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# TACTICAL ASSET ALLOCATION: FOLLOW THE RULE OF 20

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## Abstract

The false alarms set off by high market PE ratios in 1995-1996 have motivated many market participants to look for new asset allocation signals. The Rule of 20 appears to be a strong candidate to replace the PE ratio for market watchers. The Rule of 20 is simply a modification of the PE (*market PE + annual inflation*) that recognizes that PE's should be high in periods of low inflation. This paper examines the forecasting performance of The Rule of 20 relative to the PE ratio. Using a 60-year data set, the R20 measure showed better forecasting performance than the PE for 3-month, 6-month, and 12-month market changes. An experiment performed on a sub-sample of the data suggests that the R20 measure could have been used as a profitable asset allocation tool.

## INTRODUCTION

One of the most often-cited indications of stock market overvaluation is a high price earnings ratio. The widely reported version of the PE ratio is simple to calculate – it is the ratio of current stock price to the sum of the four most recent quarterly accounting earnings per share, or the number of dollars that investors are willing to pay per dollar of earnings. Thus, according to conventional wisdom, the higher the PE ratio of the market (the more investors are willing to pay for earnings), the more overvalued the market is likely to be; lower PE ratios indicate a good time to buy. This idea has been empirically tested by Bleiberg (1989) and Good (1991); both studies found that market PE ratios were inversely correlated with subsequent market returns – low PE ratios signaled high market returns and high PE ratios were generally followed by low market returns.

Recent market performance has motivated traders to look for improvements on the PE ratio. Those who believe that high PE's are a danger signal likely missed out on the 30%-plus market returns in 1995, which came in the midst of PE ratios in the 21-to-22 range. Many traders explained this apparent contradiction by claiming that the high PE ratios were justified by low inflation.[1] This explanation yielded a derivative of the PE ratio as a market predictor – the Rule of 20. The measure is calculated by adding the annualized inflation rate to the market PE ratio. The name comes from the supposedly key point of the measure – if the measure is under 20, expect the market to do well; if over 20, be wary of a declining market.

The ex post evidence on the Rule of 20 as a market timing tool is impressive. A $1000 passive investment in the market at the beginning of 1935 would have grown to over $134,000 by the end of 1995. However, an investor with knowledge of the Rule of 20 beginning in 1935 would have done much better. Absent trading costs, an investor who was fully in the market each quarter that the R20 measure was less than 20 and fully invested in T-bills when the R20 measure was greater than 20 would have accumulated over $244,000 from the same $1000 initial investment. Several sources have documented similar performance from using market PE ratios as a timing indicator; so is the Rule of 20 an improvement over the PE ratio? This paper attempts to answer that question comparing the forecasting ability of the Rule of 20 and the PE ratio.

## PE RATIOS AND INFLATION

The popular press form of the PE ratio is $P_0$ / $EPS_0$, where $P_0$ is the current price and $EPS_0$ is the most recent measure of accounting earning per share. The determinants of this ratio are easily derived using the stock valuation model that assumes constant dividend growth:

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Equation 1

$$P_0 = D_1/(k-g)$$

where $D_1$ is the value of dividend assumed to be paid one year from today, $k$ is the market's required rate of return, and $g$ is the yearly dividend growth rate. If we assume the two identities:

Equation 2

$$D_1 = D_0 \times (1+g) \text{ and } D_t = EPS_t \times PO$$

where $PO$ is the firm's dividend payout ratio of earnings at time $t$, equation (1) can be rearranged as:

Equation 3

$$P_0 / EPS_0 = (PO \times (1+g)) / (k-g)$$

Thus, the PE ratio depends on three variables: the dividend payout ratio, the growth rate in dividends, and the required return.

Inflation enters the PE equation through the required return – the higher the inflation rate, the higher return investors will require. As k rises, PE ratios will fall, and vice versa. The Rule of 20 is based on this idea that, all else equal, PE ratios should be higher in periods of low inflation and lower in periods of high inflation.

**TABLE 1**
**Summary Statistics 1935-1995**

| | PE Ratio | R20 Measure |
|---|---|---|
| Mean | 13.83 | 17.72 |
| Median | 13.69 | 18.21 |
| Standard Deviation | 4.43 | 4.99 |
| Maximum | 26.10 | 29.23 |
| Quintile 1 | | |
| | 17.94 | 21.88 |
| Quintile 2 | | |
| | 15.44 | 19.35 |
| Quintile 3 | | |
| | 12.22 | 17.22 |
| Quintile 4 | | |
| | 9.50 | 13.90 |
| Quintile 5 | | |
| Minimum | 5.90 | 0.19 |
| Correlation | 0.53 | |

"PE Ratio" is calculated as the end-of-quarter value of the S&P Index divided by the earnings reported for the most recent four quarters for the index.
"R20 Measure" equals the PE Ratio plus the annualized inflation rate, which is calculated from the quarterly change in the Consumer Price Index.

## DATA DESCRIPTION

This study uses a lengthy time series to test the Rule of 20. Price earnings ratios are available quarterly for the Standard and Poor's Index (now the S&P 500) back to 1935. I calculated inflation as the annualized percentage change in the Consumer Price Index from the previous quarter. The Rule of 20 measure is the sum of this inflation and the PE ratio. In order to insure that all information is available at time t, the S&P earnings utilized in the PE ratios are lagged three months and the inflation measures are lagged one month. For example, the end-of-year R20 measure uses the November CPI announcement and the third-quarter EPS as its most recent variables.

Table 1 provides descriptive statistics. One of the most important statistics is the correlation between PE and R20 over the time series. With a correlation of only 0.53, the two measures do show some degree of independence. The quarterly PE ratio averaged 13.83, with a median of 13.69. The observations ranged from a low of 5.9 at the end of June 1949 to a high of 26.1 at the close of 1991; the standard deviation was 4.43. Quarterly R20 measures averaged 17.72, with a median of 18.21. The highest value occurred at the end of September 1947, at 29.23. The lowest value came at the end of 1948, when annualized *deflation* of over 6% combined with a PE ratio of 6.64 to give an R20 measure of 0.19.[2] At 4.99, the standard deviation of the R20 measure was higher in absolute terms than that of the PE ratio, but lower relative to the mean.

Following Bleiberg's (1989) methodology, I sorted PE ratios and R20 measures into quintiles based on their levels. I then calculated the change in the S&P index over the next three, six, and twelve months for each date in the sample. The forecasting tests in the next section compare these subsequent returns for each quintile of PE ratios and R20 measures.

### TABLE 2
**Market Changes by Quintile 1935-1995**

| | Average S&P Index change over next: | | |
|---|---|---|---|
| **PE Quintile** | **3 months** | **6 months** | **12 months** |
| 1 (highest) | 0.15% | 0.01% | 1.98% |
| 2 | 1.66% | 4.45% | 6.79% |
| 3 | 4.31% | 5.64% | 7.82% |
| 4 | 0.75% | 4.07% | 10.17% |
| 5 (lowest) | 3.37% | 6.76% | 14.41% |

| | Average S&P Index change over next: | | |
|---|---|---|---|
| **R20 Quintile** | **3 months** | **6 months** | **12 months** |
| 1 (highest) | -1.10% | -1.92% | 0.97% |
| 2 | 1.42% | 3.42% | 6.14% |
| 3 | 2.34% | 4.34% | 9.05% |
| 4 | 4.39% | 6.86% | 9.84% |
| 5 (lowest) | 3.25% | 8.28% | 15.12% |

Market change is measured by the percent change in the S&P Index for each time period.

## FORECASTING RESULTS

Table 2 shows how the stock market reacted in the months following each measurement. Based on theory and empirical observations, we should expect the two measures to be inversely related to subsequent market movements – the lower the PE or R20, the more the market should rise. However, the predictive relationship between the PE ratio and market movements in the next quarter was minimal – the highest PE's were followed by the lowest returns, but the other quintiles failed to match the theory. PE ratios were more effective the longer the forecast period with the quintiles perfectly ordinal in their returns over a yearly range, but the Rule of 20 did a better job of forecasting subsequent market movements for all three time lengths. For example, when the R20 measure was very high

(Quintile 1), the market tended to decline over the next three and six months, and produced less than a one percent gain for the entire year. The Rule of 20 quintiles were also perfectly ordinal in their returns for all three time periods, with the lower quintile measurements always being followed by higher average returns.

## TABLE 3
### Regression Estimations 1935-1995
### (standard errors in parenthesis)

**Panel A: Return = $\alpha + \beta$ PE Ratio**

| Return | Intercept | PE Coefficient | $R^2$ |
|---|---|---|---|
| 3-month | 5.181%** (1.72%) | -0.226% (0.119%) | 1.5% |
| 6-month | 12.328%** (3.56%) | -0.589%* (0.245%) | 4.6% |
| 12-month | 22.487%** (7.21%) | -1.017%* (0.498%) | 6.6% |

**Panel B: Return = $\alpha + \beta$ R20 Measure**

| Return | Intercept | R20 Coefficient | $R^2$ |
|---|---|---|---|
| 3-month | 6.451** (1.65%) | -0.244%** (0.087%) | 3.2% |
| 6-month | 16.554%** (3.88%) | -0.684%** (0.269%) | 8.3% |
| 12-month | 30.118%** (8.66%) | -1.179%** (0.456%) | 10.2% |

** = significant at 1% level, * = significant at 5% level

Regression statistics for the data are presented in Table 3. For three-month returns, the R20 variable was significant at the 1% level. The coefficient estimate signifies that for each one unit increase in the R20 measure, an investor could expect a 24 basis point decline in the three-month return. As would be expected in a market that is at least reasonably efficient, the R20 measure explained only 3.2% of the market's total variation. For the longer returns, the R20 variable was again highly significant, and estimated that a one unit increase in the R20 measure would cause a decline of nearly 0.7% over six months and almost 1.2% over twelve months.[3] Using the PE as the explanatory variable produced similar coefficient estimates, though at lower levels of significance.

The results in presented in Table 2 ignore opportunity costs, however. By investing in risky assets in the stock market, investors forego riskless returns from government securities. Thus, the return offered by government securities may be thought of as the opportunity cost of being in the stock market. So, the market return less the riskless return is the gain (or loss) that investors receive from investing in stocks. Relative returns, the return on the market less the Treasury bill yield for each forecasting length, measure how well the Rule of 20 and PE ratios predicted this gain (Table 4).

Other than at the highest level, PE ratios again performed poorly in forecasting quarterly relative returns, and only slightly better with 6-month returns. In both cases, the returns associated with the middle quintile were very high, and relatively low returns followed the second-lowest quintile. PE ratios forecasted the longer returns much better, as the lower quintiles had higher returns. However, the Rule of 20 measurements worked extremely well, even in the short-term. Other than a very high Quintile 4 quarterly return, the returns were ordinal in their quintiles for all three time periods, and there was difference of over 10% between the 6-month returns of the highest and lowest quintiles and over 16% between the yearly returns of the extreme quintiles. Regression statistics for the data are presented in Table 5. The coefficients were very similar to those estimated using the raw returns, but the R20 measure showed much more explanatory power than the PE ratio. Only one PE coefficient was significant at the 5% level, while all R20 coefficients were significant at 1%. Additionally, the R20 measure explained over 13% of the market's yearly variation.

Considering these results, the Rule of 20 was at least moderately successful in forecasting even short-term stock market movements, and the success rate increased with the length of the forecast. It is also clear that the Rule of 20 was an improvement over the market PE ratio for each forecast length. However, knowing that something has worked in the past is not a guarantee that it will continue to work; unfortunately, there is no way to know whether this same relationship will hold in the future.

**TABLE 4**
**Relative Market Changes by Quintile 1935-1995**

| PE Quintile | Average S&P Index relative change over next: 3 months | 6 months | 12 months |
|---|---|---|---|
| 1 (highest) | -0.76% | -1.78% | -1.80% |
| 2 | 0.66% | 2.45% | 2.84% |
| 3 | 3.44% | 3.90% | 4.27% |
| 4 | -0.19% | 2.14% | 6.31% |
| 5 (lowest) | 2.01% | 4.02% | 8.79% |

| R20 Quintile | Average S&P Index relative change over next: 3 months | 6 months | 12 months |
|---|---|---|---|
| 1 (highest) | -2.21% | -4.15% | -3.60% |
| 2 | 0.18% | 0.96% | 1.12% |
| 3 | 1.22% | 2.11% | 4.51% |
| 4 | 3.35% | 4.73% | 5.45% |
| 5 (lowest) | 2.67% | 7.11% | 12.87% |

Relative change is measured by the percent change in the S&P Index less the Treasury bill yield for each time period.

## A STRATEGIC TEST

In hopes of showing the value of the forecasting knowledge of PE ratios, Bleiberg (1989) did a quick asset allocation experiment with his data. He questioned: "If I had known of this relationship 25 years ago, would it have been useful?" He answered this question by recalculating the PE quintiles *without* the 25 most recent years of data, then used a simple asset allocation model to guide his portfolio choices between stocks and bonds.

In his model, he rebalanced his stock and bond portfolio quarterly based on what the PE ratio told him. If the PE ratio was in the range of his middle quintile, his model told him to invest equal amounts in stocks and bonds. For each higher (lower) quintile, he shifted X% of his money from stocks to bonds (bonds to stocks) with X taking on values of 5%, 10%, 15%, 20%, 25%, and 0%. The 0% Move portfolio represents a buy-and-hold portfolio equally weighted between stocks and bonds. Table 6 presents the actual portfolio weights for each strategy.

Bleiberg's results showed that the PE strategy failed to dominate buy-and-hold portfolios of similar risk. I replicated this exercise with my most recent 100 quarterly observations using the Rule of 20 measure.[4] I formed new R20 quintiles from the 1935-1970 data and used them to guide the allocation between stocks and Treasury bills from 1971-1995. The results, presented in Table 7, show the R20 measure to be an excellent asset allocation device. Using the Rule of 20 measure, all five strategies completely dominated a buy-and-hold strategy, producing both higher returns and *lower* standard deviations than the static 50/50 mix. No matter what level of aggressiveness chosen (size of move), the R20 asset allocation strategy beat the buy-and-hold strategy by both increasing return *and* decreasing volatility. In fact, the portfolios' Sharpe measures increased with the level of aggressiveness chosen.

**TABLE 5**
**Regression Estimations 1935-1995**
**(standard errors in parenthesis)**

**Panel A: Relative Return = $\alpha + \beta$ PE Ratio**

| Relative Return | Intercept | PE Coefficient | $R^2$ |
|---|---|---|---|
| 3-month | 3.809%* (1.74%) | -0.200 (0.120) | 1.1% |
| 6-month | 9.542%** (3.60) | -0.535%* (0.249) | 3.7% |
| 12-month | 17.085%* (7.38%) | -0.926% (0.509%) | 5.3% |

**Panel B: Relative Return = $\alpha + \beta$ R20 Measure**

| Relative Return | Intercept | R20 Coefficient | $R^2$ |
|---|---|---|---|
| 3-month | 5.840** (1.66%) | -0.267%** (0.087%) | 3.7% |
| 6-month | 15.389%** (3.90%) | -0.732%** (0.207%) | 9.4% |
| 12-month | 29.291%** (8.66%) | -1.360%** (0.456%) | 13.1% |

** = significant at 1% level, * = significant at 5% level

## CONCLUSION

Again, however, the results of this experiment do not mean that following the Rule of 20 will guarantee wealth or even beat a buy-and-hold strategy in the future. What this experiment and the results using the last 60 years of data do show is that while market PE ratios have provided some clues on which way the market subsequently moved, the Rule of 20 measure has had an even better forecasting record. Over the last sixty years, the R20 measure showed excellent forecasting ability even over periods as short as three months. In general, the lower the R20 measure, the more the market moved upwards; the highest R20 measures were typically followed by market declines.

If this past relationship does continue to hold, investors may be able to use this information to increase their returns by avoiding “overvalued” markets. While the strategy has not worked in every quarter since 1935, it has worked on average over the long-term. An investor who demands 100% accuracy from an asset allocation device will probably never find one that is satisfactory. An investor who uses an asset allocation device that is sometimes wrong but more often right will likely realize higher returns. The PE ratio appears to fit in this category, as high PE’s have signaled “overvalued” markets in the past. And if the Rule of 20 continues to be an improvement over the PE ratio, those who follow The Rule will shift the probability of avoiding “overvalued” markets even more in their favor.

## REFERENCES


1. Bleiberg, Steven, “How Little We Know,” *Journal of Portfolio Management* 15, Summer 1989, pp. 26-31.

2. Good, Walter R., “When are Price/Earnings Ratios Too High – or Too Low?” *Financial Analysts Journal* 47, July/August 1991, pp. 9-25.

## TABLE 6
### Asset Allocation Portfolio Strategies

| R20 Quintile | Size of Move 5% | 10% | 15% | 20% | 25% | 0% |
|---|---|---|---|---|---|---|
| 1 (highest) | 40 | 30 | 20 | 10 | 0 | 50 |
| 2 | 45 | 40 | 35 | 30 | 25 | 50 |
| 3 | 50 | 50 | 50 | 50 | 50 | 50 |
| 4 | 55 | 60 | 65 | 70 | 75 | 50 |
| 5 (lowest) | 60 | 70 | 80 | 90 | 100 | 50 |

The table presents the portfolio weights given to the stock market index given the current level of the R20 measure, for different levels of aggressiveness. The remainder of the portfolio is invested in Treasury bills. The quintiles are formed using 1935-1970 data.

"Size of Move" varies the aggressiveness of the strategy. A 0% move is a completely passive strategy. A 25% move is very aggressive, allocating as much as 100% of the portfolio to equities when R20 is in its lowest historical quintile.

## TABLE 7
### Asset Allocation Performance, Rule of 20 Quintiles, 1971-1995

| Strategy | Annualized Return | Standard Deviation | Sharpe Ratio |
|---|---|---|---|
| 5% Moves | 9.17% | 15.82% | 0.137% |
| 10% Moves | 9.34% | 15.48% | 0.152% |
| 15% Moves | 9.55% | 15.41% | 0.165% |
| 20% Moves | 9.79% | 15.66% | 0.178% |
| 25% Moves | 10.08% | 16.23% | 0.190% |
| 0% Moves (Static Portfolio) | 9.03% | 16.40% | 0.124% |

The panel presents the returns, standard deviations, and Sharpe ratios realized by the strategies presented in Table 6 using the R20 measure, with differing levels of aggressiveness (0% Moves = least aggressive, 25% Moves = most aggressive).

## ENDNOTES

1. For example, see "Flaws in Market Gauges Make Stocks Seem Expensive," *The Wall Street Journal*, February 7, 1995, p. C1 or "A Doomsayer's Guide to Spotting a Bear Market," *The Wall Street Journal*, June 3, 1996, p. C1.

2. The method of annualizing quarterly inflation to obtain an estimate of yearly inflation generated two extreme outliers due to price controls lifted after World War II. In two quarters of 1946, quarterly inflation estimates annualized to yearly inflation of over 25%, yielding R20 measures of 39 and 58. Because both of these estimates were so out of line with the rest of the data, they were excluded from this analysis. With these two outliers, the R20 measure had a mean of 17.99 and a much higher standard deviation of 5.77. However, the inclusion of these two data points did not alter the forecasting results.

3. In order to avoid estimation problems caused by overlapping forecast errors, data was taken every six months (or every year for the yearly return) starting from the first observation in the sample. Using data beginning with the second observation produced similar coefficient estimates, with the R20 variable always statistically significant.

4. In this exercise, trading is assumed to be costless. Each strategy requires a maximum of four trades per year which involve moving money between an index fund and a T-bill fund. Since many discount investment companies do not charge for such transactions, this assumption does not appear to be unrealistic for investors today.