Developing Long-Term Strategies And Policies For The Student Managed Investment Group: Lessons Learned From Over A Decade Of Running The Group[1]

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Abstract

This paper documents the lessons learned from more than a decade of running the Student Managed Investment Group (SMIG) at Spring Arbor University and how other institutions of higher education and the like (e.g., high school investment clubs) can perpetuate these lessons to start and grow their own funds. The authors assembled a simulated portfolio of 25 stocks to determine if their returns exceed that of S&P 500 Index for a 10-year period (2009-2018). The study provided partial support that existing strategies should be continued to sustain the fund moving forward.

1. Introduction

1.1 Student Managed Investment Group

SMIG was created around 2007 at the Gainey School of Business of Spring Arbor University to help students put their investment knowledge and skills into practice. Since its start, about 150 students across different majors have been involved in this group through a 1-credit hour course experience. Even though students leave the university upon their graduation,

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the fund started by the founding members has continued to grow. To date, the fund is worth about $80,000. The authors have submitted a couple of proposals to the University administrators to allow the group manage part of the institutional endowment like what is done at some other universities.

In developing long-term strategies that ensure systematic growth of the fund, the authors also sought to develop policies that future students and faculty advisors can follow to sustain the SMIG. In an effort to document the returns experienced by the SMIG since its inception, the authors also tracked the growth of the S&P 500 Index from 2009-2018, and compared that to the growth of 25 stocks which are screened for this study. These stocks are chosen by using two simple criteria that reflect the SMIG investment strategies the students have been taught to use when determining which stocks to include in the portfolio.

1.2 Efficient Markets Hypothesis

The authors are also intrigued by the efficient markets hypothesis (EMH) and how this concept can be used to enhance our understanding of stock performances. Exponential smoothing modeling methods were used to test the predictability (or the lack of) of the stocks versus the S&P 500 index. This study will allow the authors to examine strategies that have been used but not yet formalized in the past. Moving forward, not only will the SMIG have general guidelines to follow, the policies will lend themselves to afford sustainable growth of the fund in the years to come. In delineating these strategies and formalizing appropriate policies, the authors also seek to share their insights with other student managed investment groups.

1.3 Portfolio and Investment Management

Portfolio and investment management has been an important part of financial education in colleges and universities, however, not every institution is able to actually create an environment where real investments can take place to maximize student learning outcomes. At Spring Arbor University, the institution where the authors are affiliated, a Student Managed Investment Group (SMIG) was started at the request of a few students who were serious about investing in the stock market. The purpose of this paper is to document lessons learned from more than a decade of managing the SMIG and to formalize strategies and policies that will ensure long-term growth of the portfolio which currently has 18 stocks representing a wide variety of industries.

2. Literature Review

This literature review section will cover three major areas of research: the Efficient Markets Hypothesis, financial education through student managed investment funds, and portfolio and investment strategies. Scholarly sources have been identified and added to the reference section. A brief description of these bodies of literature is included in this research study.

2.1 The Efficient Markets Hypothesis

The Efficient Markets Hypothesis (EMH), also known as the Random Walk Hypothesis, has been widely discussed, tested and debated using data gathered from different markets both domestically and globally. Researchers seem to agree that a strong form of efficient markets hypothesis exists in mature financial capital markets such as those in the United States, U.K., and Germany (Bacon & Cannon, 2018). On the other hand, a moderate or weak form of hypothesis

seems to be predominant in emerging markets like the BRICS (Brazil, Russian, India, China, South Africa) countries and less developed markets like Baltic, Istanbul, etc. (Degutis & Novickyte, 2014). The form by which the Efficient Markets Hypothesis takes certainly will have implication on portfolio and investment strategies, which in turn affect the SMIG fund's ability to grow without taking on unnecessary risks.

2.2 Financial Education through Student Managed Investment Funds

The second body of literature will cover the use of student-managed investments/activities as a teaching tool (Marcy, 2010). It has been documented that student managed investments with real money is a great pedagogical tool to prepare students for their post-graduation career in the financial markets. Students and alums often comment positively on their experience and the practicality of such experiential learning (Clinebell & Murphy, 2016). Andrews & Tichenor (2014) compared the investment performance of student-managed funds to professionally managed funds and concluded that the former is inferior. This conclusion however has not diminished the pedagogical benefits of having a student-managed fund. In his 2008 study, Lawrence documented that more than 300 institutions worldwide offer students the opportunity to learn about portfolio management by investing real money and in aggregate these students manage over $407 million in 2007 (Lawrence, 2008). The number of institutions and the total assets managed by students have continued to grow since this study.

2.3 Portfolio and Investment Strategies

The third area of literature reviewed in this paper covers portfolio and investment strategies. There are many strategies used by fund managers as well as seasoned investors.

Naronjo & Porter (2007) compared the efficacy of four different portfolio allocation strategies according to their absolute returns during different economic conditions. In his editorial, author Giamouridis (2017) offer insights on research on systematic investing that can provide significant practical benefits for academics, practitioners, and investors alike. Nkeki (2018) considered portfolio strategy and dividend in his paper which seeks to minimize the investment portfolio risk and maximize the dividend process of the investment over time. Gwilym, et al. discuss consistent dividend growth investment strategies in their study. The article evaluates whether firms in the United Kingdom that have a long, uninterrupted history of dividend growth outperform the broader equity market. The authors observed that firms with more than 10 years of consistent growth have returned considerably more than the equity market as a whole, with the additional benefits of lower volatility and smaller drawdowns (2009). They also divided growth rates of the dividend paying stocks into 4 quadrants. They found that the 3rd quartile performed the best and the 4th quartile performed the worst (Gwilym, 2009). They also found that no-dividend paying stocks performed far worse than any of the dividend paying stocks. There are also many market anomalies that have dissipated over the years from common knowledge and market efficiencies. Some of the strategies include the January effect, the small stock effect, the time of day and day of week effect and the Value Line effect (Malkiel, 2015). These strategies follow certain patterns that become less pronounced as more investors use them. For example, a study of the January Effect by Malkiel (2015) saw returns 5 times greater than the average month. This was combined with the small stock effect to create a more powerful strategy. The small stock effect states that small cap stocks generally outperform large cap stocks. This anomaly also seems to work well with the January Effect. Cornell (2011) states that there are

two ways to produce superior risk adjusted returns. The investor must have information that is unavailable to the general public or they must process information faster than other investors.

In the book, The Warren Buffett Stock Portfolio (Buffett & Clark, 2011), the most successful investor in modern history has a few proven techniques that deserve mention. Warren Buffett treats every investment as if he is buying a business. He uses the time value of money to calculate the average annual return on a company stock. The price must get down to his predetermined PV price to be worthy of his attention. He looks for businesses that have a consumer monopoly, a durable competitive advantage, and a high return on equity (Buffett & Clark, 2011). Coca-Cola, for instance, has all three of these attributes. He tends to like businesses that have simple products or services that people need during downturns in the economy.

2.4 The Student Managed Investment Group (SMIG) at Spring Arbor University

The Student Managed Investment Group has been managing an endowment fund since 2007. The fund started with $500 and now has approximately $80,000. The money has come from business professors, the Enactus Team, surplus money from a summer faculty program that the authors' institution has been running for several years, and the Accounting Scholarship fund started by one of the accounting professors. We offer a class called Student Managed Investments (FIN202) which is offered as a 1-credit class each semester. We typically have about 12-15 students in each class. In the spring of 2019, we had a record number of 25 students. We try to have about 15-20 stocks in the portfolio at any given time. Each stock is thoroughly researched every semester. Decisions to buy, sell or hold existing stocks are done on a consensus basis where the advisor has veto rights (although this advisor has not ever needed to exercise such rights). During each semester, each student also performs a security analysis that leads to

the voting of a stock to be added to the portfolio with the additional cash set aside in the fund. Over time, these new securities become part of the portfolio based on SMIG member votes. In any event, all new securities must be voted upon and consensus must be reached. Table 1 lists the eighteen current companies in our portfolio.

Table 1: SMIG Portfolio of Stocks

APPLE INC	JOHNSON & JOHNSON	NIKE
ALLSTATE	MCDONALDS	PROCTER & GAMBLE
AMAZON	MCKESSON	SMUCKERS
BHP BILLITON	3M	STRYKER
COSTCO	MICROSOFT	EXXON MOBIL
WALT DISNEY	NETFLIX	STARBUCKS

2.5 Investment Philosophy and Performance

Throughout the SMIG, we employ a long-term buy and hold with minimal turnover strategy. Our general rule is to hold no more than 10% of our portfolio in one company. We invest 100% in individual stocks and we hold about 2-6% in cash. For the 12 months ended August 31, 2018, our return was 24% compared to a return of 18% on the S&P 500.

Table 2: SMIG vs. S&P Returns from 2013-2016

	2013	2014	2015	2016	Average
SMIG	9.62%	2.32%	8.36%	26.79%	11.77%
S&P	11.96%	1.38%	13.69%	32.39%	14.86%

Research shows that only about 20% of all actively managed funds return more than their benchmarks. Our returns would have exceeded the S&P 500 (our benchmark) each year if we

had no energy related companies. Our energy sector dropped our returns by several percent in the years listed. We were overweight in the energy sector and now only hold two energy stocks. Our future plans are to limit our holdings to a maximum of 1 or 2 companies per industry. Our current sectors include energy, information technology, health care, telecommunication services, consumer discretionary, consumer staples and industrials. This is lesson #1 learned from our experience.

As mentioned in the literature review section, college and university students are managing large sums of endowment money all over the country. Examples of institutions of similar size to the authors' institution that allow students to manage funds include the Raven Fund at Anderson University (with over $1.3 million managed), Cedarville University and Northwest Nazarene University. The University of Wisconsin's Applied Security Analysis Program has one of the nation's biggest student-run funds, managing nearly $50 million in 2012. Other major student-run funds include the University of Minnesota's Carlson Funds, which had assets under management of more than $35 million split between a growth stock fund and fixed-income fund (as of July 31, 2012), and Ohio State's SIM fund, which managed a portfolio with a market value of approximately $11 million. At George Washington, M.B.A. students in the applied portfolio management class started with a $1 million portfolio in 2005. At the beginning of the semester, each class member identifies a stock to buy and one to sell. They then make their case to the class, professors and university trustees. Since inception, the fund has outperformed the Standard & Poor's 500-stock index every year.

3. Investing Strategies Used in the SMIG Fund

There are many investment strategies used to increase equity performance without increasing risk. The first strategy that was used is to invest in companies that have been increasing their dividends for over 25 years. These companies of the S&P 500 called the "Dividend Aristocrats" have been outperforming their index by 2.2% per year for almost 30 years. It is somewhat surprising to the authors that the half with dividend yields at the lower end of the 57 stocks in this group have significantly higher returns than the half with the highest dividend yields. In addition to this strategy, the SMIG fund has also considered earnings per share growth, PE ratio and debt management as secondary and supporting strategies for screening stocks. It is presumed that the lower dividend yields are more sustainable and allow the firm to keep additional funds for capital improvements. The firm may need to borrow more or issue more shares if their dividend yields are too high.

In this study, the authors used a stock screener to pick 25 stocks with a 10-year record of increasing dividends and also a 5- year record of high EPS. Further, we wanted to pick stocks with a 5% and 10% EPS growth rate for 5 years. All of these strategies have been well researched and have shown to produce above average returns while reducing risk. The predictability of dividends with high EPS growth should provide higher performance. One rule is that a rational investor should be willing to pay a higher price for a share the larger the growth rate of dividends and earnings. We can also look at the methods that Mary Buffett used in her book regarding the investing methods of Warren Buffett. According to Mary Buffett, a company that has a durable competitive advantage will show consistency in earnings over an extended number of years (Buffet & Clark, 2011). The authors used all of these strategies to create a

simulated portfolio to show that when meticulously followed to screen stocks, these strategies will produce returns that consistently beat the S & P 500 Index.

4. Methodology and Results

The annualized returns of each of the stocks between 2009 and 2018 were calculated and the average were compared to the S&P 500 index. The 10-year period matches, to a great extent, the history of the SMIG fund established at Spring Arbor University. Specifically, the following criteria were used to select stocks that make up the sample.

Criteria 1: Stocks meeting 10-year increasing dividend yields requirements from 2009-2018

Criteria 2: Stocks meeting 5-year record of high EPS requirements from 2009-2018

The authors expected that the stocks chosen using the SMIG strategies would outperform the S&P 500 Index over the same timeframe of the analysis. We purposely avoid including any indexed funds in the portfolio to ensure that students actually evaluate stocks using the strategies discussed in class and develop the ability to differentiate good versus poor investments. Again, the S&P 500 Index would be used to gauge the effectiveness of the student-managed investment fund performance. The stocks chosen for this study for the analysis mimic the SMIG strategies used over the past decade.

Another part of the analysis entails testing the EMH on these stocks as well as the S&P 500 index. The hypothesis being tested is that the stocks chosen using the SMIG strategies will exhibit different time series smoothing constants. This may provide further support that carefully crafted strategies will increase the predictability of the stock performance as opposed to what is described as random walk behavior of the capital markets. It is expected that S&P 500 Index will show a trend over time, however, the smoothing constants will default to 1.0 and 0.0

for the level and trend components respectively. Those for the stocks chosen using the above strategies will however have level constant less than 1.0 and trend component higher than 0.0.

To determine if there is any significant difference between the stocks selected using the two criteria and the S&P 500 index, we ran several ANOVA and t-Tests below. Annualized growth rates for the 10 years (2009-2018) were used as the primary data for the ANOVA and t-Tests.

Test #1: ANOVA

Factor : S&P 500 Index, Stocks w/ EPS >5%, Stocks w/EPS >10%

Findings: Insignificant

Test #2: T-test

Factor: S&P 500 Index, Combined Stocks w/ EPS >5% and Stocks w/ EPS >10%

Findings: Significant

Table 2: Returns of S&P 500 Index and Sample Stocks in the Study

	S&P 500 w/0 dividends	EPS > 5%	EPS >10%	EPS Combined
2009	21.43%	17.26%	22.73%	20.10%
2010	10.95%	9.54%	15.02%	12.39%
2011	-2.13%	6.14%	0.90%	3.42%
2012	11.21%	10.63%	19.64%	15.31%
2013	27.66%	25.40%	31.53%	28.58%
2014	9.47%	8.71%	19.15%	14.14%
2015	-2.84%	2.89%	7.23%	5.15%
2016	7.51%	5.63%	13.43%	9.69%
2017	17.58%	18.25%	23.31%	20.88%
2018	-8.33%	1.62%	-0.97%	0.28%
Average	9.25%	10.61%	15.20%	12.99%

Statistical Results

	S&P 500 w/0 dividends	*EPS Combined*
Mean	0.092512419	0.129944105
Variance	0.012791747	0.00765413
Observations	10	10
Pearson Correlation	0.984019346	
Hypothesized Mean Difference	0	
Df	9	
	-	
t Stat	3.796179403	
P(T<=t) one-tail	0.002121093	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.004242185	
t Critical two-tail	2.262157163	

t-Test: Paired Two Sample for Means

	EPS > 5%	*EPS >10%*
Mean	0.106078681	0.151973726
Variance	0.005680445	0.010629564
Observations	10	10
Pearson Correlation	0.894841992	
Hypothesized Mean Difference	0	
Df	9	
	-	
t Stat	2.960495392	
P(T<=t) one-tail	0.00797334	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.01594668	
t Critical two-tail	2.262157163	

Stocks with 10% EPS and 10 years of dividend increases perform better than the S&P 500 Index; however the same result wasn't found for the stocks with 5% EPS. Difference was also found between returns for stocks with EPS >5% and those >10%, suggesting that investing

in stocks with EPS >10% will likely bring higher returns. Despite this finding, the portfolio should always include a mix of stocks with 5% EPS and 10% EPS if by doing so we could further reduce the risk. It is important to remember that the 10-year period chosen represents a relatively stable time of the stock market free from any major turmoil in the financial industry. If we had chosen these same stocks for the 10 years prior, the conclusions could be very different. Pearson Correlation is close to 1 when comparing S&P 500 index and the combined data, supporting further that returns differ between the two sets of data.

Test #3: One-factor ANOVA

Factor: Dividend yields (four levels separated by the quartile measures) and S&P 500

Findings: Insignificant

Table 3: Returns of S&P 500 Index and Sample Stocks Differentiated by Dividend Yields

	S&P 500 w/o dividends	Q1 dividend yields	Q2 dividend yields	Q3 dividend yields	Q4 dividend yields
2009	21.4%	15.3%	19.6%	19.4%	32.7%
2010	11.0%	15.6%	15.9%	5.6%	9.9%
2011	-2.1%	6.0%	14.1%	-3.5%	-8.1%
2012	11.2%	22.1%	9.6%	12.3%	13.1%
2013	27.7%	28.2%	29.1%	28.2%	29.4%
2014	9.5%	17.1%	14.4%	7.9%	16.3%
2015	-2.8%	6.7%	13.0%	-1.9%	0.4%
2016	7.5%	8.9%	4.5%	16.1%	9.7%
2017	17.6%	30.8%	16.9%	23.7%	0.3%
2018	-8.3%	7.6%	9.2%	-11.1%	-12.6%
Average	9.3%	15.8%	14.6%	9.7%	9.1%

Statistical Results

	S&P 500 w/0 dividends	*Q1 dividend yields*
Mean	0.09251242	0.15841555
Variance	0.01279175	0.00791245
Observations	10	10
Pearson Correlation	0.81259897	
Hypothesized Mean Difference	0	
Df	9	
t Stat	-3.1584119	
P(T<=t) one-tail	0.00578988	
t Critical one-tail	1.83311293	
P(T<=t) two-tail	0.01157976	
t Critical two-tail	2.26215716	

t-Test: Paired Two Sample for Means

	S&P 500 w/0 dividends	*Q2 dividend yields*
Mean	0.09251242	0.14620457
Variance	0.01279175	0.00444787
Observations	10	10
Pearson Correlation	0.70218296	
Hypothesized Mean Difference	0	
Df	9	
t Stat	-2.0826306	
P(T<=t) one-tail	0.03348947	
t Critical one-tail	1.83311293	
P(T<=t) two-tail	0.06697894	
t Critical two-tail	2.26215716	

Per Table 3, stocks in the lower quadrants seem to have higher returns than those in the upper quadrants. This seems to make sense since stocks in the upper quadrants are generally

giving more dividends that naturally lower their cash flow (or worse, if they have to fund their dividends through long term or short term debt).

Return for stocks in the third quadrant seem to have the lowest return at 9.7%. t-Tests comparing S&P 500 index and stocks in the first and second quadrant show significant differences, implying that both of the latter groups outperform S&P 500 Index's returns for the 10 years. Pearson Correlation measures are respectively 0.81 and 0.70, which further support that these stocks have better returns than the S&P 500 Index.

Test #4: One-Factor ANOVA

Factor: Returns of stocks differentiated by Market Capitalization

Findings: Insignificant

Table 4: Sample Stocks in the Study Differentiated by Market Capitalization

Combined	MKT cap Q1	MKT cap Q2	MKT cap Q3	MKT cap Q4
2009	20.9%	20.9%	27.9%	10.5%
2010	19.7%	22.3%	7.9%	0.7%
2011	11.4%	-8.5%	1.2%	10.3%
2012	12.2%	24.2%	17.2%	5.5%
2013	24.8%	22.7%	46.3%	20.5%
2014	8.3%	13.0%	18.7%	10.6%
2015	1.1%	4.9%	4.6%	6.5%
2016	12.0%	11.3%	7.7%	3.6%
2017	20.2%	17.0%	19.3%	21.8%
2018	4.2%	0.3%	-1.0%	0.1%
Average	13.5%	12.8%	15.0%	9.0%

Statistical Results

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
MKT cap Q1	10	1.348359	0.134836	0.006023
MKT cap Q2	10	1.280892	0.128089	0.011977
MKT cap Q3	10	1.498515	0.149852	0.020399
MKT cap Q4	10	0.900597	0.09006	0.005537

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.019426994	3	0.006476	0.589555	0.625831	2.866266
Within Groups	0.395423368	36	0.010984			
Total	0.414850363	39				

ANOVA results show that there is no significant difference across the four quadrants separated by Market Cap of the stocks despite the fact that the fourth quadrant has the lowest return of 9.0% while the other three quadrants range from 12.8% to 15.0%. Further analysis using t-Test between the third and fourth quadrant stocks only show marginal difference favoring the third quadrant at 10% level of significance. Per our data set, Market Cap doesn't seem to matter as much. It will still be wise not to have a large proportion of stocks that are from companies with high market capitalization.

Test #5: t-Test

Factor: Third Quadrant vs. Fourth Quadrant Market Capitalization

Findings: Marginally significant at 0.10 level

Statistical Results

t-Test: Paired Two Sample for Means

	MKT cap Q3	*MKT cap Q4*
Mean	0.149851526	0.09006
Variance	0.020399074	0.005537
Observations	10	10
Pearson Correlation	0.712720059	
Hypothesized Mean Difference	0	
df	9	
t Stat	1.820517359	
P(T<=t) one-tail	0.05100975	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.102019501	
t Critical two-tail	2.262157163	

Table 5: Smoothing Constants Comparison

	S&P 500 Index	Average of 10% stocks	Average of 5% stocks
Mean of Absolute Percent Error (MAPE)	0.032	0.053	0.048
alpha	1.000	0.776	0.828
beta	0.000	0.038	0.012
gamma	0.215	0.160	0.159

Table 5 summarizes the smoothing constants when using the Winter's model (which assume trend and seasonality) to forecast the 10-year returns of S&P 500 Index, and that of the sample stocks in the study differentiated by the level of the EPS (5% vs. 10%). The time series for S&P 500 Index shows an alpha of 1.0 and beta of 0.0, giving strong evidence to the Market Efficient Hypothesis. Because alpha is 1.0, the model is basically saying that the best forecast of return of S&P 500 index is on the last time period's return. The U.S. stock market, according to the results derived from the 2009-2018 data, seems to be highly efficient. The time series for the other two subgroups shows that alpha is less than 1.0; beta values are respectively 0.776 and

0.828. One can argue that there is some predictability on the returns of the stocks that were chosen using the criteria previously discussed in this study. The high values of alpha suggest that responsiveness to changes is important in forecasting future returns. It is noteworthy that the MAPE figures across the three time series are all under 5%.

5. Discussion of Results

Per the above analyses, there seems to be evidence that the stocks selected using the EPS and dividend growth criteria outperform the S&P 500 index. Further, stocks that have 10% EPS and consistent growth for five years outperform those that only have 5% EPS (but less than 10%). However, it is not conclusive that the dividend yield level or Market Cap would have any impact on returns of stocks. The findings certainly have provided some support on keeping the investing strategies for SMIG moving forward.

6. Limitations of Study

One of the major limitations of this study is that the data is from the 10-year period from 2009 to 2018. A comparison group using another 10-year period such as 1999 to 2008 (which includes the Great Recession) is important to determine the robustness of the investment strategies. We were also limited by the access to stocks using the stock screener available to us for free. If that barrier had been lifted, we could have statistical findings that are more conclusive.

7. Conclusions

The current study attempted to delineate simple investing strategies to sustain the SMIG fund at Spring Arbor University. The goal is to grow the fund to $100,000 within 12 months from its current $80,000 size. A 10% growth without new money added to the fund will bring the fund to $88,000. A 20% growth will bring it to $96,000. The authors anticipate that $8,000-$10,000 will be added to the fund in the next year. The faculty leader will begin to formalize the following strategies gleaned from experience when guiding the student managed investment group.

1) Use a buy and hold long-term investment strategy once stocks have been purchased;
2) Limit each stock's weight to no more than 10% of the entire portfolio;
3) Diversify the portfolio and limit the number of stocks per industry to 1 or 2;
4) Only choose stocks that have consistent dividend yields growth for over 10 years;
5) Only choose stocks that have a minimum of 5-year growth in EPS exceeding 5%, and preferably exceeding 10%;

Any schools can start a student managed investment group/club. The initial investment can be as small as a few hundred dollars. If these simple strategies are followed, the chance is good that the return exceeds that of S&P 500 Index and students will grow in their confidence in investing, for long-term growth, rather than short term gains.

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