



Analyst  
Tan Xuan  
+6565311579  
tanx@phillip.com.sg

## Constant Investing Avoids Pitfalls of Market Timing

### Executive Summary

- Market timing may be difficult, especially in a volatile environment like today's. While staying in cash may seem logical, investors may miss the rebound coming out of a down market or fall into traps of selling during the bottom. Therefore, we introduce three concepts which may help investors to stay invested and make a constant effort at building wealth over time.
- Dollar Cost Averaging (DCA) is easier to implement and keep track of as it invests a fixed amount of money at every interval. It results in lower average price than Constant Share (CS) as it purchases more units when price is low and less units when price is high.
- Value Averaging (VA) resulted in the lowest average price for all three scenarios of up-market, down-market and volatile-market. However, substantial investment are required during the down-market to make up for the shortfall due to decrease in market value of portfolio, which may not be sustainable for some investors.

### Introduction

In a world without uncertainties, investing will simply encompass 'buy low and sell high'. However, we are all aware that uncertainty is perhaps the only constant in an environment like today's as the world grapples with ongoing Europe debt crisis and the possibility of global growth slowdown.

While holding cash may seem like the logical and perhaps safest thing to do during market downturn, it may cause investors to miss the rebound coming out of a down market. Therefore in today's article, we aim to introduce three concepts, constant share, dollar cost averaging and value averaging, which enable investors to stay invested and avoid falling into traps of market timing by enforcing a constant investment effort.

### Concepts Explained

One similarity among all three concepts is that investment is conducted at regular interval. For the sake of simplicity, we shall assume that investment is made on a monthly basis, on the 15<sup>th</sup> of every month. The key difference between these three concepts is how the investment amount is determined.

Constant share (CS) assumes that a constant number of shares are purchased on a regular interval. In our example, 100 units of a fund are purchased every month, regardless of its price at the time. Therefore, the investment amount will be determined by the price of the fund at the time of purchase, multiplied by the predetermined number of units.

Dollar cost averaging (DCA) refers to the concept of investing the same amount of money each time period. In our example we assume that \$100 is invested on a monthly basis, which will typically buy more units when price is low and fewer units when price is high.

*CS: invest in constant units of shares on regular intervals*

*DCA: invest in constant amount of money on regular intervals*



The aim of value averaging (VA), on the other hand, is to ensure that the total portfolio value increases by a fixed amount every interval. In our example, we assume that regardless of market situation, the total value of holdings will increase by \$100 every month, with the difference made up by the investor. Therefore, investors have to put in more money into the portfolio when its market value decreases or may even be required to sell a portion of the portfolio when market value increases.

*VA: ensures portfolio value grows by fixed amount every interval*

**Numerical Examples**

**Example 1: During Up Market**

Interval	Fund Price	Constant Share			Dollar Cost Averaging			Value Averaging			
		Input	Units	Total Value	Input	Units	Total Value	Beg Value	Input Value	Units	Total Value
1	\$1.00	\$100.00	100	\$100.00	\$100	100.0	\$100.00	\$0.00	\$100.00	100.0	\$100.00
2	\$1.20	\$120.00	100	\$240.00	\$100	83.3	\$220.00	\$120.00	\$80.00	66.7	\$200.00
3	\$1.44	\$144.00	100	\$432.00	\$100	69.4	\$364.00	\$240.00	\$60.00	41.7	\$300.00
4	\$1.73	\$172.80	100	\$691.20	\$100	57.9	\$536.80	\$360.00	\$40.00	23.1	\$400.00
5	\$2.07	\$207.36	100	\$1,036.80	\$100	48.2	\$744.16	\$480.00	\$20.00	9.6	\$500.00
	\$2.49	\$744.16	500	\$1,244.16	\$500	358.9	\$892.99		\$300.00	241.1	\$600.00
Average Cost				<b>\$1.49</b>			<b>\$1.39</b>				<b>\$1.24</b>

Source: UT Research Team Calculation  
Calculation ignores any transaction cost incurred

In our simplified example of an up market, the invested amount is the highest for the CS approach as a 100 units is purchased each month regardless of the price increases. In DCA, the units purchased decreases as the price increases because only \$100 is invested each month. As for VA, the price increases actually caused the market value of total portfolio to increase, so a even lesser amount is required to make up for the monthly increase of \$100 in portfolio value. Among the three examples, VA yielded the lowest average cost of \$1.24 while CS resulted in the highest cost.

**Example 2: During Down Market**

Interval	Fund Price	Constant Share			Dollar Cost Averaging			Value Averaging			
		Input	Units	Total Value	Input	Units	Total Value	Beg Value	Input Value	Units	Total Value
1	\$1.00	\$100.00	100.0	\$100.00	\$100.00	100.0	\$100.00	\$0.00	\$100.00	100.0	\$100.00
2	\$0.80	\$80.00	100.0	\$160.00	\$100.00	125.0	\$180.00	\$80.00	\$120.00	150.0	\$200.00
3	\$0.64	\$64.00	100.0	\$192.00	\$100.00	156.3	\$244.00	\$160.00	\$140.00	218.8	\$300.00
4	\$0.51	\$51.20	100.0	\$204.80	\$100.00	195.3	\$295.20	\$240.00	\$160.00	312.5	\$400.00
5	\$0.41	\$40.96	100.0	\$204.80	\$100.00	244.1	\$336.16	\$320.00	\$180.00	439.5	\$500.00
	\$0.33	\$336.16	500.0	\$163.84	\$500.00	820.7	\$268.93		\$700.00	1,220.7	\$400.00
Average Cost				<b>\$0.67</b>			<b>\$0.61</b>				<b>\$0.57</b>

Source: UT Research Team Calculation  
Calculation ignores any transaction cost incurred



In our example of a down market, constant share actually resulted in the least invested amount due to decreasing prices. For DCA, decrease in prices means that more units are purchased each month, but the total invested amount is the same as during the up market. For VA however, the price decreases caused total market value of the portfolio to decrease, which means the investor has to invest greater amount each month to make up for the decrease. Although VA resulted in the lowest average cost, the constant increases in investment amount might be unnerving and unsustainable for some investors, especially during prolonged period of downturn.

*VA was able to obtain the most favorable price in all three examples above, followed by dollar cost averaging, as both strategies purchase more when prices go down and less when prices go up.*

**Example 3: During Volatile Market**

Interval	Fund Price	Constant Share			Dollar Cost Averaging			Value Averaging			
		Input	Units	Total Value	Input	Units	Total Value	Beg Value	Input Value	Units	Total Value
1	\$1.00	\$100.00	100.0	\$100.00	\$100.00	100.0	\$100.00	\$0.00	\$100.00	100.0	\$100.00
2	\$1.20	\$120.00	100.0	\$240.00	\$100.00	83.3	\$220.00	\$120.00	\$80.00	66.7	\$200.00
3	\$0.96	\$96.00	100.0	\$288.00	\$100.00	104.2	\$276.00	\$160.00	\$140.00	145.8	\$300.00
4	\$1.15	\$115.20	100.0	\$460.80	\$100.00	86.8	\$431.20	\$360.00	\$40.00	34.7	\$400.00
5	\$0.92	\$92.16	100.0	\$460.80	\$100.00	108.5	\$444.96	\$320.00	\$180.00	195.3	\$500.00
	\$1.11	\$523.36	500.0	\$552.96	\$500.00	482.8	\$533.95		\$540.00	542.5	\$600.00
				<b>\$1.05</b>			<b>\$1.04</b>				<b>\$1.00</b>

Source: UT Research Team Calculation  
Calculation ignores any transaction cost incurred

Lastly in a volatile market, VA resulted in an average cost that is slightly lower than DCA, but encompassed greater invested amount as well.

Overall, VA was able to obtain the most favorable price in all three examples above, followed by dollar cost averaging, as both strategies purchase more when prices go down and less when prices go up. Therefore, if we assume that most investors are unable to time the market accurately and would like to stay invested by regularly providing an input to the portfolio, then the VA and DCA method might be able to yield more favorable prices than the CS method.

**Constant Investing vs Lump Sum Investing**

Marketing timing plays a key part in determining the returns for lump sum investing. Lump sum investing will yield more favorable returns in the up-market as compared to constant investing as it can capture the lowest price before the uptrend. However, lump sum investing will also yield the least favorable returns in a down market as it captures the highest price before the downtrend. In today's environment where nobody can really tell the market bottom or peak, constant investing might be more beneficial for investors as it helps to avoid the pitfalls of market timing.

Comparisons between DCA, VA and lump sum investing have been covered by various academic studies, but with conflicting results. Chen Haiwei and Jim Estes' conducted a study using monthly historical return data of S&P 500 and US Treasuries from 1937 to 2007. Their result shows that value-averaging strategy generates a higher terminal value for the 401 (k) retirement portfolio than traditional dollar-cost averaging method, based on total risk and reward comparisons such as Sharpe and Sortino ratios.



However, Williams and Bacon's research using data from 1926 to 1991 shows that given a lump sum, it is better to invest the lump sum immediately as opposed to gradually using DCA, and explained the results with higher opportunity cost associated with holding the uninvested portion in risk-free assets.

Lastly, Robert Dubil's research using Monte Carlo simulation showed that DCA resulted in approximately 30 percent lower expected shortfall when losses occur and the longer the averaging period relative to the total investment horizon, the greater the risk reduction. In addition, Dubil also pointed out that in absolute dollar terms, dollar-cost averaging offers the greatest advantages when applied to very risky assets.

### Conclusion

Overall, it does appear that DCA and VA can help investors to a certain extent by lowering the risk and cost of investment according to previous researches. Also, most academic research conducted their studies using equity, which tends to be more volatile, and where VA and DCA are deemed to be more useful in terms of risk reduction. However, their benefits may be limited as some research shows that DCA does not appear superior to lump sum investing.

In our opinion, the benefits of DCA and VA mainly stems from helping investors to make a constant effort in investing to avoid the pitfalls of wrong market timing. While VA appears to yield lower prices in our examples, it may result in large fluctuations in investment amount as market value of the overall portfolio fluctuates and might be unsustainable during severe market downturns. DCA, on the other hand, invests a fixed amount on a regular basis and may be easier to implement for some investors. Therefore, investors should definitely consider the risk preference of investors and suitability of each strategy before deciding on the investment strategies.

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