U.S. Company Earnings, Earnings Growth and Equity Performance in the New Millennium

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Abstract

This paper tests the empirical implications on portfolio performance of using an investment strategy focused on investing in stocks with ***consistent*** forward-looking earnings growth (EPS growth). Using actual company level EPS and stock returns data from the start of the new millennium through 2015, the methodology formalizes an annual, perfect foresight, stock selection approach to classify companies into portfolios defined by consistency in EPS growth based on a rolling three-year forward-looking EPS window. The paper presents the performance of the resulting portfolios in the new millennium and some of their key attributes such as the forward looking discounted earnings yield and the return on investment as measured by the ratio of the return and the earnings yield. The major conclusion is that consistency in EPS growth was the key to capital appreciation in the new millennium. The empirical evidence also suggests that the companies with the most consistent EPS growth generally also have a high forward-looking EPS earnings yield. In addition, the data corroborates that these companies were not only a bargain in terms of forward looking earnings purchased per dollar, but also generated the highest return per unit of earnings.

Historically, equity capital markets have served two distinct functions: First, they have provided a mechanism to raise capital for companies that are seeking to grow their businesses. Second, through this mechanism, they have allowed individual and institutional investors to participate in the growth of these companies thereby giving them an opportunity to multiply their investments (capital appreciation) over and above the risk-free rate. This mutually beneficial arrangement between companies and investors inherent in the structure of equity markets, combined with the fact that markets have delivered as promised, has been crucial to their success. In other words, equity markets provide a framework for companies and investors to collaborate so as to satisfy their respective primary objectives, sharing in the risks and rewards of growing a business enterprise, and in the process, participating in the growth of the economy.

Of late, this tacit historical arrangement between the equity markets and investors seems to have unraveled. Buy-and-hold investors complain that ever since the technology bust in the early years of the new millennium equity markets have failed to live up to their role of generating capital appreciation for the investors. Indeed, after the Dow Jones Industrial Average (DJIA) closed at 11,497.12 on December 31, 1999 at the end of the last millennium, it was only up a meager 54.71% through May 31, 2016, when it ended the month at 17,787.20. This translates into an annual price return of 2.69% over a period of 16 years and five months. Investors found no relief in the broad large capitalization equity segment of the market either. Exhibit 1, which presents the price performance of the Standard & Poor's 500 (S&P 500) over the same period, shows that the S&P 500's price increase was only 2.19% on an annual basis. Meanwhile, a risk-free investment in the U.S. 3-Month Treasury Bill (constant maturity) generated an annualized return of 1.71%, or a cumulative return of 32.07%, over the same period. This means that the implied annual equity risk premium for the S&P 500, for instance, has been an appalling 48 basis points on a price-basis in the new millennium – a dreadful trade-off for investors given the volatility of the equity markets. This explains their recent distaste for equity investments.

Exhibit 1. U.S. Equity Price Performance – New Millennium

	Close		% Growth (Price)	
Benchmark	December 31, 1999	May 31, 2016	Cumulative	Annualized
DJIA	11,497.12	17, 787.20	54.71%	2.69%
S&P 500	1,469.25	2,096.95	42.72%	2.19%
3-Month T-Bill	-	-	32.07%	1.71%

Source: Yahoo! Finance, www.federalreserve.gov and MarketGrader Research.

For most long-run buy and hold equity investors, this risk/return trade-off inherent in the markets so far this millennium might seem very discouraging. However, before writing off equity investing, it might be worthwhile to delve a little deeper into the top-down market sources of return keeping in mind that the role of aggregate information about the broad market is for the purposes of benchmarking and highlighting overall market trends and its usefulness in revealing actual drivers of over/under performance at the company level, is more limited.

In this vein, Exhibit 2 presents the total return performance of size and style benchmarks (Russell). It also includes the total return of three broad U.S. equity benchmarks, namely, the Russell 3000, the S&P 500 and the Wilshire 5000 Total Market Index (Wilshire 5000 TMI). On a total return basis, not only is the case for equities slightly better, but the disparity in performance amongst size and style factors implies that exposure to different factors may result in significantly different performance outcomes amongst investors.

By size and style, the top performer was small value with an annualized total return of 9.0%. The bottom performer by size and style factors was large growth with an annualized return of 2.4%. In terms of capital appreciation, this means that while a small value investor would have had a four-fold increase in her principle (cumulative return of 298.9%), a large growth investor would not even have doubled her initial investment (cumulative return of 46.6%) – a huge disparity in performance.

Exhibit 2. U.S. Equity Total Returns by Size and Style – New Millennium

Size & Style Benchmarks	Total Return: 2000 Through 2015 (16 Years)	
	Annualized	Cumulative
Russell Top 200	3.1%	63.9%
Russell 1000	4.4%	98.7%
Value	5.9	151.5
Growth	2.4	46.6
Russell 2000	6.6%	178.1%
Value	9.0	298.9
Growth	4.0	86.6
Russell 3000	4.5%	103.5%
S&P 500	4.1	89.1
Wilshire 5000 TMI	4.5	101.8

Source: FactSet and MarketGrader Research.

Even segmenting the broad market by just two factors – size and style – suggests that the picture for equities is not all gloomy. It is true that the broad equity market had a poor performance, but there were size and style segments in the market that performed reasonably well, which means that an investor that was fortunate to be in the right slice of the market at the right time would have experienced acceptable levels of capital appreciation. However, both professional portfolio managers and individual investors would agree that being "lucky" or trying to "time the market" to gain exposure to the outperforming size and style factors is not a viable investment strategy – such an approach is more akin to speculation or gambling. So, if the goal is to participate in the capital appreciation opportunities in different segments of the equity market, what is an investor to do?

The short answer is to drill further to understand drivers of equity performance at the company level. Of course, if that were so simple wouldn't everyone be doing it? After all, the whole top-down approach was created so as to not have to inspect the "engine" under the hood, so to speak, of each individual company whose stock is trading in the equity market. Yes, it is true that a rising tide lifts all boats, so a top-down approach works wonderfully in a bull market. It is also true, that in a bull-market, engaging in selecting stocks to identify outperformers is not only more difficult, but the relative gains from being right (correctly selecting outperforming companies) is also smaller. However, in a flat to marginally ascending long-run market - like the one we have had in the new millennium, the solution to outperformance is identifying the best performing companies trading on the equity market. But the secret to identify the best performing companies is through the understanding of their fundamentals and the drivers of performance. In other words, the strategy calls for employing a "bottom-up" stock picking investment strategy that goes back to the basics of company valuations.[1]

This proposed solution of using company fundamentals to identify outperforming companies is not new. For many decades active portfolio managers have used various investment strategies based on company fundamentals as the basis of stock selection. In fact, using company fundamentals to select outperforming stocks makes so much sense that even proponents of passive investing who previously only invested in the market using top-down size and style segments of the market, have adopted the approach by removing the "discretionary" or "subjective" component associated with a fundamentals-based active stock selection investment strategy and implementing the key components of the approach using a transparent, rules-based methodology that is used to select components for an index/portfolio.[2] This index/portfolio then serves as the basis of an investable financial product whose goal is to capture the performance associated with the investment strategy and to outperform the pure beta benchmark, and active managers that are implementing the same investment strategy, net of fees. The more important

1. This is not to say that a top-down approach cannot be combined with bottom-up security selection. Having identified an outperforming size and/or style factor, the key to adding alpha over and above the appropriate size and/or style benchmark is stock selection employing analysis that incorporates bottom-up company fundamentals.

2. Strictly speaking, the size and style broad indexes such as the Russell 1000 or Russell 1000 Value indexes are also fundamental indexes since they use company fundamentals to map stocks into size and style categories. The only difference is, because the indexes are broad, they also serve as benchmarks. That is, all of the components that satisfy the size, or size and style criteria as defined by Russell's index methodologies are included in the indexes ***versus*** applying yet another screen that selects for the better performing companies. The industry is now referring to the stock selection indexes as "smart beta", or "intelligent" indexes.

aspect though is that the investment strategy, whether active or passive, incorporates company fundamentals, which are assumed to be the generators of performance.

However, the issue raised earlier is still unresolved, namely: was there a portfolio of companies in the broad equity market that significantly outperformed the market in the new millennium? And had such a portfolio existed, was there a bottom-up investment strategy based on company fundaments that was able to successfully identify this portfolio? Since we have the inputs (fundamentals) and output (returns) of all the companies that traded on the U.S. equity market in the new millennium, it is empirically possible to analyze the performance of any given stock selection methodology and to test, with the benefit of foresight regarding company fundamentals, whether such a strategy would have worked.[3] If the strategy does not yield desirable results with the benefit of perfect foresight with respect to the company fundaments, it is unlikely that it would have done so without the benefit of foresight, i.e., once uncertainty is included into the mix.[4] This is exactly the approach we took as we started to study the significant fundamental drivers (correlates) of stock performance.

This paper presents the methodology and results of one such stock selection methodology that yielded the best results amongst those tested. This fundamentals-based stock selection methodology can be summarized as follow: Investing in companies with ***consistent*** earnings per share (EPS) growth was the key to capital appreciation in the new millennium. Note, the investment strategy clearly specifies companies with ***consistent*** EPS growth, ***not*** those with the biggest absolute growth in EPS, ***not*** those with the greatest earnings yield, and ***not*** those with the biggest absolute growth in earnings yield. This is not to say that companies with consistent EPS growth may not exhibit some of those other attributes. However, what it does say is that, in the equity market of the new millennium to date, holding ***consistent*** EPS growth companies was the one necessary condition for generating outperformance.

So there you have it – the answer to the question of identifying pockets of outperformance in the broad equity market is simple, straightforward and intuitive. The answer is ***simple*** because the strategy uses just one, albeit crucial, company fundamental – consistency in EPS growth. EPS are earnings that are normalized by shares outstanding so as to make them comparable across companies. The normalization which converts earnings into earnings per share (EPS) also allows an investor holding a given company's stock to easily calculate her portfolio's share of the total earnings from that company (EPS times the number of shares in the portfolio).

The answer is ***straightforward*** because as long as an investor has a good estimate of the forward-looking EPS, the investment strategy is easily implementable. The better the EPS estimates or forecasts, the better the EPS growth estimates, the more successful the stock screening in terms of identifying ***consistent*** EPS growth companies, and better the outcomes (returns). This means that, based on the findings of this study, the best return on an active portfolio manager's resources would be from improving estimated EPS forecasts of the universe of companies under consideration for investment. The more precise these forecasts are over the publicly available forecasts published by third-party analysts, the bigger the competitive advantage for the manager.[5] It would not be a stretch to state that the long-term success of an active bottoms-up investment strategy is directly related to the long-term success of the manager's ability to accurately forecast company EPS, and therefore, accurately forecast EPS growth rates of the universe of companies under consideration.[6]

Finally, the answer is ***intuitive***. Consistent outperformance in

3. The perfect foresight is with respect to company fundamentals, and not stock price. Because if it is the latter, then the hypothetical exercise becomes redundant.

4. If in reality such a stock selection screen did work for a portfolio manager, it was because of chance, and not because of the validity of the strategy.

5. ***More precise*** means that their proprietary forecasts are more often correct, and when they are wrong, they are wrong by a smaller amount. Essentially, they have a smaller margin of error.

6. Peter Lynch's investment principle comes to mind: Invest in what you know. Historical performance of active managers seems to imply that this is more easily said than done. Most outperformance happens to be a matter of chance.

most any discipline requires dedication, unrelenting focus on the goal, and a lot of hard work. For a company, ***consistent*** EPS growth requires outstanding employees and the ability of management to translate the output of their employees into exceptional products and services for their customers. Maintaining this outstanding performance year-over-year is a signal by the company, to investors, that their equity is a valuable asset that is worth owning. A believer of the discounted cash flow model to value companies might argue that consistency in EPS growth does not guarantee a greater present value of the asset since the EPS increases may be miniscule. Our research shows that consistent EPS growth companies also tend to have the highest present value of the forward-looking earnings yield. In other words, if an investor is looking to maximize the present value of future earnings for each dollar invested, selecting companies with consistent EPS growth is the way to go.[7]

The rest of the paper is structured as follows: The next section presents the empirical methodology and formalizes the definition of ***consistent*** EPS growth as applied to companies across time. This section also briefly covers the data used to implement the analysis. This is followed by an in-depth discussion of the results. The paper concludes with the implications of our finding for equity markets, asset managers and investors.

Methodology

As suggested by the title of the paper, the equity universe of interest is the U.S. equity universe of publicly traded companies. The time period under consideration is the new millennium starting December 31, 1999 through December 31, 2015. The hypothesis to be tested is that companies with ***consistent*** EPS growth outperform the market.

In theory this exercise sounds relatively simple, but because the devil is in the details, in practice constructing an empirical methodology that without bias tests the hypothesis while working with the constraints presented by the data was quite challenging. Given, the enormity of the analysis because of the time period of 16 years, and the challenge of presenting and interpreting the findings, the decision was made to define the selection universe on an annual basis (versus quarterly even though EPS is updated quarterly). Note: The selection universe is the cleaned, broad universe that will be used to categorize the companies by ***consistency*** in EPS growth.

Deciding to define the selection universe annually reduced the periods of analysis from 64 (16 times 4), to 16. In terms of implementing this strategy, this also implies that the stock selection is performed once a year meaning that the ***consistent*** EPS growth portfolio is reconstituted once a year, versus quarterly or prior to EPS announcement dates, as some portfolio managers choose to do. The broadest available U.S. equity universe, the Wilshire 5000 TMI, was used as a starting point to identify the selection universe. Snapshots of the Wilshire 5000 TMI were taken at the market close of trading in each calendar year (December 31st or the last trading day) starting in 1999 and ending in 2015. The 16 selection universes were labeled by year – 1999 through 2015.

Performing the portfolio selection once a year also simplified the decision regarding the choice of the frequency of EPS to use. For the purposes of implementing the portfolio selection methodology using the last 12 Months' EPS (LTM EPS) was logical.

However, this did not address the fact that although a majority of companies use the calendar year as their fiscal year, many of them don't. This means that for the same fiscal year, different companies announce earnings at different times of the year. For the purposes of performing the stock selection, we decided to treat EPS data for each selection universe as if it were known at the time of the stock selection, even if the fiscal period ended after that date. For example, for the 1999 selection universe if a company's fiscal year ended prior to, or on, December 31, 1999, by definition it was a member of the 1999 selection universe. But, if a company's fiscal year ended after December 31, 1999, say in the first quarter of 2000, it was still treated as a member of the 1999 selection universe. This issue becomes relevant for the next step of

7. Though there are various definitions of a growth at a reasonable price investment strategy, or a GARP investment strategy, this might be what some of the definitions are trying to capture.

describing how the companies in the selection universe were categorized into portfolios based on their forward looking ***consistency*** in LTM EPS growth.

For the purposes of defining consistency in EPS growth, we decided to use a three-year forward-looking window into the LTM EPS. Using a three-year window meant the loss of the 2013, 2014 and 2015 selection universes since those universe as of today don't have a full three-year forward looking window into LTM EPS. This dropped the number of selection universes from 16 to 13 – 1999 through 2012.

Exhibit 3 presents a summary of how the companies in each of the 13 selection universe (1999 through 2012) were categorized into portfolios based on their consistency of EPS growth in each of the following next three years. Companies that grew LTM EPS in each of the three years are mapped into Portfolio A. These are the most consistent EPS growth companies in each selection universe. There is only one possible outcome of LTM EPS in the following three years that could generate LTM EPS growth in all of the three years. Essentially, LTM EPS in each of the following years was greater than the LTM EPS in the preceding year.

Similarly, companies that grew LTM EPS in two of the three following years are mapped in Portfolio B. Exhibit 3 shows that there are three possible outcomes of LTM EPS that could map companies into this portfolio. Namely, outcome B1 - a down year followed by two up years. Outcome B2 - an up year followed by a down year, which is then followed by an up year. And Outcome B3 - two up years followed by a down year.

Companies that grew LTM EPS in one of the three following years are mapped in Portfolio C. Again, Exhibit 3 shows that there are three possible outcomes of EPS that could map companies into this portfolio. Namely, outcome C1 - two down years followed by an up year. Outcome C2 – a down year followed by an up year, which is then followed by a down year. And Outcome B3 - an up year followed by two down years. Lastly, companies that experienced negative LTM EPS growth in each of the three years are mapped into Portfolio D.[8]

8. After debating whether to treat each outcome of forward looking EPS combination as a separate portfolio, we decided to keep the portfolio selection methodology and analysis succinct. It might be worth noting the number of companies in each outcome in one year plays a critical role in determining the size in each portfolio for the following year's selection universe. For instance, only the B1 outcome companies have a chance to move to portfolio A in the next selection universe. Since their negative EPS growth year is in the past, and if it so happens that their EPS growth in the year that is added to the three-year window is positive, then they move to portfolio A. None of the companies in other portfolio B outcomes (B2 and B3) can move to portfolio A form one selection universe to the next. They have to wait a minimum of two years. Similarly, companies in portfolio D have to wait a minimum of three years to move to portfolio A.

Exhibit 3. Portfolio Selection by Consistency of Earnings/Share (EPS) Growth for Each Selection Universe – Three-Year Forward Looking Window

Portfolios: Selection Universe *t*	Number of Years Forward LTM EPS Growth is Positive	Possible Forward LTM EPS Outcomes – Three Year Window			
		Outcome	$EPS_t < EPS_{t+1}$	$EPS_{t+1} < EPS_{t+2}$	$EPS_{t+2} < EPS_{t+3}$
A	3 of 3	A1	Yes	Yes	Yes
B	2 of 3	B1	No	Yes	Yes
		B2	Yes	No	Yes
		B3	Yes	Yes	No
C	1 of 3	C1	No	No	Yes
		C2	No	Yes	No
		C3	Yes	No	No
D	0 of 3	D1	No	No	No

Source: MarketGrader Research.

Notice (i) that for each selection universe, the companies in each portfolio are mutually exclusive and together they equal the selection universe, i.e., each company gets mapped; (ii) Portfolios A through D can be thought of as exhibiting a decline in consistency of EPS growth, and (iii) these portfolios can be thought of as investable portfolios that are created at the start of each year using the respective selection universe.

Finally, a note on implications of using a three-year forward-looking window; since the data is available, the initial impulse is to use a longer window, but that actually detracts from the methodology for several reasons:

First, the longer the forward-looking window, the fewer the number of selection universes available for analysis. Implementing the portfolio selection methodology on an annual basis means that for each year added to the EPS forward looking window, one selection universe is lost from the analysis. As mentioned earlier, using a window of three years resulted in a loss of three cohorts. In addition, the longer the window, the more complicated the methodology to categorize the portfolios by consistent EPS growth. Also, since companies don't exhibit consistent EPS growth for very long periods of time, the longer the forward-looking window, the fewer the number of companies in Portfolio A (for instance). We were not sure that adding these complexities to the selection methodology would add any insight.[9]

Second, the use of a three-year window to evaluate companies so as to perform the portfolio selection does not imply that this investment strategy is myopic and does not value the long run. All that the use of a three-year window implies is that what matters for the short-term equity performance of a company, say a 12-month return, is the consistency in EPS growth over the next three years. Anything after that, say the 4th year of EPS growth, is less relevant and only become relevant one year from now. Perhaps rational investors have figured out that a company's EPS growth far out into the future matters less for the how the stock is going perform now (they can always buy that stock later when it is going to matter) and that maximizing a portfolio's return year over year is the optimal way to achieve long run outperformance.[10]

Third, from the practical perspective of implementing this approach into the future, using longer-term estimates would dilute the value of the methodology. EPS forecasts are more reliable in the short term and become less reliable into the future. It would be fair to say that any forecast more than five years into the future is more of an educated guess with a huge margin of error. Using a three-year forward looking window, therefore, is the most reasonable.

Having categorized each selection universe into portfolios based on consistency in EPS growth, the next step in the methodology is to analyze the performance of each portfolio of companies. For this we decided to use the forward-looking 1-year, 2-year and 3-year realized cumulative simple returns.[11]

Note that while the portfolios are constructed for year t (using EPS_t, EPS_{t+1}, EPS_{t+2}, and EPS_{t+3}), the simple returns are for years $t+1$, $t+2$ and $t+3$. In addition, it should be kept in mind that because the companies within each selection universe have different fiscal year dates, the returns for each company are adjusted for that disparity. The hypothesis being tested here is that the more consistent the EPS growth (as defined by the forward looking EPS growth), the higher the future rate of return. In addition, since the analysis of each selection universe is independent of the others, this methodology as described also allows us to determine the robustness of

9. Company earnings are cyclical and dependent on the fluctuations in their sectors. More on this later.

10. A more technical way of saying this is investors' discount the future EPS of companies heavily. For instance, an annual discount rate of 50% would mean that $1 of EPS four years in the future is worth less than $0.20 today. But this does not imply that they discount the future performance of their portfolios heavily. How the portfolio does in the fourth year still matters, but they will worry about it three years from now when they reconstitute their portfolios with the most current EPS information.

11. See Exhibit A1 at http://global.marketgrader.com/epsgAppendix for an illustration.

the relationship between the consistency in EPS growth and stock performance.

Before moving on to the results, it might be helpful to mention some of the other screens that were applied to the 13 selection universes. Companies with any relevant missing information were dropped from the selection universe. So for selection universe t, if any of the companies were missing EPS_t, EPS_{t+1}, EPS_{t+2}, EPS_{t+3}, R_{t+1}, R_{t+2} & R_{t+3}, they were dropped from the analysis. In addition, to minimize the effect of outliers on the results, we dropped companies whose EPS_t, EPS_{t+1}, EPS_{t+2}, and EPS_{t+3} was in the top or bottom 1%. Finally, if the count of the selection universe after applying these screens was greater than 2500, we selected the largest 2500 by market capitalization (as of the snapshot date) to make the analysis more applicable for investors. The resulting 2500 companies (or less, as it turned out in two of the universes) was the final selection universe that was used for the analysis.

Results

Portfolio Selection

With the benefit of perfect foresight into the three years of forward looking EPS, each selection universe was categorized into portfolios A through D based on the consistency in EPS growth using the methodology presented in Exhibit 3.[12] Exhibit 4, presents the results, in terms of the counts, of this portfolio selection.

On average across all of the 13 selection universes, about 18% of companies belong to portfolio A (consistent EPS growth in each of the forward looking three years). Only 6% of companies belong to portfolio D (negative EPS growth in each of the forward looking three years). On average, across time, about 76% of the companies were mapped into either portfolios B or C.

12. Perfect foresight guarantees that the companies are mapped accurately into the portfolios. It goes without saying that implementing this approach ***ex ante*** would result in wrong allocation of stocks to portfolios. This misallocation is a function of the accuracy of the company EPS forecasts.

Exhibit 4. U.S Equity Universe – Portfolio Counts by Selection Universe (1999 Through 2012)

Selection Universe	Portfolio				
	A	B	C	D	All Companies
1999	400	1006	912	182	2500
	16%	40%	36%	7%	100%
2000	451	995	899	155	2500
	18%	40%	36%	6%	100%
2001	701	1085	613	101	2500
	28%	43%	25%	4%	100%
2002	805	1058	536	101	2500
	32%	42%	21%	4%	100%
2003	130	1596	719	55	2500
	5%	64%	29%	2%	100%
2004	600	1045	743	112	2500
	24%	42%	30%	4%	100%
2005	381	978	892	249	2500
	15%	39%	36%	10%	100%
2006	236	963	1012	289	2500
	9%	39%	40%	12%	100%
2007	261	1112	962	165	2500
	10%	44%	38%	7%	100%
2008	438	1253	698	111	2500
	18%	50%	28%	4%	100%
2009	583	1130	697	90	2500
	23%	45%	28%	4%	100%
2010	528	1081	765	126	2500
	21%	43%	31%	5%	100%
2011	504	1055	775	160	2494
	20%	42%	31%	6%	100%
2012	410	1025	804	178	2417
	17%	42%	33%	7%	100%
Average Count	459	1099	788	148	2494
Average %	18%	44%	32%	6%	100%
Minimum	130	978	536	55	
Year	2003	2005	2002	2003	
Maximum	805	1596	1012	289	
Year	2002	2003	2006	2006	

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology. Note. For 2011 and 2012, after applying the screens discussed in the Methodology section of the paper, the counts fell below 2500.

This time series of portfolio sizes suggest that in any given year, a random (no priors) stock picker has about a one in

five odds of selecting a company from portfolio A, namely, a company with consistent EPS growth over the next three years. The chances of picking a company from portfolios B, C, and D are more than 80%. Though, the chances of picking a company with negative EPS growth for each of the three years is the slimmest – only 6%.[13]

We still haven't revealed how the companies in each of the portfolios perform, but if the hypothesis we are testing is true, then portfolio A companies are the most desirable followed by portfolio B companies. If it turns out that portfolio B companies also outperform the market, then suddenly the odds for a random stock picker to select an outperforming company jump to 62% (18% + 44%) and we should be seeing a majority of active portfolio managers actually outperform the market over this time period. But if it is only companies in portfolio A that outperform, then only 18 stocks in a portfolio of 100 randomly selected stocks is a "winner" and then the challenge for the active portfolio manager becomes how to improve this winner / loser ratio of about 22% (18% / 82%)?

It is not a coincidence that the performance metric for active managers (alpha / tracking error relative to benchmark) is referred to as the "information ratio". The term succinctly captures the proprietary information (over and above that is publicly available) that the manager has created through researching each of the companies under review. This additional information gives them an advantage over other managers to improve the winner/loser stock ratio of companies selected in the portfolio. This higher winner/loser stock ratio is then revealed as outperformance (alpha) and therefore as a higher information ratio.

Earnings / Share by Portfolio

Exhibit A2 at http://global.marketgrader.com/epsgAppendix#exhibita2 presents the median EPS for each selection universe by portfolio. The exhibit also presents the median for each year into the three-year forward-looking window.

Given the numerous data points, a summary table might be useful in highlighting the key points. In that spirit, Exhibit 5 presents the averages of the median EPSs over the 13 selection universes.

Exhibit 5. U.S Equity Universe – Average of the Median Earnings/Share by Portfolio Over All Selection Universes (1999 Through 2012)

Average of Median Earnings / Share ($EPS)	Portfolio				
	A	B	C	D	All Companies
EPS_t	0.63	0.63	0.82	1.12	0.72
EPS_{t+1}	0.97	0.75	0.64	0.70	0.76
EPS_{t+2}	1.27	0.82	0.53	0.27	0.78
EPS_{t+3}	1.62	0.99	0.31	-0.28	0.80
% EPS Growth	232%	79%	-54%	-118%	28%

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology, Exhibit 4 for the counts Exhibit 4 for portfolio counts, and Exhibit A2 at http://global.marketgrader.com/epsgAppendix#exhibita2 for median EPS by portfolio for each selection universe.

As expected, % EPS Growth is ordered going from portfolio A to D. This is a good validation of the implementation of the portfolio selection methodology. In other words, this result validates that the companies were mapped correctly according to the definition of each portfolio. On the average across the 13 selection universes, the median EPS for portfolio A grew by 232%, or by more than a multiple of three. Recall, portfolio A is made up the companies with consistent EPS growth in each of the three forward-looking years post the selection year. For portfolio B, the companies with EPS growth in two of the three forward-looking years, median EPS grew on the average by 79%. Also as expected, on the average, median EPS declined for portfolio C (companies with EPS growth in one of the three years) and for portfolio D (companies with negative EPS growth in each of the three years). This result is by construct, i.e., it is an outcome of the portfolio selection methodology. [Perhaps the curious reader has already verified that this result holds true for each of the 13 selection universe presented in Exhibit A2.]

Another result that is by construct is the average median EPS for portfolio A increases in each of the three forward-looking years. Even though this year-over-year increase is observed in the average median EPSs for portfolio B, this doesn't have to be the case. Also by construct of the selection methodolo-

13. If the data confirms the hypothesis and portfolio D actually underperforms, then this means that it is relatively difficult to pick true losers. Something to which long/short managers can testify.

gy, the average median EPS for portfolio D decreases in each of the three forward-looking years. Again, even though this year-over-year decrease is observed in the average median EPSs for portfolio C, this doesn't have to be the case. This can be confirmed by checking this relationship for the 13 selection universes presented in Exhibit A2.

Though the results described above are by construct, what is not an outcome of the portfolio selection methodology is the finding that companies in portfolio A start out with the lowest EPS. On the average, median EPS for companies in portfolio A in the typical selection year is less than all of the other portfolios, and therefore smaller than the EPS of the universe. It is only in the three forward years that the companies in Portfolios A and B move up in median EPS, whereas, the median EPS of companies in the other two portfolios decline. Since the methodology is focused on selecting companies by ***consistent*** EPS growth over the forward-looking three years (and not by the highest EPS per se), it turns out that the companies selected into portfolio A actually start off with the lowest EPS. This was not only a surprise to us but also a relevant finding. Again, Exhibit A2 reveals that this result holds true for every selection universe except 2010, 2011 and 2012.

This above described finding is relevant because the ***ex-ante*** EPSs in the selection year (when the company is selected into portfolios A through D) would most likely imply that the companies in portfolio A actually start off with the smallest earning yield (EPS_t/P_t), whereas companies in portfolio D start off with the largest earning yield.[14] So using the traditional definition of "growth" and "value", stocks in portfolio A are more growth-oriented and stocks in portfolio D are more value-oriented. This was a surprise.[15]

However, at the risk of giving away one major conclusion of the paper too early, it turns out that though, on the average, the stocks in portfolio A have the smallest contemporaneous earnings yield, they have the largest present value of the discounted forward-looking earnings yield over the three-year period. At time ***t***, the present value of the discounted three-year forward-looking earning yield for each company can be calculated as,

$$\frac{\sum_{k=1}^{3} \frac{EPS_k}{(1+\delta)^k}}{P_t},$$

where, δ is the annual discount rate. The present value of the discounted forward-looking earning yield by portfolio will be presented in the results section of this paper.[16]

The performance results by portfolio for the selection universes have yet to be presented. But if the results are consistent with the hypothesis that the most ***consistent*** EPS growth companies are also the best performers, then this means that the key to capital appreciation for an investor is to purchase companies with the biggest present value of future discounted earnings, namely, the companies in portfolio A. These companies could be referred to as growth companies for two reasons: (a) on the average, these companies have smaller contemporaneous earnings yield (EPS_t/P_t), and (b) they have consistent EPS growth. But because they are going to produce the most earnings yield in the future per dollar invested, they are also the best, or reasonably priced.[17]

Simple Total Returns by Portfolio

Since this entire thesis rests on the realized performance of the portfolios, without further ado, Exhibit A3 at http://global.marketgrader.com/epsgAppendix#exhibita3 presents the median cumulative returns over a one-year, two-year and three-year period by portfolio for each of the selection universes. For each selection universe stocks are selected at ***t*** into portfolios based on EPS_t, EPS_{t+1}, EPS_{t+2} and EPS_{t+3}.

14. In fact, on average this was the case. Though, individual stocks within portfolio A included both low and high earnings yields.

15. Lately, in 2010, 2011 and 2012, this seems to have reversed. On the average, portfolio A stocks seem to be more value-oriented.

16. Without the benefit of hindsight, this calculation would use the EPS forecasts and would be referred to as the forecasted, or expected discounted earnings yield.

17. This type of investor could be called a growth at a reasonable price investor, or GARP investor.

Therefore, the one-year, two-year and three-year returns are represented by R_{t+1}, R_{t+2} and R_{t+3}. For example, if the selection universe is t=1999, then the cumulative returns in the table are through the years 2000, 2001 and 2002.

As was the case for median EPS for the 13 selection universes, there is a lot of data to absorb. To assist with that process, Exhibit 6 presents again a summary by averaging the median returns for each of the three time periods over the 13 selection universes.

Exhibit 6. U.S Equity Universe – Average of the Median Returns by Portfolio Over All Selection Universes (1999 Through 2012)

Average of the Median Cumulative Return	Portfolio				
	A	B	C	D	All Companies
One Year (R_{t+1})	19.8%	10.1%	1.0%	-2.4%	8.3%
Two Year (R_{t+2})	20.5%	10.7%	1.2%	-5.1%	8.7%
Three Year (R_{t+3})	37.4%	21.3%	2.7%	-10.2%	17.1%

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology, Exhibit 4 for portfolio counts, and Exhibit A3 at http://global.marketgrader.com/epsgAppendix#exhibita3 for median returns by portfolio for each selection universe.

The first finding is apparent. Return performance is ordered by degree of consistency in EPS growth of the portfolios. The more consistent the EPS growth of the portfolio, the higher the return of the portfolio. This is true over a one-, two- and three-year period. On average, over a one-year period, portfolio A returned two times as much as the broad selection universe (19.8% versus 8.3%). This is true over a two-year period (20.5% versus 8.7%) and also a three-year period (37.4% versus 17.1%). Portfolio B, on the average, outperformed the selection universe, but by a much smaller amount. Portfolios C and D underperformed the selection universe significantly.

At this stage, it would be helpful for the reader to go back to Exhibit A3 and check if this finding is true for each of the selection universes. The data reveals that except for a few years when the performance switches between portfolios A and B, and portfolios C and D, the relationship in performance across portfolios is relatively robust.[18] The empirical evidence is pointing towards acceptance of the hypothesis, that at the company level, ***consistency*** in EPS growth is strongly correlated to performance.[19] At the portfolio level, it most certainly is the case.

The second finding is less apparent. This has to do with the time period that the reward (return) for selecting the outperforming stocks is realized. The evidence suggests that the majority of the return is realized over the one-year period. For instance, the two-year cumulative return of 20.5% for portfolio A is only 9.8% on annualized basis. This means that over the second of the two-year period these stocks did not perform exceptionally well (they returned only 0.6%, which was still as well or better than the performance of the other portfolios in that same year). Similarly, the three-year cumulative return of 37.4% for portfolio A translates into an annualized return of 11.2%. Given that in the first year the portfolio returned 19.8%, the second year it returned 0.6%, this means that in the third year it returned 14% - a much higher return than the other portfolios (portfolio B was the next highest with a third-year return of about 10%).

The reason this is relevant is that it is related to the optimal holding period of the outperforming portfolio, which in turn is related to the optimal reconstitution of the portfolios. For the purposes of this paper we chose to go with an annual reconstitution of the portfolios with a selection based on a three-year forward looking window (that is why the universe was selected yearly). But we essentially used this approach because (i) it was convenient to illustrate, explain and test the hypothesis, and (ii) so as not to be inundated with data. In practice, since EPS updates are announced quarterly, this approach could be implemented quarterly with, say, a 12 quarter forward-looking window. Or, the window used could be on an annual basis (since there would be more errors in the

18. It would be insightful to test exactly how robust these results are to the portfolio selection methodology. Perhaps including a distinction in portfolio B companies by the combination of up and down years would help strengthen these results.

19. By the way, we choose to present medians instead of averages. Since averages are highly sensitive to outliers, the difference in averages across portfolios was even more striking.

forecasts over 12 quarterly windows). It goes without saying that this choice is up to portfolio managers and we leave the testing of such an approach to more ambitious researchers.

The third finding has been alluded to before. The returns for portfolio A and portfolio D indicate that this investment approach lends itself nicely to a long/short framework. The average of the annual spread between the one-year return of portfolio A and portfolio D over the 13 years is 18.8%. However, this in a long/short framework is tricky. Recall that, from the counts in Exhibit 4, consistently outperforming stocks are hard to find. But consistently underperforming stocks are even harder to find. Just like a majority of active managers, most stocks are neither consistent outperformers, nor consistently underperformers – they are just average. So whereas the long portfolio, more often than not, does what it was supposed to, the short portfolio, does so less often.

Present Value of Discounted Earnings Yield by Portfolio

Having confirmed our hypothesis, another statistic that we thought might be useful for the reader to understand what exactly it is that ***consistency*** in EPS growth captures, is the present value of the discounted three-year earnings yield. To keep the calculation simple, we used a discount rate, δ, of zero, though applying a positive discount rate only changes the magnitude of the yield, but leaves the relationship across portfolios unchanged. Using a δ of zero the calculation reduces to the sum of the three-year forward EPS (EPS_{t+1} + EPS_{t+2}, *and* EPS_{t+3}) divided by the current price (P_t). Just as it is for the contemporaneous earnings yield ($EPSt/P_t$) this variable has an intuitive interpretation: Given the price (P_t) of a share of an asset, the three year forward earnings yield is the amount of earnings purchased per dollar. Exhibit 7 presents the median statistic of this important variable by portfolio.

Exhibit 7. U.S Equity Universe – Median Present Value of Three-Year Earnings Yield (%) by Portfolio for Each Selection Universe (1999 Through 2012)

	Portfolio (δ = 0)				
Selection Universe	**A**	**B**	**C**	**D**	**All Companies**
1999	28%	14%	6%	2%	13%
2000	21	12	5	4	11
2001	20	13	5	3	13
2002	25	18	11	6	18
2003	19	18	9	7	15
2004	20	15	8	4	14
2005	20	14	6	-1	12
2006	18	12	5	3	9
2007	17	10	7	3	9
2008	25	18	11	7	17
2009	23	18	11	4	18
2010	22	17	10	2	16
2011	24	19	12	5	17
2012	22	17	12	-3	16
Average	22%	15%	8%	3%	14%

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology and Exhibit 4 for counts in each portfolio by selection universe.

Once again, the takeaway is clear. Though the companies in portfolio A – the most consistent EPS growth companies – have the lowest (on average) earning yield at the time of selection, they have the highest forward looking earnings yield. On the average, companies in portfolio A have a forward looking earnings yield of 22% versus 14% for the broad selection universe. In other words, for every dollar invested, portfolio A companies generate 8 cents more in earnings (over the three-year window) than the broad universe. This makes them a good buy. Down the road, prices of these stocks increase and at that point, the portfolio capitalized on that return and rolls over into the next portfolio of stocks with the most consistent EPS growth, and therefore, the highest forward looking discounted earnings yield. In a nutshell that is the investment strategy.

By now it is obvious that the bottom-up fundamental strategy of continuously investing in it the most ***consistent*** EPS growth stocks is equivalent to continuously moving the portfolio into stocks offering the highest forward looking discounted earnings yield. Since we know for a fact that eco-

nomic sectors have cyclical earnings, therefore, it must be the case that companies within those sectors have cyclical earnings. Using the three-year forward-looking window to define consistency in earnings is a means to capture this cyclicality in companies' earnings. In essence, this investment strategy is continuously catching the next wave of strong earnings growth.

An adherent to a top-down approach might claim that one might as well use a sector rotation strategy. However, such an approach still requires to forecast the outperforming / underperforming sectors. Practitioners of tactical asset allocation (TAA) strategies using sectors generally aggregate individual company forecasts up to the sector level and combine that with other macroeconomic factors that may impact sector performance to determine deviations of the sectors from their normal weights. The risk in doing so is that the underperforming sectors get doubly penalized, and, ***vice versa***. Cyclical trend in company earnings are already partially capturing the impact of the macroeconomic factors.

In the opening paragraph of the paper, we stated that one of the major objectives of investors in equity capital markets is capital appreciation. This capital appreciation is realized when the underlying price of the asset (stock) that investors hold increases and investors sell the stock in the secondary equity market to realize the gains. So, even though Portfolio A stocks have the highest forward looking earning yield and the highest return, do they also realize the best return (price increase) per unit of earnings? At time ***t***, for one-year return, this can be simply calculated as the return (% price increase) divided by the earnings yield, or,

This statistic is literally the return per unit of earnings per dollar. One could think of it as the actual return on investment for the investor because after all investors only "buy" future earnings of an asset to realize capital appreciation.

Exhibit 8. U.S Equity Universe – Average Increase in Price Per Unit ($) of Forward Earnings by Portfolio Over All Selection Universes (1999 Through 2012)

Cumulative Return / Forward Earning Yield	Portfolio (δ = 0)				
	A	B	C	D	All Companies
1-Year	91 cents	66 cents	12 cents	-72 cents	59 cents
2-Years	94	69	14	-154	62
3-Years	172	139	32	-311	121

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology, Exhibit 4 for portfolio counts, and Exhibit 4 for counts in each portfolio by selection universe.

Using the appropriate estimates for the numerator and denominator from Exhibits 6 and 7 respectively, Exhibit 8 presents an estimate of this ratio. For the new millennium, Portfolio A – the stocks with the most consistent EPS growth, have by far the best increase in price (delta price) per unit of earnings. For each dollar of three-year forward earnings, the price of the Portfolio A increased by 91 cents over one-year, 94 cents over two-years and $1.72 over three years. For the entire universe the price increase was only 59 cents, 62 cents and $1.21, respectively.[20]

20. A ratio of 100, or more, implies that the price increase was more than the earnings increase.

$$\frac{\frac{R_{t+j}}{\sum_{k=1}^{3}\frac{EPS_k}{(1+\delta)^k}}}{P_t} = \frac{\frac{\frac{P_{t+j}-P_t}{P_t}}{\sum_{k=1}^{3}\frac{EPS_k}{(1+\delta)^k}}}{P_t} = \frac{\frac{P_{t+j}-P_t}{\sum_{k=1}^{3}\frac{EPS_k}{(1+\delta)^k}}}{}, \text{ for j = 1, 2 and 3.}$$

Results by Size & Style

It would not do justice to the thesis if we did not present a summary of the findings by size and style. To put to rest any doubt that the findings are simply being driven by size and style factors Exhibit 9 presents a brief summary of the analysis performed for the selection universe when it is controlled for size and style. In addition, only the one-year performance numbers are presented since they are most relevant.

To map the selection universe by size we used the market capitalization as of the snapshot dates and categorized the largest 1000 companies as large cap. The remaining companies were categorized as small cap (this was 1500 stocks in all of the years, except for 2011 and 2012). For the style categories we used the P/E ratio as of the snap shot date. In each of the size categories, stocks above the median P/E were mapped into growth and stocks below the median P/E were categorized as value. This resulted in an equal number of companies in large value and growth (500 each), and small value and growth (750 each, except for 2011 and 2012).

The overall relationship of returns across portfolios, categorized by consistent earnings growth, carries forward into the size universes. Also within each size category, the relations hold for the style universes. Though they are some interesting differences worth noting across sizes and styles:

Small cap portfolio A stocks, the most consistent EPS growth stocks within small cap, did much better than their broad peers (21.5% versus 8.1%) as compared to large cap stocks (18.8% versus 8.9%). On the other hand, small cap portfolio D stocks did much worse than large cap portfolio D stocks (-4.4% versus -1.5%). It goes without say that the more return variability in small cap stocks as compared to large cap stocks is a result of the increased variability in EPS growth of small cap stocks as compared to large cap stocks.

Another difference worth noting is that over this time period the value stocks of all portfolios outperformed growth stocks, except for the small cap portfolio A for which growth stocks outperformed value stocks.

In summary, within small cap, without perfect foresight, the reward for correctly forecasting EPS can be significant, but error in forecasts can also prove costly.

Exhibit 9. U.S Equity Universe – Average of the Median Returns by Portfolio Over All Selection Universes (1999 Through 2012) Controlling for Size & Style

Average of the Median	Portfolios				
One Year (R_{t+1}) Return	A	B	C	D	All Companies
All Selection Universes	19.8%	10.1%	1.0%	-2.4%	8.3%
Large Selection Universes	18.8%	9.9%	1.9%	-1.5%	8.9%
Value	22.4%	12.7%	4.5%	1.3%	11.0%
Growth	16.0%	6.7%	-1.9%	-6.3%	6.6%
Small Selection Universes	21.5%	10.6%	0.6%	-4.4%	8.1%
Value	18.9%	11.5%	2.9%	1.4%	9.3%
Growth	22.6%	10.3%	-0.9%	-9.4%	7.7%

Source: FactSet and MarketGrader Research. See Exhibit 3 for the portfolio selection methodology.

Conclusions

This paper tests the empirical implications on portfolio performance of using an investment strategy focused on investing in stocks with ***consistent*** forward-looking earnings growth (EPS growth). Using actual company level EPS and stock returns data from the start of the new millennium through 2015, the methodology formalizes an annual, perfect foresight, stock selection approach to classify companies into portfolios defined by consistency in EPS growth based on a rolling three-year forward-looking EPS window. The paper presents the performance of the resulting portfolios in the new millennium and some of their key attributes such as the forward looking discounted earnings yield and the return on investment as measured by the ratio of the return and the earnings yield. The main finding is that in the new millennium consistency in EPS growth was the key to capital appreciation. The results show that a portfolio of consistent EPS growth stocks, rebalanced annually, averaged an annual return that was twice as much as the selection universe (19.8% versus 8.3%). Over the 13-year period, this difference in annual returns translates into a 10X capital growth multiple versus a growth multiple slightly smaller than 3X. The empirical evidence also suggests that the companies with the most consistent EPS growth, in general, also had a high forward-looking EPS earnings yield. This is the primary reason that these companies were a good investment. In addition, the data corroborates that these companies were not only a bargain in terms of forward looking earnings purchased per dollar, but also generated the highest return per unit of earnings.

For active managers, the findings suggest that focusing on a single company fundamental, namely, EPS, is the secret to gaining a competitive advantage. Accurately estimating company EPS, and therefore EPS growth, will essentially determine, the ratio of "winning" stocks versus "losing" stocks in a portfolio. For a given tracking error (level of "activeness" relative to benchmark), the portfolio alpha will be a function of this ratio and so will the portfolio's information ratio.

In terms of implementation, it might be worth noting that an important aspect of company earnings is that is that the cross-sectional distribution of company EPS varies significantly by year (see Exhibit A4 at http://global.marketgrader.com/epsgAppendix#exhibita4). This means that the precision of EPS forecasts is going to vary significantly by year. In periods of high earnings variability (uncertainty), EPS forecasts are going to be less reliable which is going to make it more difficult to implement an investment strategy that relies on EPS growth estimates.

Investors could think of this investment approach as a strategy that is trying to capture the cyclicality of company earnings by continuously rolling over the portfolio into the next group of companies that are expected to generate the most growth in company earnings. This bottom-up fundamental-based approach is distinct from a top-down sector rotation strategy. At any given time, companies with consistent EPS growth can be from different sectors, though for various reasons their earnings are correlated and cyclical.

For style investors, it is important to note that this investment strategy is not a value strategy, ***nor*** is it a growth strategy. However, the empirical evidence suggests that the companies with the most consistent EPS growth generally start off with low earnings yield (but not all low earnings yield stocks will have consistent EPS growth) and over time become high E/P companies. The data also suggests that the investment strategy works for both large and small equities and value and growth equities. However, with uncertainty in EPS forecasts, both the upside and downside might be greater for small cap stocks and growth stocks.

Finally, because company earnings are cyclical, more research is required into the optimal size of the forward looking window to identify consistent EPS growth companies, without the benefit of 20/20 hindsight. Also, testing for the optimal frequency of the EPS in the forward looking window (quarterly versus semi-annually versus annually) might be insightful. The use of a more frequent EPS estimate could result in the portfolio selection being more sensitive to errors. While using an EPS annual forecast might help by cancelling out quarterly forecast errors as long as they are not biased in one direction.

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