Do Investors Benefit from DCA? Evidence from the Stock Exchange of Thailand

Received: July 12, 2018
Revised: August 24, 2018
Accepted: September 17, 2018

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Abstract

This study empirically evaluates the effectiveness of dollar cost averaging (DCA) and its alternative strategies in the Thai stock market both in term of mean variance efficiency and downside risk. With one-year investment horizon, we find that, despite being less risky, DCA strategy is inferior to other alternatives such as lump sum and asset allocation in term of Sharpe ratio. The result regarding downside risk, measured by Sortino ratio, is inconclusive as the ratio for DCA has a higher mean but lower median than lump sum and asset allocation. Finally, we create indices that reflect the wealth investing in each of the strategy. Over our sample period, while DCA leads to a less value of terminal wealth, it fails to prevent the investor's wealth from a huge loss during the 2008 financial crisis. This failure may be due to the seasonality of the returns in the stock market.

Keywords: Investment, Investing Strategy, Asset Allocation, Risk Management, Dollar-Cost Average

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การลงทุนแบบถัวเฉลี่ยต้นทุนดีต่อผู้ลงทุนจริงหรือ? ผลการศึกษาจากตลาดหลักทรัพย์แห่งประเทศไทย

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บทคัดย่อ

การศึกษานี้ประเมินประสิทธิภาพของการลงทุนแบบถัวเฉลี่ยต้นทุน (Dollar Cost Averaging-DCA) และกลยุทธ์การลงทุนทางเลือกอื่นในตลาดหลักทรัพย์ไทย ทั้งในแง่ของประสิทธิภาพ Mean Variance และความเสี่ยงขาลง (Downside risk) โดยใช้ระยะเวลาการลงทุน 1 ปี เราพบว่า ถึงแม้ว่าการลงทุนแบบถัวเฉลี่ยต้นทุนจะมีความเสี่ยงที่น้อยกว่า แต่ก็มีผลตอบแทนต่อความเสี่ยง (Sharpe Ratio) ที่ด้อยกว่ากลยุทธ์การลงทุนอื่นๆ เช่น การลงทุนด้วยเงินทั้งหมดในครั้งเดียว (Lump Sum) หรือ การลงทุนแบบจัดสรรเงินลงทุน (Asset Allocation) ส่วนผลการลงทุนในแง่ของความเสี่ยงขาลง (Sortino Ratio) นั้น เราไม่สามารถสรุปความสัมพันธ์ที่ชัดเจนได้ เนื่องจากการลงทุนแบบถัวเฉลี่ยต้นทุนนั้นมีค่าเฉลี่ยของ Sharpe Ratio ที่สูงกว่า แต่กลับมีค่ามัธยฐานต่ำกว่าการลงทุนด้วยเงินทั้งหมดในครั้งเดียว และการลงทุนแบบจัดสรรเงินลงทุน ประการสุดท้าย ผู้วิจัยได้สร้างดัชนีที่แสดงถึงมูลค่าของเงินลงทุนสำหรับกลยุทธ์การลงทุนแต่ละประเภท ในช่วงเวลาที่ผู้วิจัยทำการศึกษาเราพบว่า แม้ว่าการลงทุนแบบถัวเฉลี่ยต้นทุนจะให้ผลตอบแทนที่ต่ำกว่าแล้ว แต่ก็ยังไม่สามารถป้องกันการลดมูลค่าของสินทรัพย์ลงได้ในช่วงวิกฤติเศรษฐกิจปี ค.ศ. 2008 ซึ่งสาเหตุอาจจะมาจากการที่ผลตอบแทนมีความแตกต่างกันตามฤดูกาลของตลาดหลักทรัพย์

คำสำคัญ: การลงทุน กลยุทธ์การลงทุน การลงทุนแบบถัวเฉลี่ยต้นทุน การลงทุนแบบจัดสรรเงินลงทุน การบริหารความเสี่ยง

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Introduction

Financial advisors widely recommend using dollar-cost averaging (DCA) as an optimal strategy for reducing the risk of an investment portfolio while maintaining a reasonable level of return. DCA has been popular among professional practitioners and investors with long-term investment objectives. By gradually investing the same amount of wealth into equities at a regular schedule, the investor buys more shares when the prices are lower and fewer shares when the prices are higher. As a result, the investment portfolio becomes less vulnerable to price fluctuations and volatility.

It is common that investors will come into a lump sum of money at some points in their lifetimes; however, to make an appropriate decision on how the money should be invested can be a challenging problem. The goal of this study is to provide an idea for investors who are making decisions between 'invest now' or 'invest gradually'. We seek to empirically evaluate whether DCA optimizes the return of an investment portfolio relative to its risk. Previous studies have demonstrated that the DCA approach to investment is in fact inferior to analyses using raw return and return per unit of risk (see Constantinides, 1979; Thorley, 1994; Rozeff, 1994; Panyagometh and Zhu, 2016). Despite this empirical evidence, DCA continues to be used by professional investment consultants.

This study examines the effectiveness of DCA both in terms of mean-variance efficiency and downside risk in comparison to other common strategies namely, lump sum, asset allocation, and value averaging. Unlike, other previous studies, which evaluate the effectiveness of the strategy through terminal wealth over a long-term investment horizon (see Panyagometh and Zhu, 2016), we analyze the performance of these strategies with a year-by-year basis. The approach should give more insight for investors who have medium investment horizon and less concerned about medium term volatility. Thus, our year-by-year analysis is more realistic than assessing the terminal wealth, which is commonly done by other studies, because investors are unlikely to construct investment plans only once in their lifetimes. In fact, they are more likely to evaluate their performance and plan their investment regularly as they receive more lump sum over the course of their lives. Many investors in Thailand buy Long-Term Fund (LTF) only to be eligible for tax reduction. As a result, they revise their investment annually and hardly have their horizons longer than a few years.

This paper is divided to four sections. Section 1 starts with the review of literature about DCA and its related topics. Section 2 explains the methodology and data used for our analysis. Section 3 presents the comparison of various aspects of the strategies, and discusses implications of the results. Section 4 concludes our findings.

Literature Review

In lieu of investing all of the wealth in one go, dollar-cost averaging recommends investing the same dollar amount each period. Therefore, the quantity of shares purchased are lower when prices are higher and greater when prices are lower. Thus, the strategy is commonly claimed to help limit risk and reduce average cost. Constantinides (1979) finds that, while the strategy helps reducing risk, it is still inferior to a more simply alternative such as lump sum.

In contrast, Williams and Bacon (1993), Rozeff (1994) compare the annualized returns from the DCA and lump sum (LS) strategies and find that LS strategy outperforms the DCA strategy. Thorley (1994, 1995) compares the DCA strategy with buy and hold strategy (BH). The study finds that, not only DCA strategy leads to a lower expected return, it also increases risk of the investment. Harrington (2001) examines the performance of the S&P500 index over 10 years using a DCA strategy, Value Averaging (VA), and LS. The author concludes that LS is superior to the other two strategies. Leggio and Lien (2003) empirically evaluate the four strategies (DCA, VA, LS, and BH) and conclude that the DCA strategy is inferior to its alternatives.

More recent studies about DCA also point out that DCA strategy yields less preferable outcomes. Bisceglia and Zola (2018) examine the effectiveness of DCA across many stock markets around the world. They find that DCA strategy generally have lower annual return than LS. Daniel Berkowitz reveals on Vanguard's Investment Commentary Podcast series (recorded on 21 November 2016) about the research on performance comparison between LS and DCA. He argues that LS outperforms DCA about two-thirds of the time, with an average margin of 1.5 to 2.5 percentage points.

Other studies examine the effectiveness of these investment strategies using simulations. Abeysekera and Rosenbloom (2000) uses Monte Carlo simulation to compare

the DCA strategy with LS. The study obtains an inconclusive result when the investment is highly volatile. However, LS is a superior choice when the volatility of the investment is low. Panyagometh (2013) uses Monte Carlo simulation and Genetic Algorithms Based Optimization to investigate the effect of investment horizon on the performance of the DCA strategy and VA strategy. This study finds that over longer investment horizons, the VA becomes more preferable to DCA. Panyagometh and Zhu (2016) demonstrates that DCA strategy is approximately equivalent to investing about 50 to 65 percent in risky assets and the rest in risk free assets.

Statman (1995) explains the rationale of DCA using behavioral framework. This paper argues that investors are loss-averse and seeks to avoid the regret of making losses, particularly when all of the capital is invested when the market is at its peak. DCA strategy, with its policy to put an equal amount of wealth into the investment in each period, is just the solution to minimize the regret. However, empirical findings by Leggio and Lien (2001) contradict this explanation because DCA strategy continues to remain inferior when ranked according to loss aversion value functions.

Research Methodology

This study uses monthly average values from the SET Total Return Index (SET TRI) retrieved from Thomson Datastream, over the period December 2004 to December 2016. This data proxies the return from investing in stock market and provides a benchmark for analysis. We also use the one-month Treasury bill yield, Bank of Thailand, to proxy a risk-free asset. The sample period covers significant macro-financial, socio-legal-political, and natural disaster events in Thailand, including: the recent 2007-2009 financial crisis; the introduction and subsequent cancellation of capital control policy; Thailand's 2011 great flood, as well as the political coup d'états in 2006 and 2014. This allows us to examine how investment fare during periods of high volatility. However, it is also important to note that the period of high volatility may overstate the benefits of more conservative strategies.

Strategies

Since the purpose of this study is to examine the performance of these strategies on a year-by-year basis, we assume that the investors consider investment horizons of one-year. This horizon is realistic for investors who annually evaluate their performance and plan for their next investment the following year. This is especially true for investors who mainly invest to evade taxation. In this analysis, the investor is assumed to have a fixed amount of money of THB 12,000 at the beginning of the year. The assumed amount of THB 12,000 is mainly for the simplicity as the number is divisible by 12 so the monthly investment amounts of DCA and VA become a round number. Choosing arbitrary number does not impact the result of our analysis. Then the investor chooses a strategy, among DCA, VA, LS, and AA, in order to invest the money for the rest of the year. The performance of the portfolio is evaluated at the end of the year, and then, the investors repeats the strategy the following year.

For all strategies, the money yet to be invested in the stock market is assumed to be invested in risk-free asset, which is benchmarked by the return of the one-month Treasury bill. Since the strategies are different in term of the amount of money is invested at a particular period of time, they have different exposures to the stock market and risk-free asset.

Dollar-cost Averaging (DCA)

Dollar-cost averaging, requires the investor to put the same amount of money at a regular interval (in this case, monthly). Thus, in our analysis, the investor invests THB 1,000 (divide THB 12,000 by 12 months) into the stock market at the beginning of each month. As a result, if the price rises in the previous month, the investor would buy less number of shares in the current month. On the other hand, the investor would gain more shares following a bad month. This strategy allows the spreading of investment which provides investors protection from regret; especially when the prices sharply drop after a big purchase.

Based on DCA strategy, the standing amount of stock portfolio in each month can be calculated as,

$$WS_t = WS_{t-1}e^{RS_{t-1}} + IN_t$$

Where WS_t represents the wealth invested into stock market in the month *t*. RS_{t-1}. is the return of the stock market in the previous month, and IN_t is the additional money moved from Treasury bill portfolio to the stock portfolio in that month. Similarly, the balance of Treasury bill portfolio is

$$WB_t = WB_{t-1}e^{Rf_{t-1}} - IN_t$$

Where WB_i denotes the wealth invested into Treasury bill in the month *t* and Rf_{t-1} is the return of Treasury bill in the month before. Since DCA requires the investor to put the same amount of money into the stock portfolio each month, thus the value of IN_t is constant over the year, and equals to a constant of THB 1,000 in our analysis.

It is important to note that, since we assume the investor has an amount of money to invest at the beginning of the year and evaluates the portfolio performance every year, we calculate the portfolio values and returns each year independently from the other year. Thus, the initial values of investment are initially set to zero for WS_O and WB_O

Value Averaging (VA)

Value averaging, focuses on the cumulative value of investment. It requires investors to plan the increment of investment value for each month. In this analysis, we assume that an investor simply seeks to increase the value of the investment by the same amount each month and expect the cumulative value to reach THB 12,000 in December. Therefore, the value of investment is THB 1000 at the beginning of January, THB 2,000 at the beginning of February, THB 3,000 at the beginning of March, and so on. If the market rises by 5 percent in January and the value of investment becomes THB 1,050, the investor would only to put THB 950 (THB 2,000-THB 1,050) into the portfolio because the planned value of investment in February is THB 2,000. This, however, also means that the investor needs to add more than THB 1,000 following a month with

negative return. Following this strategy, the investor is required to add more money into the investment after market declined, and less money after market went up. Effectively, it allows the investor to take advantage of a volatile market that they would adjust the amount of money put in the portfolio based on the recent market performance.

One complexity about VA is the fact that, instead of the amount of money, the investor needs to plan for the target investment value. This means that it is not possible to predict the amount of money required for VA investment in a particular year since it ultimately depends on the return of the stock market. Therefore, in a bad year, it is possible that the investor may require more money to invest than at the beginning of the year. In our analysis, we assume that the investor will borrow money at the risk-free rate in order to fund the VA strategy if such a scenario occurs. Indeed, borrowing at the risk-free rate may not be realistic. However, the borrowing rate has very limited impact on the outcome because the case of borrowing is not common and it only happens during the last few months of the year. Therefore, we decide to use the same interest rate for lending and borrowing.

Due the nature of VA that requires the investor to add the value of investment in stock market to the target amount, the value of investment in stock in each month is simply equal to the target value of that month, which can be calculated by

$$WS_t = \left(\frac{t}{12}\right) TW$$

Where *TW* is the total wealth that the investor has for the investment in that particular year. Since we assume that the investor has THB 12,000 for investment at the beginning of each year, *TW* is set to THB 12,000. The calculation of the amount of money invested into the stock market each month, IN_t, is more complicated for VA. Since it ultimately depends on the return of the previous month, the amount can be computed as

$$IN_t = \left(\frac{t}{12}\right) TW - WS_{t-1} e^{RS_{t-1}}$$

Intuitively, the amount of money added into the stock portfolio in each month, IN_t, is equal to how much the wealth from the previous month, $WS_{t-1} e^{RS_{t-1}}$, is short from the target investment amount for that particular month, $\left(\frac{t}{12}\right) TW$.

Lump sum (LS) and Asset Allocation (AA)

Lump sum and asset allocation strategies are straightforward. Following LS, investors invest all of the THB 12,000 in the stock market at the beginning of each year. AA investors invest a half their wealth, THB 6,000, in stock market and the other half, another THB 6,000, in risk-free asset. It is important to note that this LS and AA investment occur on a yearly basis. Therefore, at a longer horizon, the LS in this analysis may be similar to DCA with a one-year interval.

Research Findings and Discussion

Performance

In this section, we compare the performance of each investment strategy in terms of risk and returns. Within each year, the investment value and return of each strategy is calculated monthly. The annual continuously compounded return is calculated from wealth at the beginning and the end of the year. Monthly log return for the month t is calculated by

$$R_t = \ln[(WS_t + WB_t)/(WS_{t-1} + WB_{t-1})]$$

Risk is calculated from the annualized standard deviation of the monthly return of that particular year. We also evaluate the efficiency of each investment strategy using Sharpe ratio. The ratio is calculated as,

$$Sharpe\,Ratio = \frac{E[R - Rf]}{\sqrt{var(R - R_f)}}$$

Where *R* and *Rf* are the returns of the portfolio and one month Treasury bill (risk-free asset) over a particular year. Table 1 shows the comparison of the performances among the four strategies. Since returns, risks, and Sharpe ratio are calculated on a yearly basis, the numbers displayed in the table are aggregated from all of the years during the period of study.

Over the sample period, LS provides the highest return among all strategies. If an investor invests all of the money in the stock market at the beginning of the year, the investor will earn a return of 10.96% per year on average (14.06% for median). The returns from DCA, VA, and AA (5.42%, 4.48%, and 7.82% respectively) are lower by a large margin and economically meaningful. However, it also comes with higher risk. The standard deviations of monthly returns for LS are higher than the other strategies in every year in the sample period. This is expected for LS since it provides the highest exposure to the stock market. It gives a huge return of 53.85% in 2009, a year after it suffered a staggering 59.96% loss because of subprime crisis. In term of risk, AA gives the lowest average standard deviation of returns and, interestingly, lower than DCA and VA, which try to control the risk by gradually invest a portion of wealth in the stock market over time. The number of year that AA strategy portfolio suffers loss is also fewer than other strategies. Over the sample period, there are three years that AA strategy portfolio makes losses; four times for the other strategies.

Giving the highest average yearly return does not mean that LS is preferred to the other strategies since return is not the only concern in an investment. When evaluated by Sharpe ratio criteria, LS and AA are ranked on the top with the average ratio of 0.81. Even though DCA and VA are less risky than LS, because of their much lower average returns, their Sharpe ratios, 0.63 and 0.71 respectively, are comparatively smaller in magnitude comparing to the other two strategies. The results based on median are consistent and the outperformance for LS and AA is even more pronounced. Therefore, it seems that LS and AA are generally better strategies when investors are concerned about how much return they earn for each unit of risk they take.

Table 1 Comparison of annualized returns, risks, and Sharpe ratio among the four strategies

Strategy	Annualized Return	Annualized Risk	Sharpe Ratio
Dollar-Cost Averaging			
Mean	5.42%	11.51%	0.63
Std Dev	18.15%	6.90%	1.60
Max	32.91%	31.49%	3.33
Median	6.36%	10.34%	0.47
Min	-34.92%	5.25%	-1.69
Loss Count	4		
Value Averaging			
Mean	4.48%	11.96%	0.71
Std Dev	18.02%	10.29%	1.58
Max	28.31%	43.42%	3.32
Median	6.53%	9.68%	0.52
Min	-39.04%	4.81%	-1.65
Loss Count	4		
Lump Sum			
Mean	10.96%	18.06%	0.81
Std Dev	29.43%	8.89%	1.45
Max	53.85%	42.79%	2.49
Median	14.06%	16.24%	0.93
Min	-59.96%	8.79%	-1.48
Loss Count	4		
Asset Allocation			
Mean	7.82%	8.94%	0.81
Std Dev	14.25%	3.30%	1.48
Max	30.95%	16.73%	2.56
Median	8.36%	8.33%	0.91
Min	-23.47%	4.68%	-1.59
Loss Count	3		

Downside Risk

Typical investors' concern on investment might be different from the experts as they are more sensitive to the losses. According to Kahneman and Tversky's (1979) prospect theory, people view loss and gain differently. They put more weight on losses than gains. This essentially makes them exhibit loss aversion. This is especially the case for investors whose main purpose of investment is to evade tax through long-term funds (LTFs). They are more concerned about whether they will still get the money they initially invest into the funds back after the term is fulfilled (as of 2017, Thais need to hold LTFs for at least 7 calendar years in order to get the tax benefit). Since, DCA is commonly suggested to typical investors by the professionals as a mean to improve 'safety' to their investment money, it is important to evaluate this empirically. Thus, in this section, we will examine the performance adjusted by downside risk of these four strategies based Sortino ratio.

Sortino ratio is a variation of Sharpe ratio where it takes into account the asymmetry of the variances between gains and losses. Instead of using standard deviation of the returns as a risk measure, Sortino ratio uses downside risk. The ratio is calculated as follow,

$$Sortino\,Ratio = \frac{E[R_p - R_f]}{\delta}$$

The calculation is similar to Sharpe ratio except for the standard deviation of returns is replaced by a downside risk, δ, which is defined as

$$\delta^2 = \int_{-\infty}^{x} (x - R_p)^2 dR_p$$

Where R_p is the expected return of the investment. In our analysis, we assume x to be 0 in order to make the ratio appropriate for investors who concern about making losses. Consequently, when $x = 0$, δ, can be seen as a standard deviation of the returns when the returns are negative. Plantinga, van der Moor, and Sortino (2001) argue that, for evaluating the performance of mutual funds, Sortino ratio is preferred to the Sharpe ratio because it also considers the skewness of the return. Empirically, the returns of the stock market of Thailand is indeed negatively skewed.

Table 2 displays aggregated yearly Sortino ratio for the four strategies. Judging by the mean of yearly Sortino ratio, VA has the best number of 1.99 while DCA closely follows at 1.93. The mean yearly Sortino ratio for LS and AA are 1.06 and 1.20 respectively. However, when we use medians instead of means, the results change dramatically. In term of median, LS and AA turn out to be better choices with the yearly ratio of 1.00 and 1.01. On the other hand, the ratios for DCA and VA drop to 0.56 and 0.63.

Table 2. Comparison of aggregated yearly Sortino ratio among the four strategies. The numbers are aggregated by mean and median.

	Sortino ratio (mean)	Sortino ratio (median)
Dollar-Cost Averaging	1.93	0.56
Value Averaging	1.99	0.63
Lump Sum	1.06	1.00
Asset Allocation	1.20	1.01

These inconclusive results may be due to the fact that the mean is highly influenced by large outliers, and the impact is significant since there are only 12 years of observation in our sample period. The year 2010 is a significant outlier, characterized by high market volatility in its first half as the market rose in three months and declined in three other months. However, the second half of the year, investors witnessed the rise of 28% in the market. This particular setting benefits the strategy which underinvests at the beginning of the year and reach its fully investment at the end of the year. As a result, the Sortino ratio for DCA and VA in 2010 are remarkably high, at 16.63 and 15.77, in 2010.

The comparison using downside risk provides an inconclusive result about which strategy is optimal. However, we find that using median is more representative for the yearly Sortino ratio because of the bias caused by outliers. So LS and AA still seem to be better choices than DCA and VA on this regard.

Return Indices

In this section, we construct indices of accumulated wealth using the four strategies over the 12 years in our sample period. To do so, we initialize the value of all indices to be 100 then let them grow at the rate of monthly return of their corresponding strategies, which we calculated in Performance section. It is important to note that using the monthly returns from the Performance section implies that the investor would liquidate his portfolio at the end of the year and invest the proceeds base on each corresponding strategy at the beginning of the following year. This might not be realistic in practice, but unless we assume this, the portfolio would be heavily weighted with equity in the latter years and the choice of strategy would become less relevant as it is only applied to the new lump sum received at the beginning of each year. Thus, we decide to use this method so that the indices would provide us a better insight about the exposure of each investment strategy.

Figure 1 shows how the return indices based on the following strategies. AA yields the greatest amount of wealth at the end of our sample period, followed closely by LS. DCA and VA which are lagged behind by a significant margin. This may be just a reflection of our results from Performance section that shows higher average yearly returns of LS and AA strategies.

One interesting observation we can make from this figure is that all strategies but AA declined greatly during the subprime crisis in 2008. This casts a doubt in the claim that DCA and VA can mitigate the loss of an investment as the two strategies were not much better than LS in the time of financial crisis. Then why DCA and VA suffered so badly? The answer to this question is that most of the losses in 2008 occurred during the second half of the year. That was when DCA and VA already loaded most of the investors' money in the stock market. So, essentially, using AA as a benchmark, the two strategies under-invest in the first half and over-invest in the second half of the year. Arguably, DCA and VA have an aspect of market-timing and the risk involved with it; seasonality of returns.

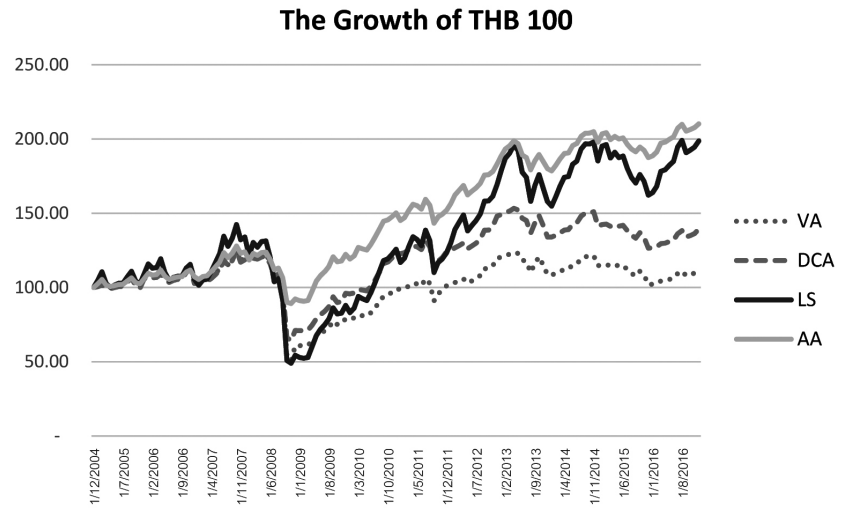

Figure 1 Comparison of the wealth growth among four strategies

Market Return by Month

This section investigates the average market return of each month during our sample period. Since DCA and VA have different levels of exposure to the stock market throughout the year, they are at risk of seasonality of returns. Bouman and Jacobsen (2002) document the "Sell in May" effect in the stock markets across 37 countries, including Thailand. Jenwittayaroje (2017) also provides the evidence of lower returns during a period of May to October in the Thai stock market. If this seasonality persists, it would jeopardize the ability to mitigate losses of DCA and VA which already have most of the money invested in the stock market in the second half of the year.

Table 3 shows the returns of the Thai stock market separated by month. Good returns usually come at the beginning of the year in our sample period. The first half of the year witnesses the average return of 1.51% per month while the second half yields only 0.32% and are more volatile. Thus, it seems like a bad idea for an investor to put most of the wealth in risk-free asset during the good first half of the year and increasingly exposes himself later on when the market become more volatile and less rewarding. Though one may argue that the investors do not have to start their investment at the beginning of the year, still it cannot be denied that DCA and VA have an element of

market-timing (overinvest/underinvest at some point of time) and thus susceptive to the seasonality of returns. If the investor wants to limit the investment risk, AA strategy seems to be a preferable choice for this market environment.

Table 3 Monthly SET TRI by month

	Mean	Median	Std_Dev
January	0.02%	-0.42%	5.61%
February	3.24%	3.61%	3.03%
March	1.68%	1.42%	4.77%
April	3.51%	3.22%	4.30%
May	0.14%	-0.49%	5.53%
June	0.46%	1.33%	5.09%
July	1.84%	2.13%	6.26%
August	0.60%	2.18%	4.96%
September	0.46%	2.80%	7.87%
October	-1.48%	0.94%	11.51%
November	-0.71%	0.66%	3.17%
December	1.20%	2.59%	6.15%
First Half of the Year	1.51%	1.76%	4.85%
Second Half of the Year	0.32%	1.88%	6.98%

Conclusion

This paper empirically examines the effectiveness of DCA and its alternative strategies in the Thai stock market. Looking at one-year investment horizon, we find that the DCA and its closely relative VA are less preferable to a simpler strategy such as LS or AA in term of risk adjusted performance. This is a contradiction to the common advice given by professional financial advisors. While they claim that DCA reduces the exposure of an investment, thus limiting its risk, our finding about downside risk measure is inconclusive. DCA and VA are better than LS and AA when using the mean of Sortino ratio, yet their medians are worse.

We create indices that follow the growth of wealth from investing in each of the strategy, and find that, while DCA and VA offer less terminal wealth, they failed to prevent the portfolios from the decline during the financial crisis in 2008. This is due to the fact that DCA and VA can only prevent the losses that occur in the early phase of the investment horizon. If the losses come later on when the strategies have already accumulated a lot of exposure on the stock market, then they are no better than LS.

However, even though DCA and VA are inferior to LS and AA in term of the outcome from investment, they might be appropriate choice for people who want to make a saving plan in which investment schedule comes in line with their monthly incomes. Thus, the usefulness of DCA and VA are rather in term of money management than investment outcome.

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