exhibit 5: Cumulative annual returns after rebalancing**  
S&P 500 firms, 1993-2002



Source: Goldman Sachs Portfolio Strategy, Factset.

### Analyzing strategy performance

In Exhibit 6 we take a closer look at the average annual excess total returns for the dividend-based investment strategies. **Panel A** shows the average excess returns for the 12 months before each rebalancing and **Panel B** shows the average excess returns for the twelve months following rebalancing. The Information Technology sector had unusually strong performance during our sample period and in **Panels C** and **D** we also show how the strategies performed when technology firms were excluded from the sample.

Before discussing the individual strategies we offer three general observations. **First, price changes were a significant component of total returns, even for high-yield stocks.** To the extent that price changes are associated with underlying fundamentals, this finding suggests that investor should focus on fundamentals and the related valuation, and not dividends. The inclusion of technology firms had a significant impact on relative price changes for all strategies. We therefore analyzed the results with and without technology firms included the sample.

**Second, the rank ordering of performance was similar regardless of whether we calculated returns before or after the portfolios were rebalanced. Only the low-yield and dividend-increase strategies outperformed the benchmark.** The low-yield strategy outperformed the benchmark in all scenarios and the dividend-increase strategy outperformed the benchmark before the portfolios were rebalanced. As noted above,

price changes were a significant component of total returns. These results are therefore consistent with low-yield and dividend-increase firms having strong underlying fundamentals.

**Third, the magnitudes of the returns are generally larger before rebalancing than after rebalancing.** This finding suggests that in the period before rebalancing, investors were responding to either (1) changes in underlying fundamentals, (2) changes in dividend characteristics, or (3) both.

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**Exhibit 6: Returns for dividend-based investment strategies**  
S&P 500 firms, 1993-2002

Panel A. 12 months prior to rebalancing

Strategy	Average annual excess price change	Average annual excess total return	Median annual excess total return
low-yield	11.6%	9.7%	7.6%
dividend-increase	2.4%	2.4%	1.2%
dividend-cut	-10.9%	-10.6%	-0.6%
high-yield	-21.6%	-18.1%	-12.2%

Panel B. 12 months following rebalancing

Strategy	Average annual excess price change	Average annual excess total return	Median annual excess total return
low-yield	5.4%	3.6%	8.8%
dividend-increase	-0.7%	-0.8%	0.6%
dividend-cut	-6.1%	-5.9%	0.4%
high-yield	-10.0%	-6.6%	0.5%

Panel C. 12 months prior to rebalancing excluding IT

Strategy	Average annual excess price change	Average annual excess total return	Median annual excess total return
low-yield	9.0%	7.2%	-2.6%
dividend-increase	-0.7%	-0.5%	-2.3%
dividend-cut	-11.1%	-10.7%	-0.5%
high-yield	-21.2%	-17.7%	-10.5%

Panel D. 12 months following rebalancing excluding IT

Strategy	Average annual excess price change	Average annual excess total return	Median annual excess total return
low-yield	7.3%	5.6%	-2.7%
dividend-increase	-2.7%	-2.6%	-0.4%
dividend-cut	-5.6%	-5.3%	0.4%
high-yield	-10.3%	-6.8%	0.5%

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Source: Goldman Sachs Portfolio Strategy, Factset.

Turning to our analysis of the individual strategies, as noted above, **the low-yield strategy was the clear outperformer.** It earned the highest return in the periods before and after rebalancing, regardless of whether technology companies were excluded from the strategy. Stock price changes were a significant determinant of total returns for this strategy. This result is consistent with low-yield companies having high growth potential.

The dividend-increase strategy earned the second-highest return. This strategy outperformed the benchmark in the period before rebalancing, but not in the period after rebalancing. This result suggests that investors can benefit from successfully predicting dividend increases. On the other hand, outperforming the benchmark was more difficult in the year after dividend increases were announced. **Later in this report we show that dividend-increasing firms tend to have relatively high ROEs.** In addition, our July 1<sup>st</sup> report shows that dividends per share are associated strong cash flows. Firms with strong fundamentals and cash flows are therefore good candidates for dividend increases.

The third-highest return was earned by the dividend-cut strategy. The strategy is comprised of 230 cases where dividends were cut. The analysis shows that negative returns continue for this strategy in the year after rebalancing. These characteristics are symptomatic of companies with weak underlying fundamentals. Note that this strategy may have performed even worse without the benefit of survivorship bias. In other words, we know the firms in the dividend-cut sample could not fail because they were selected from the S&P 500 composition at December 31, 2002. Had we not selected the sample in this way, some of these firms would likely fail.

The high-yield strategy earned the lowest return. Large price declines were a significant determinant of the negative returns for these firms. The price declines were larger in the year before rebalancing than the year after rebalancing. This result suggests that these stocks have high yields not just because they pay high dividends, but also because they have depressed share prices. Like the firms identified by the dividend-cut strategy, the firms identified by the high-yield strategy exhibit characteristics of fundamentally weak companies.

### Dividend yields and dividend increases in 2003

It is possible that recent changes in the tax law have changed the way investors view dividend characteristics. In this section we analyze total stock returns of the four dividend-based investment strategies for the first nine months of 2003. The strategies are based on dividend information that was available at September 30, 2003.

Exhibit 7 shows that, consistent with the last 10 years, the low-yield strategy continues to perform well and the high-yield strategy continues to perform poorly. In contrast to the past 10 years, the dividend-cut strategy outperforms the dividend-increase strategy.

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**Exhibit 7: Returns for dividend-based investment strategies**  
 S&P 500 firms, 1/1/2003 - 9/30/2003

## Panel A. Prior to rebalancing

<b>Strategy</b>	<b>Average monthly excess price change</b>	<b>Average monthly excess total return</b>	<b>Median monthly excess total return</b>
low-yield	1.8%	1.7%	-1.1%
dividend-increase	-0.7%	-0.7%	0.1%
dividend-cut	0.4%	0.4%	-1.0%
high-yield	-1.8%	-1.5%	-0.9%

## Panel B. Prior to rebalancing excluding IT

<b>Strategy</b>	<b>Average monthly excess price change</b>	<b>Average monthly excess total return</b>	<b>Median monthly excess total return</b>
low-yield	1.7%	1.6%	0.2%
dividend-increase	-0.8%	-0.8%	-0.1%
dividend-cut	0.4%	0.3%	-1.0%
high-yield	-1.8%	-1.5%	-0.9%

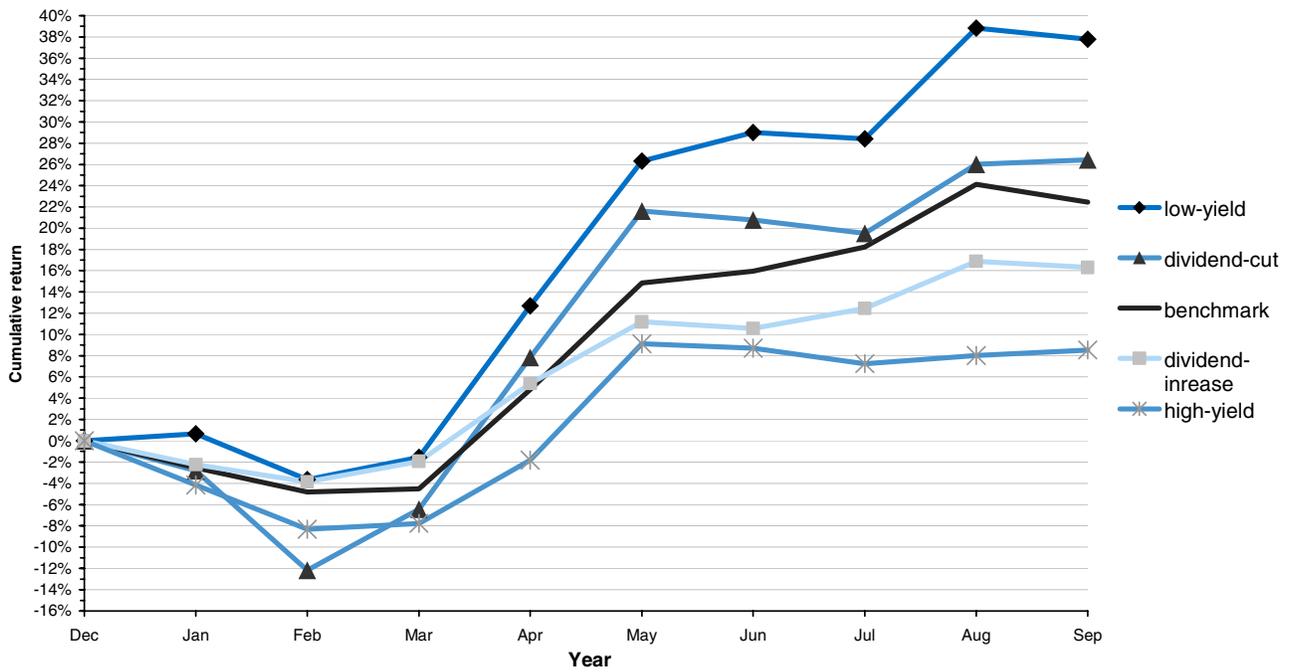
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*Source: Goldman Sachs Portfolio Strategy, Factset.*

Exhibit 8 shows the monthly returns for the four strategies. Consistent with the past 10 years, the dividend-increase strategy performed well through March, but then its performance declined. One possible explanation for these results is that actual dividend increases were less than expected dividend increases. Also consistent with the past 10 years, the dividend-cut strategy performed relatively poorly through February, but then its performance improved. A closer look at the strategy's sectoral composition revealed that a set of Utilities drove the return. The Goldman Sachs Utilities team believes these firms were potential candidates for bankruptcy filings, which resulted in low valuations. Investors may have perceived the dividend cuts as a sign that the companies were taking active steps to correct their operational problems. Excluding Utilities, the dividend-cut strategy underperformed the benchmark portfolio by 0.8%, slightly below the return for the dividend-increase strategy, and consistent with longer-term trends.

**Exhibit 8: Cumulative monthly returns**

For the period of 1/1/2003 – 9/30/2003



Source: Goldman Sachs Portfolio Strategy, Factset.

Note that we do not report the strategies' total returns excluding information technology because the performance is similar whether or not that sector is excluded.

## In the end, fundamentals matter when building portfolios

The more profitable strategies identified companies with stronger underlying fundamentals.

The preceding analyses document that both the low-yield and dividend-increase strategies outperformed the benchmark over the last decade. Our interpretation of these findings is that these strategies were constructed from companies that were fundamentally sound (i.e., companies with attractive investment opportunities and strong expected earnings growth). Exhibit 9 shows that the low-yield strategy was constructed from companies with relatively high profitability (ROE) and high expected earnings growth (low E/P). In addition, the dividend-increase strategy was constructed from companies with high profitability. As noted above, companies with strong fundamentals and cash flows are good candidates for dividend increases.

On the other hand, the dividend-cut and high-yield strategies were constructed from companies that had neither high profitability nor high expected earnings growth. **These results are consistent with the conventional wisdom that fundamentally unattractive companies offer high yield on their equities.**

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### Exhibit 9: Underlying fundamentals for investment strategies

S&P 500 firms, 1993-2002

Strategy	Mean ROE	Median ROE	Mean E/P	Median E/P
low-yield	20.9	15.8	4.6	3.9
dividend-increase	20.8	19.4	5.9	5.0
dividend-cut	16.3	13.8	5.8	5.2
high-yield	16.4	12.1	7.2	7.2

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Source: Goldman Sachs Portfolio Strategy, Factset.

We offer the following guidelines for using dividend characteristics for selecting stocks and building portfolios:

Even income-oriented investors should avoid the high-yield strategy.

- **Beware of the high-yield strategy.** Changes in US tax law, and other market forces that motivated companies to consider changes in their dividend policies, might encourage investors to select stocks based solely on dividend yields. However, we believe that even equity investors who have an income orientation should be wary of relying on such a strategy and should consider companies likely to meaningfully **increase** yields, even from low levels.
- **Diversify properly.** Similarly, investors without an income orientation should resist investing only in low-yielding stocks. Although this strategy produced the highest returns in our tests, we show in the next section that it resulted in the least diversified portfolio and therefore had the highest risk. These investors should diversify by also investing in companies that are likely to significantly increase their dividends.
- **Focus on fundamentals.** Finally, although the results for the two better-performing strategies are good, other investment strategies that result in companies with even stronger fundamentals are likely to produce even better results. In the end, we believe that an investor's assessment of a company's fundamentals and the related valuation should be the most important input to a portfolio selection process.

## Sectoral composition of strategies

In this section we analyze the number of companies in the sector as a percentage of the number of companies in the portfolio compared to the number of companies in the S&P 500 sector as a percentage of companies in the S&P 500. We use the number of companies instead of market capitalization to get a sense of weightings because the portfolios are formed on an equally weighted basis.

**The Information Technology sector had a large representation in the low-yield strategy.**

First we examine the two dividend yield strategies. Exhibit 10 shows that the **low-yield strategy** overweighted **Information Technology** and to a lesser extent **Health Care**. It underweighted **Financials** and to a lesser extent **Industrials**. Exhibit 11 shows that the **high-yield strategy** overweighted **Utilities** and to a lesser extent **Materials**. It underweighted **Information Technology** and to a lesser extent **Consumer Discretionary**. The findings for the yield strategies are consistent with conventional wisdom. Sectors with more attractive investment opportunities (e.g., Information Technology and Health Care) had lower dividend yields than sectors with fewer attractive investment opportunities (e.g., Utilities and Materials).

**Exhibit 10: Sectoral composition of low-yield strategy**  
S&P 500 firms, 1993-2002

Sector	Number of companies as % of portfolio	Sector as a % of S&P 500 sector
Consumer Discretionary	16%	18%
Consumer Staples	3%	7%
Energy	4%	5%
Financials	2%	16%
Health Care	15%	9%
Industrials	6%	13%
Information Technology	40%	15%
Materials	6%	7%
Telecommunication Services	3%	2%
Utilities	5%	7%
Total	100%	100%

Source: Goldman Sachs Portfolio Strategy, Factset.

**Exhibit 11: Sectoral composition of high-yield strategy**

S&amp;P 500 firms, 1993-2002

<b>Sector</b>	<b>Number of companies as % of portfolio</b>	<b>Sector as a % of S&amp;P 500 sector</b>
Consumer Discretionary	10%	18%
Consumer Staples	4%	7%
Energy	7%	5%
Financials	17%	16%
Health Care	6%	9%
Industrials	12%	13%
Information Technology	2%	15%
Materials	12%	7%
Telecommunication Services	4%	2%
Utilities	27%	7%
Total	100%	100%

Source: Goldman Sachs Portfolio Strategy, Factset.

Next we examine the two dividend change strategies. Exhibit 12 shows that the **dividend-cut strategy** overweighted **Utilities** and to a lesser extent **Industrials** and **Materials**. In addition, the strategy underweighted **Information Technology**. Exhibit 13 shows that **dividend-increase strategy** overweighted **Financials** and underweighted **Information Technology**. Here again, the findings for the dividend-increase and dividend-cut strategies are consistent with conventional wisdom. Sectors with higher and more stable earnings growth prospects (e.g., Financials) had higher dividend increases than sectors with lower and less stable earnings growth prospects (e.g., Utilities, Industrials, and Materials).

**Exhibit 12: Sectoral composition of dividend-cut strategy**

S&amp;P 500 firms, 1993-2002

<b>Sector</b>	<b>Number of companies as % of portfolio</b>	<b>Sector as a % of S&amp;P 500 sector</b>
Consumer Discretionary	16%	18%
Consumer Staples	3%	7%
Energy	3%	5%
Financials	14%	16%
Health Care	10%	9%
Industrials	18%	13%
Information Technology	8%	15%
Materials	11%	7%
Telecommunication Services	2%	2%
Utilities	14%	7%
Total	100%	100%

Source: Goldman Sachs Portfolio Strategy, Factset.

**Exhibit 13: Sectoral composition of dividend-increase strategy**  
S&P 500 firms, 1993-2002

Sector	Number of companies as % of portfolio	Sector as a % of S&P 500 sector
Consumer Discretionary	18%	18%
Consumer Staples	6%	7%
Energy	3%	5%
Financials	32%	16%
Health Care	8%	9%
Industrials	12%	13%
Information Technology	8%	15%
Materials	6%	7%
Telecommunication Services	0%	2%
Utilities	7%	7%
Total	100%	100%

Source: Goldman Sachs Portfolio Strategy, Factset.

**The Utilities sector had a large representation in the high-yield strategy.**

Collectively, Exhibits 10 to 13 provide two interesting insights. First, all of the strategies except for the low-yield strategy underweight the Information Technology sector. The relative performance of these three strategies would be penalized given the strong performance of technology companies during our sample period. Second, the yield strategies (Exhibits 10 and 11) use a smaller number of stocks and have a greater concentration of sectors than do the change strategies (Exhibits 12 and 13). **This result suggests that the two yield strategies are less diversified and therefore potentially riskier.**

## A more detailed look at sectoral performance

The prior analyses document the correlation between stock returns and both dividend yields and dividend changes. In this section we examine how these relationships vary by sector.

### Dividend yields, dividend increases, and stock returns

As noted above, **investors are likely to respond positively to dividend increases when the increases are interpreted as a sign of strong expected earnings and cash flows.** In Panel A of Exhibit 14 we regressed price changes on percentage dividend changes. Overall, price changes and dividend changes were positively correlated during this time period, but there was significant variation in the correlations across sectors. Telecommunication Services had the largest regression coefficient, followed by Consumer Staples and Information Technology. For example, a 100% dividend increase in Telecommunication Services was associated with a 64% increase in stock price. Similarly, 100% dividend increases in Consumer Staples and Information Technology were associated with 53% and 31% price increases, respectively. These results suggest that investors believed the dividend increases were a sign of sustainable increased profitability and cash flows in these sectors. On the other hand, there was no association between dividend increases and price changes in Industrials, Health Care, and Energy. Apparently, investors in these sectors did not believe that the dividend increases were associated with sustainable increased profitability.

Unlike a large dividend increase, a large dividend payout may be interpreted as a negative sign if investors believe the company does not have attractive internal investment alternatives. In Panel B of Exhibit 15 we regressed price changes on dividends per share. (We use dividends per share instead of dividend yields as a measure of payout because there is an induced correlation between dividend yields and returns.) Overall, price changes and dividends per share were negatively correlated during this time period, but here again there was significant variation in the correlations across sectors. Information Technology had the smallest (i.e., most negative) regression coefficient. In this sector each incremental \$1 of dividends paid per share (i.e., payout) was associated with a 35% price reduction. This result suggests that investors punished Information Technology firms more severely than other firms for having high payout ratios. One interpretation of this finding is that investors took a harsh view of technology firms that had low growth prospects.

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**Exhibit 14: Regression of price changes on % dividend changes and dividend levels**  
 S&P 500 firms, 1993-2002

**Panel A. Regression of price changes on % dividend changes**

<b>Sector</b>	<b>Coefficient</b>	<b>N</b>	<b>R-squared</b>
Consumer Discretionary	0.11 *	632	0.7%
Consumer Staples	0.53 *	314	9.3%
Energy	0.01	188	0.0%
Financials	0.12 *	718	0.7%
Health Care	0.01	259	0.0%
Industrials	0.00	476	0.1%
Information Technology	0.31 *	209	4.4%
Materials	0.21 *	303	3.8%
Telecommunication Services	0.64 *	80	13.4%
Utilities	0.23 *	337	6.4%
All observations	0.03 *	3516	0.3%

**Panel B. Regression of price changes on dividends per share**

<b>Sector</b>	<b>Coefficient</b>	<b>N</b>	<b>R-squared</b>
Consumer Discretionary	-0.18 *	811	3.0%
Consumer Staples	-0.06 *	342	1.0%
Energy	-0.14 *	229	4.3%
Financials	-0.16 *	725	5.1%
Health Care	-0.15 *	436	1.9%
Industrials	-0.08 *	577	1.9%
Information Technology	-0.35 *	739	0.5%
Materials	-0.06 *	323	1.4%
Telecommunication Services	-0.03	98	0.3%
Utilities	-0.08 *	357	1.7%
All observations	-0.15 *	4637	2.7%

\* statistically significant at the 5% level.

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Source: Goldman Sachs Portfolio Strategy, Factset

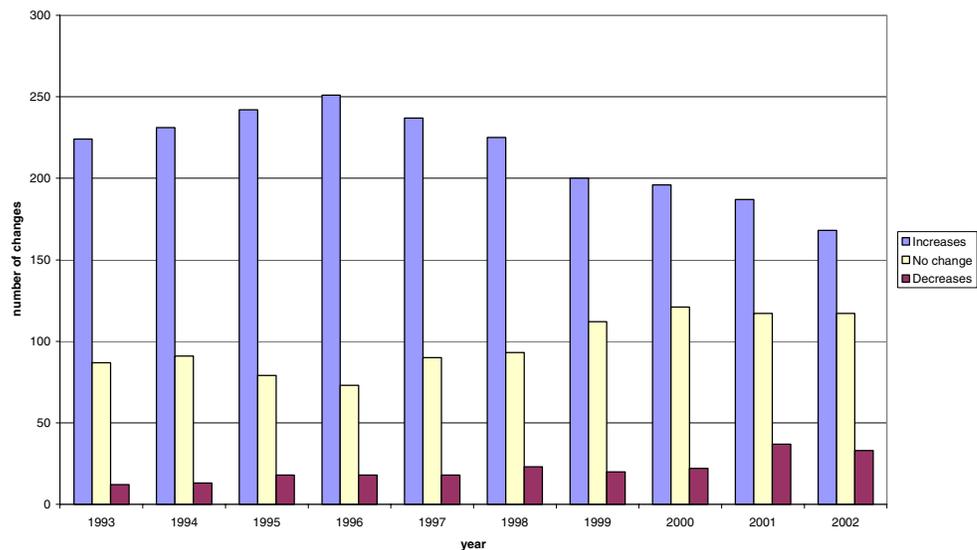
## Appendix: A quick review of dividend-paying behavior

Earlier in this report we examined changes in dividend-paying behavior for 2003. In this section we examine longer-term trends. Companies typically make dividend decisions by starting with last year's dividend and then determining how large an increase is sustainable. Their goal is to increase the dividend by the minimum amount that investors find acceptable so the company can retain earnings needed for operations and growth and sustain the dividend even under adverse business conditions. Should the company's outlook improve, it may signal this improvement by announcing an unusually large dividend. Here again, the firm will only announce an increase that it believes is sustainable. On the other hand, should the company fall on hard times, it would resist cutting the dividend. It would first consider holding the dividend flat, and it would only cut the dividend as a last resort.

### Dividend increases outnumber decreases

Consistent with this description, Exhibit 15 shows that in each year over the last decade S&P 500 companies were much more inclined to increase dividends than to decrease them.

**Exhibit 15: Dividend changes**  
S&P 500 firms at December 31, 2002



Source: Goldman Sachs Portfolio Strategy, Factset.

**Firms were more inclined to hold dividends constant than to cut them.**

In the average year between 1993 and 2002 the increases outnumbered decreases by a ratio of 10 to 1. The number of increases rose to 251 in 1996 from 224 in 1993, and then declined to 168 in 2002 (a net reduction of 56 firms). During the 1997-2002 period the firms not changing their dividends increased to 117 in 2002 from 73 in 1996 (a net increase of 44 firms.) The number of decreases only rose only modestly to 33 in 2002 from 18 in 1996 (a net increase of 15 firms).

**It should be noted that the survivorship bias inherent in the sample might overstate firms' tendencies to increase dividends and understate firms' tendencies to decrease dividends.** Our analysis examines the performance of companies in the S&P 500 over the last decade. Consistently poor performing companies would likely be removed from the index and, hence, from our sample. Poorly performing companies are less likely to increase dividends and are more likely to decrease dividends.

### Dividend payments highly correlated from one period to the next

**Dividend levels, not payout ratios, were the main determinant of short-term dividend policies.**

Also consistent with our view, Exhibit 16 shows that **dividends are significantly correlated with prior dividends.** The correlation coefficient is a statistically significant .87. **Payout ratios are not correlated from one period to the next.** The coefficient is a statistically insignificant -0.005. Although the numerator in the ratio (dividends per share) has been stable, the denominator (earnings per share) was volatile in response to business conditions and fluctuations in earnings. Many firms in the sample continued to pay dividends even when earnings were negative. The effect of these two patterns has been to lower the correlation of the payout ratio from one period to the next. If firms use payout ratios to set dividend levels, it appears that they use long-term average payout ratios. Consistent with this hypothesis, when we calculate the correlations of firms' average payout ratios from 1993-1997 with their average payout ratios from 1999-2002 the correlation coefficient rises to a statistically significant .175.

**Exhibit 16: Correlations of dividends, lagged dividends, payouts and lagged payouts**  
S&P 500 firms, 1993-2002

	dividends	lagged dividends	payout	lagged payout
dividends	1	0.87301*	0.13115*	0.01562
lagged dividends		1	0.09616*	0.02105
payout			1	-0.00535
lagged payout				1

\* statistically significant at the 5% level

Source: Goldman Sachs Portfolio Strategy, Factset.

**The hypotheses are borne out by the results.**

**These results appear to confirm the hypothesis that firms set dividends at sustainable levels and maintain them in spite of short-term volatility in earnings performance. The results are also consistent with our view that firms announce minimum acceptable dividend increases in order to avoid future dividend reductions.**

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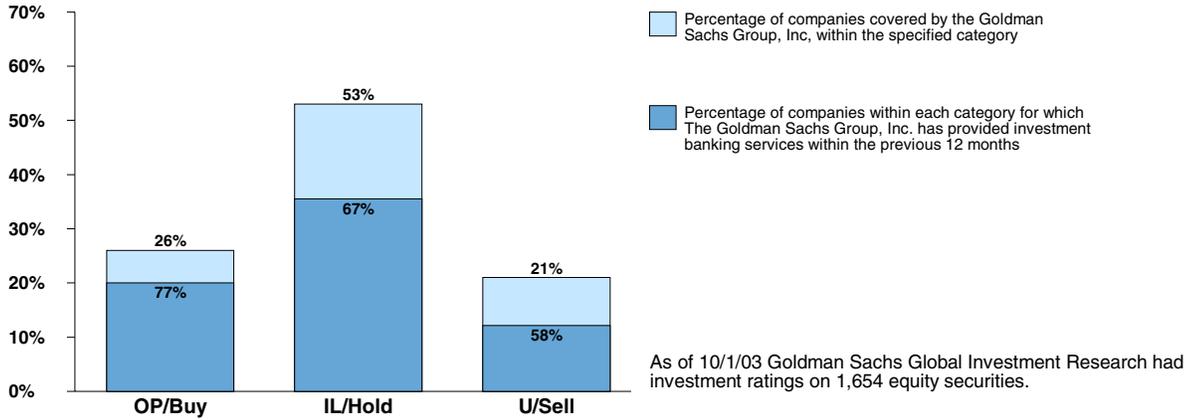
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Source: Goldman Sachs

As of October 1, 2003

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