Hughes Capital Management's
IVA Stock Selection System

Superior returns are the Holy Grail of investing. For as long as stock markets have existed, knowledgeable investors have sought ways to outperform their peers. For most, this goal has remained elusive. Most academics have claimed that its pursuit is a chimera. However, academic research in the field of Behavioral Finance continues to uncover those Factors which drive superior performance. The IVA Stock Selection System is a quantitative approach to achieving superior returns based on three of those Factors. It rests on the foundations of **I**nsider Buying, proven **V**aluation Metrics (PEG if available, otherwise EV/EBITDA or EV/EBIT), and **A**nalysts. Before continuing with a discussion of the IVA system though, it is necessary to examine the academic theory surrounding finance, most particularly the Efficient Markets Hypothesis.

The Quest for Outperformance

"Investing in a market where people believe in efficiency is like playing bridge with someone who has been told it doesn't do any good to look at the cards." – Warren Buffet

The Efficient Market Hypothesis

The first tenants of the Efficient Market Hypothesis (EMH) have been around since the 16th century. Serious work began in the 1950s, with Eugene Fama being the first to formalize the Hypothesis in a 1965 series of articles articulating that the behavior of stock prices follows a "random walk." He codified this theory further in his landmark paper: "Efficient capital markets: A review of theory and empirical work," where he defined "A market in which prices always 'fully reflect' available information is called 'efficient.'"[1] This work was also supported by Paul Samuelson, the other founding father of the Hypothesis.[2] In its modern incarnation, the Hypothesis has three main variations known as the weak, semi-strong, and strong forms.

The weak form merely posits a random walk of stock prices.[3] An investor cannot predict the future movement of stocks from past pricing information. This form of the Hypothesis maintains that technical analysis using stock price charts cannot provide a competitive advantage. Head-and-shoulder formations, channels, support, resistance, and the hundreds of other supposedly predictive formations are nothing more than random fluctuations that could easily be duplicated by plotting the results of coin flips. Momentum cannot provide an edge under this form.

The semi-strong form of the hypothesis asserts, along with everything the weak form posits, that one cannot gain excess returns from any publically available information as it is always and

[1] Sewell, M. 2011. History of the Efficient Market Hypothesis. Retrieved from: http://www.cs.ucl.ac.uk/fileadmin/UCL-CS/images/Research_Student_Information/RN_11_04.pdf
[2] Lo, A. 2007. Efficient Market Hypothesis. Retrieved from: http://web.mit.edu/alo/www/Papers/EMH_Final.pdf
[3] Stern School of Business. (n.d.). Market Efficiency - Definitions and Tests. Retrieved from: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/invemgmt/effdefn.htm

instantaneously reflected in the price of the stock.[4] According to this version, fundamental analysis from mining the company's public financial statements for insight or using a Factor driven approach to investing cannot provide a competitive advantage. The company is always trading at its intrinsic value, and only luck or inside information will allow an investor to beat the market.

The strong form posits, along with what the semi-strong form states, that an investor cannot gain excess returns from any information, public or private.[5] All information, no matter who has it, is accurately and instantly priced into the stock. This version of the EMH has mostly fallen by the wayside though as company insiders have been conclusively shown to be able to profit from non-public information.[6] Insider trading, although illegal, is highly lucrative. Another example is the rise of data brokers that sell information such as the amount of oil in storage facilities in Cushing Oklahoma to traders.[7] Under the strong form the data would be of no value and would not provide these traders with a competitive edge.

Before the most recent financial crisis, the weak and semi-strong versions of the EMH were generally accepted in academia. The acceptance of the Hypothesis lead to the surge in Exchange Traded Funds (ETFs) and other index funds that are not actively managed. As the market accurately prices all public information under the semi-strong version of the Hypothesis, bubbles and massive imbalances in financial markets could not happen.[8] A further implication of the theory was that markets are self-regulating, which led to the massive deregulation of the financial sector in the `90s and `00s. Despite the dotcom bubble, many in academia continued to believe that the largely self-regulating markets were holding up to the rigorous standards expected under efficiency.

The 2008 financial crisis, which could not happen under the EMH, shattered the Great Moderation, and with it the illusion of market efficiency. Rather than a dispassionate calculating machine that coolly synthesized all relevant information, the markets resembled a barometer of raw fear and greed (mostly fear in this case). The Great Recession, along with the preceding dotcom mania, highlighted the inability of the Hypothesis to explain not only the financial collapse but also the contagion surrounding the market failure.[9]

Despite the confluence of events that demonstrated the EMH was faulty and unable to explain financial markets during a crisis, the Hypothesis still persists, neither dead nor alive. In the wake of the financial crisis and a host of empirical evidence showing clear flaws in the EMH, some defenders of the theory set about to construe the events of the past decade as supporting

[4] Stern School of Business. (n.d.). Market Efficiency - Definitions and Tests http://pages.stern.nyu.edu/~adamodar/New_Home_Page/invemgmt/effdefn.htm

[5] Stern School of Business. (n.d.). Market Efficiency - Definitions and Tests http://pages.stern.nyu.edu/~adamodar/New_Home_Page/invemgmt/effdefn.htm

[6] Dimson, E. & Mussavian, M. 1998. A brief history of market efficiency. *European Financial Management*, Volume 4, Number 1, March 1998, pp 91-193

[7] Rothfeld, M. & Patterson, S. 2013. Traders Seek an Edge With High-Tech Snooping. *Wall Street Journal*. Retrieved from: http://online.wsj.com/news/articles/SB10001424052702303497804579240182187225264

[8] Quiggin, J. 2010. Zombie Economics: How Dead Ideas Still Walk Amongst Us.

[9] Quiggin, J. 2010. Zombie Economics: How Dead Ideas Still Walk Amongst Us.

efficiency, or at the very least not evidence against it. These attempts have only turned the once proud theory into an unfalsifiable hypothesis, one that cannot not be true, essentially removing any empirical application.[10] Today, there is currently little empirical evidence supporting the semi-strong form, while the weak form, with the significant exception of momentum, still has its supporters within academia.

Graham and Doddsville

According to the semi-strong and strong forms of the EMH, beating the stock market in any given year is a product of chance, while consistently beating the market requires inside information in the semi-strong form, and is impossible in the strong form. There are, however, several individuals who have consistently beaten the market, and their returns cannot be explained by chance alone.

Warren Buffet provided a memorable rebuttal to the idea that these returns were the result of chance in a speech titled "The Superinvestors of Graham-and-Doddsville."[11] He first presented a thought experiment of a national coin flipping contest. The first day, every American would call the flip of a coin, and those who guessed correctly would continue the next day. After 10 days there would be about 200 thousand people left. In another 10 days, there would be about 215 people left, exactly what chance would indicate. While some of these lucky few would consider their good fortune to be the product of skill, Buffet correctly pointed out that if you used the same number of orangutans at the beginning, the results would be exactly the same. However, he asks what if a large percentage of these orangutans happened to live in the same zoo. The idea that these orangutans from the same zoo could achieve this result due to chance alone would be very suspect. Moving from orangutans to the eight largest investors who followed the teachings of Benjamin Graham, seven of whom consistently beat the market, the probability that their results were the product of chance alone is near impossible. Furthermore, these investors, while following the value investing principals of Graham, implemented very different portfolio strategies.

The investing school of Graham is not the only one that has provided consistent outperformance. Edward Thorpe, a well-known hedge fund manager, ran Princeton Newtown Partners from November 1969 to December 1988, with an average annualized return of 15.1% after fees with only 3 losing months. If these returns were due to chance alone, the odds of selecting a specific atom on earth would be better than the odds of Thorpe achieving those returns.[12] James Simon's hedge fund Renaissance Technologies is yet another example of a fund consistently trouncing market returns, even after adjusting for its exorbitant 5 and 50 fee.[13] While the most famous examples, these funds are not merely isolated cases or exceptions that prove the rule.

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[10] Quiggin, J. 2010. Zombie Economics: How Dead Ideas Still Walk Amongst Us.

[11] Buffett, W. 1984. The Superinvestors of Graham-and-Doddsville. Retrieved from: http://www.safalniveshak.com/wp-content/uploads/2011/10/The-Superinvestors-of-Graham-and-Doddsville-by-Warren-Buffett.pdf

[12] Schwager, J. 2012. Hedge Fund Market Wizards: How Winning Traders Win.

[13] Mallaby, S. 2010. More Money Than God: Hedge Funds and the Making of a New Elite.

The Exceptions

While there are numerous small exceptions to the Efficient Market Hypothesis, there are three main ones that are now widely accepted in academia. The first of these exceptions to the Hypothesis of import for this paper is that over time value beats growth. Value stocks have outperformed growth stocks since 1927 by 3% annually, but do have higher volatility than their growth counterparts.[14] This is counterintuitive as growth stocks, which are traditionally believed to have higher betas, should outperform as they are riskier (more of their valuation relies on the future growth of earnings). Even after controlling for greater volatility, a 1994 study titled "Contrarian Investment, Extrapolation, and Risk" in the *Journal of Finance* found that these excess returns were due to exploitation of suboptimal investor behavior.[15] In other words, this phenomenon is an indication that investors overpay for growth, which hurts returns, and buying overlooked value stocks takes advantage of shifts in investor sentiment.

Fama and French's ubiquitous three-factor model (value, size, and market) was derived from back testing, not theory. They included value and size solely because it molded to the data better. In a June 2013 working paper, Fama and French updated their previous model to a five-factor model,[16] admitting that the value exception is explained entirely by profitability and investment. In order to reconcile these findings with EMH theory, efficient market proponents are forced to contend that firms that are more profitable and are less capital intensive are riskier, otherwise they wouldn't earn excess returns. This makes little sense. Profitable firms are widely viewed as less risky than their less profitable counterparts. The alternative explanation provided by Buffet and his acolytes, that investors often overlook profitable firms in the pursuit of growth stories, is much more realistic.

The second widely accepted exception to the EMH is that small market capitalization stocks outperform large capitalization stocks. This is intuitive as small companies are followed by fewer if any analysts and many large investors cannot establish meaningful positions in them without driving their price higher. Furthermore, investors require compensation for illiquidity, so small firms should provide a higher return than their larger counterparts. A Morningstar investigation showed that from 1927 to 1981, small stocks beat large stocks by an annual 3.1%.[17] However, the small beats large phenomenon continues to exist even after taking liquidity into account. Even within the S&P 500, all companies with a large degree of liquidity, smaller capitalization stocks outperform their larger peers. Joel Greenblatt has highlighted this effect by showing that an equal weighting of the stocks comprising the S&P 500 outperforms the index itself, which is weighted based on market capitalization.[18] This exception has been confirmed by other

[14] Bifulco, F. 2013. Dividend OverDrive Portfolio (8/26/13)
[15] Lakonishok, J., Shleifer, A., & Vishny, R. 1994. Contrarian Investment, Extrapolation, and Risk. *The Journal of Finance*, Volume 49, Issue 5 (Dec., 1994), 1541-1578.
[16] Fama, E. & French, K. (2013). A Five-Factor Asset Pricing Model Retrieved from: http://faculty.chicagobooth.edu/john.cochrane/teaching/35150_advanced_investments/FF_Five_Factor.pdf
[17] Byran, A. 2014. Does the Small-Cap Premium Exist?. *Morningstar*.
[18] Carlisle, T. 2012. Why Does an Equal-Weighted Portfolio Outperform Market Capitalization- and Pric-Weighted Portfolios. Greenbackd. Retrieved from: http://greenbackd.com/2012/05/17/why-does-an-equal-weighted-portfolio-outperform-market-capitalization-and-price-weighted-portfolios/

research.[19] In an attempt to bolster the Hypothesis, Eugene Fama and Kenneth French even attempted to incorporate this effect into a more complete model, with mixed success.[20]

The other main exception acknowledged to the Hypothesis is the existence of momentum in stock returns. All forms of the EMH rely on a "random walk" theory of stock prices. That there is some sort of connection between past prices and future prices that is predictive is a direct contradiction of the theory. A study published in the *Journal of Finance* titled "Momentum Investing and Business Cycle Risk: Evidence from Pole to Pole" found that momentum exists in all economic states.[21] Another study titled "Value and Momentum Everywhere" found that momentum exists across asset classes.[22] A recent study published in the *Journal of Financial Economics* titled "The short of it: Investment sentiment and anomalies" looked at 11 market inefficiencies and found momentum to be one of the strongest.[23] In an interview, Eugene Fama even admitted that the presence of momentum poses a problem for the Hypothesis, stating "…the one thing that causes lots of trouble is the evidence that there's some short-term momentum in returns…. in my view that's the biggest challenge to market efficiency."[24] Further research in *The Quarterly Journal of Economics* titled "Fads, Martingales, and Market Efficiency" found that taking advantage of momentum from return reversals over the period of a week resulted in arbitrage profits.[25] A study in *The Journal of Finance* titled "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency" found that momentum also exists on an intermediate-term horizon.[26] The authors found that using a stock selection strategy based on 12 month performance data and holding those positions for 3 months was the best momentum strategy and resulted in significant abnormal returns. However, given their short horizons and high turnover, these momentum based strategies are not tax efficient.

Risk and Volatility in the long run

A core foundation of the Efficient Market Hypothesis is equating risk with short-term volatility, and thereby establishing a risk-reward tradeoff. The more risk one accepts, the greater the potential reward. The only way to earn a higher return than the market is to increase the level

[19] Plyakha, Y., Uppal, R., & Vilkov, G. 2014. Equal or Value Weighting? Implications for Asset-Pricing Tests. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1787045

[20] Fox, J. 2009. The Myth of the Rational Market

[21] Griffin, J.,Ji, X., & Martin, J. 2003. Momentum Investing and Business Cycle Risk: Evidence from Pole to Pole. *The Journal of Finance*, Vol. 58, No. 6, Dec., 2003, 2515-2547.

[22] Asness, C., Moskowitz, T., & Pedersen, L. 2009. Value and Momentum Everywhere. Retrieved from: http://schwert.ssb.rochester.edu/f532/AMP12.pdf

[23] Stambaugh, R.F., et al., The short of it: Investor sentiment and anomalies. Journal of Financial Economics (2012), doi:10.1016/j.jfineco.2011.12.001

[24] The FEN One-on-One interview. 2006. Eugene F. Fama. Retrieved from: http://bama.ua.edu/~fi302/Eugene%20Fama%20FEN%20One%20on%20One%20Interview%20with%20Eugene%20Fama.htm

[25] Lehmann, B. 1990. Fads, Martingales, and Market Efficiency. *The Quarterly Journal of Economics.* http://qje.oxfordjournals.org/content/105/1/1.short

[26] Jegadeesh, N. & Titman, S. 1993. Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *The Journal of Finance*, Vol. 48, No. 1, Mar., 1993, 65-91.

of risk. On a risk-adjusted basis, nobody should beat the market consistently according to the theory.

However, for an investor seeking above market returns for an extended period of time, it is important to determine whether short term volatility accurately reflects risk. In the long run, for volatility to equal risk, movements in each stock's price must accurately reflect all available information. The stock is always at the price it should be. Therefore, any movement in the stock's price reflects a change in the company's intrinsic value.

Empirically, however, this does not appear to be the case. In panics, the price of a stock can move far away from any sane valuation, and stay there for extended periods of time. Even when normalcy prevails, the market can still misprice stocks on a risk adjusted basis. Value vs. growth and small vs. large cap stocks are two examples already discussed. Also, as we will see later, there are several Factor driven approaches that have been empirically shown to provide above normal returns.

Equating risk with volatility also overlooks that short-term volatility is not necessarily indicative of long-term risk. In *Stocks for the Long Run*, Princeton's Jeremy Siegel points out that in the long run, bonds are riskier than stocks, despite stocks being much more volatile in the short-run. Using a data set from 1802 to 2006, Siegel found that with a 10 year horizon, the maximum possible loss for a capitalization weighted index of US equities was lower than the maximum loss on corporate bonds or even T-bills. At 20 years, the worst possible result for the index was a small gain, while both bonds and T-bills worst cases were loses.[27] This conclusion is supported by Ken Fischer's recent work *The Little Book of Market Myths: How to Profit by Avoiding the Investing Mistakes Everyone Else Makes,* which found that the long-run volatility of stocks and bonds are very similar yet historical stock returns are nearly double that of their fixed income counterparts.[28]

The results from these two books are confirmed by the Morningstar study "Optimal Portfolios for the Long Run."[29] Looking at 20 countries each with 113 years of historical returns, the study constructed various portfolios based on risk aversion and time horizon. The paper found very strong evidence that a higher allocation to equities is optimal for investors with longer time horizons, and that equities become less risky over time. This empirical conclusion is directly at odds with the EMH (where volatility should not change to this degree, if at all) and casts doubt on the notion that short-term volatility is an accurate gauge of risk for the long-term investor.

Although short-term volatility may be an acceptable proxy for riskiness in a very short time horizon (although even here it has some difficulties), it does not appear to be appropriate as a

[27] Siegal, J. 2007. Stocks for the Long Run. 4th Edition.

[28] Fisher, K. 2013. The Little Book of Market Myths

[29] Blanchett, D., Michael, F., & Pfau, W. 2013. Optimal Portfolios for the Long Run. *Morningstar*. Retrieved from: http://corporate.morningstar.com/ib/documents/MethodologyDocuments/ResearchPapers/Optimal%20Portfolios%20for%20the%20Long%20Run.pdf

measure of risk for investments with long time horizons. Volatility for the long term investor, then, represents opportunity.

For example, while under Warren Buffet's control Berkshire Hathaway has seen its price halved on four separate occasions. Under the Efficient Market Hypothesis and the standard interpretation of volatility as risk, these events would mean that Berkshire was an extremely risky investment which lost more than half of its intrinsic value on each occasion. However, rather than indicating a high level of risk or Berkshire actually losing 50% of its underlying value, these episodes presented excellent buying opportunities. If an investor is willing to brave potentially extreme short-term fluctuations, in the long run his or her risk-return payoff has the opportunity to markedly increase.

Behavioral Finance

Some of the remaining proponents of the Efficient Market Hypothesis, while grudgingly willing to accept human irrationality, insist that it is random in nature and, therefore, unpredictable. Even accepting that market participants can be irrational on an individual level, proponents of the efficient market countered that it didn't matter. The emergent phenomenon of "pervasive market forces" was rational, and that's all that mattered.[30] The market as a whole got things right, not the individual participants. Some even went so far as to suggest that irrationality is random, therefore one investor's irrationality is canceled out by another's. In the end, all of the irrationality is canceled out and we are left with a rational market that prices everything correctly.

While stock prices are indeed very hard to predict in the short term, the leap from this truth to the idea that this hard-to-predict price had to be right and rational was, as Robert Shiller opined in 1984, "one of the most remarkable errors in the history of economic thought,"[31] one that had very little substantiating evidence. Furthermore, market participants' irrationality does appear to be predictable. Herding, for example, is a quite common occurrence in financial markets that has played a substantial role in bubbles from The Tulip Mania[32] to our most recent Housing bubble. In recent years, the field of behavioral finance has gained substantial ground as a way to explain these phenomena.

Why does this matter for investors? Market irrationality indicates that at extremes, when it matters most, markets can become wildly inefficient. Even during times of normalcy, however, when the market most closely resembles a random walk, there are still clear inefficiencies. For an investor, these systematic inefficiencies represent opportunities that can be exploited and provide market beating returns over the long run.

[30] Fox, J. 2009. The Myth of the Rational Market

[31] Fox, J. 2009. The Myth of the Rational Market

[32] Mackay, C. 1841. Extraordinary Popular Delusions and the Madness of Crowds

The Factors

"The market, like the Lord, helps those who help themselves. But, unlike the lord, the market does not forgive those who know not what they do." – Warren Buffett

Insider Buying

The first Factor the IVA System relies on is Insider buying. Insider buying occurs when a company director or officer buys shares of his or her own company on the open market. To avoid insider trading on non-public information, this process is strictly regulated and insiders can only buy shares at set times and must report the transaction. Within these time constraints though, insiders are relatively free to buy and sell at will. Unlike share plans, options, and other stock base incentives, insider buying on the open market is not part of compensation and is done with the individual's own money.

The intuition behind following insider buying is simple: insiders tend to know more about their own company's prospects than outsiders; and when they buy their company's shares on the open market, it indicates they consider their stock undervalued. Insiders base their stock purchases on factors that are not readily observable to the outside investor. Following insider buying allows the investor to capture a whole host of intangible factors including the management's beliefs about their own prospects. As Peter Lynch, the former manager of the market beating Magellan Fund, stated: "Insiders might sell their shares for any number of reasons, but they buy them for only one: they think the price will rise."[33]

Even with numerous regulations delineating when a company insider can buy shares, insiders still manage to invest with very good timing. A series[34] of *Wall Street Journal* (WSJ) investigative reports revealed that managers who dumped their own company's shares before bad news was released avoided an average loss of 10%.[35] However, executive's good fortune in timing was not merely limited to selling shares. Another WSJ investigation showed that managers who bought shares were often just as "lucky" in their timing.[36] It is clear that insiders have an edge over the market when it comes to their own company.

Wharton professor Jeffrey Jaffe's 1974 seminal study of insider trading found that an intensive trading criteria - where there needed to be at least 3 buyers from each company to be included in the long portfolio and 3 sellers from each company to be included in the short portfolio - produced abnormal returns of 5.07% in the first 8 months following the transactions.[37] When he included each company in the portfolio 2 months after the transaction, he still found abnormal returns of 4.84%. His conclusion that above normal returns can be achieved by buying stocks with insider buying has been confirmed by numerous studies. Most recently, a 2013 event

[33] Ma, L., Dyeniyi, T., & Chen, S. 2013. Informative Insider Trading: The Hidden Profits in Corporate Insider Filings. *S&P Capital IQ Research*.
[34] Pulliam, S., & Barry, R. 2013. Directors Take Shelter in Trading Plans. *Wall Street Journal.*
[35] Pulliam, S., & Barry, R. 2012. Executives' Good Luck in Trading Own Stock. *Wall Street Journal.*
[36] Follow the Leader?. 2013. *Wall Street Journal.*
[37] Jaffe, J. 1974. Special Information and Insider Trading. *The Journal of Business*, 2/1974; 47(3):410-28. DOI:10.1086/295655

study released by Lucena Research used information from InsiderInsights to determine whether insider buying is predictive of future performance. After implementing the event study, which found that insider buying was indeed predictive, Lucena Research then back tested a strategy of buying those companies with insider buying against S&P 500 returns over a 5 year period from 2008 to 2013. The back test revealed that the insider buying strategy had an alpha of .8 and an 85.7% return, versus 18.8% for the S&P.[38] Another study from 2013 issued by Quantamental Research found excess returns between .48% and 2.47%, which were statistically significant at the 1% level. A trading strategy based on insider buying would yield .36% weekly excess returns even after transaction costs were accounted for.[39]

Valuation Metrics

Richard Bernstein, Merrill Lynch's Chief Strategist rated more than 40 stock selection techniques from 1987 through 2006. The study was conducted by selecting the top 50 S&P 500 stocks with each technique on a monthly basis. The results are listed in the table below:

Technique	19-Year Compound Annual Return
EV/EBITDA	+17.3%
Low PEG Ratio	+16.9%
High Relative Strength	+16.8%
Low Price/Free Cashflow	+16.0%
S&P 500	+9.0%

PEG

The PEG ratio is calculated by dividing a stock's Price to Earnings ratio by analysts' projected average annual growth rate in earnings for the next five years.[40] Using the trailing-twelve-month or current PE ratio is important so that earnings are not double counted.[41] Also, using the five year projected growth rate in earnings is superior to using the growth rate over the past five years, as past growth is not as predictive of future growth.

The intuition behind using this ratio to value a stock is that low PEG stocks represent "cheap" growth companies that are undervalued relative to current earnings and expected growth. Unlike the ubiquitous PE ratio, PEG allows investors to compare companies with different growth rates. A stock with a low PE ratio may look cheap but has very few growth opportunities, whereas a stock with a high PE ratio may look expensive but has a multitude of opportunities to expand its earnings. The PEG ratio removes this problem by factoring growth in

[38] Strong, S., & Balch, T. 2013. Assessment of Insider Trading Information for Investment Strategies. *Lucena Research.*

[39] Ma, L., Dyeniyi, T., & Chen, S. 2013. Informative Insider Trading: The Hidden Profits in Corporate Insider Filings. *S&P Capital IQ Research*.

[40] Investopedia. (n.d.). Price/Earnings to Growth – PEG Ratio. Retrieved from: http://www.investopedia.com/terms/p/pegratio.asp

[41] Damodaran, A. 2012. Growth Investing: Betting on the Future?. *Stern School of Business.*

and allowing investors to determine how cheap a stock is relative to its growth potential. Investing in low PEG stocks takes advantage of investors' tendency to overpay for uncertain future growth.

The empirical data supports this intuition. The first major examination of the PEG ratio came in Donald Peters' book *A Contrarian Strategy for Growth Stock Investing*. In this work, he divided the companies comprising the S&P 500 into deciles based on their PEG ratios. Peters then analyzed each decile's return over 30 quarters starting in 1982 relative to the average. His study found that the lowest decile beat the S&P 500 for 21 out of the 30 quarters, with an overall performance of 15.36% versus 3.56% (as shown in the table to the right).[42] As shown above, Richard Bernstein's research indicated that PEG was the second best stock selection measure (narrowly edged out by EV/EBITDA) and one of four that beat the S&P 500 consistently. This research has been further corroborated by Asweath Damodaran from the Stern School of Business in "Growth Investing: Betting on the future?" which looked at how PEG faired from 1991-2010.[43] This study divided stocks into quintiles based on PEG and found that the lowest quintile provided the best returns.

Growth of $1 Invested in PE/Growth Ratio Decile Portfolios

	Compounded Returns
	January 1982 – June 1989
1	15.36
2	6.69
3	4.77
4	3.66
5	3.00
6	2.02
7	1.82
8	1.55
9	1.31
10	1.38
S&P 500	3.56

Note: The portfolios with the lowest PEG ratios are listed first.

EV/EBITDA or EV/EBIT

EV/EBITDA is Enterprise Value (sometimes written as Total Enterprise Value (TEV)) divided by Earnings Before Interest, Taxes, Depreciation, and Amortization.[44] Enterprise Value is the value of the whole firm, including equity and debt, and represents how much an investor would pay to buy the company. EV has an advantage over Price based ratios which don't account for differing levels of leverage. For example, a stock with a low PE ratio could appear to be a bargain even though it is more highly levered than a comparable firm, and accounting for the added risk of this leverage should lead an investor to pay less for those earnings. EV removes this problem by including debt. EBITDA is a way of measuring the company's earnings before they are distorted by accounting rules. The EV/EBITDA ratio then allows an investor to see how cheap a company is as a whole, not just the equity portion captured by price. A low EV/EBITDA company may be attractively priced relative to its earnings before major accounting adjustments, and is a measure that does not rely on growth projections that may be unrealistic.

The empirical evidence backing EV/EBITDA is even stronger than that for PEG. Along with the Merrill Lynch study mentioned, which found that EV/EBITDA was the best performer of all valuation ratios examined (and beat the market by an annual 8.3%), a 2012 study by Wesley

[42] Peters, D. 1992. A Contrarian Strategy for Growth Stock Investing

[43] Damodaran, A. 2012. Growth Investing: Betting on the Future?. *Stern School of Business.*

[44] Investopedia. (n.d.). Enterprise Multiple. Retrieved from: http://www.investopedia.com/terms/e/ev-ebitda.asp

Gray and Jack Vogel examined multiple valuation ratios (although not PEG) over a period of 40 years.[45] Their study found that the bottom quintile of EV/EBITDA stocks significantly outperformed the benchmark with an alpha of 2.9%, and was the best performing ratio tested. This study was updated in *Quantitative Value* by Wesley Gray and Tobias Carlisle. It found the lowest decile ("Value") of EV/EBIT edged out EV/EBITDA, while both strongly outperformed the S&P 500 as the table below illustrates.[46] Even on a risk adjusted basis, the bottom decile of EV/EBITDA outperforms by 4.46%, and EV/EBIT by 5.23%.

Compound Annual Growth Rates for All Price Measures (1964 to 2011)						
	P/E	EV/EBITDA	EV/EBIT	P/FCF	P/GP	P/B
S&P 500			9.52%			
Glamour	7.77%	7.55%	7.09%	9.05%	7.42%	8.62%
2	8.04%	8.20%	8.58%	9.55%	7.08%	9.20%
3	10.70%	8.76%	8.77%	9.13%	7.96%	9.79%
4	8.76%	8.22%	8.29%	9.71%	9.18%	9.29%
5	9.20%	8.16%	9.70%	8.80%	9.86%	9.62%
6	9.00%	10.00%	11.04%	11.19%	10.89%	10.13%
7	11.75%	11.06%	11.00%	9.74%	12.02%	11.44%
8	12.45%	11.73%	11.63%	9.98%	13.71%	11.45%
9	12.92%	13.70%	12.08%	12.83%	13.43%	11.80%
Value	12.44%	13.72%	14.55%	11.68%	13.51%	13.11%
Value Premium (10-1)	4.67%	6.17%	7.45%	2.63%	6.09%	4.49%

Analysts

A 2017 study found that the very best analysts do have some predictive power with their stock recommendations.[47] Analysts typically provide the following for a stock:

- Recommendation - variations of Buy, Hold (usually a politically correct Sell), Sell
- Earnings Estimates - generate Surprises and Trends, which have the most academic findings
- Target Price
- 5-year Earnings Growth Rate Estimate - PEG's denominator

Earnings estimates are the projections analysts make about the future earnings of a company, on a quarterly basis in the U.S.[48] Earnings estimate trends then are the changes in these projections. As news about a company comes out, analysts are forced to revise previous

[45] Gray, W., & Vogel, J. 2012. Analyzing Valuation Measures: A Performance Horse-Race Over the Past 40 Years
[46] Gray, W., & Carlisle, T. 2013. *Quantitative Value*.
[47] Kucheev, Y., Ruiz, F., & Sorensson, T. 2017. Do Stars Shine? Comparing the Performance Persistence of Star Sell-Side Analysts Listed by Institutional Investor, the Wall Street Journal, and StarMine
[48] Investopedia. (n.d.). Earnings Estimate. Retrieved from: http://www.investopedia.com/terms/e/earningsestimate.asp

estimates to present a more accurate picture of the company. A stock with earnings estimates being increased has a positive earnings estimate trend, and vice versa.

Considering earnings estimate trends allows investors to avoid companies that may look cheap, but it is largely due to a steady evaporation of earnings potential, which may be an indication of an unhealthy company. Earnings estimate trends are an excellent double check, especially for the PEG ratio. Whereas earnings estimates are revised often, analysts rarely update their growth projections. This could mean that earnings are rapidly disintegrating while the stock still appears to have an excellent growth rate, which would leave the stock with an enticingly low PEG ratio. By incorporating earnings estimate trends, this problem is solved. If analysts are upping their estimates, it indicates that the company's prospects are better than originally thought.

Donald Peters examined the influence of Earnings Estimate Trends along with the PEG ratio, and discovered that using positive trends in tandem with this valuation metric further enhanced returns. His research was corroborated by Zacks Research,[49] which found that the quintile of European stocks with the highest upward revisions outperformed the lowest quintile by 16% a year. Also, their research found that there was no correlation between the actual forecast and stock appreciation, but a major correlation between the upward revisions of those forecasts and subsequent returns.[50] It is the upward revision, not the forecast itself that is predictive.

The Process

Process matters! Otherwise, *"It's like somebody who plays Russian roulette three times in a row without the gun going off, and thinks they're great at Russian roulette. The fourth time, they blow their brains out."* – Daniel Loeb, founder of $9 billion hedge fund Third Point

Criteria for buying

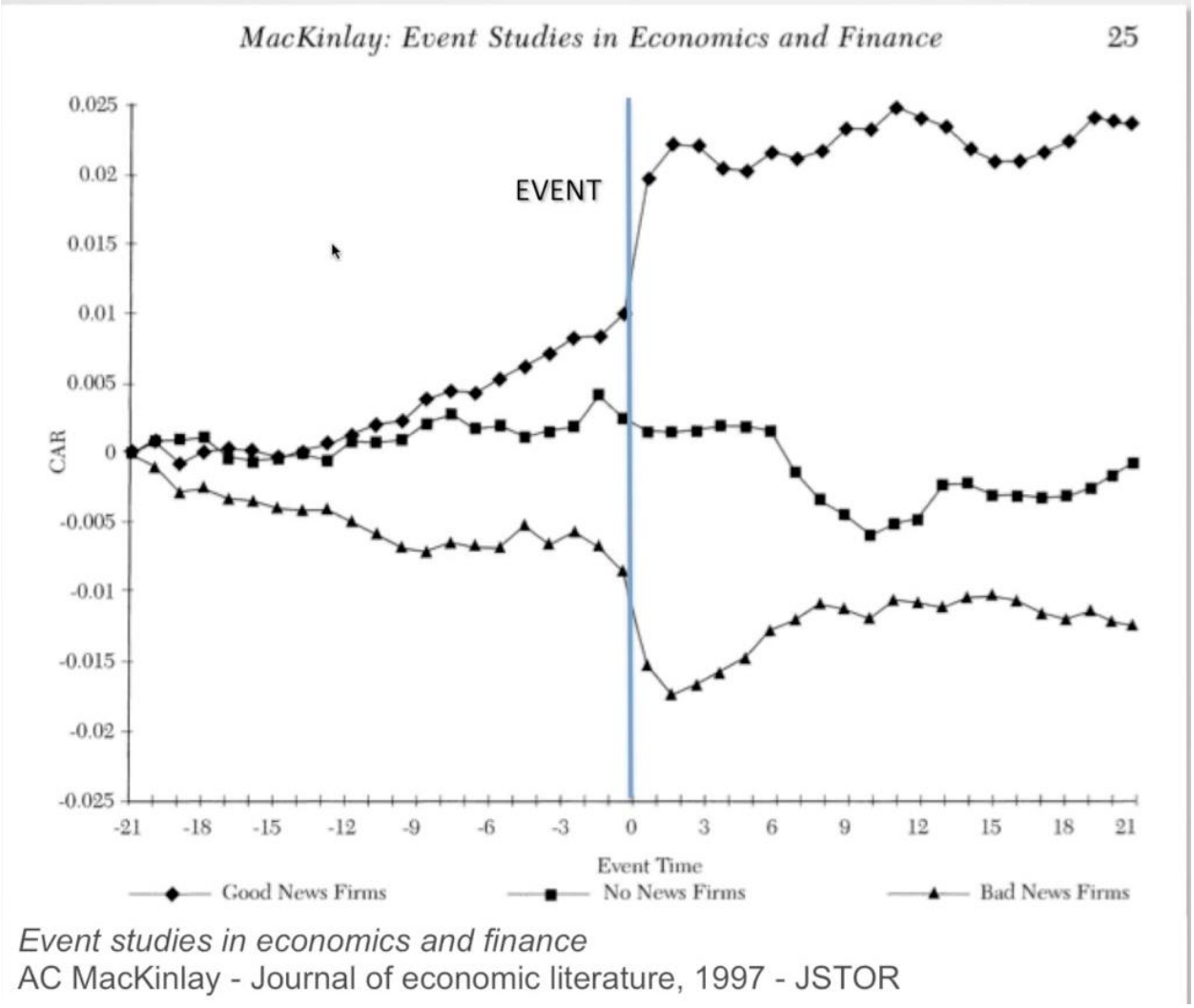
For Hughes Capital Management (HCM) to purchase a stock, it must meet a liquidity requirement by having an average daily trading volume over the last thirty days of at least 1% of the portfolio's total value. An IVA System stock must have three or more Insiders buying at least $10,000.00 each in the open market during a thirty day period without any intervening or subsequent selling, be in the bottom Valuation decile of PEG, if available, otherwise EV/EBITDA or EV/EBIT, and not have a negative Earnings Estimate or Target Price Trend. All three of these Factors must be met for HCM to purchase the stock. Using these Factors enables the investor to maximize the strengths of each factor while minimizing any weaknesses.

When to sell

HCM sells its position when the stock becomes fully valued as defined by the 5th decile of the valuation metric used. Tax considerations, such as ensuring long term capital gain treatment, are taken into account. HCM will also sell when the fundamentals of the company turn negative,

[49] Stockopedia. (2011) Earnings Estimates Revision Screen: Why investors should keep an eye on consensus Sales and EPS forecasts. *Business Insider.*
[50] Zacks, L. 1979. EPS Forecasts – Accuracy is not Enough.

which is usually signaled by lowered earnings guidance from the company that causes analysts to lower their Target Price and Insiders not buying on the resulting price decline. Today, stocks typically overreact to bad news, as shown in the chart below, so HCM will usually wait for a price bounce.



HCM will also sell part of a position to rebalance the portfolio. Rebalancing occurs back to the stock's original weight, usually 2%, when its percentage of the portfolio doubles. Tax consequences are again taken into account.

Conclusion

Achieving superior returns is possible. Academic research and empirical findings have revealed market inefficiencies or Factors that are exploitable. By using a Factor driven system that removes one's own emotion from investing, an investor is able to profit from the irrationality and emotion driven decisions of others. With a long-term investment horizon, an investor can achieve superior returns with such a system.

The IVA System removes the worst tendencies of investors while capitalizing on the irrationality of others and maximizing the power of these 3 Factors. In the words of James O'Shaughnessy, the author of *What Works on Wall Street*[51]:

"To break from our all too human tendencies to avoid losses even when it is disadvantageous to do so, chase performance, and perceive patterns where there are none, we must find an investment strategy that removes subjective, human decision making from the process and relies instead on smart, empirically proven systematic strategies. …we can become wise by realizing just how unwise we truly are." – James O'Shaughnessy, from the 4th edition of *What Works on Wall Street*

[51] O'Shaughnessy, J. 2012. What works on Wall Street. 4th edition.