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# FLIP FEATURE

## *Investing Using Dollar-Cost Averaging*

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# Investing Using Dollar-Cost Averaging

By Dr. Stephen Brincks

You've just graduated from college, have a new job, and are ready to start investing a portion of your hard-earned paycheck. How do you get started? Or maybe you just received a large lump-sum payment, either from a relative or from a cash windfall, and are wondering how to invest your money? You might be worried about investing the money right before a large market crash or worried that current stock prices are too high. Fortunately, dollar-cost averaging is a strategy that can help you consistently invest a portion of your paycheck to smooth out volatile asset prices and avoid the risk of poor market timing. Dollar-cost averaging is defined as investing a fixed dollar amount into a given investment at regular intervals (for example, monthly), regardless of the price of the investment at each purchase. Over time, you accumulate shares at varying prices, which reduces the risk of investing the full amount at an inopportune moment.

To illustrate, imagine an investor chooses to invest \$500 every month for twelve months into a broad market index fund such as the Vanguard Total Stock Market ETF (VTI) or its equivalent index mutual fund. Suppose the share price fluctuates over the twelve months as follows:

**Table 1. Example of Dollar-Cost Averaging over 12 Months**

<b>Month</b>	<b>Price per Share</b>	<b>Monthly Investment</b>	<b>Total Invested</b>	<b>Shares Bought</b>	<b>Total Shares</b>	<b>Average Cost per Share</b>
Jan	\$50.00	\$500	\$500	10	10	\$50.00
Feb	\$48.00	\$500	\$1,000	10.417	20.417	\$48.98
Mar	\$52.00	\$500	\$1,500	9.615	30.032	\$49.95
Apr	\$55.00	\$500	\$2,000	9.091	39.123	\$51.12
May	\$53.00	\$500	\$2,500	9.434	48.557	\$51.49
Jun	\$51.00	\$500	\$3,000	9.804	58.361	\$51.40
Jul	\$54.00	\$500	\$3,500	9.259	67.62	\$51.76
Aug	\$56.00	\$500	\$4,000	8.929	76.549	\$52.25
Sep	\$54.50	\$500	\$4,500	9.174	85.723	\$52.49
Oct	\$57.00	\$500	\$5,000	8.772	94.495	\$52.91
Nov	\$59.00	\$500	\$5,500	8.475	102.97	\$53.41
Dec	\$58.00	\$500	\$6,000	8.621	111.591	\$53.77

Initially, you start by purchasing shares at the January price of \$50 per share. Next month, the value of your investment has dropped to \$48 per share. However, your \$500 invested for the month of February now purchases a larger number of shares, 10.417, and lowers your average cost per share to \$48.98 per share. This illustrates one of the key advantages of dollar-cost averaging: by investing a fixed dollar amount each period, you purchase more shares when prices have dropped, allowing you to reduce your average cost per share. As a result, by December, your average cost per share is \$53.77. This example demonstrates how regular

investments at varying market prices can reduce the impact of volatility by smoothing the entry points over time.

When implementing dollar-cost averaging, investors should select broad-based ETFs (exchange-traded funds) or index mutual funds as their primary vehicle. In the U.S., for example, funds such as the Vanguard Total Stock Market Index Fund or its ETF equivalent provide low-cost exposure to the entire U.S. stock market. Investing in a broad-based ETF eliminates the risk of dollar-cost averaging your way into bankruptcy (i.e., you keep buying shares in a company with declining prospects until you lose all your money). Dollar-cost averaging into a well-diversified portfolio eliminates idiosyncratic risk and ensures that you will benefit when market prices rebound.

A great way to implement dollar-cost averaging is setting up an automatic investment program that invests a fixed dollar amount at regular intervals (monthly, quarterly, etc.), regardless of the asset's price. Many brokerages allow for scheduled purchases to occur automatically, facilitating a "set-and-forget" approach. You don't have to worry about manually buying since the broker will purchase shares at regular intervals on your behalf. This automation also allows you to invest immediately after receiving a paycheck, ensuring consistent investing behavior. Dividends can also be automatically reinvested, which prevents excess cash from sitting in your account. Overall, a well-designed dollar-cost averaging strategy is a disciplined and systematic investment method that removes emotion from the investment process and produces consistent results over time.

### **Using Your Paycheck to Dollar-Cost Average**

One of the most common uses of dollar cost averaging is investing a portion of each monthly paycheck into a broad market ETF or a diversified stock-bond portfolio. A new employee, for example, might contribute 5% of each paycheck into a retirement account, such as a 401(k), invested in a target-date or index fund. Dollar-cost averaging through retirement accounts reduces portfolio volatility while steadily building your nest egg over time. Automatic, consistent investing eliminates procrastination and allows investments to start compounding early. It also allows employees to invest without being overly concerned about current market valuations. If investments fall in value, more shares are purchased when prices are low, lowering average cost, and allowing investors to participate in upside gains when market prices recover.

Dollar-cost averaging over a long horizon is ideal for investing in higher-returning assets such as equities. Let's say you had the bad fortune to start working in 2000 at the height of the dotcom bubble and consistently invested until today. If you examined the value of your investments in 2010, your portfolio had very meager returns (stock returns during the 10-year period from the bursting of the dotcom bubble to the Great Financial Crisis were very poor). However, you accumulated shares at relatively low prices through the decade. Over the next 15 years, your stock portfolio rose significantly during a period of strong equity returns. For students and young professionals, dollar-cost averaging through workplace retirement accounts or brokerage automation provides a low-stress, long-term investing strategy to ride out market ups and downs.

### **The Alternative to Dollar-Cost Investing: Lump-Sum Investing**

Now let's assume that you are fortunate enough to receive a large lump-sum amount of cash that you want to invest. Should you invest the entire amount immediately (known as lump-sum investing) or should you implement a dollar-cost averaging strategy over quarters or years?

For example, if you receive \$120,000 as a lump sum, you could invest the money in \$10,000 increments at the end of each month for the next year. Or you could split the funds into \$5,000 investments over the next 24 months. Funds not immediately invested in risky assets can be held in safe assets, such as short-term Treasury bills.

Lump-sum investors benefit from maximized time-in-market, allowing compounding to begin immediately. Stock returns can be accurately modeled as a random walk with drift. Stock returns are incredibly difficult to predict. The best prediction of where asset prices will be in the future is simply today's price plus the expected risk premium for the asset. Because the risk premium is a function of time, the longer you hold the asset, the greater the return. This can be summed up in the adage, "time in the market beats timing the market." Lump-sum investing maximizes time in the market. This strength is also its greatest weakest: investors incur significant market-timing risk—the possibility of investing right before a downturn. While lump-sum investing statistically offers higher expected returns, it can also bring great regret if the market declines soon after entry.

Dollar cost averaging's primary advantage is risk reduction through time diversification. By spreading investment over months or years, the investor lessens the likelihood of buying at a market peak. Dollar-cost averaging also offers significant behavioral advantages: dollar-cost averaging curbs emotional decision-making, reduces remorse after market drops, and gets investors into the market. However, the cost of dollar-cost averaging is lower expected returns because only a portion of the funds are invested in high-risk, high-returning assets. For example, if you invest \$5,000 each month for 24 months, it takes two years before all funds are fully invested in the risky, high-returning asset. The expected return on your funds invested in safer assets is lower, which reduces your overall rate of return.

**Table 2. Summary of Pros and Cons of DCA**

<b>Pros</b>	<b>Cons</b>
Reduces entry-point risk	Potential underperformance (~2% annually)
Encourages saving discipline	Cash drag during investment phase
Simplifies investing behavior	Slower portfolio growth
Reduces emotional stress	False sense of risk protection

### **Research Findings on Dollar-Cost Averaging**

Some of the largest institutional investment companies and wealth-management firms have examined the performance of lump sum versus dollar-cost averaging over time. Vanguard's comprehensive study, "Dollar-Cost Averaging Just Means Taking Risk Later" (2012), analyzed data from the U.S., U.K., and Australian markets. The study found that lump sum investing outperformed dollar-cost averaging approximately two-thirds of the time. In the U.S. market, lump sum investing yielded an average annualized return of 11.7%, compared to 10.4% for dollar-cost averaging. However, Vanguard found that dollar-cost averaging resulted in lower volatility and smaller average drawdowns, with a standard deviation of returns of 15.2% for dollar-cost averaging versus 17.8% for lump sum investing. Additionally, the maximum drawdown for dollar-cost averaging was 50.2%, while lump sum investing experienced a maximum drawdown of 55.3% during the same period.

Morgan Stanley Wealth Management's team found similar findings. Lump sum investing tended to outperform dollar-cost averaging in environments with higher expected returns and lower volatility. In their hypothetical model, a portfolio with a 6% expected return and 5% volatility showed a 72.4% probability that lump sum investing would outperform dollar-cost averaging. Conversely, in a scenario with a 1% expected return and 12% volatility, the probability decreased to 45.1%. This underscores the importance of market conditions in determining whether dollar-cost averaging or lump sum investing is better.

### **Academic Research on Dollar-Cost Averaging**

Several academic papers have extensively examined dollar-cost averaging versus lump sum investing. In a 2021 paper, "Dollar Cost Averaging Returns Estimation," Hayden Brown uses Geometric Brownian Motion to model annual returns of the S&P Composite Index over the past 150 years. He concluded that the probability of negative returns is significantly lower for dollar-cost averaging compared to lump-sum investing for longer investment horizons. Specifically, for dollar-cost averaging periods extending over 40 years, the probability of experiencing negative returns drops below 2.5%.

In a 2022 paper by Zein and Darma (2022) entitled "The Dollar-Cost Averaging, Lump Sum, and Value Averaging Strategies in Mutual Fund Investments," the authors found that in volatile market conditions, dollar-cost averaging often provided higher risk-adjusted returns compared to lump sum investing. For instance, in a mutual fund with a standard deviation of returns of 18%, dollar-cost averaging achieved a Sharpe ratio of 0.68, while lump sum investing resulted in a Sharpe ratio of 0.60. They concluded that dollar-cost averaging offers superior risk-adjusted returns in highly volatile market.

Calvet et al. (2023) introduced an enhanced version of dollar-cost averaging, termed "SmartDCA," which adjusts investment amounts based on market conditions. Their research demonstrated that SmartDCA consistently outperforms traditional dollar-cost averaging and, in many scenarios, also surpasses lump sum investing in terms of long-term returns. For example, in simulations using data from the S&P 500, SmartDCA strategies yielded annualized returns of 9.2% and 12.5%, respectively, compared to 8.5% and 11.8% for traditional dollar-cost averaging. The key takeaway is that lump-sum investing does better in market periods with rising prices and low volatility while dollar-cost averaging does better during choppy markets with high volatility (more of a mean-reverting market).

The conclusion from both institutional and academic studies is clear: while lump sum investing has higher expected returns overall, especially in rising and less volatile markets, dollar-cost averaging offers benefits by reducing portfolio standard deviation, max drawdown, and risk over a long-time horizon.

### **Practical Recommendations**

What should you do if you are lucky enough to receive a large lump-sum? I would recommend a hybrid strategy: using dollar-cost averaging, invest a portion of the lump sum each month over a 12-to-24-month period into the highest-returning, highest risk asset class that you are willing to tolerate (such as stocks). Instead of investing the remaining funds in completely safe assets, such as short-term Treasuries, invest those funds in a well-diversified portfolio of diversified bonds and low-beta stocks. You can gradually shift the bond and low-beta stock portfolio into the risky portfolio over time. This hybrid strategy reduces the return difference between lump-sum investing and dollar-cost averaging while reducing market timing risk.

For students and early-career professionals, the best approach (as is typically the case of “financial advice”) depends on circumstances:

- **If investing from job income:** Automate monthly contributions to a diversified, low-cost ETF or index fund. You’ll naturally use dollar-cost averaging through your paycheck.
- **If investing a lump sum:** Consider dollar-cost averaging over a shorter time-period—like 6-to-12 months—to limit opportunity cost while easing psychological stress. Invest the remaining funds in a well-diversified mix of bonds and low-beta stocks.
- **Focus on priorities:** The key is not perfect timing, but disciplined, regular investing and low-cost fund selection. Consistency, diversification, and emotional stability matter far more than the choice between DCA and LSI.

Dollar-cost averaging is a great strategy for students and early-career investors to build long-term wealth from their paychecks. While lump-sum investing may offer superior returns on average, dollar-cost averaging provides smoother entry, reduces regret, and aligns naturally with paycheck-based investing. Remember the core lesson: **invest early, invest consistently, and stay invested**. Whether through dollar-cost averaging or lump-sum deployment, *time in the market* ultimately drives success more than *timing the market*.