Is It Better to Wade in or Cannonball?

Quantifying the Trade-Offs of Dollar-Cost Averaging

BERNSTEIN

Executive Summary

- In typical or strong markets, dollar-cost averaging reduces returns compared to investing immediately—but it also preserves more capital during declining markets. Think of dollar-cost averaging as a form of insurance: it reduces both investment risks and returns in exchange for peace of mind.

- If an investor chooses to dollar-cost average, a period of up to six months is the most efficient. Between six and 18 months, the trade-off remains reasonable. But beyond 18 months, the cost of missing out on substantial gains outweighs the benefit.

- The market valuation at the beginning of the investment period influences the cost and benefit analysis. The excess CAPE yield—a measure of the market's valuation relative to long-term, inflation-adjusted earnings and current bond yields—is useful for determining whether dollar-cost averaging makes sense.

- Compared to US large-caps, the balance between cost and benefit for dollar-cost averaging is more favorable in US small-caps and emerging markets, but less favorable in bonds.

- When taxes enter the equation, both the cost and benefit of dollar-cost averaging versus investing immediately are dampened, particularly when factoring in tax-loss harvesting considerations.

New Insights into Dollar-Cost Averaging

Dollar-cost averaging is a popular investment strategy that involves systematically investing a fixed amount of money in the market at regular intervals over time. For example, an investor with $1 million might choose to invest $100,000 in the stock market on the first day of each month for 10 months in a row, keeping the remaining balance in cash until it's fully invested. Alternatively, with lump sum or immediate investing, the investor dives in headfirst, placing the entire $1 million into the stock market at once.

Statistically speaking, investing immediately tends to yield higher returns than dollar-cost averaging. That's because the stock market has historically trended upward, and keeping money on the sidelines means forgoing wealth building during periods of positive returns. This upward trajectory becomes especially clear when viewed over longer periods, such as 10 years or more. So, why do so many investors still choose to dollar-cost average?

We believe there are several reasons. First, dollar-cost averaging helps investors avoid the risk of putting all their money in the market at an inopportune time, such as just before a major market correction. Such unfortunate timing might deter investors from future investments. In contrast, investing at a slower pace may alleviate the anxiety and remorse many investors feel after a steep market decline. What's more, investors who start dollar-cost averaging just before a bear market hits can benefit by purchasing more shares at lower

prices, effectively turning market downturns to their advantage. In this way, dollar-cost averaging not only reduces the risk of investing but also acts as a safety net against volatile markets. Finally, dollar-cost averaging may be ideal for those who might otherwise be paralyzed by fear, ultimately helping them take the plunge.

These insights on dollar-cost averaging are well known. After all, this strategy has been analyzed in the past from both theoretical and empirical perspectives in many academic and industry research papers, including multiple Bernstein white papers. The 2008 Bernstein white paper "Entering the Market" quantified the trade-offs associated with dollar-cost averaging using historical S&P 500 returns dating back to 1926. Since its publication 16 years ago, we have experienced a variety of market environments, including:

- the 2008–2009 Global Financial Crisis and subsequent long bull market fueled by easy monetary policies and record-low interest rates
- the sudden and swift 2020 COVID market drawdown and rapid recovery
- the significant rise of inflation driven by supply chain disruptions and rebounding consumer demands post-pandemic, and
- the Fed's shift to tightening monetary policy and interest rate hikes.

Given these market developments, do the conclusions from the 2008 paper still hold?

Revisiting Dollar-Cost Averaging with New Data

To answer this question, we have updated our prior research with 16 years of new data. In doing so, we confirm that the following conclusions about dollar-cost averaging still hold:

- In typical markets, the approach reduces investors' returns compared to investing immediately. This pattern persists regardless of whether the market was rising or falling in the year leading up to the investment's inception, and it holds true whether investments are made during market dips or upswings.

- Dollar-cost averaging helps preserve capital during declining markets. If the market performs poorly while averaging in, this strategy results in more wealth than investing all at once. So, while reducing median returns in most scenarios, dollar-cost averaging also narrows the range of returns.

- When going this route, the optimal balance between cost and benefit occurs over a period of no more than six months. Beyond that, the cost starts to outweigh the benefit, and after 18 months, the cost of missing substantial gains far outweighs the potential benefits.

In 2020, Bernstein published another white paper, "Once Bitten, Twice Shy?," examining dollar-cost averaging using global stocks and bonds. Due to the asset classes selected, the analysis is limited to a shorter period, dating back to 1988. More importantly, the current market environment departs greatly from that of five years ago.

Following the 2021–2022 inflation spike and subsequent Fed tightening cycle, today's interest rates stand at a much higher level. The market for US large-cap stocks has reached historically high valuation levels, albeit with volatility and drawdowns along the way, while becoming even more concentrated. How much does the dollar-cost averaging outcome depend on starting market conditions? Furthermore, most analyses focus on US large-cap stocks, but how does it fare with more volatile asset classes, like US small-caps and emerging markets? And what about bonds?

Exploring the Trade-Offs from New Angles

In what follows, we explore these new questions along with the following insights:

- The cost and benefit of dollar-cost averaging are impacted by starting market valuations. For example, the excess CAPE yield helps indicate when dollar-cost averaging may offer a better trade-off compared to investing immediately.

- The trade-off between cost and benefit is more advantageous in US small-caps and emerging markets compared to US large-caps, making dollar-cost averaging more likely to outperform in these asset classes. Conversely, when it comes to bonds, the trade-off is less favorable than it is for US large-caps.

Compared to five years ago, we now have a greater portion of client assets invested in private alternative asset classes, such as private equity and private debt, as well as in risk-managed strategies like buffered ETFs. Additionally, we've developed a US equity tax-loss harvesting strategy with a strong track record, enabling benchmark-sensitive investors to benefit from tax savings—a silver lining during equity market downturns. Consequently, we will also discuss dollar-cost averaging within private alternatives and buffered ETFs, as well as the costs and benefits of dollar-cost averaging versus immediate investing on an after-tax basis, particularly in light of tax-loss harvesting opportunities.

But first, let's start by quantifying the risk-return trade-offs of dollar-cost averaging versus immediate investing and reaffirming the insights from previous Bernstein white papers.

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How much do outcomes depend on starting market conditions? And how does dollar-cost averaging fare with more volatile asset classes?"

Dollar-Cost Averaging: Costly in Typical and Strong Markets, but Protective in Poor Markets

We compared dollar-cost averaging with investing immediately in a historical analysis of the US stock market as represented by the S&P 500 index. The analysis covers the period from January 1926 through December 2024, using monthly total return performance data of the S&P 500 and cash. This nearly 100-year span includes over 1,000 rolling 12-month investment periods, starting with the period from January 1, 1926 to December 31, 1926, and ending with the period from January 1, 2024 to December 31, 2024.

For each one-year investment period, we simulated the investment outcomes of two strategies: investing immediately in the US stock market at the beginning of the period, and dollar-cost averaging, which involves dividing the money into 12 equal installments and investing one installment at the beginning of each month for 12 months. For reference, we also examined the outcome of holding cash for the same period.

Collectively, these rolling one-year investment periods encompass a wide range of market environments, providing a comprehensive sample of investment results and statistics to enhance our understanding of these strategies. As shown in *Display 1*, left, the median return of the US stock market across all rolling one-year investment periods since 1926 is 13.3%. During the same periods, the median return of holding cash is 2.9%, and the median return of dollar-cost averaging is 9.1%

It is not surprising that the return of dollar-cost averaging falls between investing immediately and holding cash. After all, it is a strategy that provides comfort by gradually transitioning from cash to being fully invested. However, the cost of this comfort is significant. Dollar-cost averaging reduces the median one-year return by more than 4% compared to investing immediately!

On the other hand, investing immediately carries the downside risk of poor timing, while dollar-cost averaging mitigates this risk by holding a greater proportion of cash on average. Consequently, the range of returns is substantially greater for investing immediately than for dollar-cost averaging, as shown in *Display 1*, right. For instance, the downside potential, represented by the 90th percentile outcome, is −6.4% for dollar-cost averaging, and it nearly doubles to −12.3% for investing immediately.

DISPLAY 1: INVESTING IMMEDIATELY OFFERS THE HIGHEST POTENTIAL RETURN, BUT ALSO INCREASES THE DOWNSIDE RISK ASSOCIATED WITH POOR TIMING

Median One-Year Returns
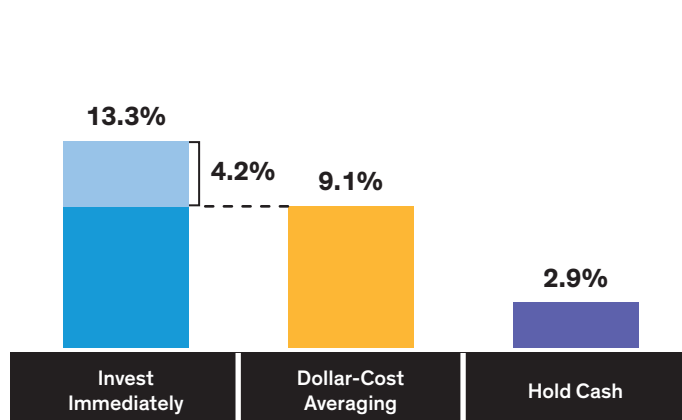
Range of One-Year Returns
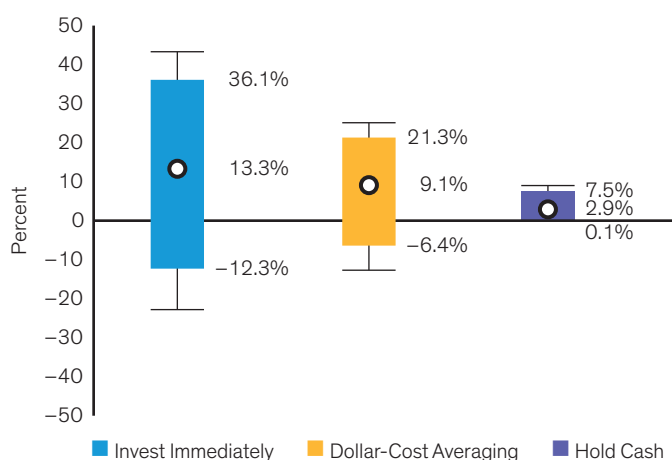
Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns for the US large-cap stock market, as represented by the S&P 500 Index, from 1926 to 2024. Dollar-cost averaging assumes equal monthly investments over 12 months. Box and whiskers (right display) show 5th, 10th, median, 90th, and 95th percentiles.

As of December 31, 2024 | **Source:** Standard & Poor's (S&P) and Bernstein analysis

While predicting the market return for the next one-year period with great accuracy is impossible, the market performance in the prior one-year period is known. Does the market's performance in the previous period affect the return give-up of dollar-cost averaging versus investing immediately, as shown in Display 1, page 5? Not really.

Display 2 shows median one-year returns following positive market returns (left) and negative market returns (right) in the previous 12-month period. Because the stock market return tends to revert to its long-term average, the one-year median return of investing immediately is actually better in years following a negative 12-month period compared to a positive 12-month period: 16.9% versus 12.9%. The same holds true for dollar-cost averaging. However, regardless of the market direction in the most recent 12-month period, the median return give-up of dollar-cost averaging versus investing immediately remains a little over 4%, very close to the differential shown in Display 1, left.
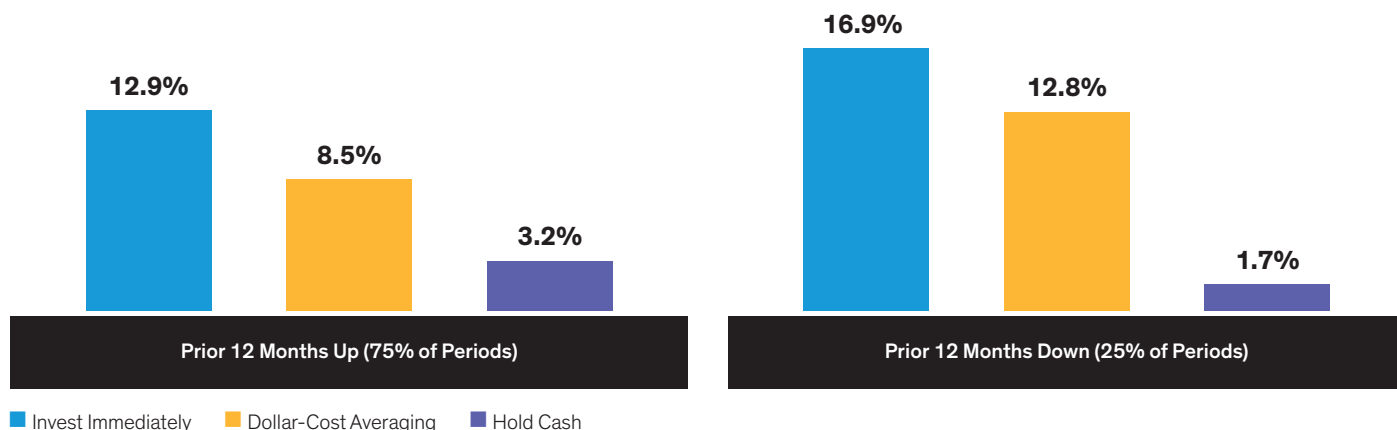
While the statistics shown in Displays 1 and 2 provide valuable insights into the performance of the strategies, they don't offer bona fide direct comparisons, as the median returns of investing immediately and dollar-cost averaging likely occurred in different rolling one-year periods. A more direct comparison involves evaluating the total wealth resulting from investing immediately versus dollar-cost averaging within the same one-year investment window. Again, we examined all rolling one-year periods since 1926 to make this wealth comparison within each period.

Intuitively, certain periods of flat or downward trending stock market performance should lead to superior returns with dollar-cost averaging compared to investing immediately. To confirm this intuition, we arranged all the one-year periods by market performance, from the strongest to the weakest. Display 3, page 7, shows that in poor markets, defined as the bottom quintile of market performance, dollar-cost averaging indeed helps preserve capital and results in 10.5% more wealth than investing immediately. However, in typical markets (the middle quintile of market performance), dollar-cost averaging results in 3.8% less wealth. In strong markets (the top quintile of market performance), dollar-cost averaging significantly underperforms investing immediately, resulting in 12.4% less wealth!

Note that these numbers are not symmetrical—the benefit in poor markets is less than the cost in strong markets. Additionally, the wealth gap between dollar-cost averaging and investing immediately has a lasting impact on the investor's long-term wealth. This is because, at the end of the one-year period, both strategies are fully invested and will experience the same returns going forward. If we have two portfolios with identical starting values, except that one is funded with dollar-cost averaging and the other with investing immediately, and track them side by side for many years, the portfolio that begins with a 3.8% wealth reduction from dollar-cost averaging in typical markets will always be worth 3.8% less than the portfolio that begins with investing immediately. Similarly, the 12.4% wealth gap that begins in strong markets extends indefinitely into future wealth.

DISPLAY 2: RECENT MARKET PERFORMANCE DOESN'T AFFECT THE RETURN GIVE-UP OF DOLLAR-COST AVERAGING

Median One-Year Returns

Prior 12 Months Up (75% of Periods)

12.9% — Invest Immediately
8.5% — Dollar-Cost Averaging
3.2% — Hold Cash

Prior 12 Months Down (25% of Periods)

16.9% — Invest Immediately
12.8% — Dollar-Cost Averaging
1.7% — Hold Cash

■ Invest Immediately   ■ Dollar-Cost Averaging   ■ Hold Cash

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 12 months.

As of December 31, 2024 | **Source:** S&P and Bernstein analysis

Median Wealth After One Year
Dollar-Cost Averaging vs. Investing Immediately

Market	Value
Poor Markets	10.5%
Typical Markets	−3.8%
Strong Markets	−12.4%

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 12 months. Typical markets represent the middle 20%, poor markets the bottom 20%, and strong markets the top 20% of rolling one-year S&P 500 returns.

As of December 31, 2024 | **Source:** S&P and Bernstein analysis

Some might ask: the results shown so far assume the standard implementation of dollar-cost averaging by strictly following the predetermined investment schedule without considering market signals along the way. Is it possible to improve on the standard implementation with a more tactical approach, such as by following market movements carefully to either invest only on market dips, or by investing only on the upswings? We analyzed both approaches to see if they could further improve the results.

Using the same set of rolling investment periods, we tested the following two strategies. In the first, the investor invests in six equal installments, but only after down months, in order to invest on the dips. This means that the investor only invests the first installment on the first day of the investment period if the prior month's market return is negative. Otherwise, the investor waits until experiencing a month of negative market return to invest. The investor then waits until experiencing another month of negative market return to invest the second installment, and so on. In the second strategy, the investor also invests in six equal installments but follows the opposite strategy of only investing after up-market months, in order to invest on the upswings.

Note that the time it takes to become fully invested when investing on the dips or the upswings is not fixed, because it depends on market performance as the investments are being made. In many cases, it could take longer than the 12 months needed for dollar-cost averaging. For this reason, the outcome of investing immediately at each rolling start date is measured over an investment period that matches the end date of investing on the dips or the upswings, ensuring an apples-to-apples comparison.

Display 4, page 8, shows the results: Investing on the dips results in a bigger cost than dollar-cost averaging in typical markets (−5.0% versus −3.8%) and a smaller benefit in poor markets (9.7% versus 10.5%), so there is no improvement in this strategy. Investing on the upswings also has a smaller benefit than dollar-cost averaging in poor markets and shows a lower cost in typical markets, although its cost of −3.2% is only slightly better than the −3.8% cost of regular monthly dollar-cost averaging.
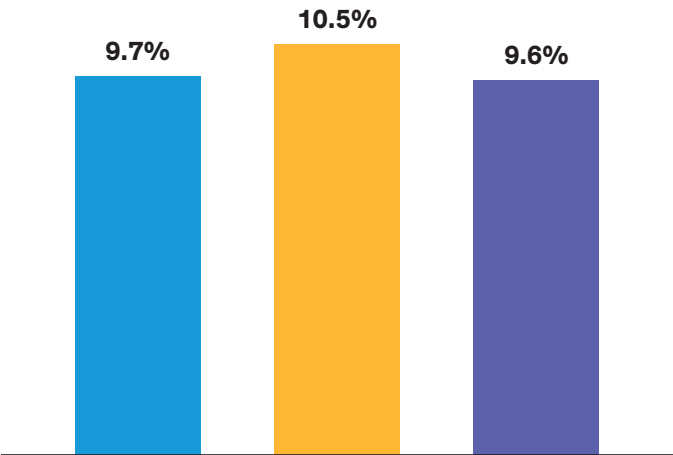
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Is it possible to improve outcomes with a more tactical approach, such as by investing only on market dips or upswings?"

DISPLAY 4: DOLLAR-COST AVERAGING IN ON THE DIPS OR THE UPSWINGS MAKES LITTLE DIFFERENCE

Cost in Typical Markets

−5.0%   −3.8%   −3.2%

Benefit in Poor Markets

9.7%   10.5%   9.6%
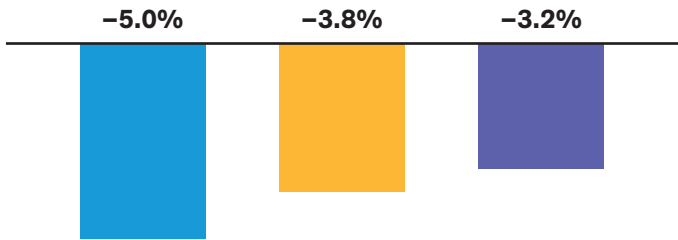
■ Invest on the Dips   ■ Dollar-Cost Averaging   ■ Invest on the Upswings

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 12 months. Typical markets represent the middle 20% and poor markets represent the bottom 20% of rolling one-year S&P 500 returns. Investing on the dips assumes six equal investments, each following a down month. Investing on the upswings assumes six equal investments, each following an up month. The numbers represent the median wealth of each strategy versus investing immediately until the strategy becomes fully invested.

As of December 31, 2024 | **Source:** S&P and Bernstein analysis

Time to Average In: The Cost and Benefit of Dollar-Cost Averaging over Different Horizons

After considering all the trade-offs discussed in the previous section, our investor decides to implement dollar-cost averaging. The next question is: over how long of a time horizon to average in? Up to this point, we have focused on a one-year horizon, but how do the results vary for shorter or longer horizons?

Display 5 illustrates the outcomes of averaging in over different time horizons: six months, one year, 18 months, and two years. One would expect that in typical markets, the longer it takes to average in, the greater the cost. This is because the stock market generally trends upward over time, and the longer the horizon, the more likely it is for the market to end up at a higher level. For instance, as shown in the previous section, averaging in over one year during typical markets has historically resulted in a 3.8% reduction in wealth. However,

extending the averaging in horizon to two years has historically led to a 7% reduction in wealth (Display 5, left).

But Display 5, right, also shows that in poor markets, the longer it takes to average in, the greater the benefit. So, as the horizon extends, does the benefit outweigh the cost, or is it the other way around? To understand this, we need to plot both cost and benefit on the same chart. *Display 6*, page 10, shows the cost and benefit mapped in relation to each other. We can see that after 18 months, the benefit of dollar-cost averaging (the vertical axis) flattens out, while the cost (the horizontal axis) increases significantly. The benefit-to-cost ratio is captured by the slope of the line, and it is favorably steep if the horizon is six months: a 6.2% benefit for a cost of only 1.9%. For horizons between six and 18 months, the benefit-to-cost trade-off is more moderate. And after 18 months, the slope becomes quite flat, indicating that there is little increased benefit as the cost continues to rise.

DISPLAY 5: PROLONGING THE DOLLAR-COST AVERAGING HORIZON PAYS IN POOR MARKETS, BUT ALSO INCREASES THE COSTS IN TYPICAL MARKETS

Cost: Amount "Worse Off" in Typical Markets

−1.9%   −3.8%   −5.0%   −7.0%

Months of Dollar-Cost Averaging
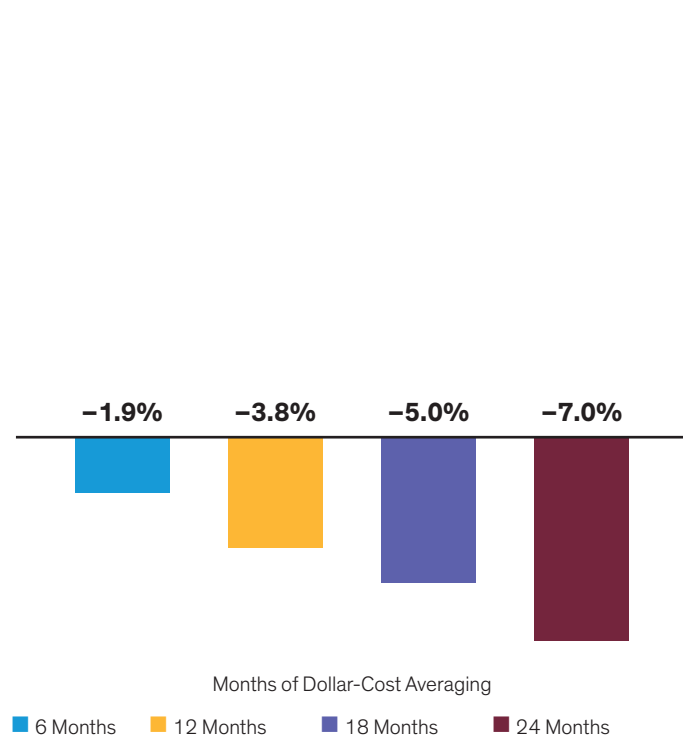
Benefit: Amount "Better Off" in Poor Markets
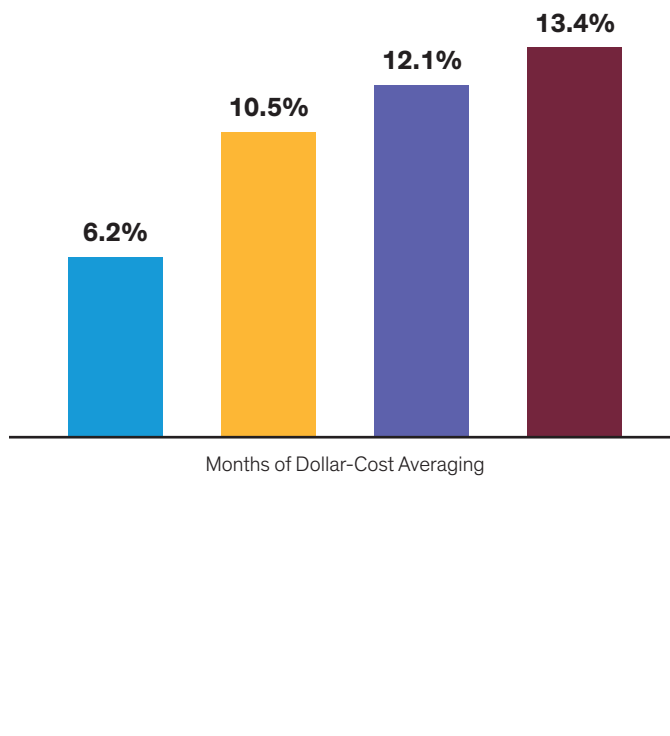
6.2%   10.5%   12.1%   13.4%

Months of Dollar-Cost Averaging

■ 6 Months   ■ 12 Months   ■ 18 Months   ■ 24 Months

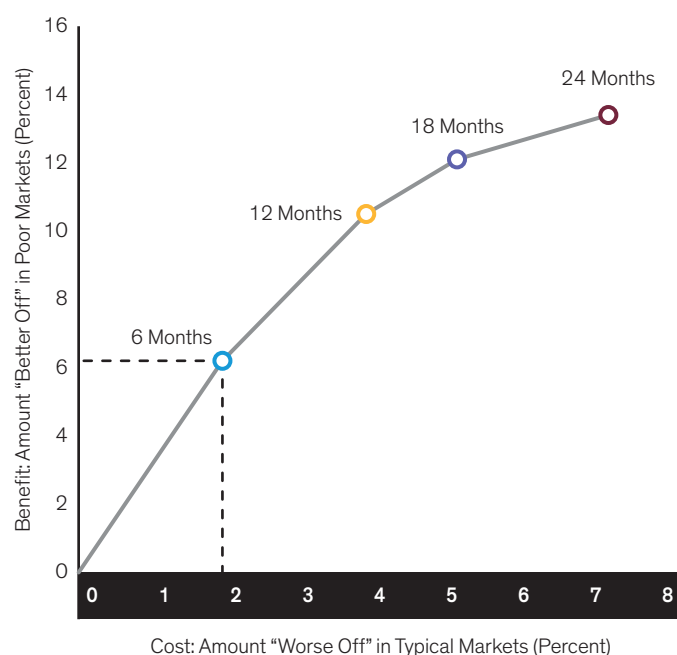**Past performance is no guarantee of future results.**

This analysis is based on rolling 6, 12, 18, and 24 months of returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 6, 12, 18, and 24 months. Typical markets represent the middle 20% and poor markets represent the bottom 20% of rolling S&P 500 returns. The numbers represent median wealth after 6, 12, 18, and 24 months of dollar-cost averaging versus investing immediately.

As of December 31, 2024 | **Source:** S&P and Bernstein analysis

Ultimately, the investor would be wise to average in over a period of six months or less, as that horizon offers the best trade-off between benefit and cost. If the investor is very risk-averse and willing to accept a moderate cost, she can extend the dollar-cost averaging horizon to as long as 18 months, but it is not recommended to go beyond that.

DISPLAY 6: THE BENEFIT DOESN'T KEEP PACE WITH THE COST AFTER 18 MONTHS

Cost/Benefit Ratio of Dollar-Cost Averaging

Past performance is no guarantee of future results.

This analysis is based on rolling 6, 12, 18, and 24 months of returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 6, 12, 18, and 24 months. Typical markets represent the middle 20% and poor markets represent the bottom 20% of rolling S&P 500 returns. The numbers represent median wealth after 6, 12, 18, and 24 months of dollar-cost averaging versus investing immediately.

As of December 31, 2024 | **Source:** S&P and Bernstein analysis

Dollar-Cost Averaging Within Private Alternatives and Buffered ETFs

In recent years, we have expanded our investment offerings to include strategies that diversify beyond stocks and bonds, such as private market alternatives and buffered ETFs (also known as defined outcome ETFs). How should investors approach dollar-cost averaging with these new strategies?

In some ways, dollar-cost averaging naturally emerges when investing in private market strategies within alternative asset classes like private equity, venture capital, private debt, and commercial real estate. In these private vehicles, investors pledge a specific investment amount at the strategy's inception but gradually fulfill this commitment over time, rather than funding it all at once. They do so in the form of capital calls as compelling private market investments arise over a pre-specified investment period that can last up to five years. Private vehicles typically accelerate the pace of capital calls when their asset class opportunity set grows more attractive and, conversely, slow the pace of deployment as market conditions deteriorate. As a result, investors effectively delegate the dollar-cost averaging deployment strategy to the investment managers who administer these strategies, relying on their assessment of the optimal time to deploy capital based on market conditions.

In comparison, buffered ETFs are a relatively new risk-managed strategy designed to preserve capital during falling markets. They are structured to provide defined outcomes relative to a reference index or asset—such as the S&P 500 index or a S&P 500 ETF—by offering a fixed amount of downside protection in exchange for capping upside market participation above a certain limit. Providers of buffered ETFs tend to issue multiple individual ETFs over different defined outcome periods. For example, one ETF might provide a defined outcome from January 1 to December 31, another from February 1 to January 31 of the following year, and so on. Investors often face the challenge of deciding which ETF to invest in and how to minimize the associated timing risk. If investors only invest in a single ETF, the outcome is dependent on the performance of the reference asset over that specific defined outcome period. Investors can mitigate this timing risk by dollar-cost averaging into multiple ETFs and staggering them over rolling one-year periods. This kind of diversification can lead to better long-term results with continuous downside protection and a smoother return experience. For convenience, some buffered ETF providers have streamlined the approach by offering a single laddered ETF that invests in a portfolio of underlying buffered ETFs with different outcome periods.

The Cost and Benefit of Dollar-Cost Averaging with Different Market Starting Valuations

Up to this point, we have focused on updating our prior analysis and confirming that the conclusions still hold. Yet we also set out to explore new concepts not previously addressed, including finding potential factors that signal when dollar-cost averaging may be particularly attractive. Having ruled out prior one-year market performance, we've also demonstrated that tactically investing solely on dips or upswings yields little advantage. But what about stock market valuation metrics that have proven reliable in gauging future return potential?

One such popular metric is the Cyclically Adjusted Price-to-Earnings (CAPE) ratio, also known as the "Shiller P/E ratio." This ratio is calculated by dividing the current price of a market index (such as the S&P 500) by the average of its inflation-adjusted earnings over the past 10 years. Could the CAPE ratio help pinpoint where dollar-cost averaging provides an edge? Unfortunately, our analysis shows that on its own, the CAPE ratio is not ideal. When it's historically low (in the bottom quintile), the median return of dollar-cost averaging lags investing immediately by 7%. But when the ratio is historically high (in the top quintile), the median return still trails by 3.1%—not meaningfully different from the 4.2% gap shown in Display 1, left, page 5.

> "
>
> **Investing solely on dips or upswings yields little advantage. But what about stock market valuation metrics that have proven reliable in gauging future return potential?"**

We believe the effectiveness of the CAPE ratio can be improved when considered relative to interest rates. After all, prior to its deployment, the balance in a dollar-cost averaging program remains in cash, earning the risk-free interest rate. The excess CAPE yield (ECY) measures exactly that, accounting for the interaction between equity valuations (represented by CAPE) and interest rate levels.

The ECY is calculated by inverting the CAPE ratio to determine the earnings yield for the stock market, then subtracting the inflation-adjusted 10-year US Treasury yield. In effect, it measures the relative attractiveness of stocks to bonds by comparing the stock market valuation against bonds' potential return based on current interest rates. Note that while a *lower CAPE ratio* suggests that the stock market looks more attractively valued on an absolute basis, a *higher ECY* suggests that stocks appear more compelling compared to bonds.

Display 7 illustrates the stark difference in outcomes in both absolute and relative performance between dollar-cost averaging and immediate investing in high and low ECY environments. Compared to the full history results (Display 1, page 5), high ECY environments—which signal relative cheapness for stocks—lead to materially higher future median one-year returns for both approaches. However, with

a gap of 8.3%, high ECY environments also demand a much greater sacrifice of an investor's return when dollar-cost averaging (Display 7, left). In contrast, for low ECY environments—when stocks are most expensive relative to bonds—future one-year returns are significantly lower for both strategies, and dollar-cost averaging only has a modest 0.6% return give-up in the median case (Display 7, right).

Another way to gauge the impact of ECY on dollar-cost averaging is by examining its outperformance at different ECY levels. As *Display 8*, page 13, shows, when the ECY is high (in the top quintile), the chance of dollar-cost averaging outperforming falls to as low as 16.6%. However, when the ECY drops to the bottom quintile, the likelihood it beats investing immediately climbs to roughly 50%, similar to a coin flip.

DISPLAY 7: CHEAPER STARTING VALUATIONS INCREASE THE OPPORTUNITY COST OF DOLLAR-COST AVERAGING, WHILE EXPENSIVE STARTING VALUATIONS INCREASE THE POTENTIAL BENEFIT

Median One-Year Returns
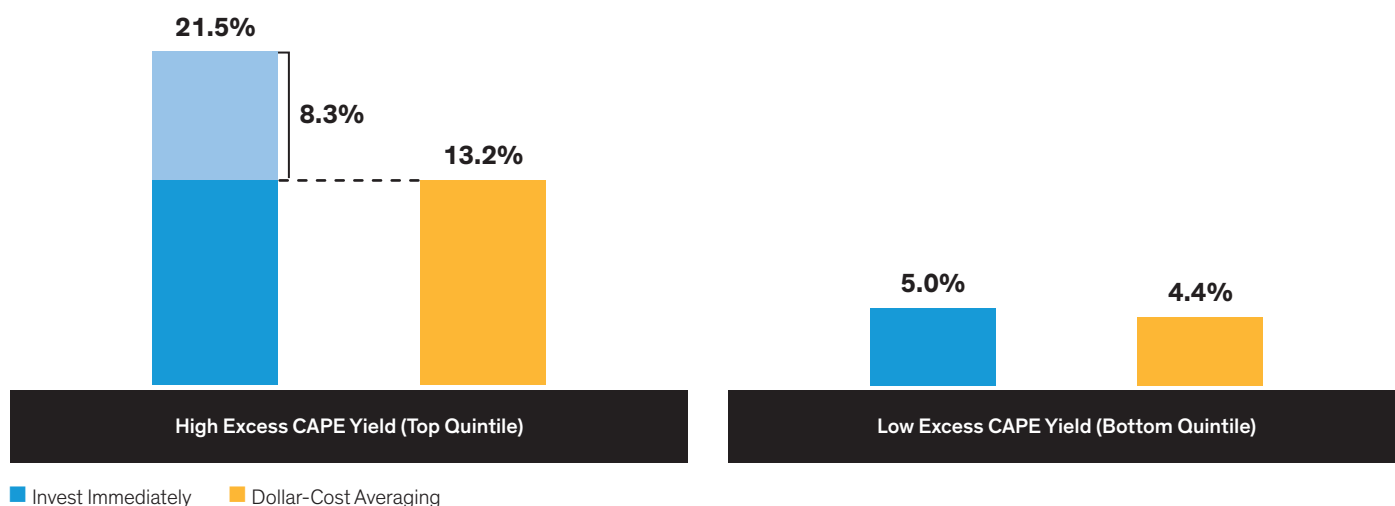
High Excess CAPE Yield (Top Quintile): Invest Immediately 21.5%, gap 8.3%, Dollar-Cost Averaging 13.2%

Low Excess CAPE Yield (Bottom Quintile): Invest Immediately 5.0%, Dollar-Cost Averaging 4.4%

■ Invest Immediately   ■ Dollar-Cost Averaging

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 12 months. High excess CAPE yield represents the top 20% and low excess CAPE yield represents the bottom 20% of all months.

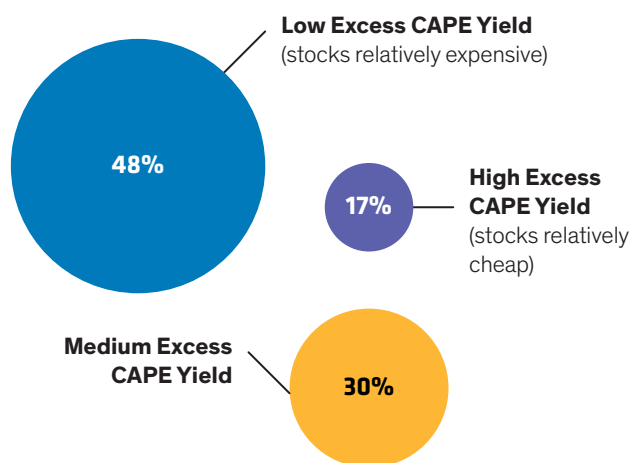As of December 31, 2024 | **Source:** S&P, Shiller Data, and Bernstein analysis

Why is the ECY such a useful indicator? In short, other factors like recent market performance or current market levels have no predictive power when it comes to future performance. Market valuation, on the other hand, has historically mattered to future returns.

But doesn't Display 3, page 7, show that the market environment matters when averaging in, since dollar-cost averaging protects in poor markets and becomes costlier in typical and strong markets? Yes, but when dollar-cost averaging commences, *future* market performance is unknown. In contrast, the ECY is a better predictive tool because its value is known when dollar-cost averaging gets underway. So, what does ECY tell us today? As of the end of the first quarter of 2025, the ECY stood at a historically low level of 1.9%. One would have to go back to June 2007 to find a comparable level. This bodes well for using dollar-cost averaging.

An investor might wonder: although today's low ECY reading suggests a strong likelihood for dollar-cost averaging to outperform, how does the potential benefit of this strategy compare to its risk of underperformance at low ECY levels? *Display 9* demonstrates that this trade-off is quite favorable for dollar-cost averaging under such conditions. When dollar-cost averaging lags compared to immediate investing on the upside, as indicated by the 90th percentile outcomes, the returns are 19.5% versus 30.2%, resulting in 10.7% underperformance. However, when dollar-cost averaging yields a benefit, as shown by the 10th percentile outcomes (−17.6% versus −31.6%), the advantage is 14%.

DISPLAY 8: DOLLAR-COST AVERAGING HAS A HIGHER CHANCE OF OUTPERFORMING WHEN THERE'S A LOW EXCESS CAPE YIELD (ECY)

Probability of Dollar-Cost Averaging Outperforming After One Year

Low Excess CAPE Yield
(stocks relatively expensive)

48%

High Excess CAPE Yield
(stocks relatively cheap)

17%

Medium Excess CAPE Yield

30%

DISPLAY 9: WHEN EXCESS CAPE YIELD (ECY) IS LOW, DOLLAR-COST AVERAGING OFFERS A FAVORABLE TRADE-OFF BETWEEN POTENTIAL BENEFIT AND THE RISK OF UNDERPERFORMANCE

Range of One-Year Returns
Low Excess CAPE Yield

Percent

30.2%
5.0%
−31.6%

19.5%
4.4%
−17.6%

■ Invest Immediately ■ Dollar-Cost Averaging

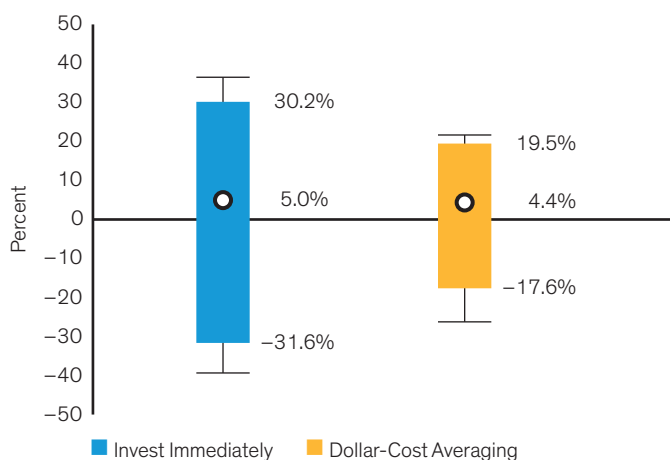**Past performance is no guarantee of future results.**

This analysis is based on rolling one-year returns from 1926 to 2024 for the US large-cap stock market, as represented by the S&P 500 Index. Dollar-cost averaging assumes equal monthly investments over 12 months. High excess CAPE yield represents the top 20%, medium excess CAPE yield represents the middle 20%, and low excess CAPE yield represents the bottom 20% of all months.

As of December 31, 2024 | **Source:** S&P, Shiller Data, and Bernstein analysis

Dollar-Cost Averaging: After-Tax Returns and Tax-Loss Harvesting

While we've broadly focused on trade-offs in terms of pretax outcomes, it's useful to consider dollar-cost averaging on an after-tax basis, especially in relation to tax-loss harvesting. In short, both the cost and benefit of dollar-cost averaging are dampened when viewed on an after-tax basis.

Recall that in typical and strong markets, dollar-cost averaging incurs a cost. However, it also provides opportunities to establish and diversify cost bases at higher levels. This can generate more tax-loss harvesting opportunities in the future—opportunities that are otherwise unavailable when funds are invested all at once. This is because selling the highest-basis positions first is the most tax-efficient strategy when investors eventually liquidate their portfolios. And dollar-cost averaging offers a greater range of cost bases to choose from, potentially securing a tax advantage, all else being equal. Nevertheless, this after-tax benefit is unlikely to fully compensate for the loss of wealth accumulation associated with dollar-cost averaging compared to investing immediately.

At the same time, the benefit of dollar-cost averaging in poor markets is also somewhat diminished on an after-tax basis. If the money is invested all at once and the market subsequently falls, investors have a silver lining: the chance to harvest significant losses to offset capital gains. In contrast, dollar-cost averaging cannot harvest nearly the same amount of losses because only a small fraction was invested before the market's decline.

The Impact of Dollar-Cost Averaging with Different Asset Classes

Up to this point, our analysis has revolved around US large-cap stocks, as represented by the S&P 500 index. However, we recognize that our clients enjoy a broader investment universe, including US small-caps and non-US stocks. How do the results vary across these asset classes? To answer this question, we replicated our prior historical analysis using US small-caps, as represented by the Russell 2000 index, and emerging markets, as represented by the MSCI Emerging Markets index.

A note of caution: reliable data for emerging markets only starts in 1988. To ensure an apples-to-apples comparison, we've truncated our analysis of US large-caps and US small-cap stocks as well. Put simply, to inform our wealth comparison within each period, we examined all rolling one-year periods since 1988 to collect the returns of dollar-cost averaging versus investing immediately.

Display 10, page 15, shows that the median return concession for dollar-cost averaging in US large-caps is 5.3% (8.8% versus 14.1%). At 3.4% (8.1% versus 11.5%), this reduction is more modest for US small-caps, and even narrower at 2% (7.7% versus 9.7%) in emerging markets.

Similarly, *Display 11*, page 15, illustrates that with dollar-cost averaging, the trade-off between cost and benefit is more favorable in US small-caps compared to US large-caps, and even more advantageous in emerging markets. For instance, in typical market conditions, dollar-cost averaging results in a 4.9% wealth cost for US large-caps, a smaller 3.8% cost for US small-caps, and an even lower 2.8% cost for emerging markets, based on median outcomes. However, in challenging markets, dollar-cost averaging preserves more wealth in US small-caps than in US large-caps (9.2% versus 7.3%) and offers a significantly higher 15.2% wealth preservation in emerging markets, according to median figures.
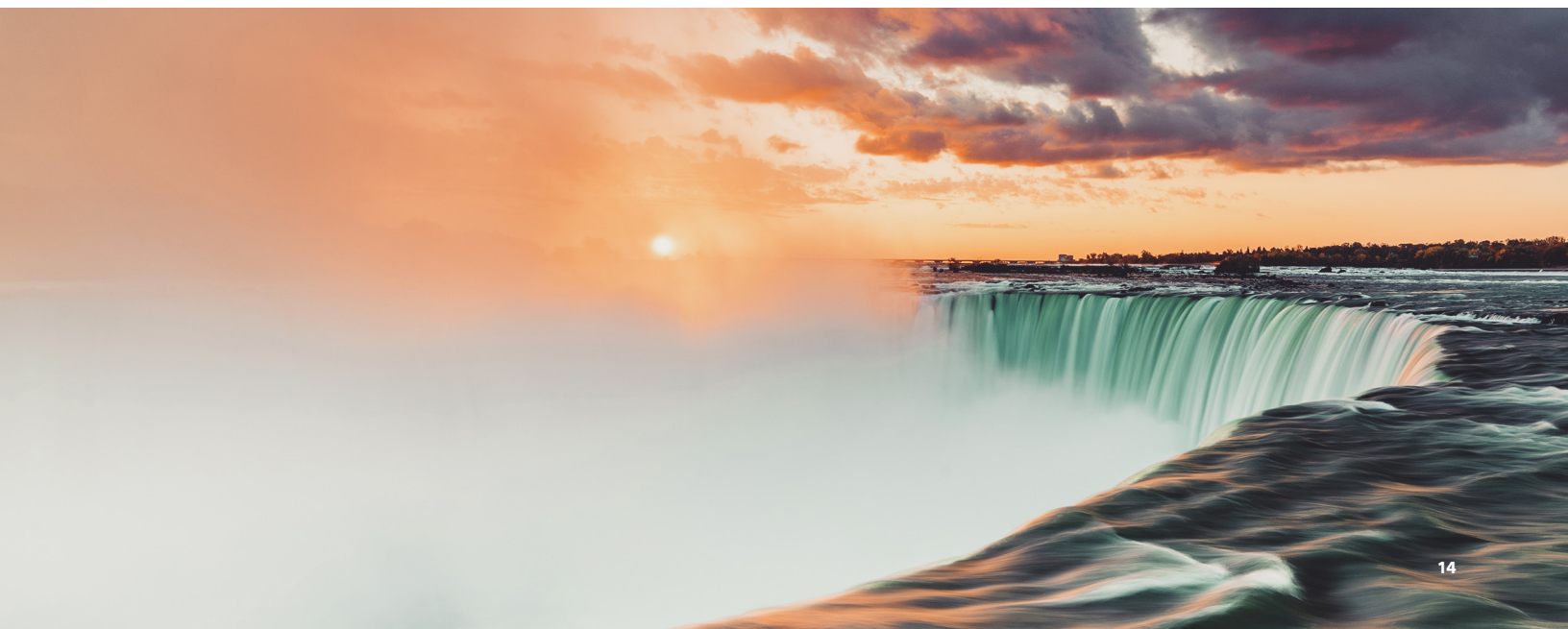
DISPLAY 10: THE RETURN CONCESSION OF DOLLAR-COST AVERAGING IS MORE MODEST IN US SMALL-CAPS THAN IN US LARGE-CAPS, AND EVEN SMALLER IN EMERGING MARKETS

Median One-Year Returns
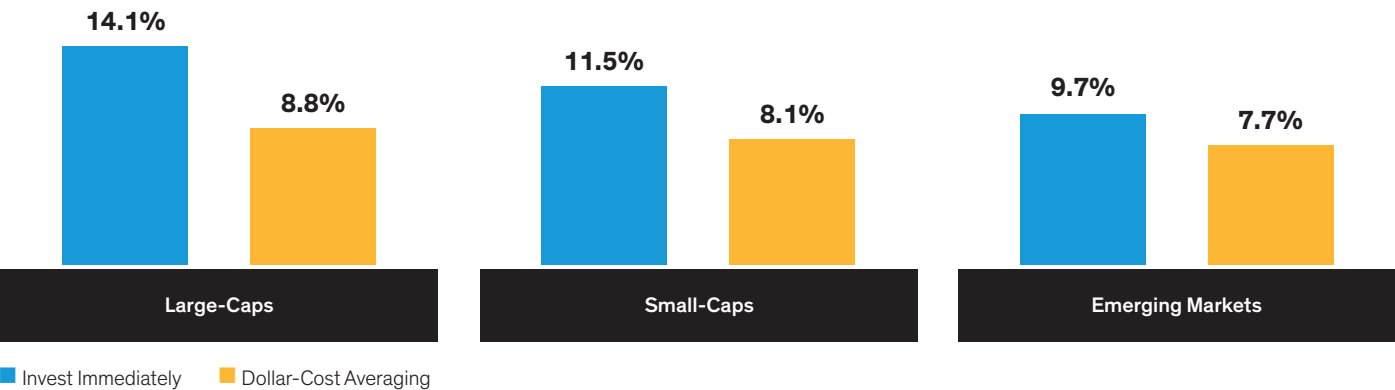
Large-Caps: 14.1% / 8.8%
Small-Caps: 11.5% / 8.1%
Emerging Markets: 9.7% / 7.7%
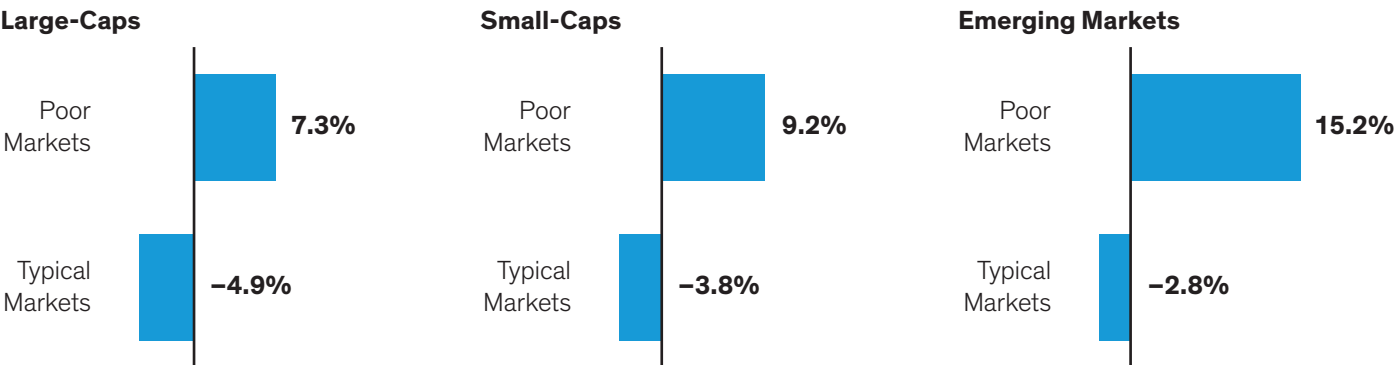
■ Invest Immediately ■ Dollar-Cost Averaging

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1988 to 2024 for the US large-cap stocks (as represented by the S&P 500 Index), US small-cap stocks (as represented by the Russell 2000 Index) and emerging market equities (as represented by the MSCI Emerging Markets Index). Dollar-cost averaging assumes equal monthly investments over 12 months.

As of December 31, 2024 | **Source:** S&P, FTSE Russell, MSCI and Bernstein analysis

DISPLAY 11: THE COST AND BENEFIT TRADE-OFF WITH DOLLAR-COST AVERAGING IS MORE FAVORABLE IN US SMALL-CAPS THAN IN US LARGE-CAPS, AND EVEN MORE COMPELLING IN EMERGING MARKETS

Median Wealth After One Year

Large-Caps

Poor Markets: 7.3%
Typical Markets: −4.9%

Small-Caps

Poor Markets: 9.2%
Typical Markets: −3.8%

Emerging Markets

Poor Markets: 15.2%
Typical Markets: −2.8%

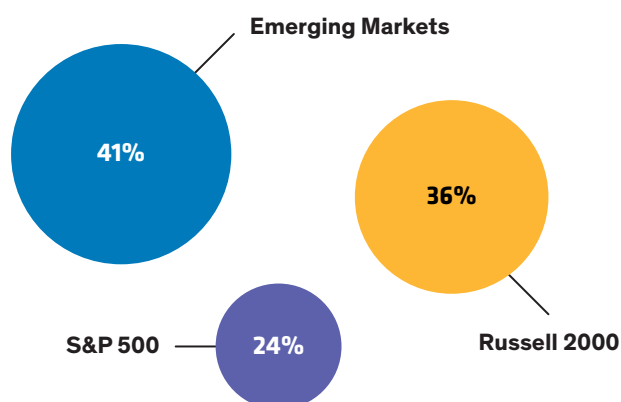**Past performance is no guarantee of future results.**

This analysis of dollar-cost averaging versus investing immediately is based on rolling one-year returns from 1988 to 2024 for the US large-cap stocks (as represented by the S&P 500 Index), US small-cap stocks (as represented by the Russell 2000 Index) and emerging market equities (as represented by the MSCI Emerging Markets Index). Dollar-cost averaging assumes equal monthly investments over 12 months. Typical markets represent the middle 20% and poor markets the bottom 20% of rolling one-year returns within each asset class.

As of December 31, 2024 | **Source:** S&P, FTSE Russell, MSCI, and Bernstein analysis

Why does dollar-cost averaging seem to work better in US small-caps and emerging markets? There are two reasons, in our view. First, over the past 36 years, the returns in US small-caps have lagged US large-caps. And in emerging markets, returns have been even lower. More frequent downward trends make dollar-cost averaging more effective compared to investing immediately. Second, all else being equal, dollar-cost averaging benefits from market volatility because it provides more chances to buy additional shares at lower prices. Volatility tends to be higher in US small-caps than in US large-caps, and even more prevalent in emerging markets. Taken together, the higher volatility and more frequent downward trends increase the likelihood that dollar-cost averaging will outperform in US small-caps and emerging markets compared to US large-caps, as illustrated in *Display 12*.

DISPLAY 12: DOLLAR-COST AVERAGING HAS A HIGHER CHANCE OF OUTPERFORMING AFTER ONE YEAR IN US SMALL-CAPS AND EMERGING MARKETS THAN IN US LARGE-CAPS

Probability of Dollar-Cost Averaging Outperforming

Past performance is no guarantee of future results.

This analysis is based on rolling one-year returns from 1988 to 2024 for the US large-cap stocks (as represented by the S&P 500 Index), US small-cap stocks (as represented by the Russell 2000 Index), and emerging market equities (as represented by the MSCI Emerging Markets Index). Dollar-cost averaging assumes equal monthly investments over 12 months.

As of December 31, 2024 | **Source:** S&P, FTSE Russell, MSCI, and Bernstein analysis

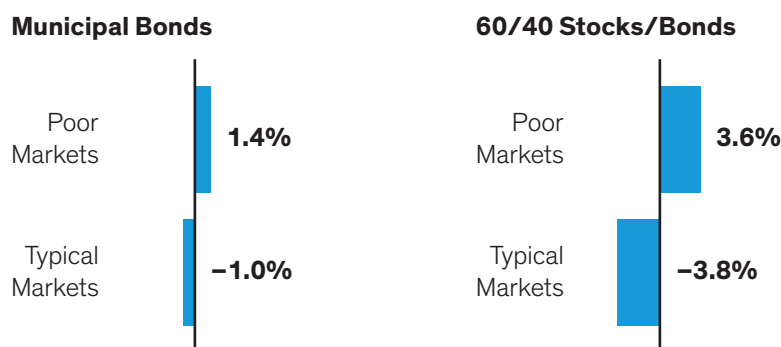## Dollar-Cost Averaging with Bonds and Balanced Portfolios

Until now, our discussion has centered on dollar-cost averaging with stocks. However, many portfolios also include bonds due to their low correlation with stocks and ability to provide stability and income. How does dollar-cost averaging apply to fixed-income investments? Generally, it is less effective with bonds because they tend to exhibit lower volatility. This reduced volatility means there is less risk of significant declines in value, which in turn diminishes the potential advantages of dollar-cost averaging.

Display 13, left, page 17, illustrates that dollar-cost averaging in municipal bonds, as represented by the Bloomberg Municipal Bond Index, yields similar results to investing immediately. In typical market conditions, there is a 1% wealth cost associated with dollar-cost averaging, while in poor markets, it preserves 1.4% more wealth. These figures are much closer to zero compared to US large-caps, which show a 4.9% wealth cost and 7.3% for wealth preservation, as seen in *Display 11*, left, page 15. Furthermore, the trade-off between the cost and benefit of dollar-cost averaging is less favorable for municipal bonds than for US large-caps. For US large-caps, the benefit during poor markets exceeds the cost during typical markets by 2.4% more wealth, whereas for municipal bonds, the difference is only 0.4%. This behavior contrasts with that of US small-caps and emerging markets (Display 11, middle and right), primarily due to the lower volatility of bonds.

Display 13, right, page 17, demonstrates that dollar-cost averaging in a 60/40 portfolio—comprising 60% US large-caps and 40% municipal bonds—produces results that fall between those of a portfolio entirely composed of US large-caps and one entirely composed of municipal bonds, which is intuitive. Based on these findings, how should investors approach dollar-cost averaging for bonds and balanced stock/bond portfolios? For bonds, the benefits of dollar-cost averaging are minimal, so investing immediately is recommended. For balanced portfolios, investors who choose dollar-cost averaging have two potential strategies. The first involves dollar-cost averaging into stocks while investing immediately in bonds. However, this approach requires careful attention, as the asset mix will temporarily deviate from the intended target—as will the risk profile—until stocks are fully invested by the end of the averaging period. The second strategy is to accelerate the pace of dollar-cost averaging compared to a schedule designed for 100% stocks, to account for the presence of bonds and the reduced effectiveness of dollar-cost averaging with bonds.

Median Wealth After One Year

Municipal Bonds		60/40 Stocks/Bonds	
Poor Markets	1.4%	Poor Markets	3.6%
Typical Markets	−1.0%	Typical Markets	−3.8%

Past performance is no guarantee of future results.

This analysis of dollar-cost averaging versus investing immediately is based on rolling one-year returns from 1988 to 2024 for US large-cap stocks (as represented by the S&P 500 Index) and municipal bonds (as represented by the Bloomberg Municipal Bond Index). Dollar-cost averaging assumes equal monthly investments over 12 months. Typical markets represent the middle 20% and poor markets the bottom 20% of rolling one-year returns within each asset class.

As of December 31, 2024 | **Source:** S&P, FactSet, and Bernstein analysis

Sticking to the Plan: The Discipline of Dollar-Cost Averaging

This paper delves into the intricate cost-benefit dynamics of dollar-cost averaging versus immediate investing, offering a fresh perspective for those with a lump sum to invest. Our analysis reveals that while dollar-cost averaging may reduce returns in typical or strong markets, it serves as a safeguard in turbulent times. By preserving more capital during market drawdowns, it provides investors with a reassuring buffer as well as peace of mind.

When choosing the horizon for dollar-cost averaging, our findings suggest that the sweet spot lies within a six-month period. Beyond that, the cost outweighs the benefit, especially after 18 months. Interestingly, the effectiveness of dollar-cost averaging remains relatively stable regardless of market trends in the preceding year or timing investments during dips or surges. However, it is notably influenced by market valuation at the outset of the investment period. In particular, the excess CAPE yield emerges as a useful indicator for determining when dollar-cost averaging may offer a better cost-benefit trade-off compared to investing immediately. The trade-off also varies across asset classes, proving most effective in emerging markets, followed by US small-caps, then US large-caps, and is least favorable in bonds.

When venturing into private alternative asset classes, investors pledge a certain amount of capital but fulfill this commitment incrementally through capital calls over time. This approach effectively allows investors to practice a form of dollar-cost averaging, relying on alternative investment managers to strategically deploy capital at opportune

moments based on prevailing market conditions. Meanwhile, to mitigate timing risks associated with investing in buffered ETFs, investors can adopt a dollar-cost averaging strategy across multiple ETFs with staggered rolling outcome periods. This approach ensures continuous downside protection and tends to result in smoother returns. Some providers streamline this process by offering a single laddered ETF, which invests in a diversified portfolio of individual buffered ETFs with varying outcome periods, simplifying the investment experience.

When considering the after-tax implications, the dynamics between dollar-cost averaging and immediate investing become more nuanced. In typical and strong markets, while dollar-cost averaging generally results in less wealth accumulation, it offers a strategic advantage when it comes to tax-loss harvesting. By diversifying cost bases, the approach can enhance future tax-loss harvesting opportunities, securing potential tax savings during portfolio liquidation. Conversely, in poor markets, investing immediately allows for substantial immediate tax-loss harvesting opportunities as the market falls—a benefit that the gradual nature of dollar-cost averaging cannot fully match.

Ultimately, whether investors choose to invest immediately or to dollar-cost average in, it is essential to set a clear time horizon, establish a long-term strategic asset allocation, and stick to the plan. Trying to time the market or allowing emotions to dictate investment decisions can significantly undermine long-term wealth accumulation. Dollar-cost averaging serves as a valuable tool overall, helping investors execute a disciplined asset allocation strategy and achieve their investment goals, even if it doesn't always secure the highest returns.

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