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RESEARCH ARTICLE

THE IMPACT OF ASS*ET AL*LOCATION STRATEGY ON PORTFOLIO PERFORMANCE: EVIDENCE FROM DAMASCUS SECURITIES EXCHANGE (DSE)

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ABSTRACT

Background: Investors and portfolio managers who intend to invest in stocks listed on Damascus Securities Exchange (DSE) should understand and evaluate the performance of portfolios constructed using different ass *et al* location strategies, which in turn helps them shape their allocation decision with this understanding in mind. The purpose of this paper is to investigate the impact of ass*et al*location strategy on portfolio performance. It compares the out-of-sample performance of mean-variance, minimum variance, equally weighted and market value weighted strategies. The study utilized Sharpe ratio as a proxy for performance measurement. **Methods**: This paper discusses first the background and literature related to ass *et al* location strategies' performance comparison. Then, moves on to test the impact of four ass *et al* location strategies on portfolio performance of stocks listed on Damascus Securities Exchange (DSE) using bootstrapping technique as a robust inference method proposed by Ledoit *et al*. (2008) who suggested to construct a student zed time series bootstrap confidence interval for the difference of the Sharpe ratios and to declare the two ratios as significantly different if zero is not contained in the obtained interval. **Results**: Mean-variance, minimum variance, equally weighted and market value weighted strategies do not realize significantly different performance as measured by Sharpe ratio. **Conclusion:** The ass *et al* location strategy does not have an impact on portfolio performance of stocks listed on Damascus Securities Exchange (DSE).

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INTRODUCTION

Investment environment is characterized by variety and sophistication of financial instruments. Investors, whether individual or institutional, always face the question of how to allocate their funds among the available assets. To answer this question, investors use portfolio management as a systematic way to search, analyze, select, execute and provide feedback on the performance of the funds invested. Among the activities involved in the portfolio management process; ass *et al* location has a significant role as it entails committing the portfolio to certain investment for a period of time to realize the expected return (Dziwok, 2014). Ass *et al* location was firstly concerned with the intuitive idea of diversification to reduce risk. This concept first appeared in Netherlands in 1774 where the first investment trust was created as the world's first mutual fund by Abraham van Ketwich who invited investors to consider (Eendragt Maakt Magt), the first closed-end investment trust.

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The trust invested in a portfolio of foreign government bonds from Austria, Denmark, Germany, Spain, Sweden, and Russia as well as plantation mortgages from the West Indies (Kahn, 2018). The concept of allocation to different geographies was also evidenced in the work of Lowenfeld Lowenfeld, (1909) who indicated in his paper that if an investor widely distributes his capital over the earth's surface, local depression in one quarter will be counter-balanced by local trade activity in another quarter. Subsequently, Harry Markowitz, (1952) who is considered as the father of Modern Portfolio Theory published a paper (Portfolio Selection) where he was the first to introduce the risk reduction possibility by allocating capital to assets that have low correlation in returns and introduced that as a mathematical formula. Markowitz also introduced the efficient frontier of optimized portfolios. Efficiency is meant to be the highest return possible at a given portfolio risk or vice versa. Investors then can select the portfolio that is suitable given their risk aversion. There are variety of disciplines in ass *et al* locations, including asset-only, factor based, liability driven, goal-based and heuristic approaches

(Jennings *et al*., 2019). Strategies selected in this research are four strategies that are helpful to investors and portfolio managers who intend to invest in stocks listed on Damascus Securities Exchange (DSE). Therefore, this research presents descriptive and statistical comparison of the performance of four ass*et al*location strategies using Sharpe ratio as a proxy for performance measurement so that investors and portfolio managers can apply it while taking the ass*et al*location decision. The research is organized by presenting detailed literature review in section 2, followed by formulation of the research question and objectives in section 3, section 4 presents the materials and methods used, section 5 shows the test results and finally the research conclusions and recommendations are presented in section 6.

Literature Review: Windcliffand *et al*. (2003) used simple mathematical argument applied on 5 asset classes' 15 years historical data from February 1981 to September 1997 with downward adjustment of returns by 5% to mimic the market conditions. The asset classes chosen to be representative of the conditions that pension plan participants face with short selling restriction while optimizing portfolios. The study compared the portfolios' performance in units of standard deviation of portfolio returns. The study concluded that with short sample period used of 60 months to estimate the portfolio parameters, there was less information contained in the sample mean and that investors were better off equally weighting their assets. The study also noted that extending the sampling period to 240 months to obtain better estimates was not a solution because it was highly unlikely that market parameters would remain stationary over 20 years window. De Miguel *et al*. (2007) compared the out-of-sample performance of the equally weighted strategy to 14 different ass*et al*location strategies including mean-variance, minimum variance and market value weighted strategies. The study was applied on seven different empirical data sets covering periods ranging from 1963 to 2004.

The performance measurement was based on three different criteria including the Sharp ratio. The study found that out of the 14 strategies evaluated, none was consistently better than the equally weighted strategy in terms of Sharpe ratio, which indicates that, out-of-sample, the gain from optimal diversification is more than offset by estimation error. In addition, the study found that the out-of-sample Sharpe ratio of the mean-variance strategy is much lower than that of the equally weighted strategy, indicating that the errors in estimating means and covariances erode all the gains from optimal relative to naïve diversification. Kolusheva (2010) compared the out-of-sample performance of the equally weighted strategy to the mean-variance and minimum variance strategies using Sharpe ratio as a proxy for performance measurement. The study used monthly total returns on 10 sectors in the S&P 500 for the period from 31 October 1989 to 30 November 2007. Bootstrapping technique as developed by Ledoit *et al*. (2008) and the method of Jobson *et al*. (1981) with the adjustment proposed by Memmel (2003) "JKM" were used to test the difference in Sharpe ratios. The study revealed that the equally weighted strategy outperformed the mean-variance and minimum variance strategies. Kritzman *et al*. (2010) claimed that the underperformance out-of-sample of the optimization strategies as compared with the equally weighted strategy to be attributable to the sensitivity of those strategies to estimation errors was untrue and that when naive but plausible estimates of returns, volatilities and correlations were used resulted in better performance of the optimization strategies versus equally weighted strategy. The study applied optimization strategies using the out-of-sample information available at the time of portfolios construction, which was rolled forward based on new information and with long-only restriction on assets' weights to avoid estimation based on historical samples. The data used were related to 13 data sets comprising 1,208 data series and 50,000 portfolios were constructed under three main groupings. The study used Sharpe ratio as a proxy for performance measurement and revealed that the optimized strategies outperformed the equally weighted strategy. Jacobs *et al*. (2013) assessed the performance of ass*et al*location strategies over 40 years from February 1973 to December 2012 based on monthly returns. Beginning on each February, returns data of the previous 60 months were used as an input to determine the estimated weights of each index in the portfolio. Using those weights, the returns in the next 12 months were calculated and so forth. Bootstrapping technique as developed by Ledoit *et al*. (2008) was used to test the difference in Sharpe ratio as a proxy for portfolio performance. The study compared 11 optimization strategies including maximum Sharpe ratio strategy with short selling constraint and minimum variance strategy with short selling constraint to three heuristic strategies including equally weighted and market value weighted strategies. The study revealed that for global equity diversification, prominent optimization models did not outperform heuristic stock weighting schemes. Bakke (2014) implemented similar logic of DeMiguel *et al*. (2007) by testing the out-of-sample performance of portfolios using Jobson *et al*. (1981) with the adjustment proposed by Memmel (2003) "JKM" as the test statistic and Sharpe ratio as a proxy for performance measurement. The study tested four ass*et al*location strategies including mean-variance, minimum variance, market value weighted and the equally weighted. The data sets included eight different U.S. equity stocks as reported by Kenneth French online data library. The monthly returns for the in-sample period were for two periods, for six of the data sets from January 1927 to December 2012 and for two of the data sets from January 1931 to December 2012. The estimated covariance matrix was shrunk and used for estimation of the weights as per JKM method. The in-sample periods were 60, 120, 240 and all monthly data periods for each ass*et al*location strategy. The study revealed that none of the optimized or equally weighted strategies consistently deliver statistically distinguishable Sharpe ratios from each other.

The market value weighted strategy was found to frequently be statistically suboptimal when compared to the other ass*et al*location strategies. Sánchez (2015) compared the out-of-sample performance of 14 strategies using different performance measures including Sharpe ratio. The study focused on 10 European markets and used monthly excess returns over one-month German bill from January 1975 to December 2012. The evaluation of performance was conducted on two levels. On the whole out-of-sample period of 456 months, and on sub-periods of 300 months each counting to 157 sub-periods. The study compared the performance empirically for the 14 strategies and concluded that out of the 14 strategies evaluated, the minimum variance strategy outperformed the equally weighted strategy when number of assets was low. However, by adding more assets in the dataset, the minimum variance strategy underperformed the equally weighted strategy due to rebalancing. In addition, the study revealed that the minimum variance strategy with no short selling showed better performance as compared to the equally weighted strategy followed by other two strategies not relevant to this research paper. Plyakha *et al*. (2015) constructed the equally weighted and market value weighted portfolios from the 100 stocks that were in the S&P 500 index over the period from February 1967 to December 2009 using monthly returns. In addition, the study checked the robustness of the tests by constructing portfolios from stock belonging to Mid Cap S&P 400 index from July 1991 to December 2009 and Small Cap S&P 600 index from November 1994 to December 2009. The study measured the performance using different techniques that among others include Sharp ratio. The test results showed that the equally weighted portfolio with monthly rebalancing outperforms the market value weighted portfolio in terms of total mean return, alpha, and Sharpe ratio. Bastin (2017) compared the empirical results of the minimum variance portfolios constructed using Markowitz optimization method with the objective function being to minimize the portfolio risk without regards to returns. Three minimum variance portfolios were constructed and compared with the market value weighted index, which represents the German Stock Market.

The minimum variance portfolios included stocks sorted with their market cap (top 200, top 100 and top 50). Certain restrictions were also applied including restriction on short selling, maximum and minimum weights per security and minimum weight per industry. In addition, the study created equally weighted portfolio for the same periods for comparison. The period covered was from March 2002 to March 2015 with monthly stock returns and quarterly optimization which resulted in 52 quarterly portfolios estimated weights and returns for each minimum variance portfolio. The performance measurement criteria used included beta and standard deviation as risk measures while Sharpe ratio and Alpha were used as risk adjusted returns. The study revealed that the minimum variance portfolios had lower risk and same or higher returns than the market value weighted index. In addition to having better risk adjusted performance figures as compared with the equally weighted portfolio.

Research Question: One of the important decisions that investors make in portfolio management process is how to allocate their funds among the financial assets. There are a lot of strategies for allocation purposes, some of them rely on the work of Markowitz (1952) such as the mean-variance and minimum variance strategies to construct the optimized portfolio, while others provide reasonable but not necessarily optimal solution such as equally weighted and market value weighted strategies. Optimization strategies including mean-variance and minimum variance have drawbacks including sensitivity to inputs in estimating weights, estimation errors, single period framework and sources of risk may not be diversified in spite of the fact that the allocated assets may appear diversified (Jennings *et al*., 2019). In contrast, equally weighted strategy do not include such drawbacks and therefore should not be dominated by the optimized strategies. Moreover, market value weighted strategy requires rebalancing and is subject to the bias of overweighting large-cap versus small-cap in spite of the fact that small-cap stocks might outperform the large-cap, which in turn renders the market value weighted strategy to underperform the equally weighted strategy (Malladi, 2017). The objective of this research is to help investors and portfolio managers who intend to invest in stocks listed on Damascus Securities Exchange (DSE) by evaluating and comparing the performance of portfolios constructed using four different ass*et al*location strategies which in turn helps them shape their allocation decision with this understanding in mind. Therefore, the research question can be formulated as below:

"Dose an ass*et al*location strategy have an impact on portfolio performance of stocks listed on Damascus Securities Exchange (DSE)?"

Variables Measurement

Mean-Variance Strategy: Mean-variance strategy is based on Markowitz methodology. In this strategy the investor tradeoff between mean and variance of portfolio return. To implement this strategy, sample period mean and covariance matrix of stock returns are used and therefore, this strategy completely ignores the possibility of estimation error (DeMiguel *et al*., 2007). The estimates of returns and covariance from the in-sample period are plugged in the optimization formula with the objective of maximizing the portfolio return per unit of risk and with restrictions of no short selling and total weights must be equal to 1. Those weights are then used in calculating the first out-of-sample portfolio return. Then, the process is repeated for each rolling period until we end up with full out-of-sample period mean-variance strategy returns.

Minimum Variance Strategy: Minimum variance strategy is similar to the mean-variance strategy with the difference in the objective function being to minimize the portfolio risk without regards to returns. To implement this strategy, we use similar approach of DeMiguel *et al*. (2007) where we use only the estimates of the covariance matrix of asset returns (the sample covariance matrix) and completely ignore the expected returns' estimates.

Equally Weighted Strategy: This strategy is a simple heuristic, in which a fraction 1/N of wealth is allocated to each of the N assets available for investment at each rebalancing date (Pinho *et al*., 2017). For our study purpose, on each out-of-sample month, the returns of the N stocks will be weighted by the factor 1/N.

Market Value Weighted Strategy: Market value weighted strategy is a simple heuristic strategy like the equally weighted strategy with the difference in which the asset's weight for each out-of-sample period is based on the asset's market capitalization at the beginning of that period. The asset's weight for each out-of-sample period is calculated by dividing the asset's market capitalization at the beginning of that period by all assets' market capitalization for the same period. In CAPM world, this strategy is the optimal strategy as it represents the market value weighted portfolio, (DeMiguel *et al*., 2007).

Portfolio Performance: To measure the performance of each strategy we used the Sharpe ratio which from an investor's point of view, describes how well the return of an investment portfolio compensates for the risk taking (Schmid *et al*., 2009). To calculate each strategy out-of-sample Sharpe ratio we took the average of the 41 monthly excess returns, and divided it by the standard deviation of those monthly excess returns, as presented in the following formula:

$$\text{Sharpe Ratio} = \frac{R_p}{\sigma_p} \quad (1)$$

Where:

○R_p: Average monthly excess return of the strategy
○σ_p: Standard deviation of the strategy's monthly excess return

Return "$R_{i,t}$" was measured by the following formula, for stock i, at period t,

$$R_{i,t} = \frac{P_{i,t} - P_{(i,t-1)}}{P_{(i,t-1)}} \quad (2)$$

Where:

- $R_{i,t}$: The return of the stock i, at period t.
- $P_{i,t}$: Closing price of the stock i, at period t.
- $P_{(i,t-1)}$: Closing price of the stock i, at period (t-1)

Returns were adjusted for stock split by the split factor which was calculated by dividing the total number of outstanding pre-split stocks by the total number of post-split stocks. Our proxy for the risk-free rate was the interest rate on one month deposit at Syrian governmental banks, as there were no government debt instruments that can be used instead. The annual rate on that deposit was 7% which was divided by 12 to calculate the monthly rate (http://cb.gov.sy/ar).

MATERIALS AND METHODS

The type of research used in this paper is the explanatory quantitative. The total population consists of 26 companies listed on Damascus Securities Exchange (DSE) as of May 31, 2019. The sample included all stocks listed on Damascus Securities Exchange (DSE) as of January 1, 2011 for which: price data are available till the end of the study period of May 31, 2019; it did not cease trading during the study period and finally, stocks' prices did not remain constant for more than 12 consecutive months during the study period. The resulting sample included 13 stocks (see Appendix A). The data were processed into two periods, the in-sample period extending to 60 months from January 1, 2011 to December 31, 2015, and the out-of-sample period extending from January 1, 2016 to May 31, 2019 with total of 41 months. The 60 months in-sample period returns are used to calculate the mean return, variance and covariance to be used in the optimization process for estimating the weights of the mean-variance and minimum variance strategies for the first out-of-sample period. Accordingly, and based on the weights obtained, we calculate the strategy return for the first out-of-sample period. Subsequently, we used a rolling approach by adding one month in the future and dropping one month at the beginning of the in-sample period to calculate the mean return, variance and covariance to be used in the optimization process for estimating the weights of the mean-variance and minimum variance strategies for the next out-of-sample period. Then, repeating the same calculation procedures mentioned above, we end up with 41 period weights for each optimized strategy and by applying those weights to the stocks' returns in each out-of-sample period, we obtained 41 out-of-sample returns for each optimized strategy. Weights of the equally weighted strategy for all out-of-sample period are calculated by dividing one by the number of stocks which in our case is 13. Then, by applying those weights to the stocks' returns in each out-of-sample period, we obtained 41 out-of-sample returns for the equally weighted strategy. Finally, the weights of the market value weighted strategy for each out-of-sample period are calculated by dividing the stock's market capitalization at the beginning of that period by all stocks' market capitalization at the same period. Then, by applying those weights to the stocks' returns in each out-of-sample period, we obtained 41 out-of-sample returns for the market value weighted strategy.
To test the significance of the difference in Sharpe ratios of the four assets allocation strategies; one can find that among others, there are mainly two commonly used test methods in the literature including; the popular method proposed by Jobson *et al*. (1981) as corrected by Memmel (2003) "JKM" and the "LW" bootstrapping technique proposed by Ledoit *et al*. (2008). The JKM test is the most commonly used for performance hypothesis with Sharpe ratio. Unfortunately, this test is not valid when returns have tails heavier than the normal distribution or are of time series nature (Ledoit *et al*., 2008). Accordingly, and due to the fact that our data are of time series nature we decided to use "LW" bootstrapping technique proposed by Ledoit *et al*. (2008) as a robust inference method. LW suggest to construct a studentized time series bootstrap confidence interval for the difference of the Sharpe ratios and to declare the two ratios as significantly different if zero is not contained in the obtained interval.

RESULTS AND DISCUSSION

Descriptive Statistics: The out-of-sample average excess returns as well as the standard deviation, coefficient of variation and Sharpe ratio for each strategy are presented in Table 1. Mean-variance strategy generated the highest Sharpe ratio, followed by equally weighted, minimum variance and market value weighted strategies. Market value weighted strategy has the highest coefficient of variation which indicates that its returns fluctuate more severely than the optimized and equally weighted strategies. On the other hand, the mean-variance strategy has the lowest variations as compared to the other three strategies. Minimum variance strategy resulted in the lowest return but not the lowest risk as measured by standard deviation which ranks it third in terms of coefficient of variation. In order to gain more insight on the reasons behind the changes in the out-of-sample strategies' returns, the changes of the out-of-sample returns of each strategy are analyzed by taking the monthly changes in returns and presenting them on a chart that enables visual grasp of the significant changes as presented in figures 1, 2, 3 and 4 below. The starting month of the returns' changes was February 2016 because it represents the change in the out-of-sample returns for each strategy between January and February 2016. This means that January 2016 will show no changes as it represents the starting point of our analysis and accordingly, the period presented will be 40 months ending by May 2019. As shown in Figure 1, fluctuations in returns of the mean-variance strategy that exceeded the 10% threshold were analyzed such as in April, May and October of 2017 and in February, October and November of 2018. The returns' fluctuations were mainly due to changes in returns during the months of 2017 and 2018 aforementioned. Major contributors to the fluctuations during the periods were BBS, BSO and SGB in 2017 and ATI, AVOC, BASY, BBS, BSO and SHRQ in 2018. However, SGB in April 2017 and BBS in February 2018 had a material effect due to weight changes by 5% and -7% respectively. As shown in Figure 2, fluctuations in returns of the minimum variance strategy that exceeded the 10% threshold were analyzed such as in April and May of 2017 and in February 2018.

Table 1. Descriptive statistics of the out-of-sample strategy returns. (Prepared by researchers)

Strategy	Mean (average excess returns)	Standard deviation	Sharpe ratio	Coefficient of Variation
Mean-variance strategy	0.0299	0.0728	0.4109	2.4335
Minimum variance strategy	0.0297	0.0788	0.3763	2.6574
Equally weighted strategy	0.0353	0.0912	0.3871	2.5835
Market value weighted strategy	0.0320	0.1020	0.3141	3.1842

Table 2. Block-size calibration and bootstrap results (R code output)

Strategy pairs	Sharpe ratio difference	block size "b"	p-value
Market value weighted - Equally weighted	(0.073)	1	0.17*
Mean-variance - Equally weighted	0.024	1	0.86*
Minimum variance - Equally weighted	(0.011)	1	0.91*
Mean-variance - Market value Weighted	0.097	1	0.54*
Mean-variance- Minimum variance	0.035	3	0.77*
Minimum variance – Market value weighted	0.062	1	0.62*

* Significance level 5%

**The bootstrapping and block size calculation used in this paper are calculated using the R code available at(www.econ.uzh.ch/en/people/faculty/wolf/publications.html).

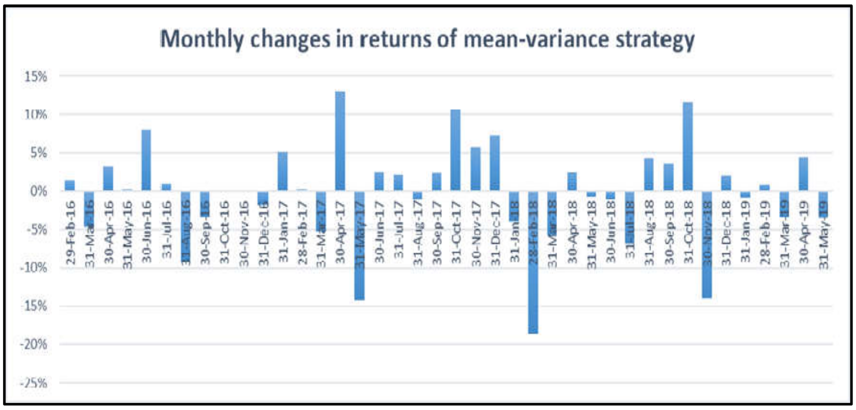

Figure 1. Monthly changes in returns of mean-variance strategy (Prepared by researchers)

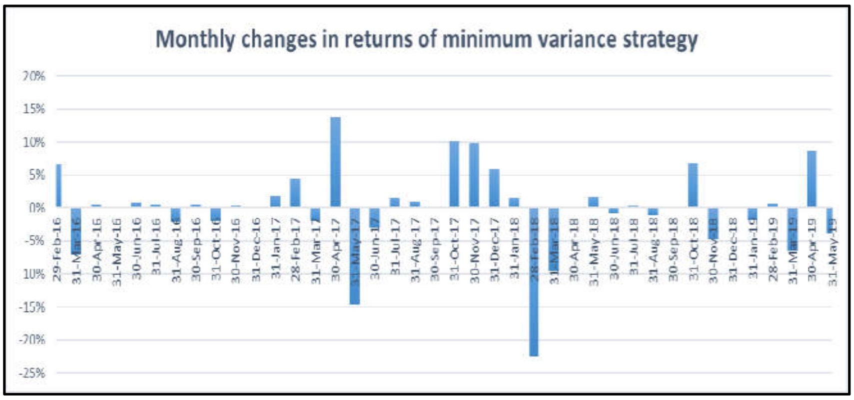

Figure 2. Monthly changes in returns of minimum variance strategy (Prepared by researchers)

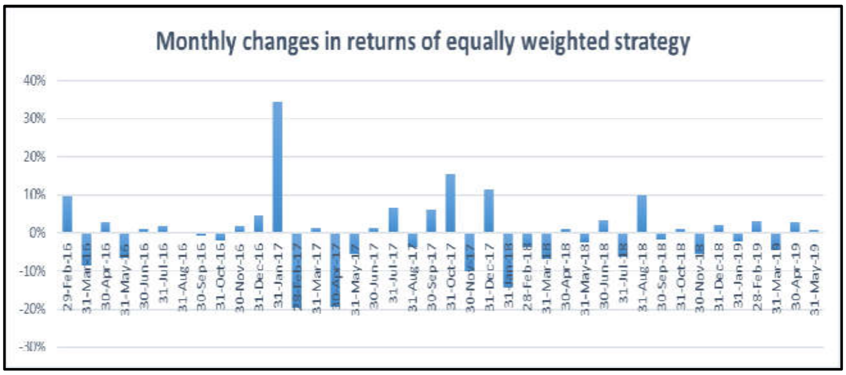

Figure 3. Monthly changes in returns of equally weighted strategy (Prepared by researchers)

strategies during the period from January 2016 to May 2019 as

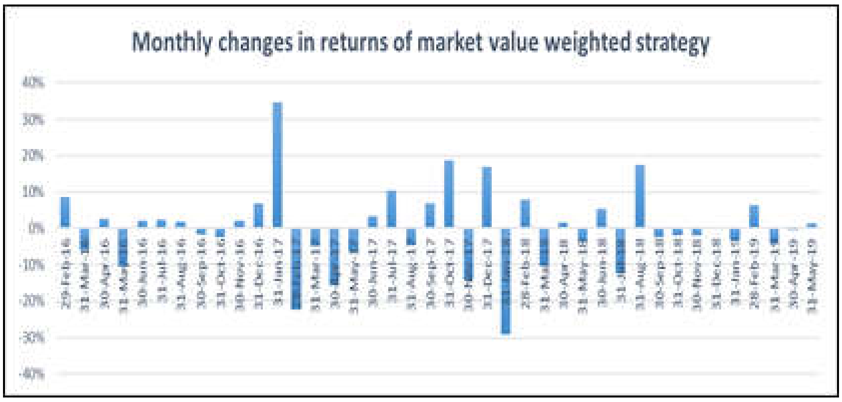

Figure 4. Monthly changes in returns of market value weighted strategy (Prepared by researchers)

The returns' fluctuations were mainly due to the changes in returns during the aforementioned months. Major contributors to the fluctuations during the periods were BBS, SGB and SHRQ in 2017 and BBS in 2018.As shown in Figure 3, changes in returns of the equally weighted strategy fluctuated in the range of (+/-) 10%. In certain months the fluctuations exceeded the range such as in January, February and April of 2016, October and December of 2017 and January 2018. Equally weighted strategy holds identical weights for all stocks in the portfolio. Therefore, any change in returns would be mainly attributable to changes in returns of those stocks. In 2016, the major contributors to the fluctuations in returns were ATI, BOJS, FSBS, IBTF, QNB and SIIB. In October 2017, the major contributors to the fluctuations in returns were ATI, BBSF, BOJS, QNB, SGB and SIIB, while in December 2017 and January 2018, AVOC, IBTF and SIIB were the main contributors. As shown in Figure 4, changes in returns of the market value weighted strategy fluctuated in the range of (+/-) 10%. In certain months the fluctuations exceeded the range such as in January, February and April of 2016, October, November and December of 2017 and January 2018. Our analysis of the main reasons behind the fluctuations can be traced mainly to changes in returns of the major holdings within this strategy such as QNB, SIIB and SGB with an average weights over the analysis period of 18%, 18% and 7% respectively.

Inferential Test Results: As proposed by Ledoit *et al*. (2008), we constructed the two-sided confidence interval using bootstrapping technique. We reject the null hypothesis that the two Sharpe ratios being tested are not significantly different if "0" is not included in the confidence interval constructed. Bootstrap data are generated using circular block bootstrap. This required that we first calculate the block size "b" using the block size calibration function under R code with significance level of 5%, selected block size of {1,3,6,10} and pseudo sequence "K" as 1,000 and the bootstraps resample "M" as 4,999. Thereafter, we used the "b" to construct the confidence interval using bootstrapping function in R code to obtain the p-value using the number of bootstraps resample "M" as 4,999. Table 2. Shows the block size calibration and bootstrap p-value estimation results as applied on the monthly excess returns of each pair of strategies. The results in Table 2 show that the difference noted in Sharpe ratios of the four ass *et al* location strategies are not significantly different. This measured by Sharpe ratio are not significantly different for investment in stocks listed on Damascus Securities Exchange (DSE).

Conclusion

Our test results show that the Sharpe ratio of the four ass*et al*location strategies does not significantly differ from each other and therefore, the ass*et al*location strategy does not have an impact on portfolio performance of stocks listed on Damascus Securities Exchange (DSE). We find that the mean-variance, minimum variance, equally weighted and market value weighted Sharpe ratios are not significantly differ from each other which is contrary to Bastin (2017) who found that the minimum variance and equally weighted strategies had better Sharpe ratios than market value weighted strategy. Similar to Bastin (2017), we used in-sample period covering 60 months while our out-of-sample period covered 41 months as compared to Bastin (2017) who covered 156 months. We find that the equally weighted and market value weighted Sharpe ratios are not significantly different which is contrary to Plyakha *et al*. (2015) who found that the equally weighted Sharpe ratio was better than market value weighted when they compared the Sharpe ratios based on investment in 100 stocks of the S&P 500 over a period of 515 months.

Contrary to Sánchez (2015), we find that there is no significant difference between the Sharpe ratios of the equally weighted and minimum variance strategies, while Sánchez (2015), found that the Sharpe ratio of the minimum variance strategy was better than the Sharpe ratio of the equally weighted strategy. The study of Sánchez (2015) covered 10 European markets and the out-of-sample and in-sample periods of returns were 336 and 120 months respectively. On the other hand, our study was applied on stocks listed on Damascus Securities Exchange (DSE) and covered 41 months as out-of-sample period and 60 months as in-sample period. Similar to Bakke (2014), we find that optimization strategies and the equally weighted strategy do not generate significantly different Sharpe ratios. However, contrary to Bakke (2014) who found that the market value weighted strategy was sub-optimal, we find that the market value weighted strategy do not generate significantly different Sharpe ratio from other strategies. Also, we used the bootstrapping technique to test the significance of the Sharpe ratio difference while Bakke (2014), used the JKM method which is not suitable for time series data. Similar to Jacobs *et al*. (2013), we find that optimization strategies do not outperform the naïve diversification. Jacobs *et al*. (2013) utilized bootstrapping technique on international equity stocks and they used 60 months as in-sample period and 35 years out-of-sample period with annual excess returns. On the other hand, our study used bootstrapping technique on stocks listed on Damascus Securities Exchange (DSE) and covered 41 months out-of-sample period and 60 months in-sample period. Contrary to Kritzman *et al*. (2010) who found in his defense of optimization that the minimum variance strategy outperformed the equally weighted strategy in terms of Sharpe ratio, we find that both strategies do not yield significantly different Sharpe ratios. Also, contrary to Kolusheva (2010) who found that the equally weighted strategy yield better performance as measured by Sharpe ratio than optimization strategies using bootstrapping and JKM methods, we find that there is no significant difference in Sharpe ratios among the three strategies. DeMiguel *et al*. (2007) found that neither mean-variance nor minimum variance strategies were consistently better than the equally weighted strategy in terms of Sharpe ratio using JKM method. In contrast, we find that all strategies do not have Sharpe ratios that differ significantly among each other. Contrary to Windcliff et al. (2003) who suggested that investors were better off equally weighting their portfolio and did not recommend to extend the sample period from 60 to 240 months to obtain better estimates as it was highly unlikely that market parameters will stay constant, we find that optimization and equally weighted strategies have no significantly different Sharpe ratios.

We believe that further research can be conducted on stocks listed on Damascus Securities Exchange (DSE) by selecting other performance measurement methods besides the Sharpe ratio used in this study such as Treynor ratio and Certainty equivalent ratio. Moreover, other ass*et al*location strategies can be compared with each other such as those used in study of DeMiguel *et al*. (2007). In addition, one can use rolling sample approach that includes cumulative periods in the sense that instead of dropping off earlier month and adding new month in each roll, one month can be added without dropping earlier month. In summary, there is no consent in academia on the superiority of one strategy over another. Various studies were explored in this paper and contrasted with our results. Those studies reached different conclusions when applied to different stock markets and using various testing methods. Giving all these debates on the subject matter, our paper contributes in implementing four ass*et al*location strategies on Damascus Securities Exchange (DSE) which is a nascent stock market with limited trading history and limited number of listed stocks that can be included in a strategy. Moreover, further academic research on nascent markets such as DSE can be encouraged by the current research to explore the portfolio performance of other ass*et al*location strategies.

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Appendices

Appendix A. Companies under Study

Company	Symbol	Listing Date
Banking Sector		
Bank Alsharq	SHRQ	3/10/2010
Bank Audi Syria	BASY	7/2/2009
Bank of Jordan Syria	BOJS	22/6/2010
Bank of Syria and Overseas	BSO	5/3/2009
Banque Bemo Saudi Fransi	BBSF	2/2/2009
Byblos Bank Syria	BBS	21/5/2009
Fransabank –Syria	FSBS	15/11/2010
Qatar National Bank – Syria	QNB	8/4/2010
Syria Gulf Bank	SGB	31/7/2010
Syria International Islamic Bank	SIIB	7/5/2009
The International Bank for Trade & Finance	IBTF	31/3/2009
Insurance Sector		
Al-Aqeelah Takaful Insurance	ATI	23/8/2010
Industrial Sector		
Alahliah Vegetable Oil Company	AVOC	15/3/2009
Total = 13 Companies		

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