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Combining Value and Capital Return Strategies

[Value and Growth Investing: Evidence from NYSE listed firms in the Period 2004-2010]

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Preface

In front of you lies not only my thesis but a part of my lives story. I am proud to have been able to finish this thesis, although the process was long and filled with drawbacks. I would like to take the opportunity to thank my supervisor, dr. Qin, for his invaluable advice and guidance throughout this journey. I appreciate his understanding of my health problems. I am indebted to my parents, Ria and Gé, for their care and support, even though my thesis subject has remained mysterious to them. Finally I would like to thank Esra for her love, support and understanding.

"To laugh often and much; to win the respect of intelligent people and the affection of children; to earn the appreciation of honest critics and to endure the betrayal of false friends. To appreciate beauty; to find the best in others; to leave the world a bit better whether by a healthy child, a garden patch, or a redeemed social condition; to know that even one life has breathed easier because you have lived. This is to have succeeded."

— Ralph Waldo Emerson

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Value and Growth Investing: Evidence from NYSE listed firms in the Period 2004-2010

Rowan Nijboer

Abstract

Do investors get higher returns by investing in value stocks instead of growth stocks? For many years, academics and investment authorities have claimed that value strategies beat the market. These value strategies appeals for buying stocks that have low prices compared with earnings, dividends, book assets, or other measures of fundamental value. Although there is some agreement that value strategies create higher returns, the interpretation of why they do so is more debated. This thesis offers by means of a multiple regression analysis weak confirmation that value strategies produce higher returns. For the 1-dimensional value strategies, the t-tests have shown significant value-premium for returns classified by *P/B* and *P/C*. This thesis combined simple value strategies with capital return strategies. For the 2-dimensional value strategies the t-tests showed significant returns classified by combinations (*P/C*; *ROA*) and (*P/C*; *ROC*) only.

Keywords: Investing, Glamour, Value, Value-Premium, Portfolios.

CONTENTS

1. INTRODUCTION

In 2008, profiting from the increasing price of his company Berkshire Hathaway, Warren Buffet became the world's wealthiest men with a fortune of about $ 62 billion. His company posted a compounded annual gain between 1965-2007 of 21.1 percent, more than double the S&P 500 gain in the same period. This value approach was first developed in 1934 by Benjamin Graham who argued in his famous book, *security analysis* (2008), that out-of-favor stocks are often underpriced in the market and that investors who recognize this can earn significant returns. This philosophy is now widely known as value investing (Elze, 2010). Value stocks have a lower market price then their intrinsic value, and investors in this area believe that share prices will eventually evolve to meet the intrinsic value. Although value investing is defined differently since its inception, it generally involves buying shares which appear to be underpriced based on fundamental analysis. Value investing strategies focus on buying shares with low prices relative to book value, earnings, cash flow or other measures of value. Glamour or growth investing is characterized by a valuation metric at the opposite end of the spectrum. The difference between the return on value and glamour stocks is defined as the value premium (Zhang, 2005). Over the years, various researchers have documented the value premium. Basu (1977) found that value investing strategies produce abnormal returns on a risk-adjusted basis. Chan, Hamao, and Lakonishok (1991) studied Japanese data and found strong support for abnormal performance of value investing strategies. According to Lakonishok, Schleifer and Vishny (1994) value stocks were characterized by higher Sharpe ratios[1] and lower levels of volatility relative to glamour stocks. Piotroski (2000) demonstrated that the healthiest value companies offer both higher returns and stronger-financial results. The author argued that common measures of risk do not support the argument that the return difference is due to higher risks of value stocks. Moreover, Chan and Lakonishok (2004) came to the final conclusion after weighing all value studies so far that value stocks are not riskier than glamour stocks. More recently, the Brandes Institute (2010) expanded on the previous study and found that value stocks have outperformed glamour stocks in developed and emerging markets as well as in most individual developed nations since 1980. By using traditional measures of risk such as standard

[1] The Sharpe ratio measures the risk premium per unit of deviation in an asset, typically used as a measure of risk (Sharpe, 1992).

deviation, the results across all markets show value stocks historically delivered higher returns with commensurate lower levels of volatility.

While there is quite some agreement that value investing produces positive market adjusted returns, it is less clear why this strategy is successful. Researchers offer two competing arguments for why the value premium exists, namely this is based on risk-taking and investor behavior. Fama and French (1992) took the position of the efficient market hypothesis (EMH) and attributed the higher returns of value strategies to their increased risk. The other perspective comes from Lakonishok et al. (1994) who demonstrated that the value premium was caused by behavioral influences. Both explanations are fundamentally different since the Fama and French stream argued that abnormal returns are only possible at higher levels of risk while behavioralists argue that abnormal returns are possible at no higher risk.

Behavioral researchers believe that investors consistently tend to overpay for growth stocks that subsequently fail to live up to expectations (Kahneman and Riepe, 1998; Gilovich, Griffin and Kahneman, 2002). From this perspective, value strategies produce higher returns because they are contrary to naive strategies followed by most investors. These naive strategies might range from extrapolating past earnings growth too far into the future, to assume a trend in stock prices, to overreact to good or bad news, or to simply equating a good investment with a well run company irrespective of price. Regardless of the reason, some investors tend to get overly excited about stocks that have done very well in the past and buy them up, so that glamour stocks become overpriced. On the other side, similarly, investors overreact to stocks that have done very poorly, oversell them, and therefore these out-of-favor value stocks become underpriced. Lakonishok et al. (1994) are major contributors in this field and they suggest that value stocks have delivered superior returns because their valuations suffers from behavioral errors. Most empirically recognized errors are extrapolation, myopia, overconfidence, loss aversion.

Most of the research evidence on value investing strategies undermines the EMH. In an efficient capital market, prices fully reflect available information and adjust to new information in a rapid and unbiased fashion. As a result, prices provide unbiased estimates of the underlying values. No known trading rule or security selection strategy which uses only publicly available information would provide an investor with the ability to earn, on average, positive abnormal returns in a market that is efficient in the semi-strong sense. Thus, a finding that common stocks selected, using a readily available, widely disseminated set of rules which requires only publicly available information for decision-making purposes, earn on average, positive market adjusted returns represents strong contradictory evidence regarding the semi-strong form of the EMH. The purpose of this paper is to present such a finding. The evidence reported here might represent an addition to the accumulating body of evidence on the existence of possible inefficiencies in the market. In the academic world such a finding is often called an anomaly.

Furthermore, previous studies have examined simple one dimension value studies extensively. Most researchers find that simple value strategies outperform growth strategies. Simply analyzing these value strategies does not add real value to the academic world. Therefore this paper aims to add value in a relatively understudied area by combining simple value strategies with a capital return strategy. Capital returns are often a synonym for the competitiveness or quality of a company. There are reasons to think that such a combination will produce superior returns and it is the intention to evaluate this method. It is based on the same argumentation as Warren Buffet who advocates buying good companies at a bargain price rather than buying just cheap companies.

Two important practical implications from this study for investors are the following. First, if value investing strategies produce positive market adjusted returns in the long run this is highly interesting for all sorts of investors. Second, a more complicated reasoning based on the explanation by Fama and French (1992 and 1996) that higher returns are produced at higher risks. They explain whenever this is the case it can be expected that these value strategies should underperform during periods of deteriorating economic conditions. The logic behind this expectation is that when investors demand high returns this can only come at high risks. The high risk strategy in this case is the value portfolio. This is confirmed by Lakonishok et al. (1994) who stated that from a classic asset allocation point of view one would only invest in a value portfolio if someone is risk seeking. On the other side, if these market adjusted returns cannot be explained by measures of risk, then bad economic conditions should not lead to a lower, but instead may improve performance. This is highly interesting for investors because if these value strategies perform well during bad economic conditions then these strategies offer another significant advantage in protecting portfolios against significant losses. Therefore, in order to test if a high return and high risk go hand in hand the underperformance of the value portfolio should be realized in times of market declines (Lakonishok et al., 1994).

While most one-dimensional value studies focus on the extreme bull market from 1982-2000, this study will include a severe market and economy decline not incorporated in other major papers. Another more important reason for including a period of market downturn is, that according to Fama and French (1992, 1996) stream, it can be expected that value strategies should underperform in market downturns. However, a majority of researchers acknowledge the positive performance for value strategies in times of bad economic conditions even after accounting for risk. This paradox is highly debated among academics and an analysis in a period of general market downturn gives the opportunity to examine which stream is correct, the EMH or the behavioristic stream.

Summarized, besides the 1 and 2-dimensional value strategies, the major contribution of this thesis is that simple value strategies are combined with the capital return variables in one regression model. This multivariate regression analysis strives to find a significant positive relation between stock returns and the value and capital return strategies. The finding of this thesis by means of a multiple regression analysis is that weak positive relations have been found between value strategies and returns. Concerning the 1-dimensional value strategies, the t-tests showed significant value-premium for returns classified by *P/B* and *P/C*. The combined simple value strategies with capital return strategies, namely the 2-dimensional value strategies, showed significant returns classified by combinations (*P/C*; *ROA*) and (*P/C*; *ROC*) only.

This paper is structured as follows: Section 2 presents more relevant literature about value investing and three value metrics that this paper adopts to distinct value from growth stocks. Furthermore, literature about combining value and quality is presented. Section 3 presents the hypothesis development. Sections 4 and 5 provide the data description and methodology, respectively. Section 6 presents and discusses the results. And finally this paper will come up with an extensive discussion of the results and completes with limitations and further recommendations.

2. LITERATURE REVIEW

In order to understand the line of reasoning behind the hypotheses a better understanding of the literature background is essential.

An important finding in research is that low price to earnings (*P/E*) stocks in general outperform high *P/E* stocks (Basu, 1983). However the efficient market stream explains this finding by suggesting this is an anomaly and that in general markets are efficient, hence outperformance of the market is not possible. Furthermore there is also skepticism whether a value investing strategy based on forming portfolios by simple value metrics is truly effective (Brush, 2007; Sareewiwatthana, 2011; Malkiel, 1999). The *P/E* ratio is the most well-known ratio of investing and is often reported in financial newspapers. At first sight the *P/E* is an awkward number. The numerator is market based and therefore forward-looking while the denominator is often a historical figure over the last accounting period. Yet, this ratio remains the single most popular measure for stock valuation in practice (Truong, 2009). Some argue that it is difficult to manipulate the *P/E*, simply as the price is taken from the stock market (Nicholsen, 1960; Ball, 1978). This is not always true as the earnings are more or less arbitrary in the short run. For instance, firms can capitalize expenses and accrue earnings and thereby they can shift the earnings to satisfy investors and other insiders. It becomes even more complex when earnings measurements have to be compared under different accounting standards in different markets. Proponents of the EMH argue that market participants can see through earnings and therefore investors cannot be fooled and, profiting from mispriced stocks is not possible. However, many authors argued that stocks with low *P/E* outperform stocks with high *P/E* on a risk adjusted base (Chan et al., 1991; Oppenheimer, 1984; De Bondt and Thaler, 1985). The prevalent argumentation for this comes from the behavioristic field. Behaviorists believe that investors consistently tend to underpay for value stocks (low *P/E* ratio) that subsequently beat market expectations (Kahneman and Riepe, 1998). Value strategies produce higher returns because they are contrarian to growth strategies followed by the majority of investors. These naive growth strategies range from assuming a trend in stock prices, overreacting to news, or equating a profitable investment with a super company irrespective of looking at price paid, or simply by extrapolating past earnings growth to far in the future (Elze, 2010). This is confirmed by Stickel (1998) who documents that analysts mostly recommend firms with strong recent performance (high *P/E, P/C, P/B* stocks with positive momentum). Moreover, investors tend to get overly excited about stocks that were showing fantastic returns in the past and therefore these growth stocks become too expensive. Vice versa, investors overreact to stocks that have done poorly, they oversell them, and therefore these value stocks become underpriced.

3. HYPOTHESES

3.1 SIMPLE VALUE STRATEGIES

This paper will follow this behavioristic argumentation from the majority of researchers and hence the first hypothesis is:

Hypothesis 1: Portfolios with low P/E ratios produce positive risk adjusted returns.

Others argue that instead of earnings, cash flows cannot be manipulated (Oppenheimer, 1984; De Bondt and Thaler, 1987). Although cash flows can be partly manipulated by creative accounting it is way more difficult. Hence, the price to cash flow ratio (*P/C*) is probably a better measurement of value. Low *P/C* stocks are often oversold and therefore these assets become mispriced which gives possibilities for abnormal returns. Subsequently these low *P/C* stocks tend to beat investor expectations regularly and hence share prices rise significant. On the other hand, high *P/C* stocks (growth stocks) fail to live up the high expectations and therefore decline significantly. First reason for a decline comes from the weaker cash flow than expected (denominator), followed by decline in price (numerator) to maintain the same ratio level. Second, the high multiple is no longer justified since growth is less than expected and therefore share prices decline significant. The opposite is the case for value stocks which first beat expectations (denominator) and lead to higher future expectations which will be illustrated by a higher multiple. Hence share prices can increase significantly. The reasoning behind the *P/C* ratio is equal to the *P/E* and hence expected that low *P/C* portfolios produce abnormal returns while high *P/C* portfolios should underperform the market. In conclusion, expected can be that the *P/C* ratio is a better measurement of value and for that reason the low *P/C* portfolio is expected to outperform the market slightly more significantly than the low *P/E* portfolio. Moreover, this leads to the following hypothesis:

Hypothesis 2: Portfolios with low P/C ratios produce positive risk adjusted returns.

Another well-known value metric is the classic price to book (*P/B*) ratio. Bird and Whitaker (2004) concluded that the *P/B* is the best measure of value compared to the others. The major contribution in this field is from Piotroski (2000) who examined the performance of the *P/B* ratio in combination with company's financial condition. Piotroski (2000) concludes that by holding a portfolio with low *P/B* and financial strong stocks the mean return can be increased by at least 7.5% annually. In addition, an investment strategy that buys expected winners (low *P/B*) and shorts expected losers (high *P/B*) generates a 23% annual return between 1976 and 1996 and is robust overtime. Furthermore, as mentioned previously Fama and French (1992, 1996) found that low *P/B* portfolios generally offer significant future returns in major stock markets in the world which is also confirmed by Lakonishok et al. (1994). The logic behind the aforementioned proposition is based on the same reasoning as for the *P/E* and *P/C*. Bird and Whitaker (2009) explain the success of this value strategy in one clear behavioral based sentence. The authors suggest that the outperformance is a premium to compensate for the discomfort associated with holding value stocks. And in this respect a negative premium for the comfort of holding glamour stocks. Contrary evidence comes from Malkiel (1999) who argued that low *P/B* portfolios do not outperform the markets on a risk adjusted base. However, again the majority of authors concluded that low *P/B* portfolios produce positive market adjusted returns on a risk adjusted base (Sharpe, 1992; Bantz, 1981; Rosenburg, Reid and Lanstein, 1985). Hence, the following hypothesis:

Hypothesis 3: Portfolios with low P/B ratios produce positive risk adjusted returns.

3.2 COMBINING VALUE AND QUALITY

The fundamental ratios in hypothesis 1-3 are simple one dimensional value measures. The majority of researchers acknowledge the superior performance of portfolios existing out of standalone value ratios (Fama and French, 1992, 1996; Lakonishok et al., 1994). Even after adjusting for risk the superior performance keeps in place (Sharpe, 1992; Bantz, 1981; Rosenburg et al., 1985). Therefore, in this paper the expectation is that these value strategies will show a positive market adjusted return. Since one dimensional value strategies are researched extensively there is no additional value by focusing merely on fundamental value ratios.

This thesis aims to add value in a relatively new and understudied area. The purpose of this paper is to extend the previous analysis and to discover new strategies which combine value and capital return variables. The limited research in this field comes from Elze (2010), who names the strategy of combining simple value metrics (e.g. *P/E, P/C, P/B*, dividend yield) with capital returns (i.e. Return on Capital, Return on Equity), "the consistent earner strategy". Elze found that this consistent earner strategy slightly outperformed simple value metrics. Moreover, statistical significance improved drastically. Elze (2010) states further that the consistent earner strategy somewhat quantifies Warren Buffett's modernized approach to value investing. Buffett specified that it is better to buy an outstanding company at a reasonable price than a mediocre company at a cheap price. According to Buffet an outstanding company, with a competitive advantage, can be recognized by high capital returns, which in turn should lead to abnormal returns (Hagstrom, 1995). This approach is different from Graham (2003) who preferred generic firms at a bargain price.

Greenblatt (2005) exhibited that by combining cheapness and quality an annual return of 31% can be reached in the years 1988-2004. In this theory cheapness stands for companies with high earning yields, basically the reciprocal of the *P/E* ratio. Quality is measured to the degree to which firms use their capital productive. Quality firms find it easy to turn investments into increased profits without the need for outside capital. Most of these companies have a competitive advantage. In the study of Greenblatt (2005) this is measured by the return on capital employed.

The logic for the significance of performance for this combined value strategy is again arising from human and behavioral biases. Most of times the stocks that are expected to outperform are out of favor. Companies with negative future forecasts or companies threatened by harmful events. Stock prices of companies in these situations are punished by the investment world. However, in many cases stock prices are pushed irrationally far downwards (Piotroski, 2000). Moreover expectations decrease which lead to even further declines in stock prices by downward pressure on for instance a non-sustainable *P/E* ratio (Hagstrom, 1995). When companies can turn around those negative appearances and even beat expectations huge upwards increases in share prices may lay ahead (Greenblatt, 2005).

Although the logic and execution of this strategy is not complex, in practice not many investors apply a strategy of combining price and quality. According to Greenblatt (2005), this is exactly the reason why this anomaly on the efficient market hypothesis works and will keep working in the future. Greenblatt explicitly named two reasons why investors restrain from following this method. First, as mentioned utmost cheap quality firms on this list are out of favor, investors are afraid to buy those shares for the reason of uncertain future prospects. Secondly, and this is also mentioned by Graham (2003), this method is long term based and does not function properly every single year. Investors are keen to outperform the market every single year or else they will reallocate their capital. More or less the same counts for Buffett's method (Hagstrom, 1995). Many investors claim they invest according to Buffett's investment strategies. Though, investors interpret this strategy in a more qualitative way (Qian, Sorensen and Hua, 2009). This probably leads to imperfect and more emotional driven portfolios compositions. Consequently applying value strategies in a consistent and disciplined manner can enhance performance significant (Elze, 2010). Graham (2003) was probably right when he argued that investors should let numbers speak.

Previous researchers as Piotroski (2000) controlled solely for capital return ratios but never have mutually studied their effects with the fundamental value ratios. Combining the before mentioned two strategies can separate poor and strong value firms and may lead to a higher percentage positive performers in a value portfolio (Piotroski, 2000).

Hypothesis 4: Forming portfolios by combining top ranked value and quality stocks outperform simple value portfolios.

4. DATA

The sample period consists of 7 years and starts on January 1, 2004 until December 31, 2010. For this research data will be collected from the NYSE, which contains the largest firms listed in the US. The reason for choosing the NYSE is threefold. First, the need to derive to a universe representative for an institutionally sized investor and therefore only the largest public listed firms are included. Second, in this way also the problem with thin trading is avoided (Lakonishok et al., 1994). Third, large firms are less contaminated by significant look ahead and survivorship bias (Piotroski, 2000)[2]. In case a stock is delisted for whatever reason during a year, we will continue with the same portfolio using the return of that stock at the time it was last traded (Elze, 2010).

The sample selection process follows Fama and French (1992) and includes all New York Stock Exchange (NYSE) firms. All of the research variables are gathered from the Thomson One Banker database. Stock returns are measured from January 2005 through December 2010. Using the Fama and French (1992) methodology, the portfolios are formed in December of each year starting in 2004 and ending in 2009. The hypothesized ratios P/B, P/C and P/E; capital return variables ROA and ROC; the control variables market capitalization (firms' size), leverage ratios and firms' volatilities are all gathered from the Thomson One Banker database; and finally the dummy variables accounting for firms' cross listing, industry and percentage of insider ownership are also gathered via Thomson One Banker database. The returns are defined as the buy-and-hold return for the 12 months after portfolio formation, starting at the end of December 2004. The financial variables from year t are matched with the returns of year t+1. Monthly returns are derived from the monthly stock prices and the yearly dividends collected via Thomson One Banker database and will be calculated as follows:

$$\boxed{R_{it} = \frac{D_{it+1} + P_{it+1} - P_{it}}{P_{it}}} \qquad \text{EQ. 1}$$

[2] Look ahead and survivorship bias are common types of sample selection biases. The first is created by the use of information or data in a study or simulation that would not have been known or available during the period being analyzed. This will usually lead to inaccurate results in the study or simulation. To avoid this bias we calculated ratios based on data available at the time of portfolio formation and reformation, not from revisions published thereafter. The second bias occurs, for example, when back testing an investment strategy on a large group of stocks. Then it may be convenient to look for securities that have data for the entire sample period.

P_t represents the share price at the beginning of the period (July 1), P_{t+1} represents the share price at the end of the period and D_{t+1} represents the dividend per share received during the period. The most firms listed on the NYSE have their fiscal year end on December 31. In this study the January 1 – December 31 window is tested to match firms' accounting period. In this way windows for return calculation are firm-specific, based on their fiscal year end.

The return will be calculated with the market adjusted return. This means the individual stock return minus the risk free return. Stock return data are adjusted so that dividends and stocks splits are included/ adjusted for. Transaction costs are not included.The adjusted returns in formula is defined as:

$$Radj_{it} = R_{it} - R_{ft} = \frac{D_{it+1} + P_{it+1} - P_{it}}{P_{it}} - R_{ft} \qquad \text{EQ. 2}$$

5. METHODOLOGY

5.1 ONE-DIMENSIONAL RETURN CLASSIFICATION

Chan, Hamao and Lakonishok (1991) analyze the returns in relation to, what they call the fundamental variables. They form a one-dimensional classification by these fundamental variables by sorting the stock returns by these various measures of value. They conduct an analysis of the relation between stock returns and fundamental variables at the portfolio level. These fundamental variables are $(E/P)_{pt}$, the average earnings yield for portfolio p in month t, $(LS)_{pt}$ the average of the natural logarithms of market capitalizations of firms in portfolio p in month t; $(B/M)_{pt}$, the average book-to-market value for portfolio p in month t, and $(C/P)_{pt}$, the average cash flow yield for portfolio p in month t. They form 4 groups of equal size for positive values of the fundamental variable, and where necessary a separate group contains those stocks with negative values of the fundamental variable. They form the portfolios on the basis of these fundamental variables known to investors as of the end of June for firms with March 31 fiscal year-ends. The accounting information in their data changes on the announcement month. Even if the accounting data are not publicly released three months after the end of the fiscal year, or if the fiscal year does not end in March, they end up using outdated information from the prior fiscal year. The fundamental variables change every month because of the fluctuations in stock prices.

Elze (2010) classifies the returns in 10 deciles for portfolio strategies based on one-dimensional classifications by the value measures *DY* (dividend yield), *P/B* and *P/E*. Unlike Chan et al. (1991), Elze (2010) does not form a group of returns for negative values of the value measures. Elze (2010) sorts the stock returns in descending order based on *P/E* and *P/B* and in ascending order based on dividend yield (*DY*). The value portfolio refers to the decile portfolio containing stocks ranking lowest on *P/E* or *P/B*, or highest on dividend yield (*DY*). The glamour portfolio contains stocks with precisely the opposite set of rankings. Elze (2010) forms the portfolio yearly at the beginning of July. Elze (2010) states that if a stock is delisted from the stock exchange during a year that they continue with the same portfolio using the return of that stock at the time it was last traded until the end of the observation period.

5.2 TWO-DIMENSIONAL RETURN CLASSIFICATION

Besides a one-dimensional classification, Lakonishok, Schleifer and Vishny (1994) combine value investing variables *C/P* and *E/P* with *GS* (the average growth rate of sales 5 years prior the formation of the portfolios). I.e., they sort the returns on two variables. Elze (2010) also combines accounting ratios following the selection procedure of Lakonishok et al. (1994). This research will form the 2-dimensional classification of portfolio returns in the same manner and apply the Consistent Earner Strategy of Elze (2010). Since the returns are sorted on two variables, sorting stocks into deciles on each variable is unpractical. Accordingly, the stocks are independently sorted into three groups, namely (1) top 30%, (2) middle 40% and (3) bottom 30% by two variables. First the stocks are independently sorted in descending order by *P/B, P/C, P/E* in the three groups, and second independently from the first sort, sorted in ascending order by the capital return variables *ROC* and *ROA* in the three groups. By taking the interceptions of both of the sorts nine groups are formed. By combining the ratios and capital return variables, the purpose is to test hypothesis 4, namely whether combining value and quality stocks outperform the simple value portfolios.

5.3 REGRESSION MODELS

Besides, the analysis of one- and two-dimensional portfolio strategies which define glamour and value portfolios, also a regression model is employed to measure the effects of the individual accounting variables on the returns. Previous research has acknowledged a variety of variables that can express glamour and value portfolios. In this paragraph the question is asked, which of these variables are significant in a multiple regression. For this purpose this research follows the method of Fama and MacBeth (1973) methodology to run monthly regressions from December 2004 through December 2010:

$$R_{it} - R_{ft} = \alpha_0 + \sum_{j=1}^{5} \beta_j Year_i + \sum_{k=1}^{11} \gamma_k Ind_i + \delta_1 FR_{it} + \delta_2 CR_{it} + \delta_3 FR_{it} CR_{it} + \delta_4 \ln(TA_{it}) + \delta_5 Lev_{it} + \delta_6 Vol_{it} + \delta_7 CL_{it} + \delta_8 IO_{it} + \varepsilon_{it} \quad \text{EQ. 3}$$

$R_{it} - R_{ft}$ is firm i's risk-adjusted return in month t; to make the interpretation of regression outcomes easier, the hypothesized ratios in this regression analysis are inverted and so the FR_{it} is firm i's price multiplier, represented by earnings-to-price (E/P), cash flow-to-price (C/P) and book-to-price (B/P) in month t; CR_{it} is firm i's capital return variable denoted by Return on Capital (ROC) and Return on Assets (ROA) in month t; $Year_i$ is firm i's year dummy variable; Ind_i is firm i's industry dummy variable; FR_{it} CR_{it} is firm i's moderating variable represented by the product of the price multiplier with the capital return variables in month t; $ln(TA_{it})$ is a proxy for firm i's size (the logarithm of total assets) in month t; Lev_{it} is firm i's leverage in month t; Vol_{it} is firm i's price volatility in month t; CL_{it} is firm i's cross listing dummy variable in month t; IO_{it} is firm i's insider ownership dummy variable in month t. α_0, β_j, γ_k, δ_l are the parameters to be estimated and ε_{it} are the residuals. Independent variables are winsorized at the 1% and 99% levels to limit the impact of outliers. According to Houge and Loughran (2006) the Fama-MacBeth (1973) procedure offers several benefits. First, it does not force firms into growth or value portfolios, so it accounts for the complete spectrum of price multipliers and capital market returns across each monthly regression. Second, the analysis weights the monthly regressions equally. Months that contain few firms have the similar influence as months with many firms. As Fama and French (1992) also use the Fama-MacBeth methodology, the analysis of this thesis can easily be compared to results in the literature. Since the research sample includes multiple years and multiple industries, this thesis takes account of year and industry fixed effects. To do so, year dummies and industry dummies are included in the regression model. For the industry dummy variables the Fama-French 12 industry classification are considered. In Appendix I the classification scheme can be read. The depicted model in Eq. 3 is estimated to test Hypotheses 1-4. Hypothesis 1-3 is tested by testing the significance of the parameter estimates of the individual pricemultipliers. Hypothesis 4 is tested by including a moderating variable, namely the product of the price multipliers and the capital returns variables.

Eventually a cross-sectional time-series regression model is estimated, which accounts for the year effects for each stock in the sample. The year effects are captured by the year dummy variables. For each of categorical variables $Year_i$ and Ind_i a dummy variable is created to capture each of the year in the sample. In the case dummy variables for all categories were to be included, their sum would be equal to 1 for all of the observations, which is identical to the elements of the constant term. This would consequence in perfect multicollinearity, however 1 category is dropped to prevent the dummy variable trap. Eventually, 5 dummy variables for year variable and 11 dummy variables for industry variable is created. The dropped category acts as a reference category.[3]

5.4 BACKGROUND INFORMATION ON RESEARCH VARIABLES

A standard way to evaluate the value of a company is by its fundamental ratios. The simplicity and usability of these valuation metrics makes them the favorites of institutional and retail investors. In this research, the relationship between the fundamentals and risk adjusted returns of NYSE stocks is measured. The goal is to analyze how several well-known ratios, specifically, *P/E, P/C, P/B* are related to risk adjusted returns.

5.4.1 FUNDAMENTAL RATIOS

Price-to-earnings (P/E)

The *P/E* ratio of a stock is equal to the price of a share of the stock divided by per share earnings of the stock. The investment community has long used *P/E* ratios, to determine if individual stocks are under- or overpriced. Economists have argued that the average *P/E* ratio for a stock

[3] To get a quick review of the variable definitions, a table of variable definitions is added to Appendix II.

market index such as the Dow Jones Industrial Average can help predict long-term changes in that index. According to this perspective, a low *P/E* ratio tends to be followed by fast growth in share prices in the subsequent decade and a high *P/E* ratio by slow growth in share prices (Shen, 2000).

Price-to-Cash flow (P/C)

P/C ratio is calculated with a similar approach to what is used in the other price-based metrics. The *C*, found in the denominator of the ratio, is obtained through a calculation of the trailing 12-month cash flows generated by the firm, divided by the number of outstanding shares. There are several advantages that the *P/C* holds over other investment ratios. Most importantly, in contrast to earnings, sales and book value, companies have a much harder time manipulating cash flow. While earnings can be manipulated through aggressive accounting practices, and book value of assets falls victim to subjective estimates and depreciation methods, cash flow is simply cash flow – it is a concrete metric of how much cash a firm brought in within a given period. Cash flow multiples also provide a more accurate picture of a company. Revenue, for example, can be extremely high, but a declining margin would wipe away the positive benefits of high sales volume. Subsequently, earnings multiples are often difficult to standardize due to different accounting practices across companies. Studies regarding fundamental analysis have concluded that the *P/C* ratio provides a reliable indication of long-term returns (Pinkasovitch, 2011).

Price-to-Book (P/B)

The *P/B* ratio is a basic measure of the relative value that the market places on a share of stock. Although it has many shortcomings, book value per share remains the best easily accessible measure of the assets which lie behind each share. Accordingly, the ratio of this per share book value to the stock's market price provides a very useful index of how much value the market places on the firm as a going concern (market price of stock) as opposed to the bundle of assets (book value per share) that the managers have to work with. The higher the *P/B*, the more favorably the market views the company and its prospects. A *P/B* below one suggests that the firm's value as a going concern is actually below the value its assets.

Fama and French (1995) analyze book-to-market factors further, which is another way of expressing the inverse of *P/B*. They report that the ratio signals persistent indications (poor or strong) for future earnings: "High *BE/ME* stocks are less profitable than low-*BE/ME* for four years before and at least five years after ranking dates," although "the growth rates of earnings of low- and high-*BE/ME* stocks become more similar in the years after portfolio formation." As such, the authors claim, "size and *BE/ME* relate to economic fundamentals"

Even though the existence of *P/B* effects is not universally accepted, subsequent research has considered book-to-market – along with size – as an important factor in understanding returns. Barber and Lyon (1997), for instance, work with a holdout sample of financial firms (excluded from Fama and French, 1992) and find that the relation between size, book-to-market, and returns remains robust. They also find no evidence that survivorship bias or data mining contaminated the results.

5.4.2 Performance Measures

The performance aspects recognized in the literature as candidates for the association with a firm's capital returns has the emphasis of this thesis. Management researchers favor accounting performance measures, such as return on equity (*ROE*), return on investment (*ROI*), and return on assets (*ROA*). Researchers from finance and economics appear to favor market returns or cash flow measures beside with their variability as performance measures. The performance measures in prior researches usually measure accounting rate of return. The notion behind this measure is possibly to assess performance from a managerial viewpoint. Return on investment (*ROI*), return on capital (*ROC*), return on assets (*ROA*) and return on sales (*ROS*) are basically efficiency measurement indicators. Specifically, how fine management is expending the assets to breed accounting returns (e.g. per dollar of investment, assets or sales). *ROA* and *ROE* are the furthermost often used performance measurement indicators in early researches (Carter, 1977; McDougall and Round, 1984). *ROA* has been used in this thesis as a performance measure as it is a generally used indicator of managerial performance. In addition to *ROA*, for the firms in each of the portfolios which are to be constructed in this research, other financial performance measure, namely, return on capital (*ROC*) will be used.

5.4.3 CONTROL VARIABLES

Size

Several researches inspect the size aspect and determine that smaller companies consume the majority of returns. The explanation for this is that smaller companies have frequently less analyst coverage. In this fashion information is spread more slowly and the share price moves simply away from its intrinsic value (Lakonishok et al., 1994). Henceforth, this generates mispriced equities and consequently abnormal returns are easier accomplished. In this thesis regression model will be controlled for size factor and total assets as a proxy for size will be used, in explaining portfolio returns. Kahle (2000) has found in his regressions, that stock returns are negatively correlated with firm size and negatively correlated with the *P/B* ratio. This finding supports the sight that insiders exploit windows of chance when giving out equity, consistent with Kahle (2000).

Leverage ratio

Furthermore, leverage might also play a significant part in explaining portfolio returns. It is designed by dividing total debt by total assets (debt to asset ratio). Adami, Gough, Muradoglu and Sivaprasad (2010), focus on the empirical relation between returns and leverage concerning the financial risk element of leverage. Companies with minor leverage will be alleged as less risky because of lesser distress risk and enjoy greater returns. Their outcomes show that returns decay in book leverage. This study will include the leverage ratio as a control variable in the regression analysis also.

Daily price volatility

Stock return volatility signifies the changeability of stock price fluctuations throughout a period of time. Investors, analysts, brokers, dealers and regulators find it important to measure stock return volatility not just for the reason that it is obvious as a risk measure, but because they concern about “disproportionate” volatility in which observed variations in stock prices do not appear to be go along with any important news about the firm or market as a whole. The presence of extreme volatility, or noise, weakens the effectiveness of stock prices as a sign about the real intrinsic value of a company, an idea that is essential to the hypothesis of the informational market efficiency. Stock return volatility increases more after stock price drops (bad news) than after stock price rises (good news) (Karolyi, 1998). This study will add price volatility to a regression model to control for the volatility of the portfolio returns.

Cross listing (CL)

A new aspect in literature is the effect of cross listing on market adjusted returns with respect to value investing. This paper will argue that risk adjusted returns for firms who are cross listed are less compared to firms which are US-only listed. This can be explained that probably cross listed firms have more significant analyst coverage and this makes the market more efficient and reduces the opportunity for significant returns (Piotroski, 2000). This argumentation is based on the same reasoning as the size factor, namely that cross listed firms have more analyst coverage and therefore prices of those stocks are more efficient. This creates space for the proposition that smaller firms have less analyst coverage and therefore abnormal profit opportunities are more significant. In addition, the US stock market is by far the biggest in the world and therefore I expect more analyst coverage for US only stocks. In the following, this situation creates positive abnormal profit opportunities for small firms which are not cross listed. Cross listing was studied by Bris, Cantale, Hrnjic and Nishiotis (2011) and they found that cross listed firms have documented significant positive market adjusted returns. The finance literature has identified two sources for cross listing benefits: the benefits which arise from trading in foreign market and the one arising from the reduction in asymmetric information. First, they stress out the fact that a greater information disclosure provides investors a reduction in the returns. Reese and Weisbach (2002) state that by the increased disclosure and legal obligations of cross listed firms, investors get more protection and consequently the agency costs of controlling shareholders is reduced. They call this the bonding hypothesis. Secondly, the signaling hypothesis states that companies choose to be cross listed on exchanges with more credible disclosure requirements, so that they can communicate their higher quality to the market.

Insider Ownership (IO)

A dummy will be created for insider shareholding. Managerial ownership between 5% and 20% is hypothesized to positively affect stock returns. Firms where management own between 5% and 20% of outstanding shares will get "1", firms where management own less than 5% or more than 20% of outstanding shares will be addressed "0". Corporate managers are the shareholders' agents. This relation can create a problem for shareholders who require ways to induce managers to pursue shareholder interests. Jensen and Meckling (1976) formalize the relation between corporate value and managerial equity ownership. They divide shareholders into two groups, an inside shareholder who manages the firm and has exclusive voting rights and outside shareholders who have no voting rights. Both classes of shareholders are entitled to the same dividends per share of stock held. However, in this framework, there is an incentive for the manager to adopt beneficiary investment and financing policies, reducing the outside stockholders' payoff. Consequently, the value of the firm depends on the fraction of shares owned by insiders. The larger the proportion of shares owned by insiders, the larger the value of the firm. Hermalin and Weisbach (1987) and Merck, Shleifer and Vishny (1988) estimate a linear regression in which the dependent variable is *Tobin's Q* (a proxy for firm value) and the primary independent variable is the fraction of shares owned by corporate insiders. This research will analyze inside ownership in the range of 5%-20%. Presumably it may be expected that whenever management owns between 5% and 20% of outstanding stock this will have a positive effect on stock returns. Adversely, firms with less than 5% or more than 20% inside ownership are expected to have a negative effect on stock returns.

6. RESULTS

6.1 SIMPLE GLAMOUR AND VALUE STRATEGIES

Table 1, Panel A shows the returns on a strategy that has established a lot of consideration (Fama and French, 1992), namely returns of the market-to-book strategy denoted throughout the report by *P/B*. Each year, the universe of stocks is divided into *P/B* deciles. The emphasis lies on 6 years horizon returns on different strategies. The motive for observing such horizons is that the interest is in performance of substitute investment strategies over a time span suitable for long term stockholders. Furthermore, this research undertakes on annual base buying and holding periods in contrast to monthly buying and holding periods anticipated in earlier studies. For the reason of several market microstructure concerns as well as execution costs, this research's procedure generates returns that are closer to those that stockholders can actually capture. In Panel A of Table 1, the returns for years 1 through 6 are obtainable after the portfolio realization (R1 through R6), so are the average annual 6-year return (AR) and the cumulative 6-year return (CR6). The statistics shown are the averages over all formation periods in the sample. The outcomes confirm and spread out the results proven by Rosenberg, Reid, and Lanstein (1984), Chan, Hamao, and Lakonishok (1991), and Fama and French (1992). On average over the post formation years, the high *P/B* (glamour) stocks have an average annual return of 2.2 percent and the low *P/B* (value) stocks have an average annual return of 3.4 percent, for a difference of 1.2 percent per year. The statistical significance of the differences in portfolio returns with respect to the growth and value portfolios (respectively decile 1 and 10) is tested and also shown in the last column of the 1-dimensional classification scheme of Table 1. For the *P/B* sorted returns it can be seen that the differences between the growth and value portfolios is mostly significant for the years 2005 – 2009.

If portfolios are held with the annually rebalancing defined above, then the cumulative returns based on value stocks beat glamour stocks by 8.25 percent[4] over years 1 through 6. The

[4] Cumulative 6 year return equals 13.81 percent for decile 1 portfolio; cumulative 6 year return equals 22.06 percent for decile 10 portfolio. In effect the difference is equal to 8.25 percent.

following question can be asked: what is the P/B truly capturing? Unfortunately, several different aspects are reflected in this ratio. A high P/B may refer to a firm with a lot of intangible assets, like research and development ($R\&D$) capital, which is not revealed in the accounting book value as $R\&D$ is expensed. A high P/B can also refer to a firm with striking growth prospects that do not enter the calculation of book value but do enter the market price. Moreover, a natural reserve company, for instance an oil producer lacking good growth prospects but having high short-term profits, might have a high P/B after a rise in oil prices. A stock with low risk and whose cash flows in future are discounted at a low rate has a high P/B as well. Lastly, a high P/B may designate an overrated glamour stock. The idea at this point is unpretentious: even though the returns from the P/B sorted portfolios are imposing, P/B is not a "clean" variable fully related to economically interpretable firm characteristics. Questionably, the most essential of those economically interpretable characteristics are the market's beliefs of future and the past growth of these companies. To proxy for expected growth, the ratios of several measures of price to profitability are used in this research, so that companies with low P/B ratios have low expected growth. The notion behind this is Gordon's formula (1959), which defines $P = D(+1)/(r-g)$, in which $D(+1)$ is following period's dividend, P is the present stock price, r is the stock's required rate of return, and g is the dividend's expected growth rate (Gordon and Shapiro (1956). A comparable formula relates to cash flow and earnings. For instance, an expression in terms of cash flow can be written as $D(+1) = \rho C(+1)$, where $C(+1)$ is following period's cash flow and ρ, is the payout ratio, i.e. the constant portion of cash flow paid out as dividends. $P = \rho C(+1)/(r-g)$ can then be written in which the growth rate g for dividends is likewise the growth rate for cash flow if assumed that dividends are proportional to cash flow. Conferring to these expressions, holding the discount rates and payout ratios constantly, a lower price-to-cash flow (P/C) firm has a low expected growth rate of cash flow, despite the fact that a higher P/C firm has a high expected growth rate of cash flow. Nevertheless the postulation of a dividend's constant growth rate and strict proportionality between cash flow (or earnings) and dividends are restrictive, the insight behind Gordon's formula is rather common. An analogous formulation can be applied to earnings but with a dissimilar payout ratio. In the same way as for the P/C, Gordon's formula can be applied for the ratio of price-to-earnings (P/E) and the price-to-book ratio (P/B).

TABLE 1

RETURNS FOR DECILE PORTFOLIOS BASED ON ONE-DIMENSIONAL CLASSIFICATIONS BY VARIOUS MEASURES OF VALUE

At the end of each December between 2004 and 2009, 10-decile portfolios are formed in descending order based on *P/E, P/C, P/B, ROA, ROC* and *TA*. *P/E* is the ratio of market value of equity to book value of equity; *P/C* is the ratio of market value of equity to cash flow; *P/E* is the ratio of market value of equity to earnings, *ROA* is the Return on Assets, *ROC* is the Return on Capital, and *TA* refers to Total Asset which is a proxy for firm size. The returns presented in the table are averages over all formation periods. R_t is the average return in year t after formation, t = 1, …, 6. *AR* is the average annual return over 6 post formation years. CR_6 is the compounded 6-year return assuming annual rebalancing. The glamour portfolio refers to the decile portfolio containing stocks ranking highest on *P/E, P/C, P/B,* and *TA*, or lowest on *ROA* and *ROC*. The value portfolio refers to the decile portfolio containing stocks ranking lowest on *P/E, P/C, P/B, ROA, ROC* and *TA*. The right-most column contains the value premium based on the performance difference between decile 10 and 1.

	Glamour									**Value**	**Value Premium**	
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	Sig.
				Panel A: *P/B*								
R1	2.02%	1.91%	1.69%	2.20%	2.99%	2.58%	2.49%	2.79%	2.35%	1.88%	-0.14%	
R2	2.37%	2.47%	2.54%	3.20%	2.77%	3.10%	3.21%	3.87%	3.84%	3.68%	1.31%	**
R3	1.92%	1.63%	1.82%	1.95%	1.83%	1.97%	1.60%	1.53%	1.37%	0.76%	-1.16%	***
R4	-2.31%	-2.61%	-2.01%	-2.19%	-0.96%	-0.97%	-0.85%	0.35%	-0.73%	-0.23%	2.08%	***
R5	5.55%	4.10%	5.03%	5.40%	5.81%	6.95%	5.47%	6.73%	7.67%	9.99%	4.44%	***
R6	3.70%	3.04%	3.35%	3.78%	3.53%	3.83%	3.90%	4.64%	4.38%	4.51%	0.82%	*
AR	2.21%	1.76%	2.07%	2.39%	2.66%	2.91%	2.64%	3.32%	3.15%	3.43%	1.22%	***
CR6	13.81%	10.87%	12.93%	15.04%	16.93%	18.59%	16.77%	21.47%	20.19%	22.06%	8.25%	**
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	
				Panel B: *P/C*								
R1	1.69%	1.71%	2.02%	2.38%	2.29%	2.34%	2.25%	2.80%	2.93%	2.32%	0.63%	**
R2	1.88%	2.49%	2.91%	2.92%	3.22%	3.53%	3.51%	3.72%	3.31%	2.89%	1.01%	**
R3	1.24%	1.79%	1.53%	1.65%	2.03%	1.46%	1.46%	2.01%	1.89%	0.68%	-0.56%	
R4	-2.81%	-2.24%	-1.92%	-0.29%	-0.87%	-0.82%	-0.22%	-0.54%	-0.99%	-2.42%	0.40%	
R5	4.12%	4.43%	4.69%	5.67%	5.85%	6.14%	6.88%	7.35%	7.52%	9.55%	5.43%	***
R6	3.25%	3.66%	3.71%	3.56%	3.90%	3.88%	3.86%	4.11%	4.02%	4.35%	1.10%	**
AR	1.56%	1.98%	2.16%	2.65%	2.74%	2.76%	2.96%	3.24%	3.11%	2.89%	1.33%	**
CR6	9.58%	12.30%	13.52%	16.87%	17.44%	17.56%	18.94%	20.92%	19.98%	18.22%	8.64%	*

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

TABLE 1- *Continued*

	Glamour									Value	Value Premium	
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	Sig.
				Panel C: *P/E*								
R1	2.98%	3.40%	2.60%	2.41%	1.78%	1.96%	1.56%	1.88%	2.27%	2.87%	-0.12%	
R2	4.09%	3.20%	3.44%	3.11%	3.07%	2.40%	3.20%	2.57%	2.65%	3.56%	-0.53%	
R3	2.17%	1.78%	1.33%	2.00%	1.55%	2.12%	1.02%	1.66%	1.58%	1.91%	-0.26%	
R4	-0.52%	-1.23%	0.22%	-1.00%	-0.45%	-1.26%	-1.51%	-1.85%	-1.48%	-1.81%	-1.29%	
R5	9.46%	7.71%	5.70%	5.80%	5.32%	4.85%	4.28%	4.58%	5.18%	5.86%	-3.60%	
R6	5.42%	3.54%	3.70%	3.92%	3.88%	3.79%	3.42%	3.48%	3.75%	3.96%	-1.45%	
AR	3.93%	3.07%	2.83%	2.71%	2.53%	2.31%	2.00%	2.05%	2.33%	2.73%	-1.21%	
CR6	25.73%	19.62%	18.13%	17.23%	16.04%	14.57%	12.48%	12.84%	14.65%	17.32%	-8.41%	
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	
				Panel D: *ROA*								
R1	2.20%	2.15%	2.95%	2.63%	2.65%	2.45%	2.24%	1.93%	1.74%	3.03%	0.83%	**
R2	3.11%	3.55%	3.77%	3.82%	3.77%	2.55%	2.90%	2.33%	2.19%	3.70%	0.60%	*
R3	0.98%	1.63%	1.68%	1.96%	1.69%	2.02%	1.61%	1.71%	1.65%	2.11%	1.13%	***
R4	-0.91%	-0.75%	-0.36%	0.16%	-1.01%	-1.40%	-1.46%	-1.75%	-1.94%	-1.48%	-0.57%	
R5	5.83%	7.50%	6.91%	5.96%	5.94%	5.50%	5.19%	6.11%	6.09%	7.14%	1.31%	
R6	3.94%	3.96%	4.75%	4.22%	3.99%	3.95%	3.63%	3.16%	3.66%	4.87%	0.93%	**
AR	2.52%	3.01%	3.28%	3.13%	2.84%	2.51%	2.35%	2.25%	2.23%	3.23%	0.70%	**
CR6	15.98%	19.23%	21.21%	20.17%	18.13%	15.90%	14.82%	14.09%	13.96%	20.77%	4.78%	**

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

Panel B of Table 1 shows the outcomes of sorting on the ratio of *P/C*. Low *P/C* stocks are acknowledged with value stocks since their growth rate of cash flow is likely to be low. Alternatively, the prices of those stocks are low per dollar of cash flow. Contrariwise, high *P/C* stocks are glamour stocks. On average, over the 6 post formation years, decile 1 *P/C* stocks have a return of 1.56 percent per annum, whereas the decile 10 *P/C* stocks have an average return of 2.89 percent per annum, for a difference of 1.33 percent[5]. The 6-year cumulative returns are 9.58 percent and 18.22 percent, respectively, for a difference of 8.64 percent. Sorting on *P/C* thus appears to produce more in returns than sorting on *P/B* ratios. This is consistent with the idea that measuring the market's expectations of future growth more directly gives rise to better

[5] Decile 1 is referred to top 10% by *P/B, P/C, P/E, ROA, ROC* and *TA*. Adversely Decile 10 is referred to bottom 10% of the aforementioned variables.

value strategies.[6] Overall, according to the t-test outcomes of the return differences between growth and value portfolios are found significant over the years 2004-2009. Another popular ratio, studied by Basu (1977), is the *P/E*. Table 1, Panel C presents the results for *P/E*. On average, over the 6 post formation years, first-decile *P/E* stocks have an average annual return of 3.93 percent and tenth-decile *P/E* stocks have an average annual return of 2.73 percent, for a difference of -1.21 percent. Low *P/E* stocks underperform high *P/E* stocks, although the difference is not very large. However, according to the t-test results of the return differences are not significant at any of the significance levels 1%, 5% or 10%.

TABLE 1- *Continued*

	Glamour									**Value**	**Value Premium**	
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	Sig.
				Panel E: *ROC*								
R1	2.53%	2.56%	2.89%	2.61%	2.10%	2.31%	2.17%	1.90%	1.96%	2.89%	0.36%	
R2	3.31%	4.33%	4.09%	3.39%	3.25%	2.58%	2.46%	2.40%	2.38%	3.33%	0.01%	
R3	1.11%	2.06%	1.66%	1.89%	1.98%	1.88%	1.72%	1.30%	1.46%	2.07%	0.96%	***
R4	-0.94%	0.17%	0.64%	-0.57%	-0.93%	-2.07%	-1.26%	-1.98%	-2.31%	-1.73%	-0.78%	*
R5	7.60%	7.28%	6.72%	6.60%	5.91%	4.44%	5.64%	6.08%	4.99%	6.85%	-0.75%	**
R6	4.21%	5.20%	3.95%	4.62%	3.77%	3.75%	3.20%	3.46%	3.14%	4.93%	0.72%	*
AR	2.97%	3.60%	3.32%	3.09%	2.68%	2.15%	2.32%	2.19%	1.94%	3.06%	0.09%	*
CR6	18.96%	23.46%	21.55%	19.87%	17.05%	13.46%	14.63%	13.71%	12.05%	19.55%	0.59%	*
	1	2	3	4	5	6	7	8	9	10	10-1[(a)]	
				Panel F: *TA*								
R1	2.68%	2.17%	2.18%	2.05%	2.46%	2.27%	2.20%	2.12%	1.69%	3.58%	0.90%	***
R2	3.10%	2.80%	2.85%	2.80%	3.02%	3.48%	3.17%	2.83%	3.38%	4.68%	1.58%	***
R3	1.95%	1.92%	1.22%	1.47%	1.80%	1.55%	0.99%	1.65%	1.75%	2.75%	0.79%	**
R4	-1.07%	-0.86%	-1.47%	-1.82%	-1.06%	-1.34%	-1.56%	-1.48%	-1.09%	-0.54%	0.53%	
R5	5.06%	5.67%	6.47%	6.36%	6.86%	6.89%	6.25%	6.39%	7.29%	7.14%	2.08%	***
R6	3.60%	3.80%	3.66%	3.77%	4.05%	3.88%	4.16%	3.69%	4.19%	5.11%	1.51%	***
AR	2.56%	2.58%	2.49%	2.44%	2.86%	2.79%	2.53%	2.53%	2.87%	3.79%	1.23%	***
CR6	16.23%	16.42%	15.68%	15.34%	18.21%	17.74%	16.01%	16.02%	18.28%	24.78%	8.55%	***

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

[6] La Porta (1993) has shown that the contrarian strategies, based directly on analysts' forecasts of future growth can produce even larger returns than those based on financial ratios.

An alternate way to operationalize the designs of glamour and value is to categorize stocks based on *ROA*, *ROC* and size (*TA*). Panel D and E presents the results for respectively *ROA* and *ROC*. In panel F, portfolios are formed on basis of total assets (*TA*). Except for *TA*, the last three panels show no evidence for increasing portfolios returns by increasing decile levels for the cumulative returns over the 6 post formation years. Except for *TA*, the difference is mean portfolio returns for glamour and value portfolio do show weak significance for the returns classified by *ROA* and *ROC*.

In this paragraph, the results of previous studies is mostly confirmed and extended. A wide variety of simple value strategies based on ordering of firms by one fundamental variable yield large returns over the 6-year period 2004 to 2011. In disparity to some earlier research, the strategies worked out in this thesis comprise classifying companies based on fundamentals and then buying and holding annually for a 6 year period. In the next paragraph, the more refined two-dimensional types of these strategies are explored, which are intended to correct a number of the misclassification of firms innate to a one-variable method. For instance, high *P/E* stocks, which are apparently glamour stocks, contain many stocks with temporarily low earnings that are probable to recover. The two-dimensional approach of the next paragraph are expressed with a sense toward more directly exploiting the possible “faults” made by naive stockholders.

6.2 PERFORMANCE EVALUATION: 2-DIMENSIONAL VALUE STRATEGIES

Considerable psychological proof signposts that individuals form their forecasts of the future lacking a full awareness of mean reversion. That is to say, investors tend to base their expectations on historical data without correctly weighting data on what psychologists call the "base rate," or the class average. Kahneman, Slovic and Tversky (1982, p. 417) clarify:

One of the basic principles of statistical prediction, which is also one of the least intuitive, is that the extremeness of predictions must be moderated by considerations of predictability ... Predictions are allowed to match impressions only in the case of perfect predictability. In intermediate situations, which are of course the most common, the prediction should be regressive; that is, it should fall between the class average and the value that best represents one's impression of the case at hand. The lower the predictability the closer the prediction should be to the class average. Intuitive predictions are typically nonregressive: people often *make extreme predictions on the basis of information whose reliability and predictive validity are known to be low…*

To abuse this blemish intuitive predictions, contrarian investors must sell stocks with high historical growth as well as high expected future growth and buy stocks with low historical growth as well as low expected future growth. Value strategies might yield higher returns since they are contrarian to "naïve" strategies monitored by other stockholders. Prices of these stocks are expected to mirror the failure of stockholders to impose mean reversion on growth predictions. Therefore, a glamour stock is defined to be a stock with high past growth and high expected future growth. A value stock must have had low growth in the past and be expected by the market to carry on growing gradually. In this paragraph, low ratios of *P/B, P/C* and *P/E* are used as a representation for a low expected growth rate. Table 2 shows the yearly average percentage quantile returns for two-dimensional value strategies each one categorized into nine stock groups by independently sorting in descending order into three arrays ((1) top 30%, (2) middle 40%, and (3) bottom 30%) each of two variables. The sorts are 6 pairs of variables: *P/E* and *ROA, P/E* and *ROC, P/C* and *ROA, P/C* and *ROC, P/B* and *ROA, P/B* and *ROC*. Depending on the two variables being used for classification, the value portfolio denotes the portfolio containing stocks ranked in the bottom group (3) on either of the variables from among *P/E, P/C* and *P/B* (sorted in descending order), and variables in the top group (1) on *ROA* or *ROC*, sorted in descending order. The glamour portfolio contains stocks with precisely the opposite set of rankings. Portfolios reformation occurs yearly at the end of December during the period from 2004 to 2009. Strategies based on combinations of value and capital return variables (Elze (2010) calls these formations the Consistent Earner Strategy) seem to result in investment returns comparable to single variable value strategies. For two-dimensional portfolio strategies the yearly average return differences between the glamour and value over the 6-year post formation period (portfolio 3/1 minus portfolio 1/3) presented below fall in a range between -1.37 percent and 2.21 percent depending on the variable combination chosen. These strategies do not improve investment performance compared to simple value strategies. The Consistent Earner Strategy mimics investment styles of well-known investors like Warren Buffett or Joel Greenblatt (2005) who further developed the value investing concept by focusing on "finding an outstanding company at a sensible price" or buying "cheap and good companies with competitive advantages indicated by a high return on capital" rather than generic companies at a bargain price as originally promoted by Graham and Dodd.

TABLE 2
RETURNS FOR PORTFOLIOS BASED ON TWO-DIMENSIONAL CLASSIFICATIONS BY VARIOUS MEASURES OF VALUE

At the end of each December between 2004 and 2010, 9 groups of stocks are formed. The stocks are independently sorted in descending order into 3 groups ((1) top 30 percent, (2) middle 40 percent, and (3) bottom 30 percent) based on each of the two variables. The sorts are for 6 pairs of variables: *P/E* and *ROA*, *P/E* and *ROC*, *P/C* and *ROA*, *P/C* and *ROC*, *P/B* and *ROA*, *P/B* and *ROC*, in descending order based on *P/E, P/E, P/B*, *ROA* and *ROC*. *P/E* is the ratio of market value of equity to book value of equity; *P/C* is the ratio of market value of equity to cash flow; *P/E* is the ratio of market value of equity to earnings, *ROA* is the Return on Assets, *ROC* is the Return on Capital. The returns presented in the table are averages over all formation periods. R_t is the average return in year t after formation, t = 1, …, 6. *AR* is the average annual return over 6 post formation years. CR_6 is the compounded 6-year return assuming annual rebalancing. The value portfolio refers to the portfolio containing stocks ranked in the bottom group (3) on variables among *P/E, P/E, P/B* and the stocks ranked in the top group (1) on variables *ROA* and *ROC*. The glamour portfolio contains stocks with precisely the opposite set of rankings.

Panel A: *P/E* and *ROA*											
			Glamour				Value			Value Premium	
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	Sig.
R1	3.81%	2.48%	2.73%	1.58%	2.35%	1.74%	1.23%	3.45%	1.79%	-1.50%	**
R2	3.57%	3.72%	2.93%	2.41%	3.17%	3.27%	2.28%	3.45%	2.84%	-0.64%	
R3	2.48%	1.06%	0.33%	1.44%	1.89%	1.21%	0.95%	1.97%	1.26%	0.62%	*
R4	-0.89%	-0.50%	0.52%	-2.17%	-0.76%	0.54%	-3.06%	-1.12%	-2.59%	-3.58%	***
R5	6.67%	6.20%	5.08%	3.59%	4.92%	5.63%	8.25%	6.74%	6.21%	3.18%	
R6	4.36%	4.00%	4.48%	3.25%	3.85%	3.68%	3.60%	3.95%	3.86%	-0.88%	
AR	3.33%	2.83%	2.68%	1.68%	2.57%	2.68%	2.21%	3.07%	2.23%	-0.47%	*
CR6	21.56%	18.05%	17.06%	10.43%	16.34%	17.08%	13.64%	19.74%	13.89%	-3.42%	
Panel B: *P/E* and *ROC*											
			Glamour				Value				
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	
R1	3.61%	2.53%	3.17%	1.55%	2.29%	1.87%	1.15%	3.12%	2.14%	-2.02%	**
R2	3.41%	3.61%	3.00%	2.23%	3.27%	3.55%	1.32%	3.19%	3.17%	-1.68%	**
R3	2.16%	1.40%	-2.00%	1.34%	1.95%	1.12%	0.79%	1.98%	1.38%	2.79%	**
R4	-1.03%	-0.20%	1.45%	-2.21%	-0.84%	1.27%	-4.01%	-1.08%	-2.20%	-5.46%	***
R5	6.28%	6.24%	7.48%	3.12%	4.59%	6.60%	7.80%	6.64%	6.29%	0.32%	
R6	4.00%	4.02%	6.11%	3.30%	3.58%	4.31%	3.95%	3.39%	3.93%	-2.16%	**
AR	3.07%	2.94%	3.20%	1.55%	2.47%	3.12%	1.83%	2.87%	2.45%	-1.37%	**
CR6	19.74%	18.81%	20.48%	9.59%	15.69%	20.11%	11.10%	18.36%	15.41%	-9.38%	**

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

The average cumulative returns over the 6-year post formation period fall in a range between -9.38 percent and 15.17 percent. The tests outcome for the mean differences between the glamour and value portfolios (these are respectively the portfolio 1/3 and 3/1 following annotation of Table 2) are shown in the last column of Table 2, Panel A shows the outcomes for the strategy that sorts on both *P/E* and *ROA*. Since the stock returns are sorted on two variables, sorting stocks into deciles on each ratio and capital return variable is unpractical. Therefore, the stocks are independently sorted into three groups ((1) top 30 percent, (2) middle 40 percent, and (3) bottom 30 percent) by for example *P/E* and by *ROA*, and then the intersections are taken, resulting from the two classifications. For example, high *P/E* stocks with low past *ROA*, which is defined as glamour stocks, have an average annual future return of 2.68 percent, but low *P/E* stocks with a high past *ROA*, which is defined as value stocks, have an average annual future return of only 2.21 percent, with a difference of -0.47 percent per year. The test statistic for the mean difference of these two portfolios can be read from the last column. For the 2-sided t-test statistic it can be shown that the mean return differences for the years 2006, 2009 and 2010 are not significant. Moreover 2005, 2007 and 2008 have significant return differences. Over the 6 post formation years, the cumulative difference in returns is -3.42 percent. Table 2, Panel B presents the return outcome for a classification structure using both past *P/E* and *ROC*. The average annual change in returns over the 6-year period between the two 3/1 and 1/3 portfolios is -1.37 percent per year, while the difference between glamour and value portfolios is -9.38 percent over 6 post formation years. As with *P/E* and *ROA*, the (*P/E, ROC*) strategy yields noticeably higher returns for strategy 1/3 portfolios. For instance, amongst firms with the highest/ lowest *P/E* ratios and lowest/highest *ROC*, the average annual future return is 3.20/ 1.83 percent, whereas the (*P/E, ROA*) strategy yields for the same portfolios respectively 2.68 percent and 2.21 percent.

When this classification structure is used, the two-dimensional strategy constructed on *P/E* generates returns approximately as high as those formed by the two-dimensional strategy based on *P/C*, however in both cases the glamour portfolio realizes higher average yearly returns than the value portfolios. Table 2, Panel C presents results for portfolios categorized by *P/C* and *ROA*. The difference in average returns between the portfolios 3/1 and 1/3 is 0.71 percent per year. The difference between the value and glamour portfolio returns for the *P/C* and *ROC* sorted returns is 0.71 percent. The difference average returns between the value and glamour portfolios for the (*P/B, ROA*) and (*P/B, ROC*) sorted returns are respectively 2.21 and 1.32 percent (Panel E and F). Clearly the outcomes from the last two panels of Table 2 offer higher returns for the value portfolios relative to the value portfolio returns from Panel A-D. However, these premium value (difference in glamour and value portfolio returns) are weakly significant as few of the post formation years show significant value premiums (see last column for the test outcome).

TABLE 2 – *Continued*

Panel C: *P/C* and *ROA*											
			Glamour				Value			Value Premium	
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	Sig.
R1	1.47%	2.63%	1.87%	2.31%	2.70%	2.16%	3.51%	2.20%	1.68%	1.64%	***
R2	2.24%	3.01%	2.32%	3.06%	3.63%	3.43%	3.23%	3.04%	2.79%	0.91%	*
R3	1.44%	1.95%	1.07%	1.78%	1.64%	1.59%	1.46%	1.34%	0.68%	0.40%	
R4	-2.16%	-2.10%	-2.09%	-1.48%	-0.29%	-0.14%	-2.26%	-0.52%	-3.09%	-0.17%	
R5	3.79%	3.72%	4.83%	4.79%	5.00%	5.01%	7.80%	6.74%	7.13%	2.97%	***
R6	3.64%	3.34%	3.37%	3.45%	4.01%	3.85%	3.38%	4.13%	4.28%	0.02%	
AR	1.74%	2.09%	1.89%	2.32%	2.78%	2.65%	2.85%	2.82%	2.24%	0.96%	*
CR6	10.75%	13.10%	11.77%	14.61%	17.80%	16.89%	18.10%	18.00%	13.92%	6.33%	*
Panel D: *P/C* and *ROC*											
			Glamour				Value				
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	
R1	1.43%	2.44%	2.16%	2.33%	2.56%	2.53%	3.14%	2.25%	1.62%	0.98%	**
R2	2.12%	2.91%	2.72%	2.66%	3.68%	3.93%	3.08%	3.06%	2.59%	0.37%	
R3	1.22%	2.00%	1.56%	1.71%	1.73%	1.42%	1.66%	1.49%	0.40%	0.09%	
R4	-2.55%	-1.39%	-2.67%	-1.51%	-0.13%	-0.24%	-1.89%	-1.14%	-2.43%	0.78%	
R5	3.19%	4.02%	4.94%	4.66%	4.64%	5.75%	7.15%	6.73%	7.42%	2.20%	***
R6	3.58%	3.10%	3.58%	3.29%	3.82%	4.23%	3.42%	3.98%	4.41%	-0.16%	
AR	1.50%	2.18%	2.05%	2.19%	2.72%	2.93%	2.76%	2.73%	2.33%	0.71%	
CR6	9.20%	13.71%	12.76%	13.76%	17.37%	18.81%	17.50%	17.33%	14.53%	4.74%	

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

TABLE 2 – *Continued*

Panel E: *P/B* and *ROA*											
			Glamour				Value			Value Premium	
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	Sig.
R1	1.77%	2.75%	1.40%	2.91%	2.64%	2.21%	2.60%	2.23%	1.94%	1.21%	
R2	2.49%	2.78%	2.86%	3.01%	3.39%	2.98%	4.74%	3.86%	3.20%	1.88%	*
R3	1.66%	2.09%	1.06%	1.87%	1.83%	1.36%	1.74%	0.75%	0.60%	0.68%	
R4	-2.11%	-2.38%	-3.01%	-1.85%	-0.22%	-1.74%	0.66%	-0.10%	-1.08%	3.68%	***
R5	5.39%	3.93%	5.21%	5.66%	4.89%	4.39%	8.17%	6.99%	7.11%	2.96%	
R6	3.68%	3.54%	2.40%	2.94%	3.67%	3.76%	5.25%	4.50%	4.16%	2.85%	***
AR	2.15%	2.12%	1.65%	2.43%	2.70%	2.16%	3.86%	3.04%	2.65%	2.21%	*
CR 6	13.42%	13.27%	10.13%	15.30%	17.25%	13.54%	25.30%	19.48%	16.78%	15.17%	*
Panel F: *P/B* and *ROC*											
			Glamour				Value				
	1/1	1/2	1/3	2/1	2/2	2/3	3/1	3/2	3/3	3/1-1/3	
R1	1.72%	2.65%	1.81%	2.91%	2.47%	2.60%	2.42%	2.26%	1.86%	0.61%	
R2	2.37%	2.85%	3.39%	2.55%	3.46%	3.12%	4.74%	3.49%	3.56%	1.35%	
R3	1.60%	2.21%	1.16%	1.61%	1.95%	1.34%	1.07%	0.82%	0.96%	-0.08%	
R4	-2.31%	-1.96%	-3.01%	-1.72%	-0.31%	-1.58%	-0.22%	-0.19%	-0.87%	2.79%	**
R5	5.25%	3.65%	5.96%	5.43%	4.80%	4.98%	7.77%	6.85%	7.31%	1.82%	
R6	3.62%	3.39%	2.77%	3.17%	3.49%	3.88%	4.20%	4.22%	4.42%	1.43%	**
AR	2.04%	2.13%	2.01%	2.32%	2.65%	2.39%	3.33%	2.91%	2.87%	1.32%	
CR 6	12.72%	13.36%	12.46%	14.63%	16.88%	15.06%	21.50%	18.59%	18.30%	9.03%	

The t-test for the value premium per year, namely the mean difference between the returns of deciles 1 and 10.
* significant at 10%, ** significant at 5%, *** significant at 1%

6.3 SUMMARY STATISTICS

Below in Table 3 respectively the descriptive statistics of the research variables and the correlations between these variables are shown. The mean, standard deviation and percentiles 1%, 25%, 50%, 75% and 99% are given.

TABLE 3
DESCRIPTIVE STATISTICS OF THE RESEARCH VARIABLES. THE RETURNS REPRESENT THE AVERAGE RETURNS OVER THE YEARS 2005-2010.

	mean	sd	1%	25%	50%	75%	99%
Returns	0.0387	0.1206	-0.3063	-0.0159	0.0441	0.0912	0.4067
B/P	0.8661	229.80	0.0554	0.3153	0.4985	0.7418	3.0085
C/P	0.5696	35.391	-0.2797	0.0722	0.1042	0.1623	1.0567
E/P	-1.1718	77.712	-2.3082	0.0969	0.1624	0.2344	2.3906
ROA	0.0856	0.6754	-0.3345	0.0253	0.0554	0.0934	0.4783
ROC	0.4695	13.801	-0.4879	0.0403	0.0805	0.1378	0.9370
TA	15969.03	96094.96	20.138	760.26	2.173	6986	217359
ln(TA)	7.7502	1.7891	3.0026	6.6336	7.6838	8.8516	1.2289
LEV	0.2843	0.2407	0	0.1037	0.2508	0.4068	0.9393
VOL	0.2921	0.1068	0.1296	0.2117	0.2738	0.3549	0.6068
CL	0.0645	0.2457	0	0	0	0	1
IO	0.2875	0.4526	0	0	0	1	1

TABLE 4
CORRELATIONS BETWEEN THE RESEARCH VARIABLES.

	Returns	*B/P*	*C/P*	*E/P*	*ROA*	*ROC*	*TA*	*ln(TA)*	*LEV*	*VOL*	*CL*	*IO*
Returns	1											
B/P	0.0715	1										
C/P	0.0223	-0.1434	1									
E/P	-0.0049	-0.0019	0.0054	1								
ROA	0.0095	-0.2103	-0.0125	-0.0012	1							
ROC	0.0151	-0.1697	-0.0049	0.0005	0.9440	1						
TA	-0.0043	0.0339	0.0521	0.0035	-0.0448	-0.0203	1					
ln(TA)	0.0062	0.0204	0.0799	0.0295	-0.0946	-0.0566	0.4431	1				
LEV	0.0690	0.0353	0.0853	-0.0017	-0.1153	-0.1411	0.0114	0.1278	1			
VOL	-0.0246	0.1508	0.0134	-0.0242	-0.0605	-0.0444	-0.0821	-0.3238	-0.1008	1		
CL	0.0014	-0.0011	0.0018	0.0049	-0.0204	-0.0204	-0.0283	-0.0018	0.0382	-0.0058	1	
IO	-0.0024	-0.0110	-0.0191	-0.0055	-0.0056	-0.0054	-0.0514	-0.0564	0.0009	0.0435	-0.0346	1

The correlations between the variables, presented in Table 4, are relatively low and do not present any evidence for multicollinearity. This would presumably be the case if the correlations were extremely high (e.g. 80%). According to O'Brien 2007, building of a pair-wise correlation matrix yields indications as to the possibility that any specified couplet of right-hand-side variables of a regression model are multi-collinear. Correlation values 0.40 and higher can point to a multicolliniearity concern, but occasionally variables might be correlated as high as 0.80 without causing such issues. The correlation between *ROC* and *ROA* is 0.944, however this is not an issue for the regression estimates since each regression one of the capital return variables is used.

6.4 REGRESSION ANALYSIS

Prior study has recognized a variety of variables that can explain glamour and value portfolios. In this paragraph, the significance of these variables is tested in a multiple regression context. In the present analysis 6 portfolio formation periods are defined, namely at the end of each year starting from 2004 and ending in 2009. Regressions are run for each post formation year, starting from the year 2005 and ending with 2010 for each stock. The independent variables are the monthly risk adjusted NYSE stock returns from December 2004 to December 2010.

The result in Table 5 tests the Hypotheses 1-3. This research uses the fundamentals *P/B*, *P/C* and *P/B* and capital return variables *ROA* and *ROC* as independent variable in the portfolio regressions. Also dummy and control variables are included to control for firm characteristics. Table 5 shows the outcome of regressions of returns for every stock on the characteristics of stocks that have been acknowledged by Eq. 3. Since the emphasis is on the predictive power of the fundamental and capital return variables, the relevant variables for each regression model have been put on top of the variable list in the output table. The regression models with the price multiplier *B/P* shows positive and significant outcome for the *B/P* coefficient estimates (resp. $\delta = 0.0049$; $p \leq 1\%$). The positive sign for the parameter of the price multiplier is in accordance with Hypothesis 3; therefore Hypothesis 3 is accepted. In the third and fourth column of Table 5 the estimates for the pricemultiplier *C/P* are found both positive and significant (resp. $\delta = 0.0055$; $p \leq 1\%$) and therefore Hypothesis 2 is accepted also. The estimates for the pricemultiplier *E/P* are insignificant at the 10% level (last two columns of Table 5). For these reasons hypothesis 1 is rejected. None of the control variables cross listing (*CL*) of firms and the insider ownership of managers (*IO*) are found significant. Despite these findings, the remaining control variables size (*ln(TA)),* leverage (*Lev)* and volatility (*Vol)* are significant at 1% through all the 6 models in Table 5.

The results in Table 5 also tests Hypothesis 4. The parameter estimates for the price multipliers *B/P* and *C/P* in respectively Columns 1-4 are found positive and significant in contrast to the previous analysis. The estimates of *E/P* on the other hand are also found insignificant in Columns 5 and 6 in Table 5. The regression model with the ratio *B/P* and the variable *ROA* shows a positive and significant outcome for the *B/P* ratio ($\beta = 0.0049$, $p < 1\%$) and a significant negative coefficient estimate for the moderator variable *(B/P)*ROA* ($\beta = -0.0201$, $p < 1\%$). The sign on the moderator variable is not in accordance with hypothesis 4, which states that high quality firms (namely firms with high capital returns *ROA* or *ROC*) in combination with low *P/B* stocks (or high *B/P*), produce also higher returns. This finding ensues that Hypothesis 4 is rejected for the multiplier *B/P* in combination with *ROA*. Analogous results are found for explaining returns by the ratio *B/P* and *ROC* (estimates in the second column of

Table 5). Again Hypothesis 4 is rejected as the moderator variable *(B/P)*ROC* is negatively related to the stock returns.

In the third and fourth columns of Table 5 the estimation results with respectively the ratios *C/P, ROA* and *ROC* as explanatory variables are shown. The predictor *C/P* is found positive and significant in both specifications (resp. $\beta = 0.0032$, $p < 1\%$ and $\beta = 0.0024$, $p < 1\%$). Both the capital return variable *ROA* and *ROC* are significantly related to stock returns. The moderator variable *(C/P)*ROA* is positive and significant, showing that in this case the outcome is in conjunction with Hypothesis 4. The combination of high *C/P* and high *ROA* predicts higher returns ($\beta = 0.0042$, $p < 1\%$) which is a reason to accept Hypothesis 4. For the model with *C/P* and *ROC* as predictor variable the results are the same. The *C/P* parameter is significant and positive but smaller compared to the estimates of column 3. For this particular case the capital return *ROC* is found significant and negative. The moderator variable *(C/P)*ROC* however is significant but still smaller as to the estimates of column 3 ($\beta = 0.0024$, $p < 1\%$). Hypothesis 4 is accepted as the product of *C/P* and *ROC* has a positive effect on the returns.

In most of the occasions, the stock returns are significantly explained by the independent variables. The regression models with the independent variables *E/P, ROA* and *ROC* as predictor variables have poor estimation results. Except for *ROA*, *ROC* and control variables for size, leverage and volatility, all of the remaining predictors are insignificant in the fifth and sixth column of Table 5. Also the moderator variables *(E/P)*ROA* and *(E/P)*ROC* do not have significant effect on the stock returns (both have estimates $\beta = -0.00007$, $p > 10\%$). Hypothesis 4 is rejected and so no positive returns are realized by high *E/P* ratios in combination with high moderating effects.

According to Chan et al. (1991) the *B/P* ratio is expected to be less noisy than earnings *(E/P)* or cash flow yields (*C/P*). The latter two are sensitive to the occasions of a single year and might be more straightforwardly manipulated by the management board and its influence can be identified more reliably. As for the results in Table 5, for any of the model specifications 1-6 none of the control variables cross listing and insider ownership are significant. The sign of the size variable is conferring to previous study of Kahle (2000) who established in his estimates, that stock returns are negatively associated with firm size. The sign of the variable leverage on the other hand again does not meet the relationships of Adami et al. (2010)'s study. They found that firms with minor leverage are assumed as less risky since they enjoy lesser distress risk and enjoy extra returns. Their results illustrate that returns decline in book leverage. The sign of the volatility is in accordance with the discovery of Karolyi (1998), who realizes that stock return volatility surges more after stock price falls than after stock price rises. i.e. a negative sign for volatility foresees a deterioration in the returns.

TABLE 5

REGRESSION OUTPUT WITH MODERATION VARIABLES FOR TESTING HYPOTHESES 1-4

For ease of notation the parameter estimates for dummy year and dummy industry variables are omitted. Year and industry dummies are included in all model specifications, but are not shown in the output table for readability. The dependent variable are the returns from December 2004 through December 2010. T-statistics are in brackets.

	B/P-ROA		B/P-ROC		C/P-ROA		C/P-ROC		E/P-ROA		E/P-ROC	
	C		C		C		C		C		C	
Intercept	0.0337	***	0.0327	***	0.0352	***	0.0379	***	0.0324	***	0.0369	***
	(8.83)		(8.57)		(9.21)		(10.03)		(8.91)		(10.31)	
B/P	0.0049	***	0.0055	***								
	(8.29)		(8.51)									
C/P					0.0032	***	0.0024	***				
					(7.71)		(6..67)					
E/P									0.0000		0.0000	
									(0.68)		(0.81)	
ROA	0.0105	***			0.0079	***			0.0122	***		
	(4.16)				(5.39)				(7.76)			
ROC			0.0095	***			-0.0002	***			0.0001	***
			(5.81)				(-3.68)				(4.08)	
(B/P)*ROA	-0.0201	***										
	(-8.28)											
(B/P)*ROC			-0.0087	***								
			(8.57)									
(C/P)*ROA					0.0042	***						
					(7.82)							
(C/P)*ROC							0.0024	***				
							(6.80)					
(E/P)*ROA									-0.00007			
									(-0.75)			
(E/P)*ROC											-0.00007	
											(-0.88)	
ln(TA)	-0.0019	***	-0.0019	***	-0.0018	***	-0.0020	***	-0.0015	***	-0.0018	***
	(-8.37)		(-6.38)		(-6.21)		(-6.76)		(-5.42)		(-6.61)	
Lev	0.0347	***	0.0356	***	0.0278	***	0.0276	***	0.0278	***	0.0275	***
	(13.99)		(14.33)		(12.54)		(12.49)		(13.00)		(12.93)	
Vol	-0.0559	***	0.0552	***	-0.0491	***	-0.0525	***	-0.0506	***	-0.0554	***
	(-10.60)		(-10.45)		(-9.60)		(-10.22)		(-10.26)		(-11.26)	
CL	0.0006		0.0007		-0.0002		-0.0006		0.0013		0.0011	
	(0.37)		(0.43)		(-0.10)		(-0.35)		(0.80)		(0.16)	
IO	0.0005		0.0006		0.0007		0.0005		0.0004		0.0002	
	(0.53)		(0.60)		(0.70)		(6.80)		(0.47)		(0.16)	
No Obs	71381		71322		72716		72526		71519		71388	
R^2	0.12		0.12		0.11		0.11		0.11		0.11	
F	115.44		115.82		116.01		114.16		119.86		117.88	
Prob > F	0.000		0.000		0.000		0.000		0.000		0.000	

* significant at 10%, ** significant at 5%, *** significant at 1%, t-statistics between parentheses.

7. CONCLUSIONS

Value investing is an investment model that originates from the thoughts on investment and speculation that Ben Graham & David Dodd initiated instructing at Business School of Columbia in 1928. Ever since various academic researchers have consistently established that value stocks beat glamour stocks and the market as a whole. This thesis prolonged main studies on prevailing value anomalies. It assessed simple value strategies for the American stock market in addition to refined two-dimensional value strategies that also comprise capital return variables (*ROA* and *ROC*). It was revealed that a diversity of simple categorization tables sorting value and glamour stocks founded on price-to-book ratio (*P/B*), price-to-earnings ratio (*P/E*), price-to-cash flow ratio (*P/C*) formed larger returns for value portfolios with respect to glamour portfolios. As market proxy for the American market the NYSE index was selected. Return differences between value and glamour ranged between -1.21 and 1.33 percent per annum on average dependent on the selection conditions chosen through the period from December 31, 2004/2005 to December 31, 2009/2010. Driven by these outcomes portfolio strategies founded on two-dimensional selection conditions were examined. It was revealed that two-dimensional value strategies centered on a grouping of simple value strategies do not more improve investment performance. Actually, investment returns were smaller and value portfolios did not outperform glamour portfolios. The Consistent Earner Strategy, as Elze (2010) calls, comprising the portfolios formed by ratios and capital return variables (e.g. *ROE*), contributed to a rise of investment returns comparable to simple value strategies but greatly superior than for single capital return variables. Return differences or premiums are in a range between -9.38 and 15.17 percent. The Consistent Earner Strategy mimics investment models of investors similar to Warren Buffett or Joel Greenblatt who settled the value investing idea by aiming on "finding an exceptional firm at a sensible price" or buying "cheap and good firms with competitive advantages specified by a high return on capital" rather than common firms at a cheap price as initially supported by Graham and Dodd. Overall, value strategies built both on one- and two-dimensional simple value principles as well as refined strategies containing capital return variables have beaten glamour strategies pretty consistently deprived of support for the premise that value strategies are basically riskier.

The difference in mean returns between the glamour and value deciles of firms sorted by the *P/B* and *ROA* is 2.21 percent per year, and 1.32 percent per year when firms are sorted by *P/B* and

ROC. On the other hand the firms sorted by *P/E* and *ROA* or *ROC* give a difference in mean returns of respectively -0.47 and -1.37 percent per year. It is possibly also reasonable that the cash flow yield (*P/C*) variable has greater prognostic power than earnings yield (*P/E*) in light of the distortions in the earnings of US firms tempted by enhanced depreciation allowances. The strategy suggested in this research is not new. It surveys the methodology of Graham and Dodd and is, in essence, value investing. The question can be asked: why can't a value concerned money manager capture high returns constantly? If followed exactly, a strategy of screening stocks on the base of *P/B* and *P/C* may not be very attractive to many money managers since it might cause to placing considerable bets on a limited amount of industries that appear cheap. This can give rise to considerable tracking inaccuracy if a wide-ranging benchmark index is used to assess money managers' performance. There is therefore a strong attraction for a self-professed value-focused money manager to depart from such a value chasing tactic, even if this involves losing potentially superior performance in the long track (Chan et al., 1991).

Lakonishok et al. (1994) use also the ratios of *B/P, C/P* and of *E/P* in the regression analysis. However they have not inherited the moderating variables for testing the effect of simple value strategies with capital return strategies. Their results are in line with Fama and French (1992), while in their model *B/P* is the most significant variable when adding only this variable in the model. In their study the weakness of *B/P* emerges when adding extra control variables to the regression model. Lakonishok et al. (1994) recognize that their *C/P* and *E/P* ratios have been found negative, and hereafter they state these results cannot plausibly be interpreted as expected growth rates. They deal with this problem by adding dummy variables for positive *C/P* and *E/P*. which strengthens the explanatory power of *C/P* and *E/P*. They recognize that the coefficient on *B/P* is in effect zero when adding more predictor variables to the models. Overall, their result seems not to present the same result as this thesis. Namely, in the present study the coefficient estimates for the multipliers *B/P*, *C/P* have positive and significant outcomes and therefore Hypotheses 2 and 3 are accepted. The verdicts disclose a significant relation between the NYSE stock returns and especially the fundamental variable, *P/E*, and so Hypothesis 1 is rejected. The performance of the *B/P* and *C/P* ratio is statistically and economically the most important of the three ratios examined in the regression model. Systematically the *P/E* ratio produces poor stock returns, in the 1-dimensional and 2 dimensional portfolio classification schemes. In both of these cases, the glamour portfolio returns beat the value portfolio returns. The regression results show that earnings yield *E/P* has no significant effect on returns.

Chan et al. (1991) find that, of their three fundamental variables *B/P, C/P* and *E/P*, the *B/P* ratio and, to a lesser extent, the *C/P* have the most significant effect on expected returns, which is in line with the present study. They recall that especially, *B/P* has a positive, statistically significant parameter in every of their model. Chan et al. (1991) also state that since the *B/P* ratio is expected to be less noisy than *E/P* or *C/P* (which are very susceptible to events within a particular year and might be more easily manipulated by management), its impact can be distinguished more reliably. That could be an argument for the relative stronger significance of the parameter of *B/P* in this thesis. They find in different models the presence of a "size effect": namely small firms in their sample tend to outperform larger firms. This outcome is consistently found for all regression outcomes in this thesis. Of the three ratios they have considered, they have encountered also problem with the *E/P* ratio, viz. it was hardest to unravel the effect of the earnings yield variable. Overall hypothesis 2 and 3 is accepted. In the setting of their full model, earnings yield even has a significant negative effect on stock returns. However, their regression models have looked at the mutual effects of the price multipliers alone while this thesis has combined each multiplier with a specific capital return variable in each specification. The moderating effect of the price multiplier *C/P, ROA* and *C/P, ROC* are positive and significant. Therefore hypothesis 4 is solely accepted for these combinations. The remaining price multiplier capital return variable moderators were insignificant and for these specifications hypothesis 4 is rejected.

Many studies, like Basu (1977), Fama and French (1992), Lakonishok et al. (1994), Chan et al. (1991) have conducted the regression analysis at portfolio level, and however Chan et al. (1991) state that one advantage of conducting the analysis at firm level is that it is not required to make arbitrary decisions about grouping stocks into portfolios. Overall Chan et al. (1991) find that the results with individual securities reinforce the findings of regressions on portfolio basis. They state further the possibility that certain other predictors, omitted from the list of fundamental variables, drive stock returns and *B/P* and *C/P* are purely proxying for these omitted variables. They proceed that even if this were the case, still, gainful trading strategies based on *B/P* and *C/P* can be considered if the link between *B/P, C/P* and the omitted variables can be presumed to be constant.

Besides, this thesis has controlled for leverage, volatility, cross listing and the effect of insider ownership on the stock returns. The last two variables are consistently found insignificant, while leverage, volatility were significant throughout all the estimation outputs.

7.2 LIMITATIONS

Most studies open up as many questions as they can answer. In the case of the research one logical question is whether investors can obtain better performance by combining even more criteria. Chan et al. (1991) make no attempt to justify the general level of Japanese equity prices; it is possibly encouraging to find that cross-sectional differences in Japanese stock returns are connected to a small set of relatively standard fundamental variables. They state that it is possibly also comprehensible that the earnings yield has lower predictive power than cash flow yield or the book-to-market ratio, in light of the distortions in the earnings of Japanese firms tempted by enhanced depreciation allowances. The noise in reported earnings, associated to Japanese accounting standards, may too help to clarify why the *B/P* ratio has such a strong effect on the stock returns.

The strategy this thesis suggests here is not new. It tracks in the spirit of Graham and Dodd and is, value investing. Consequently why can't a value-oriented money manager apprehend such high returns regularly? If followed exactly, a strategy of screening stocks on the foundation of *B/P, C/P* and *E/P* may not be very attractive to numerous money managers as it may end in assigning substantial gambles on a limited number of firms or industries that appear low-priced. This may give rise to considerable tracking error if a broad benchmark index is used to assess money managers' performance. There is thus a strong temptation for a self-professed value-oriented money manager to stray from such a value strategy, even if this involves losing potentially higher performance in the long run. Houge and Loughan (2006) suggest that the value premium is simply outside the reach of investors. Hence, investors should abort the illusion that pursuing a value style will produce superior long-run performance.

Actually the literature avoids from making suggestions for implementing strategies in which value strategies outperform undeniably the growth strategies. Lakonishok et al. (1994) even suggests looking at the actual portfolios of institutional money managers, by which one can discover whether they have been overinvested in glamour stocks and underinvested in value stocks.

Martani, Mulyono and Khairurizka (2009) conclude that financial ratios, firm size, and cash flow from operating undertakings overall move market adjusted return and abnormal return. They show that from investors' viewpoint financial ratios are beneficial in making investment decisions. This thesis also uncovers that the drive of stock returns is affected much by features other than firm's financial performance. Actually they state that macroeconomic condition, political circumstances, government industrial plan, and technical facets within firms are factors other than financial performance that can move the stock prices and returns. Bearing in mind the limited number of firms and the observed period, it is recommended to increase the sample in both number of firms and observation period for the following study. To reduce the variability of dependent variable (i.e. stock returns), investigators can categorize the firms based on certain conditions, e.g. company size (total assets or market capitalization) or risk level (e.g. firm's leverage). Bird and Whitaker (2004) also debated that other factors for instance interest rate, inflation rate, and exchange rate can be a stimulus for the changes in stock returns. So, other macro level variables which can affect stock return like interest rate, economic growth (GDP), and inflation can be added to multiple regression models to expand the next research.

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APPENDIX

I. INDUSTRY CLASSIFICATIONS

	Industry	*Nr.*
1	Consumer Non-Durables --Food, Tobacco, Textiles, Apparel, Leather, Toys	88
2	Consumer Durables -- Cars, TV's, Furniture, Household, Appliances	51
3	Manufacturing -- Machinery, Trucks, Planes, Paper	182
4	Oil, Gas and Coal Extraction and Products	141
5	Chemicals and Allied Products	63
6	Business Equipment -- Computers, Software and Electronic Equipment	141
7	Telephone and Television Transmission	28
8	Utilities	111
9	Wholesale, Retail, and Some Services (Laundries, Repair Shops)	154
10	Healthcare, medical Equipment and Drugs	82
11	Finance	406
12	Other -- Mines, Construction, Hotels, Bus Services, Entertainment	566

Industry Classifications and the number of firms in a specific industry for the research sample.

II. SUMMARY REGRESSION VARIABLES

$R_{it} - R_{ft}$	firm *i*'s risk-adjusted return for each month *t*;
$Year_i$	firm *i*'s year dummy variable;
Ind_i	firm *i*'s industry dummy variable;
$(E/P)_{it}$	firm *i*'s price multiplier, represented by earnings-to-price for each month *t*;
$(C/P)_{it}$	firm *i*'s price multiplier, cash flow-to-price for each month *t*;
$(B/P)_{it}$	firm *i*'s price multiplier, book-to-price for each month *t*;
ROA_{it}	firm *i*'s capital return variable denoted by Return on Assets for each month *t*;
ROC_{it}	firm *i*'s capital return variable denoted by Return on Capital for each month *t*;
$(E/P)_{it}$ ROA_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$(E/P)_{it}$ ROC_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$(B/P)_{it}$ ROA_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$(B/P)_{it}$ ROC_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$(C/P)_{it}$ ROA_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$(C/P)_{it}$ ROC_{it}	firm *i*'s moderating variable represented by the product of the price multiplier with the capital return variables in month *t;*
$ln(TA_{it})$	a proxy for firm *i*'s size (the logarithm of total assets) in month *t;*
Lev_{it}	firm *i*'s leverage in month *t;*
Vol_{it}	firm *i*'s price volatility in month *t;*
CL_{it}	firm *i*'s cross listing dummy variable in month *t;*
IO_{it}	firm *i*'s insider ownership dummy variable in month *t.*