NTNU – Trondheim
Norwegian University of
Science and Technology

Risk factor analysis across business segments in the US equity market

Sveinung Alvestad
Dan Erik Harlem Glover

Industrial Economics and Technology Management
Submission date: June 2012
Supervisor: Sjur Westgaard, IØT

Norwegian University of Science and Technology
Department of Industrial Economics and Technology Management

NTNU
Det skapende universitet

MASTERKONTRAKT

- uttak av masteroppgave

1. Studentens personalia

Etternavn, fornavn **Glover, Dan Erik Harlem**	Fødselsdato **23. jul 1986**
E-post **danerik.glover@gmail.com**	Telefon **90848984**

2. Studieopplysninger

Fakultet **Fakultet for Samfunnsvitenskap og teknologiledelse**	
Institutt **Institutt for industriell økonomi og teknologiledelse**	
Studieprogram **Industriell økonomi og teknologiledelse**	Hovedprofil **Investering, finans og økonomistyring**

3. Masteroppgave

Oppstartsdato **31. jan 2012**	Innleveringsfrist **26. jun 2012**
Oppgavens (foreløpige) tittel **Risk factor analysis across business segments in the US equity market**	
Oppgavetekst/Problembeskrivelse The thesis will investigate how corporate multiples affect the return on equity within different business segments. The data sample is collected from the US equity market on a yearly basis. The approach will be to review and present relevant literature and theories, as well as to conduct a thorough empirical study of the data set. Lastly, the thesis aims to reveal new and valuable results that can be beneficial for further analysis and company valuations.	
Hovedveileder ved institutt **Førsteamanuensis Sjur Westgaard**	Medveileder(e) ved institutt
Merknader **1 uke ekstra p.g.a påske.**	

4. Underskrift

Student: Jeg erklærer herved at jeg har satt meg inn i gjeldende bestemmelser for mastergradsstudiet og at jeg oppfyller kravene for adgang til å påbegynne oppgaven, herunder eventuelle praksiskrav.

Partene er gjort kjent med avtalens vilkår, samt kapitlene i studiehåndboken om generelle regler og aktuell studieplan for masterstudiet.

10Feb12
Sted og dato

Student

Hovedveileder

Originalen lagres i NTNUs elektroniske arkiv. Kopi av avtalen sendes til instituttet og studenten.

NTNU
Det skapende universitet

MASTERKONTRAKT
- uttak av masteroppgave

1. Studentens personalia

Etternavn, fornavn **Alvestad, Sveinung**	Fødselsdato **29. sep 1983**
E-post **sveinung.alvestad@gmail.com**	Telefon **48090128**

2. Studieopplysninger

Fakultet **Fakultet for Samfunnsvitenskap og teknologiledelse**	
Institutt **Institutt for industriell økonomi og teknologiledelse**	
Studieprogram **Industriell økonomi og teknologiledelse**	Hovedprofil **Investering, finans og økonomistyring**

3. Masteroppgave

Oppstartsdato **31. jan 2012**	Innleveringsfrist **26. jun 2012**
Oppgavens (foreløpige) tittel **Risk factor analysis across business segments in the US equity market**	
Oppgavetekst/Problembeskrivelse The thesis will investigate how corporate multiples affect the return on equity within different business segments. The data sample is collected from the US equity market on a yearly basis. The approach will be to review and present relevant literature and theories, as well as to conduct a thorough empirical study of the data set. Lastly, the thesis aims to reveal new and valuable results that can be beneficial for further analysis and company valuations.	
Hovedveileder ved institutt **Førsteamanuensis Sjur Westgaard**	Medveileder(e) ved institutt
Merknader **1 uke ekstra p.g.a påske.**	

4. Underskrift

Student: Jeg erklærer herved at jeg har satt meg inn i gjeldende bestemmelser for mastergradsstudiet og at jeg oppfyller kravene for adgang til å påbegynne oppgaven, herunder eventuelle praksiskrav.

Partene er gjort kjent med avtalens vilkår, samt kapitlene i studiehåndboken om generelle regler og aktuell studieplan for masterstudiet.

Trondheim 07.02.12
....
Sted og dato

Sveinung Alvestad
....
Student

....
Hovedveileder

Originalen lagres i NTNUs elektroniske arkiv. Kopi av avtalen sendes til instituttet og studenten.

[This page is intentionally left blank]

[This page is intentionally left blank]

SAMMENDRAG

I denne rapporten har vi undersøkt i hvilken grad ulike finansielle multipler kan predikere den risikojusterte aksjeavkastningen til investorer. Våre konklusjoner er basert på resultater fra multivariate tverrsnitts-regresjoner og paneldata. Våre viktigste funn er som følger; 1) vekstselskaper utkonkurrerer verdiselskaper i perioden 2001 til 2010, 2) små selskaper gir en risikojustert meravkastning, spesielt før finanskrisen i 2008, 3) selskaper med store kontantbeholdninger presterer dårligere enn selskaper som investerer sine kontantbeholdninger, og, 4) gjeldsgrad er trolig ikke assosiert med en form for risikopremie. I tillegg viser vi at forklaringsgraden til de ulike ratene kan variere mellom industrier. Til slutt forsøker vi å implementere en enkel investeringsstrategi på bakgrunn av offentlig regnskapsdata og våre regresjonsestimater. Vi finner at en slik modell gir en risikojustert meravkastning i tidsrommet 2003 til 2011.

[This page is intentionally left blank]

FINANCIAL FACTORS AND RISK-ADJUSTED PERFORMANCE IN THE NORTH AMERICAN EQUITY MARKET*

Dan Erik Glover† and Sveinung Alvestad‡

Supervisor:
Sjur Westgaard§

Co-supervisor:
Peter Molnar**
Terje Berg††

† MSc Student at NTNU. E-mail: glover@stud.ntnu.no
‡ MSc Student at NTNU. E-mail: sveinual@stud.ntnu.no
§ Associate Professor at NTNU. E-mail: sjur.westgaard@iot.ntnu.no, Tlf: +47 73 59 35 11
†† Post doktor at NTNU. E-mail: peter.molnar@iot.ntnu.no, Tlf: +47 48 26 00 94
*** Lecturer at BI Trondheim. E-mail: terje.berg@bi.no, Tlf: +47 98 25 16 81*

ABSTRACT
This report examines whether the excess total return to shareholders could be projected by common accounting and market ratios using regression analysis. Our four most important results indicate that; 1) growth stocks outperformed value stocks from 2002 to 2011, 2) size premium of small stocks was valid before the financial crisis in 2008, 3) companies are penalized by having relatively high cash reserves, and, 4) companies with high degree of leverage do not yield a risk premium in normal financial times, but are instead more influenced by such risks in financial recessions. We also show that differences between industry segments are present, and that some ratios could be more predictive when investigating separate segments. Finally, an investment strategy is constructed based on the result of our analysis. We showed that a positive risk-reward return could be earned by using only public information and the preceding year's cross-sectional regression estimates.

Norwegian University of Science and Technology
Department of Industrial Economics and Technology Management

* *First of all, we would like to thank our supervisor Sjur Westgaard for helpful and constructive criticism during the process of writing this report. We are also humble and grateful for the comments and guidance of Peter Molnar, his experience on the topic was most helpful in the process. Also, Terje Berg was helpful with providing background literature which made our work considerably easier. Lastly, a special thanks goes to several unnamed contributors for their support in our work.*

INTRODUCTION AND LITTERATURE REVIEW

This paper aims to analyze the relation between several accounting and market factors and equity returns in the North American equity market between 2001 and 2011. Equity researches often use accounting ratios to support the valuation analysis of a company. The common perception is that the impact of different accounting ratios may vary between segments. Thus, the ratios are used to compare a specific company with its peers. In order to quantify this behavior, we will examine several segments and the entire universe within the North American equity market. The results are intended to be used as a tool for investors to determine which accounting and market factors they should evaluate in a stock-picking process.

A highly discussed topic in finance is to understand the cross-section of equity market return. It was not until the capital asset price model (CAPM) was introduced in the late 1960s the field became somewhat rigorous ((Lintner (1965a), (1965b)), (Sharpe, 1964), (Mossin, 1966)). CAPM describes the expected return of a security based on the systematic risk, and the expected return of the market portfolio and a theoretical risk-free asset. The central assumption of the model is that the market portfolio is mean-variance efficient. This implies two facts that have been widely discussed in the literature; the expected return of a security is a positive linear function of their market betas, and market betas are sufficient to describe the cross-section of expected returns (Fama & French, 1992).

The CAPM framework catalyzed the work on models that could determines which factors that can explain expected return of a security. The literature is mainly divided between two approaches.

First, a portfolio approach, where portfolios are constructed by sorting stocks on some criteria of interest, followed by an estimation of the factors with a regression model. This method imposes two types of problems: Relevant return may be concealed as the portfolio uses average returns, which may cause the rejection of no effect on security return more difficult (Roll, 1977). While Lo and MacKinlay (1990) argue that portfolios based on characteristics which have been related to average return in prior empirical research tends to reject the null hypothesis too often due to data-snooping bias. Since the portfolio approach falls outside the scope of this paper, it will not be elaborated any further.

Second, a regression model approach which is controlled for risks either by using risk-adjusted returns as the dependent variable, or by including the factor loadings as independent variables. The factors used to control for risk can be constructed in several ways. A short discussion of the dominating methods is appropriate.

One of the first regression methods to estimate parameters for asset pricing models was introduced by Fama and MacBeth (1973). They used a CAPM based time regression on historical data to estimate the sensitivity of a security. The sensitivity, often referred to as factor loading, is then extracted to be used in further analysis, for instance cross-section regression analysis. Since the CAPM framework was introduced, there have been vast amounts of literature which has challenged it. Still, the framework is based on solid economic theory, albeit with strong assumptions. Academics still pursue to establish a new and better theoretical foundation. Nevertheless, CAPM is still frequently used as a risk adjusting framework by academics (Koller, et al., 2010).

Connor and Korajczyk (1988) used an asymptotic principal components technique in order to estimate factors that influence the equity return. By applying this method with Ross's (1976) arbitrage pricing theory, they managed to provide a better description of the expected equity return then the CAPM framework. In short, the technique uses an orthogonal transformation to combine possible collinear factors into new linearly uncorrelated sets. These are then regressed as independent variables in the analysis. The principal component regression is a powerful framework for large models, but its disadvantage is the absence of intuitive economic interpretation of individual factors.

Through a series of articles, Fama and French ((1992), (1993)) introduced the three factor model which they argue is superior to the CAPM. In addition to the market sensitivity, they added the SMB[1] and HML[2] factors which aim to mimic illiquidity and default risk. The SMB and HML factors are calculated of excess return from portfolios composed from market capitalization (henceforth, termed market cap) and book-to-market (B/P) ratios respectively. By applying this method, a company does not receive a premium of being small, but instead the company receives a risk premium if its stocks return is correlated with those of small stocks, analogues for B/P risk premium. Ever since the introduction of the three factor model, most academics have relied on it to measure the historical risk. Even so, many articles have criticized the model since it is purely based on empirical evidence. For example, Ang and Chen (2007) argue that after the size effect vanished after 1981, only the B/P effect is left from the CAPM abnormality, and by including a time varying beta the B/P effect would be eliminated as well.

The models presented above have focused company specific ratios, while Chen, et al (1986) shed light on which economic news are likely to affect all assets. They find that the spread between long and short interest rates, expected and unexpected inflation, spread between high grade and low grade bonds, and industrial production describe parts of the equity stock return. The framework is an extension of Ross's (1976) arbitrage pricing theory, with macroeconomic factors.

All the methodologies above aim to explain the systematic risk of a security. The trend to use one over the other raises the question if the results are robust to different methodologies, which is not extensively discussed in the literature. The risk-adjusting methods above include several specific factors predefined by the respective models. The next section discusses several articles which have been dedicated to document additional factors with explanatory power on cross-sectional returns in the equity market.

Banz (1981) argues that the size effect is significant in the 1936-1975, however Knez and Ready (1997) finds that the size effect disappeared if you trim one percent most extreme observation each month. In addition, several other papers argues that the effect disappear from 1981 ((Ang & Chen , 2007), (Koller, et al., 2010)). Dividend yield is found to have a significant explanatory power on the return between 1936 and 1977 (Litzenberger & Ramaswamy, 1979). Further, Basu (1983) found that the earnings-to-price ratio was positive correlated to returns, and the B/P ratio was found to be positively correlated to returns by Stattman (1980). Davis (1994) and La Porta (1996) investigated the impact of cash flow yield, and argue it had a positive effect on a stock return. Also, a company's degree of leverage is claimed to have a positive impact on the return (Bhandari, 1988).

The discussed studies above have examined their respective ratios without regards of differences between industries, and most of these articles use data from the 20th century. To the best of our knowledge, we are not aware of articles that have analyzed the individual segments of the North American Equity market with respect to a wide selection of popular valuation ratios with data from the 21th century. Therefore, we find it appropriate to revisit a selection of the discussed factors, and examine if their established hypotheses are consistent between the largest segments and the whole universe of the North American equity market in a more recent data sample.

The remainder of this paper is organized as follows. First we identify the factors we include in our analysis, and describe the impact we believe they will have on the excess return to shareholders. In the second section we introduce the empirical methodology. Next, we describe the data sample and its structure. We will also discuss which criteria we apply to include a given company in the analysis. Further, we will present the results from our analysis, and discuss the effect in light of our hypothesis. A short section about an application of the finding is also included. Lastly, we will draw a brief conclusion of our main findings.

[1] SMB – Historical excess return of small market capitalization stocks over big market capitalization stocks
[2] HML – Historical excess return of high book-to-market stocks over low book-to-market stocks.

IDENTIFICATION OF FACTORS AND HYPOTHESES

The main purpose with this paper is to establish a statistical relationship between excess total return to shareholders and several accounting and market factors. As discussed, equity analysts often use accounting ratios to support their valuation analysis of a company. By analyzing the ratios, the analysts can evaluate if a company is overpriced, underpriced, or priced in line with its peers.

When choosing which factors to include in the analysis, it is important to reason which economic relationship an explanatory factor would have with the dependent variable. Alexander (2008) emphasize that there is no econometric theory on how to choose the best explanatory factors, only the logical interpretation of an incremental change in the factor, and user experience. Nevertheless, it is important to keep in mind that factors can turn out to be significant in the analysis even though they do not have an economical relationship to the dependent variable, and vice versa. As a precursor to this, we describe in detail which relationship each of the dependent factors is believed to have with the dependent variable.

Based on efficient market theory, security prices are assumed to fully reflect all available information in the market, implying that only new unknown information will influence the stock price (Fama, 1970). As discussed above, several methodologies can be used to estimate risk-adjusted return of a security. Regardless of which of these models that are used, if additional significant factors are found the model do not capture all risk.

As Subrahmanyam (2010) points out, a vast amount of factors have throughout the literature been used to explain and predict cross-sectional equity returns. Those variables are generally motivated in one of the four following ways.

The first category, equity researcher's wisdom, is factors motivated by informal interpretation of scholars and finance professionals. Equity researchers base their stock recommendations partially by comparing the company's ratios with their peers. This valuation method has intrigued the scholars for years, and numerous academic papers have been dedicated to quantify this informal belief. The lion's share of our independent variables is motivated from this, simply because of the scope of this paper.

Second, since the introduction of the CAPM framework, several new theoretical factors inspired from different risk-return models has emerged. Many academics have extended the CAPM framework by including more factors, for example macro factors, and firm specific characteristics. Other types of models have also been used to explain the relationship to stock returns. Examples of these methods are ICAPM[3], macroeconomic APT[4], principal components method, and the Fama and French three factor model as discussed above. The connection is that all models attempt to increase the explanatory power of stock return. We choose to include the market beta from the CAPM framework as a risk-adjusting variable in our analysis, as it is the only risk -adjusting method which is thoroughly backed up by economic theory and accessibility of the data.

Next, several factors is derived from behavioral biases or miss reaction by inexperienced investors. Several studies have observed that a company's long term performance is negative related to past performance measure. This is argued to be consequences of investors extrapolate historical performance too far into the future. In our analysis, we do not include direct factors to observe these effects. On the other hand, we believe that some factors can experience this effect implicitly, for example the earning-to-price ratio.

Lastly, in the literature several factors have been connected to the effect of illiquidity. For example, the bid-ask spread have been found to have a significant effect on the stock return,

[3] Intertemporal CAPM includes a selection of factors such as interest rate level, inflation, and sharp ration in addition to the market risk (Merton, 1973).

[4] Macroeconomic APT (arbitrage pricing theory) accounts for risk by including industrial production, inflation, term structure etc. (Chen, et al., 1986).

while others use trading volume as a proxy of illiquidity. Fama and French (1993) claim the size effect is a proxy of the illiquidity risk, which is elaborated below.

The following subsections discuss the motivation and assumed effects of the factors we include in our analysis. Exhibit 1 summarizes the discussion, and states our hypothesis.

Acronym	Description	Hypothesis
Beta	Market beta	~
ME	Market value of equity effect	~
B/P	Book-to-market equity	+
S/P	Sales-to-price	+
E/P	Earnings-to-price	+
EBITDA/EV	EBITDA-to-enterprise value	+
FCFF/ME	FCFF-to-market cap	+
Cash/FV	Relative cash reserves effect	-
E/A	Capital structure effect	-

Exhibit 1: The factor we include in our analysis is given with acronym and descriptive name in the two first columns. Our hypothesis of the factors effect on return, based on the discussion bellow, is given in the last column.

Value stocks versus Growth stocks

Before examining the factors included in our analysis, a brief explanation of the difference between value stocks and growth stock is appropriate.

Investment banks often categorize companies as value and growth stocks based on different ratios, and then constructs portfolio based on these ratios. A company that seems to trade below its fundamental value is called a value stock. Common characteristics for these stocks are, among others, high book-to-price, sales-to-price, earnings-to-price, and cash flow-to-price ratios. Companies with low values of these ratios are often associated with high expected growth in their characteristics, and are therefore termed as growth stocks.

Previous studies have shown that value stocks have outperformed the market during the last 40-50 years (Haugen's (1999), (O'Shaughnessy, 2005)). This relation was enhanced by international results found by Maroney and Protopapadakis (2002) and Fama and French (1998). However, this tends to fluctuate in different markets and economic conditions. Black (1993) and MacKinlay (1995) argued that the value stock premium is sample-specific or could be a result of data-mining, but show no evidence that contradicts the value premium. Value stocks are therefore expected to yield a premium over growth stocks in our analysis. Several of the factors below are motivated by this perception and will be thoroughly examined.

Market beta

According to rational economic sense, a risk-averse investor acquires higher average return on an investment to compensate for increased risk. Hence, the market portfolio is mean-variance efficient (Sharpe, 1964). The most basic measure of risk is the volatility of the stock price. The stocks sensitivity (market beta) to the market portfolio can be estimated using the CAPM framework (Fama & MacBeth, 1973). Consequently, companies' market beta is a measurement of risk exposure relative to the market portfolio.

Fundamental economic risk differs between segments. Some segments can be exposed to certain risks that others are immune to. However, all companies are exposed to systematic risk to some extent. Thus, the magnitude of the market beta between both segments and companies may therefor vary (Fama & French, 1997).

The coefficient connected to the market beta should measure the market return less the risk free rate, which can be negative if the market return is negative. We believe that the coefficient of the risk adjusting factor would have mixed impact in our analysis depending on the general state of the economy.

Market value of equity effect

The explanatory power of companies' market equity value (ME) on stock return has been analyzed in several studies. The two most profound and sited studies of the American stock market are done by Banz, and Fama and French.

Banz (1981) argues that common stock of small firms have higher risk-adjusted returns than the larger firms. However, his result was not stable over the whole time period (1936-1975). He tread carefully in concluding what this effect is a proxy for. While, Fama and French postulates through a series of articles that ME, combined with the B/P ratio, captures most of the cross-sectional variation in average stock returns. They argue that ME, combined with B/P, is a proxy for distress and illiquidity risk since the investors demand a premium by holding a small companies because of their reduced ability to comprehend financial turmoil (Fama & French (1992), (1995), (1993)). Heston, et al. (1999) quantified the same results for twelve European countries. Others also argue that investors are averse to invest in small cap firms due to insufficient information and uncertainty surrounding value estimations due to low equity analyst coverage and lack of information flow (Klein & Bawa, 1977). In addition, Perez-Quiros and Timmermann (2000) find that small companies display the highest degree of asymmetry in their risk across recession and expansion states.

Most studies favor a higher expected premium from smaller ME companies. Knez and Ready (1997) find, however that the size effect disappeared if you remove the one percent most extreme observation each month. In addition, several other papers argue that the size effect disappeared after 1981 ((Ang & Chen , 2007), (Koller, et al., 2010)).

Some industries, such as utility and energy, are exposed to high entry costs and are dominated by large companies. These type of segments might have a positive relationship to the ME factor. For the other segments we do not have a clear hypothesis due to the conflicting results in studies presented above. We aim to determine if the size effect still holds, and quantify differences between segments.

Book-to-market equity

The academic environment has mushroomed with articles trying to explain the relationship between companies' book-to-market equity ratio and its stock return. The ratio attempts to identify undervalued and overvalued stocks by dividing the company's book value on the market value of equity and comparing it to its peers.

Fama and French published several articles which discussed the B/P ratio and its relationship to stock returns in the 1990s. They found that the B/P ratio and size effect could explain the difference in average return across portfolios which the CAPM framework could not account for. By constructing portfolios of companies with high B/P ratios they earned higher risk-adjusted returns than low B/P ratio portfolios. They associate these results with the differences between value stocks and growth stocks favoring a value stock premium, and argue that this effect is a proxy for relative distress risk (Fama & French (1992), (1993), (1998)). Dichev (1998) and Campbell, et al. (2008), on the other hand, find that the distress risk, measured by more explicit proxies, is negatively related to expected returns. They are instead supportive of the hypothesis that investors underreact to information in the balance sheet about impending distress.

We intend to continue this discussion and investigate further the relation between the B/P ratio and stock return. We expect a value stock premium as most studies have shown, but we acknowledge there might be irregularities within this effect.

Sales-to-price

The sales-to-price (S/P) rato is constructed from the firms total sales divided on the market cap. This ratio has not obtained vast amount of interest in the academic envirnoment, but is used as an additional ratio to support the valutaion preformed by equity analysts.

O'Shaughnessy (2005) shows that by arranging companies based on their preceding year's P/S ratios, the lower quantile outperformed the higher quantile. Hence, the P/S ratio has predictive power on the future price development. In addition, he argues that the P/S ratio is the best predictor of value stocks and growth stocks, with high and low P/S ratios respectively.

The S/P ratio is a somewhat limited benchmark when comparing companies since it only compares the total sales, and disregards elements as cost of sales, interest expenses, depreciation, et cetera, which could vary between industries. Comparing companies using this ratio is therefore of limited value between segments, and should only be used to compare firms with similar expenses and capital structure.

As we examine risk-adjusted return in different segments, we therefore wish to include this ratio to examine if it has explanatory power of average returns within each segment, and quantify potential differences between the segments. We invert the ratio in consistence with the other ratios in this report, and believe that the S/P ratio would have a positive coefficient in our analysis in line with the value premium theory.

Earnings-to-price

The earnings-to-price (E/P) ratio has been popular with financial professionals, and has been discussed in several academic papers[5]. The E/P ratio is an alternative ratio to the B/P ratio with regard to distinguish value stocks from growth stocks. It signals how much an investor is willing to pay for each dollar of earnings. The general interpretation is that investors which have faith in a company's earnings growth are willing to pay more for a dollar of earnings.

Basu (1977) finds that when sorting companies by their P/E value into different portfolios, low P/E ratio portfolios outperform high P/E portfolios. In a following paper he extend his argument to high E/P companies earn higher risk-adjusted return then companies with high E/P ratio even when controlling for size and market beta (Basu, 1983). Fama and French (1992) find a positive relation between E/P and average returns when examining ranked portfolios. However, they argue that size and book-to-market equity captures the cross-sectional variance in average stock returns associated with the E/P ratio.

Reported earnings incorporated in the stock price could include high levels of accruals (difference between accounted earnings and cash flow), which are found to be negatively associated with future stock returns (Chan, et al., 2006). This could indicate a negative relation between E/P and stock return.

The fundamentals of segments differ, and the E/P ratio is not well suited to compare companies between segments. We therefore find it interesting to investigate this ratio on different segments. We believe that the E/P ratio would give a positive regression coefficient, as value stocks are believed to outperform growth stocks and most other studies favor this conclusion.

Earnings before interest, tax, depreciation and amortization-to-enterprise value

The Earnings before interest, tax, depreciation and amortization to enterprise value[6] (EBITDA/EV) ratio is rarely examined in academic research, but is a widely used ratio by equity analysts. More than 30 percent of Morgan Stanley Dean Witter's equity analysis uses this ratio as a tool to valuate and determine equity recommendations ((Fernandez , 2001), (Minjina, 2008)).

The general interpretation of the EBITDA/EV ratio is that a high ratio indicates high return on investments. It is often used as an alternative to the E/P ratio to determine the fair market value of a company, since it is not affected by accounting differences in for example depreciation and capital structure. EBITDA normalizes the differences in taxation and fixed asset accounting. It does not consider capital investments and changes in the working capital. We scale by dividing

[5] The academic community shows interest in both the E/P and P/E ratios. We analyze the E/P ratio, the two methods is analogues only with opposite interoperation.

[6] Enterprise value is the year-end market cap plus market debt value minus the cash reserves.

with EV as it normalizes for differences in the company's capital structure. Although this ratio should be incorporated in the stock price, inefficiencies may apply.

With this in mind, and due to its popularity and accessibility, we find it interesting to analyze the EBITDA/EV ratio. We believe a high EBITDA/EV ratios could also be associated with value stocks, and therefore expect it to behave similarly to the B/P, S/P and E/P ratios. It should also be more stable across segments due to its normalizing effects.

Free cash flow to the firm-to-market equity

The cash flow statement is useful in determining the short-term sustainability of a company. Several studies have examined the impact of cash flows on stock returns. Davis (1994) and La Porta (1996) both find a positive relation between cash flow yield and stock returns. The same result is found in the Japanese equity market by Chan, et al. (1991). Rayburn (1986) argues that the operating cash flow could be skewed due to accruals. She finds that there is an association between abnormal returns and cash flow after controlling for aggregate accruals. Sloan (1996) argues that stock prices act as investors fail on distinguish between the different properties of accrual and cash flow components of earnings.

A more accurate measurement of a company's cash-generating efficiency is the free cash flow to the firm divided by the market value of equity (FCFF/ME). Free cash flow to the firm (FCFF) signals a company's ability to pay debt, dividends, buy back stocks and facilitate the growth of business. It is a measurement of cash transactions for the current year, independent from the past. FCFF would be a more accurate representation of the return to shareholders then the operating cash flow, since it incorporates capital expenditures and ongoing costs. Hence, it is less affected by accounting manipulation and controls for accruals.

We believe companies with high FCFF/ME ratios would yield higher risk-adjusted return than the ones with low ratios as this ratio also could be connected to the value stock versus growth stock discussion. This relation would also hold if investors underestimate the free cash flow component of earnings. Differences between significance levels across segments may also appear as some industries are more cash flow driven than more asset driven industries, and therefore are more affected by fluctuation in the FCFF.

Relative cash reserves effect

Company's relative cash reserves are defined as its cash reserves divided by the firm value[7] (Cash/FV).

Companies with excess cash flow could distribute the wealth in several ways; increase dividend, repurchase stocks, invest in new projects, and increase the company's cash reserves. Studies have shown that high dividend yield would have a positive effect on a company's expected return ((Litzenberger & Ramaswamy, 1979), (Charest, 1978)). A change in the dividend pay-out would affect the stock price. If a company decides to use cash reserves to repurchase shares, it is interpreted as the management believes the stock is undervalued. This tends to trigger an elevation of the stock price (Dann, 1981). When a company chooses to invest in a project yielding higher returns than the deposit rate, the returns are expected to increase.

All the mentioned alternatives to keeping their cash reserves are associated with higher returns. We wish to investigate whether a large cash reserve could be viewed as an option to carry through with these mentioned alternatives, or if it can be interpreted as the company fail to utilize their resources. We favor the latter and therefore expect a negative relation between the Cash/FV ratio and stock return.

Capital structure effect

A company's financial leverage can be analyzed by looking at the capital structure. By dividing the market value of equity on market value of debt and equity (E/A), you get the relative proportion of equity used to finance the company's debt.

[7] Firm value is defined as the market cap plus market debt value.

Bhandari (1988) analyzes the relationship between risk-adjusted return and the debt-to-equity (D/E) ratio on common stocks. His result shows that stock returns are positively related to the D/E ratio when controlling for the market beta and firm size. He is careful to conclude what exactly the D/E ratio is a proxy for. However, he argues if it is a proxy for some sort of risk premium, a positive relation to the expected stock returns would be expected.

In this report the E/A ratio is used to describe the capital structure effect. When the D/E ratio is high, the E/A ratio would by design be low. In effect, Bhandari's results would imply that E/A is negatively correlated to the stocks return.

If the earnings gained by increasing the company's leverage are larger than the costs associated with the increased debt minus the tax shield, the shareholders would benefit. Also, shareholders risk would increase with higher leverage, implying higher expected return. In contrast, the shareholders' value decrease if the company fails to generate returns above the cost of capital, and the chance of distress increases.

Based on the discussion above, we believe that the regression coefficient of the E/A ratio would be negative in our analysis. We also believe the significance level might vary among segments, since some segments are more capital intensive than other.

EMPIRICAL METHODOLOGY

We seek to establish statistical evidence of which accounting and market factors that can explain excess total return to shareholders in the North American equity market. Two approaches are used to analyze this; a two-step panel data analysis for the whole time period, and a two-step cross-sectional analysis for each year. Both approaches use the same first step. First step estimates the factor loading of the systematic risk by an ordinary least square (OLS) regression. Next, the panel data method estimates a two dimensional regression on the whole data sample, while the cross-sectional regression is estimated separately for each of the ten years in our data sample. The software used is MATLAB, OxMetric and Microsoft Excel.

First step includes the well-known first step of Fama-MacBeth regression, where the factor loading is estimated by the CAPM framework. The calculation is done by a time regression of the market risk given in Equation (1). The factor loading is estimated with weekly returns over the 156 weeks previous to the test year. This procedure is repeated for all securities for each of the ten years analyzed (Fama & MacBeth, 1973).

$$r_{i,\tau} - r_{f,\tau} = \alpha_{i,\tau} + \beta_{i,\tau}\left(r_{m,\tau} - r_{f,\tau}\right) + \varepsilon_{i,\tau} \qquad (1)$$

$r_{i,\tau}$ is the return of security i at time τ, $r_{f,\tau}$ is the risk-free return at time τ. $r_{m,\tau}$ is the return of the NYSE composite index (NYSE index) at time τ. $\alpha_{i,\tau}$ is the excess return of security i at time τ. $\beta_{i,\tau}$ is the risk coefficient of security i at time τ. $\varepsilon_{i,\tau}$ is the error term for security i at time τ, and τ is element in 156 weeks prior of the respective year to the actual date. The $\hat{\beta}_i$ is the estimated coefficient for each of security i for the given year, it is stored and used in the second step as factor loading to adjust for systematic risk.

As described above, the second step differs for the two methodologies. The panel data approach uses a combination of time series and cross-sectional regressions in order to estimate the factor's coefficient over the entire sample period. We also include time dummies to absorb time effects. The regression estimates Equation (2) in two dimensions; time and cross-section. The factor loading ($\hat{\beta}_i$) from the first step is included to risk-adjust the estimations (Miller & Scholes, 1982).

$$TRS_{i,t+1} - r_{f,t+1} = \alpha_{i,t} + \gamma_{i,t}\hat{\beta}_{i,t} + \sum_{k}\left(\vartheta_{i,t,k}x_{i,t,k}\right) + \sum_{T}\left(\varphi_{i,t,T}\delta_{i,t,T}\right) + \varepsilon_{i,t} \qquad (2)$$

$TRS_{i,t+1}$ is the total return to shareholders (capital and dividend gains) for company i at time t+1. $\gamma_{i,t}$ is the risk premium related to the $\hat{\beta}_{i,t}$ of security i at time t. $x_{i,t,k}$ is the value of characteristic k for security i at time t. $\vartheta_{i,t,k}$ represent the premium per unit of characteristic k for security i at time t. $\delta_{i,t,T}$ is a dummy variable that is one if year t equals to T and zero otherwise, where $T \in [2001, \dots, 2010]$. $\varphi_{i,t,T}$ is the premium associated with the time effect for the given year and security.

The cross-sectional approach estimates a slightly different version of Equation (2). The time dummies and their coefficient are excluded, and the equation is estimated separately for each of the ten years.

Our approach differs from Fama and MacBeth (1973), Black and Scholes (1974), and Fama and French ((1992), (1993)), as we apply the two-step method using individual companies in contrast to portfolios or grouped data. This is done to make a direct comparison of results between segments and years easier ((Miller & Scholes, 1982), (Brennana, et al., 1998)).

We use a backward selection procedure to reduce the risk of over fitting the model. This is done by exclude insignificant variables, where the least significant variable is omitted from the model before it is estimated again. The procedure is repeated until all variables are significant to at least a 10% significance level.

The presence of heteroscedasticity in the residuals could corrupt the estimator's minimum variance estimation. Hence, the coefficient standard errors would not hold, however the OLS estimators would still give unbiased coefficients. To test for this phenomenon, a Koenker (1981) modification of the Breusch–Pagan (1979) heteroscedasticity test is used. Since preliminary test of the data showed sign of heteroscedasticity, we use White's (1980) adjusted heteroscedasticity consistent least-squares regression (henceforth, White's regression) on all of our cross-sectional regressions, and the panel data approach applies a robust standard error regression to avoid this problem.

Multicollinearity could occur when there is a high degree of correlation between independent variables. As a result of this, the regression coefficient would not be estimated with much precision, and the model would not be efficient. A sign of multicollinearity is when an estimated coefficient changes extensively when a collinear variable is added to the regression model (Alexander, 2008). In order to control for multicollinearity, correlation matrixes for each of the regressions is calculated. If the square correlation between independent variables exceeds 0.5, new step-wise regressions are performed where we test all combinations until no multicollinearity occurs (Maringer, 2004). The combination that obtain the largest adjusted R-squared is chosen, and the respectively variables that contributed to multicollinearity are omitted.

Lastly, in order to ensure that the regression models provide accurate estimations, we need to check whether the OLS assumptions hold. Hence, the error term should be homoscedastic, uncorrelated, and normally distributed with zero mean, and the independent variables should be non-stochastic. If those are violated the regression could be ineffective or biased. To verify the assumptions several tests are conducted on the data. A summary of the results and a discussion of these are given in Appendix I.

DATA

The data consist of year-end prices and firm specific characteristics for companies listed NYSE, NASDAQ, AMEX and TSX in the time period 2001 to 2011. The company data is collected from ValueLine[8], theoretical risk-free rate[9] from EcoWin, and stock splits from Yahoo Finance.

The data is arranged in such a way that the regression model for year t includes the firm specific characteristics for year t, and the return for year t+1. Each company needs to satisfy several criteria in order to be included in the data sample for a given year. Companies which did

[8] The downloaded data is organized by Aswath Damodaran, but stem from ValueLine (Damodaran, 2012).

[9] Three month T-Bill index return is used as a risk-free proxy

not have data to compute return and construct the factors required in Equation (2) were omitted. We also included some factor specific criteria which are discussed below. Note that, companies do not need to be present throughout all of the years to be included in the analysis. This would remove the survival bias (Sandvik, et al., 2011).

Twelve portfolios were created from the data sample, these was constructed by their Standard Industrial Classification code. The grouping is based on French's (2012) definition. In addition, we will also analyze the whole universe, which contains the twelve segments. A summary of the segments are given in Exhibit 2, and a full description is disclosed in Appendix II.

Short name	Full segment name
BusEq	Business Equipment
Chems	Chemicals and Allied Products
Durbl	Consumer Durables
Enrgy	Oil, Gas, and Coal Extraction and Products
Hlth	Healthcare, Medical Equipment, and Drugs
Manuf	Manufacturing
Money	Finance
NoDur	Consumer Non-Durables
Others	Others
Shops	Wholesale, Retail, and Some Services (Laundries, Repair Shops)
Telcm	Telephone and Television Transmission
Utils	Utilities
Whole	Whole Universe

Exhibit 2: Segments description, with a short name and full name.

The dependent variable is expressed as excess total return for shareholders (henceforth, excess TRS). It is calculated by subtracting a risk-free return proxy from the total return to shareholders. We have also applied logarithmic transformation to make the return continually compounded since the arithmetic return showed sign of excess kurtosis and skewness compared to the normal distribution (Brennana, et al., 1998). TRS is calculated as Equation (3) illustrates:

$$TRS_{t+1} = \frac{P_{t+1} + Div_{stock,t+1} - \frac{P_t}{S_{t+1}}}{\frac{P_t}{S_{t+1}}} = \frac{P_{t+1}}{P_t} \cdot S_{t+1} \cdot \left(1 + Div_{yield,t+1}\right) - 1 \qquad (3)$$

Where, P_t and P_{t+1} is the year-end price of the respective security at time t and t+1 respectively. $Div_{yield,t+1}$ is the dividend yield calculated by dividing the cumulative dividend paid out per share in year t+1 by the year end stock price at year t+1. S_{t+1} is the stock split adjusting variable, which represent the split ratio if the company has had a split in the year t+1, and one otherwise. This ensures that the TRS is calculated from the same price basis.

Descriptive summary for the dependent variable is given in Exhibit 3; it is calculated of the entire data sample, hence it includes excess TRS data of all companies in the respective segments from year 2002 to 2011[10].

[10] A full descriptive summary for each of the segments and the ten years are provided in an attached Excel file. In addition, several more descriptive properties are disclosed there.

Segment	Count	Mean	Standard Deviation	Excess Kurtosis	Skewness	Minimum	Maximum
NoDur	1312	0.042	0.442	4.800	-0.539	-2.840	1.884
Durbl	559	-0.023	0.537	3.583	-0.317	-2.880	2.619
Manuf	2514	0.067	0.471	3.853	-0.292	-3.029	3.159
Enrgy	518	0.144	0.486	2.096	-0.337	-1.687	2.314
Chems	895	0.052	0.461	3.607	-0.274	-2.356	2.197
BusEq	3257	0.041	0.508	2.290	0.146	-2.354	3.226
Telcm	725	-0.001	0.508	2.184	0.349	-1.759	2.149
Utils	818	0.062	0.329	8.091	-1.321	-2.101	1.636
Shops	1651	0.067	0.476	6.428	0.127	-2.148	4.571
Hlth	2037	0.060	0.478	3.072	-0.066	-2.410	2.831
Money	789	0.017	0.566	4.967	-0.799	-3.242	2.844
Others	4007	0.040	0.488	5.227	-0.565	-4.414	2.625
Whole	19082	0.048	0.484	4.121	-0.252	-4.414	4.571

Exhibit 3: Descriptive statistic for the dependent variable, excess-TRS. The statistic is calculated from the entire dataset. Excess kurtosis and skewness is considerable reduced by using continued compounded returns. The statistic reveals that the excess-TRS vary extensively between segments. Durbl being the loser with an average loss of two percent year over year (YOY), and Enrgy as the winner with a 14 percent increase YOY. The average return for all the segments combined is five percent YOY

For each company the following independent variables were constructed for the respective years. Market beta is the risk-adjusting factor; it is estimated by a first step Fama-MacBeth approach on 156 weekly returns prior the given year. The market betas are provided by the downloaded data set. The company's market cap is denoted ME, and it is calculated by multiplying number of shares outstanding with year-end stock price. FCFF/ME represents the free cash flow to firm divided by market cap. Cash/FV is the respective companies' cash reserves at year-end divided by the firm value. EBITDA/EV is defined as earnings before interest, tax, depreciation, and amortization dividend by enterprise value. E/P, B/P, and S/P are the cumulative earnings, year-end book value of equity, and total sales through the year dividend by the year-end market cap respectively. E/A is the year-end market value of equity divided by the market value of debt and equity. All values are denoted as year-end quotes.

We also apply some factor specific criteria that need to be fulfilled in order to include the given company in the regression. Companies with market cap less than ten million dollars are omitted from the analysis; this minimizes the microstructure-induced biases (Davis, 1994). We also omit all companies that have zero or negative values for the following factors; FCFF/ME, Cash/FV, EBITDA/EV, E/P, B/P, and S/P. This is done avoid a U-shape in our regression estimation ((Chan & Chen, 1991), (Jaffe, et al., 1989)). Another advantage with doing this is that we can use a logarithmic transformation on the variables. Preliminary tests show that natural logarithm has advantageous properties in explaining return of the mentioned factors. Additional, this reduces the skewedness and kurtosis of the data sample; hence, the distribution becomes more symmetric (Wilcox, 1999). Descriptive summary for the independent variables is provided in Exhibit 4, where the omitted companies have been removed, and the transformation discussed above has been applied[11].

Scaling factors by dividing on market cap, firm value, or enterprise value would reduce the heteroscedasticity since the deflator includes the markets expectation for growth and inflation ((Beaver, 1970), (Rayburn, 1986)). Even though this is done, evidence of heteroscedasticity in the residuals is detected in several of the models. We therefore use robust standard error regression models to adjust for heteroscedasticity. Several factors also show signs of multicollinearity. These are excluded from the given model, as discussed in empirical methodology. The correlation

[11] A full descriptive summary for each of the segments and the ten years is given in the attach Excel file. In addition, several more descriptive properties are disclosed there.

matrixes for the whole period are given in Exhibit 6 and Appendix III, and yearly correlation matrixes for Whole segment is attached in Appendix IV.

		Beta		ME		B/P		S/P		E/P	
Segment	Count	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
NoDur	1312	0.853	0.789	6.729	2.106	-0.877	0.881	0.144	0.908	-2.841	0.653
Durbl	559	1.196	0.864	6.635	1.918	-0.691	0.902	0.550	0.931	-2.802	0.786
Manuf	2514	1.179	0.851	6.733	1.808	-0.809	0.703	-0.008	0.882	-2.920	0.776
Enrgy	518	0.885	0.812	8.131	2.297	-1.002	0.693	-0.649	1.201	-2.780	0.779
Chems	895	1.069	0.760	7.024	1.985	-0.979	0.832	0.005	0.824	-2.826	0.612
BusEq	3257	1.500	1.051	6.555	1.935	-1.038	0.834	-0.603	1.085	-3.296	0.919
Telcm	725	1.361	1.001	7.177	2.428	-0.857	0.805	-0.526	0.869	-3.066	0.868
Utils	818	0.560	0.541	7.384	1.715	-0.752	0.713	-0.188	0.852	-2.856	0.618
Shops	1651	1.009	0.789	6.893	1.911	-0.823	0.789	0.513	1.005	-2.871	0.668
Hlth	2037	0.856	0.737	6.887	2.119	-1.119	0.750	-0.664	1.003	-3.106	0.759
Money	789	1.097	0.848	6.857	1.972	-0.849	0.954	-0.681	1.109	-2.799	0.854
Others	4007	1.119	0.858	6.640	1.851	-0.883	0.871	-0.186	1.028	-3.014	0.817
Whole	19082	1.114	0.892	6.812	1.981	-0.913	0.822	-0.217	1.062	-3.000	0.804

		EBITDA/EV		FCFF/ME		Cash/FV		E/A	
Segment	Count	Mean	SD	Mean	SD	Mean	SD	Mean	SD
NoDur	1312	-2.067	0.505	-2.611	0.901	-3.366	1.359	-0.268	0.343
Durbl	559	-1.907	0.601	-2.478	1.076	-2.947	1.256	-0.330	0.477
Manuf	2514	-2.100	0.570	-2.677	0.968	-3.260	1.266	-0.243	0.278
Enrgy	518	-1.881	0.656	-3.068	1.115	-3.904	1.516	-0.218	0.210
Chems	895	-2.055	0.549	-2.568	0.835	-3.172	1.273	-0.259	0.271
BusEq	3257	-2.405	0.812	-3.075	0.974	-2.107	1.050	-0.099	0.200
Telcm	725	-2.099	0.779	-2.797	1.116	-2.614	1.401	-0.249	0.306
Utils	818	-2.047	0.425	-2.896	1.082	-4.409	1.447	-0.545	0.303
Shops	1651	-1.933	0.628	-2.835	1.097	-3.085	1.248	-0.248	0.354
Hlth	2037	-2.359	0.767	-3.036	1.016	-2.751	1.190	-0.139	0.218
Money	789	-2.109	0.929	-2.289	1.414	-2.614	1.609	-0.498	0.769
Others	4007	-2.154	0.667	-2.753	1.021	-2.966	1.369	-0.266	0.394
Whole	19082	-2.159	0.701	-2.806	1.047	-2.942	1.393	-0.241	0.358

Exhibit 4: Descriptive statistic for the independent variables, it is calculated from the entire dataset. The statistic reveal that the Betas mean fluctuates across segments, which may indicate that some segments are more risky than other (e.g. BusEq is more exposed to market risk compared to Utils).

EMPIRICAL RESULTS

In this section we will present and discuss our main results and compare it to the most relevant previous studies. We have performed two dimensional panel data regressions on both the whole dataset and twelve different segments, in addition to yearly cross-sectional regressions on the whole dataset. We will first discuss the results from the Whole segment, independent from the sub segments, and analyze the relation between each ratio and excess TRS. The discussion will mainly focus on the panel data estimation, but we also support these results with the yearly cross-sectional regressions. This is followed by a section with in-depth discussions of each segment, where we enlighten the results that deviates from the Whole segment analysis. The subsequent section will employ graphical presentation to further discuss the most important findings. Lastly, we will demonstrate a practical application of our analysis.

Whole segment

The regression results for the Whole segment are presented in Exhibit 5 and Exhibit 7, and correlation matrixes are provided in Exhibit 6 and Appendix IV.

Time dummies are included in all the panel data regressions to compensate for yearly market variations which would increase the models stability. By analyzing the time dummy coefficients, it is apparent that the financial market in our data period has been exposed to financial turmoil. The time dummies are denoted as the given regression year, and should be compared with the following year's returns. They are mostly significant, and thereby compensate for yearly market variations. The other ratios will therefore probably be a better proxy for their associated risks independently of these market variations.

	Coefficient	Std.Error	t-value	t-prob
Beta	-0.017	0.005	-3.510	0.000
ME	-0.006	0.002	-3.820	0.000
B/P	-0.122	0.006	-21.400	0.000
S/P	0.048	0.004	11.100	0.000
E/P	-0.028	0.005	-5.740	0.000
EBITDA/EV	-0.130	0.007	-17.800	0.000
Cash/FV	-0.028	0.002	-12.100	0.000
E/A	0.145	0.015	9.410	0.000
Constant	-0.484	0.024	-20.500	0.000
T2002	0.381	0.014	26.600	0.000
T2003	0.140	0.014	9.830	0.000
T2004	-0.009	0.014	-0.630	0.529
T2005	0.073	0.015	4.960	0.000
T2006	-0.083	0.015	-5.460	0.000
T2007	-0.326	0.016	-20.000	0.000
T2008	0.420	0.016	26.600	0.000
T2009	0.216	0.014	15.300	0.000
T2010	0.004	0.014	0.286	0.775
R^2	0.366			
No. Obs.	19082			

Exhibit 5: Panel data regression estimates for the Whole segment. Insignificant factors are omitted from the model.

	Beta	ME	FCFF /ME	Cash /FV	EBITDA /EV	E/P	B/P	S/P	E/A
Beta	1								
ME	0.02	1							
FCFF/ME	0.00	-0.17	1						
Cash/FV	0.19	-0.11	0.00	1					
EBITDA/EV	-0.05	-0.17	0.64	0.15	1				
E/P	-0.04	-0.04	0.43	-0.01	0.50	1			
B/P	0.02	-0.32	0.41	0.15	0.54	0.29	1		
S/P	0.00	-0.31	0.52	0.00	0.62	0.38	0.59	1	
E/A	-0.02	0.09	-0.51	0.19	-0.25	-0.27	-0.39	-0.47	1

Exhibit 6: Correlation matrix for whole segment. The correlation is calculated over the entire data period.

The market beta coefficient is negative and is significant at least at the 1% level. This implies a negative market premium associated with the systematic risk a stock is exposed to. Looking at the yearly regressions, the market beta's coefficients are not found significant across the whole time period. This could be explained by the markets behavior during the studied time period. As Exhibit 7 shows, the relation between the market beta and excess TRS fluctuates between negative and positive values more or less depending on if the market had an upward or downward trend. When estimating a common relation for all years, these opposite effects can offset each other and a general relation could be tough to prove. We will therefore not lay too much weight on the negative coefficient found in the Whole segment, nor will we discuss the beta coefficients in the different segments.

Previously in this report we argue that the size effect could be a proxy for distress and illiquidity risk, or other risks associated with insufficient information and uncertainty in analyst's estimations. Regardless the case, size is expected to have a negative relation to the common stock returns. This contradicts the studies that claim this effect disappeared after 1981. The ME coefficient is low in absolute terms, but still negative and strongly significant, which is in line with the Banzs' (1981) earlier results. However, even though small firms outperformed larger firms within this time period in general, investigating the yearly regressions indicate that this effect were more prevailing in the years prior financial crisis in 2008. In fact, under the financial crisis the coefficient indicate a positive relation between size and excess TRS. In such environment, investors are less confident in the company's probability to survive. As the weakest companies might file for bankruptcy, companies exposed to that risk will on average provide lower stock returns than companies not as severe exposed to such risks. Our results indicate that smaller companies are more exposed to these risks since they on average provide higher excess TRS, but provide lower average returns in financial challenging periods.

The only ratio not significant in our regression model from the whole data sample is FCFF/ME. According to the correlation matrix, illustrated in Exhibit 6, this factor is relatively high correlated with the EBITDA/EV ratio and other ratios scaled by market cap. Seemingly, most of the risk this ratio acts as a proxy for is accounted for by the other correlated ratios. By examining the yearly regressions, results also indicates that FCFF/ME ratio is usually not significant. This deviates from previous studies, which found a positive relation. We do not conclude whether this is due to the risk associated with the ratio has diminished, or if the effect has been accounted for by other factors, but we favor the latter due to high probability of multicollinearity.

The company's Cash/FV ratio has a significant negative relation with the stock returns. This strengthens the hypothesis that companies with extensive cash reserves fail to utilize their resources which give higher returns than the deposit rate. When the regressions are run for each year, similar results are found, a significant negative coefficient is usually present for all the estimated years. This strongly indicates that, regardless of the financial state, companies are penalized by having large cash reserves.

The factor with the highest level of significance, measured by absolute t-value, is the company's B/P ratio. It shows a strong negative relation with the excess TRS. Results from the yearly cross-sectional analysis revile the same relation, where a negative coefficient is found significant in all investigated years. Hence, the results indicates that the market underrate the risk of distress no matter the state of the economy. This is an opposite result of what Fama and French ((1992), (1993), (1998)) postulates through several studies. Another view is that of Black (1993) and MacKinlay (1995) who argues that value stocks not always should outperform growth stock as the results could be sample-specific. Since the B/P ratio is used to identify value and growth stocks, our results indicate that growth stocks outperform value stocks.

In addition to the B/P ratio, the E/P ratio is also used to categorize value stocks from growth stocks. While the E/P ratio has a lower t-value than the B/P ratio, it is still significant at the 1% level. This means that even when the other ratios are included in the model, the E/P ratio has significant explanatory power of the excess TRS. The coefficient connected to the E/P ratio is also negative, which supports findings of a growth stocks premium within our data sample. The individual yearly regression results, however, show less significance which reduces the robustness of the E/P's explanatory power. It can be argued, in accordance with Fama and French (1992), that the ME and B/P factors captures some of the effect associated with E/P.

A third ratio also connected to the classification of value and growth stocks is the S/P ratio. This ratio is also highly significant in our model, but has a positive coefficient indicating a premium for value stocks. The same effect is found in the yearly cross-sectional regression as well. These contradicting findings are puzzling. It could be that the S/P ratio acts as a proxy for some other type of risk than the other values stock identifiers. Another plausible explanation is that the premium of growth stocks is a result of investors failing to incorporate differences in accounting methods. A company's sales are rigid to accounting methods, while this is not the case for E/P and B/P. However, as this is a bold theory, and the correlation between the B/P and the S/P ratio is relatively high (59%), it could just be the case that the S/P ratio is a worse predictor of growth and value stocks than the B/P and E/P ratio. These other factors could have absorbed all the risk associated with the S/P ratio, which contradicts the findings of O'Shaughnessy (2005) who argues that S/P is the best variable to identify value stocks.

A strongly significant negative coefficient associated with the EBITDA/EV ratio is estimated in the whole model as well as for each year. This ratio is often used in addition or as an alternative to the E/P ratio to estimate the fair market value of a company by professional analysts. It could also be used as a tool to differentiate between value and growth stocks while normalizes for differences in capital structure, taxation and fixed asset accounting. This could imply that the E/P ratio has less explanatory power when the EBITDA/EV ratio is present in the model. Using EBITDA/EV as a predictor of the degree of value stocks or growth stocks supports our theory of a growth stock premium within our dataset further.

The last factor we examine is the capital structure effect. This effect has a significantly positive coefficient indicating a negative relation between a company's leverage and excess TRS. This contradicts the findings of Bhandari (1988) who find a positive relation between a company's D/E ratio and common stock returns when controlling for size and market beta. When investigating the separate regressions it is clear that the positive relation between the E/A ratio and excess TRS is only significant in case of financial turmoil. This may be a case of highly leveraged firms experiencing distress as a result of the financial difficult times. In between 2003 and 2007, displayed in the 2002 to 2006 models, there is no evidence of the leverage effect in our data sample. This indicates that the previous leverage premium has diminished and only punishes stock returns when the market suffers from a downfall. It is difficult to conclude if the capital structure effect should be a proxy for some kind of risk premium, especially as we find a positive premium associated with our E/A ratio.

As discussed earlier in this report, several previous studies support the superior returns connected with value stocks, while a few argue that the value premium is sample-specific. Most of our result contradicts the findings of Fama and French ((1993), (1995), (1996) (1998)), Lakonishok et al. (1994) and Haugen (1999), and confirm that the value premium is sample-specific. In our data sample, we find strong evidence that favors the conclusion that investors overvalue distressed stocks and undervalue growth stocks, resulting in a growth stock premium.

Our data sample has been exposed to several dramatic financial events, the dot-com bubble and the 2008 financial crisis, which may have caused some of our puzzling results. If this is due to a fundamental change in the financial market, or if our results are sample-specific, is a matter for further studies.

	Whole									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Constant	-0.037	0.102	-0.122	-0.433	-0.454	-0.655	-0.617	-0.372	-0.314	-0.437
Beta	-0.109	0.063	-0.030		0.023	-0.057	-0.321	0.301	0.079	-0.087
ME	-0.033	-0.045	-0.017			0.010	0.019		-0.008	
B/P	-0.133	-0.106	-0.121	-0.122	-0.116	-0.141	-0.117	-0.092	-0.051	-0.093
S/P		0.062	0.073		0.062		0.064	0.050	0.035	0.060
E/P	-0.037		0.022				-0.068			
EBITDA/EV	-0.097	-0.195	-0.124	-0.056	-0.142	-0.155	-0.114	-0.168	-0.172	-0.176
FCFF/ME	0.061			-0.038						
Cash/FV	-0.019		-0.035	-0.020	-0.023	-0.038	-0.027		-0.021	-0.029
E/A	0.152					0.220	0.299	0.101	0.087	0.139
R^2	0.148	0.226	0.125	0.137	0.110	0.288	0.552	0.306	0.181	0.245

Exhibit 7: Yearly cross-sectional regression estimates for the Whole segment. Dark grey, light grey and white indicates 1%, 5%, and 10% significance level respectively.

Segment specific results

This section will discuss and compare the regression results in the different segments. We will limit our discussion to the segments which behave differently compared to the Whole segment, and try to distinguish between segments as well. We will focus on the results from the panel data regressions, since the data sample gets rather limited if we preform yearly cross-sectional regression on each segment. The estimated regression results are presented in Exhibit 8, and correlation matrices are disclosed in Appendix III. In addition, we referrer to Appendix II for an overview of the industries associated with the different segments.

Some of the segments are relatively large in regards to number of observations and includes a more diversified group of companies. These segments have in common that their results are similar to the ones in the Whole segment. The deviations between these segments are usually due to high correlated variables being omitted from the model to reduce the chance of multicollinearity. This is the case for the BusEq, Hlth, Manuf segments, as well as the Others segment which contains all industries not included in the other segments.

The total explanatory power of the Telcm and Durbl regression models, measured by the R-square, is relatively high compared to other segments. These two models have in common that only a few numbers of factors are significant. B/P and EBITDA/EV are significant in both segments, while E/A and Cash/FV are found significant within the Durbl and Telcm segments respectively. This implies that variations in the stock returns within these segments are fairly explained by using only these mentioned ratios.

The B/P ratio is the only ratio within the Money segment with 1% significance level. The second most significant factor is the E/P ratio, which suggests the companies with low E/P ratios outperform the high E/P stocks. This suggests that for the Money segment, the E/P ratio is a better growth stock indicator than EBITDA/EV. The other results are in line with the Whole segment only with lower significance levels.

In the NoDur segment and the Shops segment, both the S/P and FCFF/ME ratios are significant with a positive coefficient. As these are cash flow driven segments, it is apparent to believe that companies with relative higher sales and FCFF would outperform companies with low values of these ratios. This is an interesting result as this is not applicable to all segments. In addition to the other more common significant ratios, FCFF/ME and S/P should also be taken into consideration when distinguishing companies apart in a stock-picking process.

Lowest explanatory power (26%) is found in the Utils model. The ME ratio has a positive coefficient, indicating that larger companies outperform smaller companies. This was somewhat expected since this segment is capital intensive. Our intuition is divided in two. First, new profitable projects often are large and costly, thereby excluding the smallest players. Second, the larger companies already have the infrastructure, and can take advantages of the large-scale effects. The Manuf segment is also deemed to be capital intensive. However, the ME factor is not found significant within this segment. Whether our findings are sample-specific or if capital intensive segments have fundamental effect on excess TRS, would be an interesting topic for further studies.

As presented above and illustrated in Exhibit 8, some of the factors are represented in most of the segments, and combined discussion is therefore appropriate. The B/P ratio is found significant with a negative relationship to the excess TRS for all segments, in addition it is mainly found to have the strongest explanatory relationship of the significant factors. Further, the EBITDA/EV ratio is also found to have a strongly negative relationship to the excess TRS in all segments except Utils. In addition, the E/P ratios' coefficient is also negative for the segments where it is significant. This together, boosts our conclusion of a growth premium in all segments in the dataset. Lastly, a factor that is frequently significant with a positive coefficient is the E/A ratio. This shows, as previously discussed, that the leverage premium has diminished, and the companies which are equity funded preforms better than the highly leveraged firms.

	BusEq	Chems	Durbl	Enrgy	Hlth	Manuf	Money	NoDur	Others	Shops	Telcm	Utils	Whole
Beta	-0.026						-0.047	0.035			-0.058		-0.017
ME	-0.011	-0.024		-0.023					-0.010	-0.021		0.017†	-0.006
B/P	-0.119*	-0.108*	-0.060*	-0.104	-0.178*	-0.125†	-0.152*	-0.078	-0.120*	-0.132*	-0.083†	-0.074*	-0.122*
S/P	0.055	0.057		0.060*	0.077†	0.061	0.051	0.116†	0.046	0.053			0.048
E/P		-0.075			-0.072		-0.076†		-0.022	-0.092		-0.055	-0.028
EBITDA/EV	-0.170†	-0.169†	-0.216	-0.122†	-0.077	-0.204*	-0.047	-0.295*	-0.142†	-0.179	-0.166*		-0.130†
FCFF/ME								0.041		0.041		-0.023	
Cash/FV	-0.039			-0.022	-0.036	-0.015	-0.018		-0.024	-0.018	-0.024		-0.028
E/A	0.248	0.194	0.239†		0.157	0.143	0.069	0.375	0.191	0.221†		0.107	0.145
Constant	-0.504	-0.394	-0.366	-0.090	-0.762	-0.514	-0.480	-0.392	-0.422	-0.497	-0.631	-0.384	-0.484
T2002	0.460	0.173	0.330	0.248	0.499	0.315	0.521	0.190	0.377	0.290	0.748	0.304	0.381
T2003	0.057+	0.097+	0.089+	0.195	0.184	0.189	0.285	-0.020+	0.136	0.202	0.216	0.141	0.140
T2004	-0.002+	-0.165	-0.153	0.077+	0.136	-0.046+	0.110+	-0.184	-0.073	-0.022+	0.124+	0.042+	-0.009+
T2005	0.069+	0.059+	0.008+	-0.170	0.135	0.032+	0.133+	-0.135	0.029+	0.041+	0.248	0.136	0.073
T2006	-0.058+	-0.126	-0.306	0.082+	0.072+	-0.058+	-0.147	-0.321	-0.138	-0.274	0.040+	0.096	-0.083
T2007	-0.295	-0.368	-0.510	-0.511	-0.157	-0.443	-0.350	-0.399	-0.392	-0.195	-0.181	-0.213	-0.326
T2008	0.533	0.349	0.536	0.319	0.431	0.393	0.424	0.254	0.363	0.451	0.538	0.197	0.420
T2009	0.231	0.149	0.216	0.135	0.296	0.173	0.237	-0.024+	0.189	0.200	0.389	0.135	0.216
T2010	0.007+	-0.086+	-0.208	-0.167	0.233	-0.086	0.068+	-0.184	-0.072	0.046+	0.090+	0.094	0.004+
R^2	0.429	0.364	0.525	0.318	0.325	0.420	0.396	0.351	0.402	0.384	0.434	0.257	0.366
No. Obs.	3257	895	559	518	2037	2514	789	1312	4007	1651	725	818	19082

Exhibit 8: Panel data results, the colors indicate significance level. Dark grey, light grey and white indicates 1%, 5%, and 10% significance level respectively. + indicates the time dummies which have significance level above 10%. * and † represent the factors which is the most and second most significant respectively.

Graphical evidence

To support and further analyze our results from the panel data regression and yearly cross-sectional regressions, we perform a graphical analysis on the most significant and theoretical contradicting factors. We use data from the Whole segment in order to get a representative assortment, and the companies are sorted by the factors analyzed. Next, we constructed five percent quantiles, and the excess TRS is calculated by an average of the companies in the given quantile. The top quantile contains the largest values observed of the given factor, and vice versa. The data is then illustrated with a surface plot, where the excess TRS is addressed to the z-axis, while years and quantiles to the x-axis and y-axis as specified in the respective graphs in Exhibit 9.

The NYSE index is included in Exhibit 9 since it is used to estimate the market beta. In addition, some of our discussion involves which economic state the market is in. Note that our regression results are denoted with actual year-end date for the independent variables and excess TRS is given for the following year. As the graph illustrates, the time period for our sample has been somewhat turbulent.

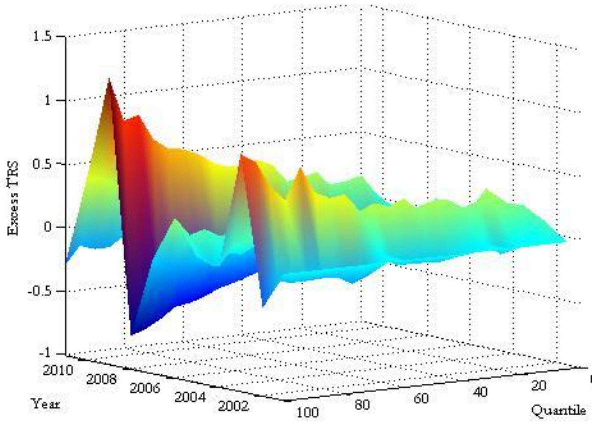
The CAPM risk-reward efficiency implies the return for a company with a market beta larger than one would fluctuate in accordance with the market, only with higher amplitudes, and with lower amplitudes if the market beta is less than one. If the company's market beta is negative, the company would yield opposite returns than the market. From the individual cross-sectional regressions, it is apparent that the CAPM framework adjusts for part of the systematic risk. The market betas effect on our data sample is illustrated in Exhibit 9. We see that the top quantiles have substantial higher volatility than the lower. Hence, the top quantiles sustains large negative returns in bear markets (2002, 2008, and 2011), and conversely has large positive return in bull markets. The lower quantiles show less fluctuations in returns and are therefore less affected by the market return. Additional, the graphs illustrates that the slopes direction changes between the years. This is in line with the result from the yearly cross-sectional regressions where the coefficient changes sign over time. This coincides with the CAPM theory.

Our analysis, both panel data and yearly cross-sectional, shows a strong evidence of negative relationship between excess TRS and the EBITDA/FV and B/P ratio. For both the EBITDA/EV and B/P ratios the graphs shows that the average excess TRS is decreasing when moving from the low to the high quantiles for all years. This support our regression estimation of a negative coefficient as previously discussed.

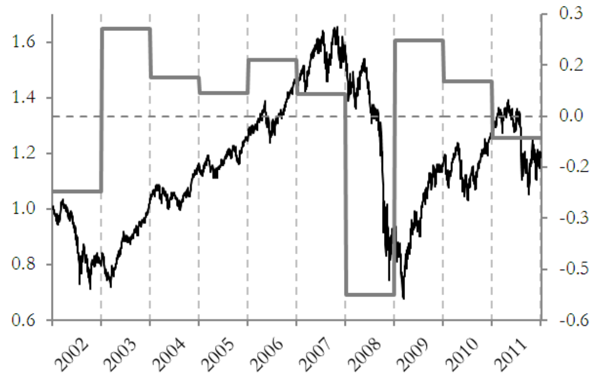
In our regression analysis we found that the S/P ratio had a positive effect on the excess TRS, which is in line with our hypothesis. However, initially we argued that companies with high S/P, B/P, and E/P ratios are identified as value stock. Therefore, we find it confusing that the coefficients of the S/P ratios have opposite signs compared to the other value ratios. In order to examine this further, we graph the S/P ratio. The graph reveals that it in fact has the same pattern as both B/P and EBITDA/EV, only with a less distinctive slope. Hence, companies with low S/P ratio on average outperform the ones with high. This phenomenon might be a result of relative high correlation between those variables. As they proposed to describe similar risk, it is possible the other factors describe the risk adequate and the S/P ratio only contribute to a better fit in the regression models.

The E/A ratio is found significant with a positive relationship to excess TRS in the panel data regression and the most of the yearly cross-sectional regressions. This result is inconsistent with our hypothesis, where we expected a negative coefficient. The quantile plot support the regression results as the top quantile provides higher excess TRS than the lower. However, it is worth mentioning that the slope is rather moderate, and it varies between the years. As discussed above, the result strengthens the hypothesis of Bhandari (1988) that our other variables are adequate to explain the risk associated with leverage effect.

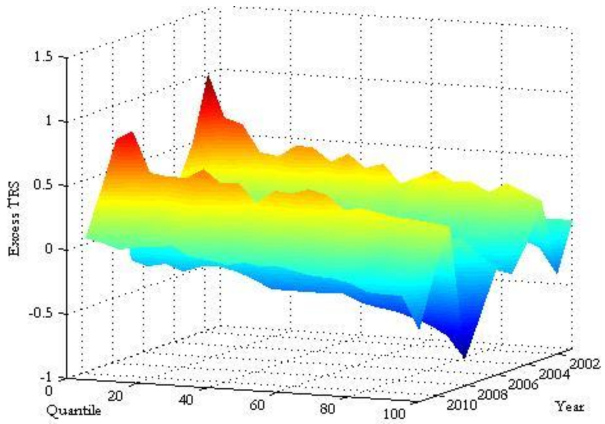
Market Beta



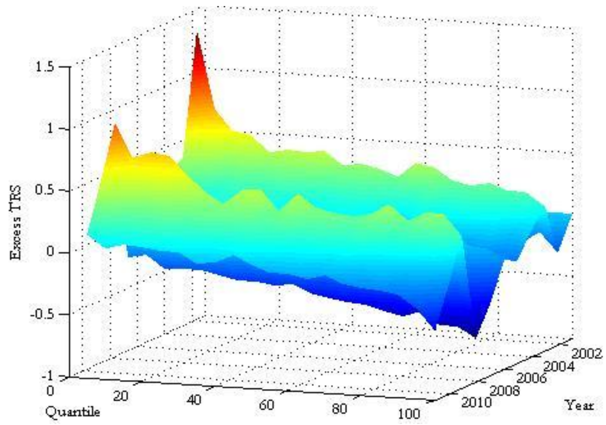
NYSE Composite



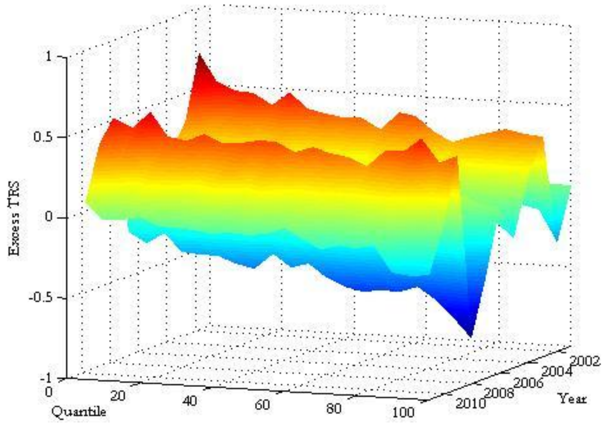
B/P



EBITDA/FV



S/P



E/A

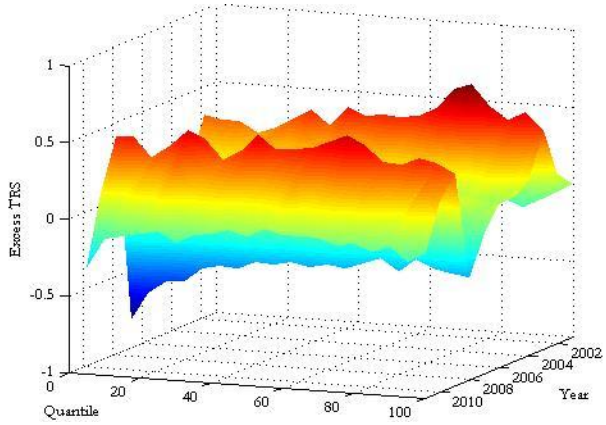


Exhibit 9: Graphical illustration for different dependent factor and the NYSE composite index. The surface plots have the excess TRS on the z-axis, and the year and quantiles as the x-axis and y-axis as showed in the graphs. The data is arranged such the lowest values of the given ratio are given in the lowest quantile, and vice versa. All returns are YOY arithmetic, and are given for the actual year. Accordingly, the regression results at time t represents returns from year t+1.

Investment strategy - an application

As discussed in the introduction, this paper is intended to shed some light on which independent ratios that have significant explanatory power to companies' excess TRS. In order to test if the regression estimation can be used as additional information to equity analyst's recommendation, we construct a simple investing strategy and investigate if it can provide consistently superior returns in the period 2003 to 2011. The analysis is performed on the whole segment as it contains the most companies and hopefully gives more robust results.

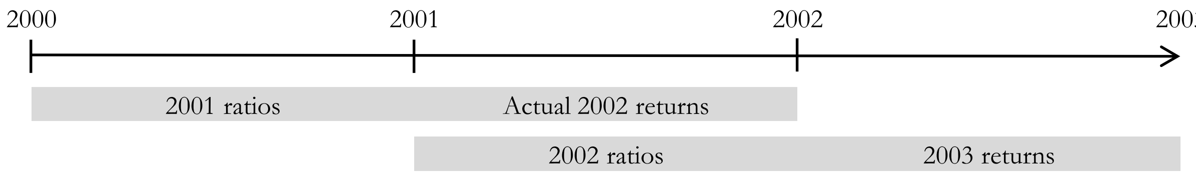


Exhibit 10: The procedure for stock-picking to achieve abnormal future return, exemplified by the period 2000 to 2003. The years in the timeline is denoted as year-end dates. The upper branch illustrates the 2001 regression model. The lower branch illustrates the portfolio model which select companies from based on their 2002 ratios according to the results from the 2001 regression model.

We use a similar method as Eakins and Stansell (2003), to predict which companies that can provide abnormal return. Consider the timeline illustrated in Exhibit 10. At year-end 2002, investors have excess to the company specific ratios for 2001 and excess TRS for 2002, and the firm specific ratios for 2002 can be obtained[12]. A cross-sectional regression is estimated for the 2001 ratios and 2002 excess TRS (denoted as the 2001 regression). The coefficients with less than one percent significance level are used to construct the portfolio for 2003. For a company to be included in the portfolio, all the respective 2002 ratios need to be included in the top 50 percent quantiles. The quantiles are constructed by sorting all the 2002 ratios into groups based on the significant regression coefficient from 2001. Note that the quantiles are sorted descending or ascending in respect to the coefficients sign. We set a maximum of 50 companies in the each portfolio[13]. If there are more companies that fit the criteria, the factor with the highest absolute t-value would be decisive. Next, the 2003 excess TRS for the portfolio is calculated based on a value weighted principle. This procedure is repeated for each year from 2001 to 2009, and the portfolio is rebalanced at each year-end.

This investment strategy allows for a realistic test where only disclosed firm characteristics are used. Bear in mind that the relationship among variables from one year are used to predict returns two years later. We acknowledge the burden with this approach, but we find it crucial that all the information is available for the common investors to avoid the case of data-mining.

Coefficients with significance level less than one percent are used to construct the portfolios. The yearly cross-sectional regressions result if provided in Exhibit 7; dark grey indicates coefficients at the one percent significance level. Exhibit 12 summarizes which effect the given ratio is estimated to have on the excess TRS. The estimations neglect to account for transaction cost associated with rebalancing the portfolio each year. Also, we choose to omit the S/P ratio since the effect seems to be absorbed by other factors, see previous discussion. The market beta is also omitted from the strategy. This is done because it is used as a risk-adjusting coefficient which is based on historical data three year prior to the regression year. The performance of the portfolios is shown in Exhibit 11, where both YOY and cumulative return is presented. The black line represents the portfolio based our investing strategy, the dark grey line denotes a

[12] We are aware that the companies do not disclose their annual figures before the annual meeting. However, these ratios can be constructed. We use year-end returns in our analysis due to data availability.

[13] Max 50 companies in the portfolio are used since this represent a rational sized portfolio for an individual investor.

portfolio composed from 50 random selected companies from our data sample, and the light grey represents the NYSE index.

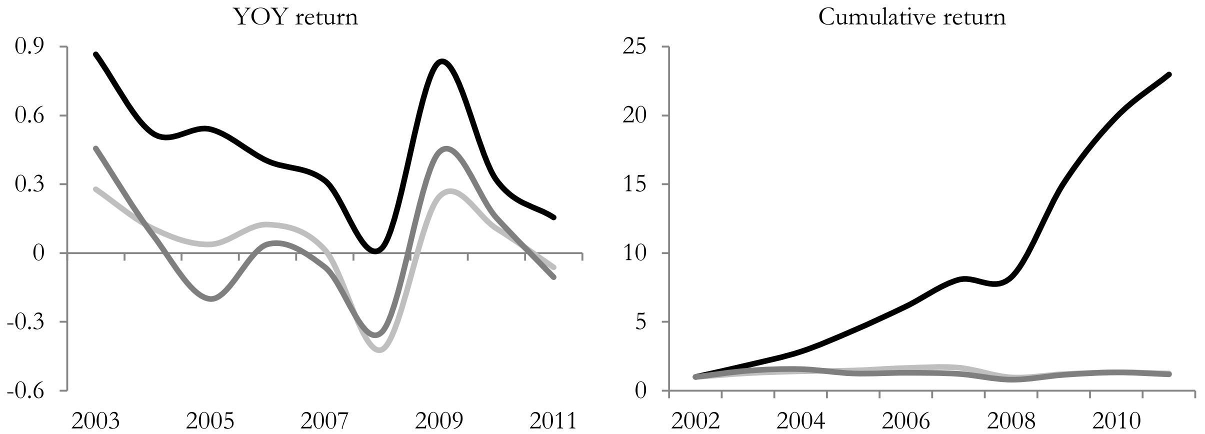


Exhibit 11: The graphs illustrates returns for two constructed portfolios from our dataset, and the NYSE index, both graphs are denoted in arithmetic returns.

The investing strategy for the whole segment always outperforms the other two portfolios, and it performs relatively well even in economical challenging periods. In contrast, the random selected portfolio is more volatile, and fluctuates around the NYSE index. When comparing the sharp ratios[14], we find that our investment strategy obtain 1.56, while the NYSE index and random portfolio provide sharp ratios of 0.23 and 0.19 respectively. Hence, the investment strategy portfolio outperform the others portfolios on a risk-reward basis as well.

The cumulative return graph illustrates how much one dollar invested in year-end 2002 would yield after the respective years. Note that the NYSE index and random portfolio only increased by 25 and 19 percent, respectively, in the nine year period. While one dollar investment in our strategy, would yield almost 22 dollar in year-end 2011. This result clearly indicates that an investment strategy based on a cross-sectional regressions result could give higher returns than a random selected portfolio. We humbly admit that this evidence could be sample-specific and occur as a result of minor data-mining errors. However, the results are so severe that we have no other choice than to include the results in this paper and encourage further studies on this method to compose investment portfolios.

	ME	B/P	S/P	E/P	EBITDA/EV	FCFF/ME	Cash/FV	E/A
2001	-	-			-	+		+
2002	-	-			-			
2003	-	-			-		-	
2004		-			-	-	-	
2005		-			-		-	
2006		-			-		-	+
2007	+	-			-		-	+
2008		-		-	-			+
2009		-			-		-	

Exhibit 12: The effect of the respective factors in the different years, used to compose our portfolio.

[14] Sharp ratio is a measure of how much expected return obtain compared to the risk associated with the variation of the return. It is calculated by average yearly return divided by the standard deviation of the data sample; hence a high sharp ratio is preferred.

CONCLUSION

This report has analyzed several common accounting ratios based on publicly available information and its effect on the following year's excess TRS for different industries and the whole North American equity market in general. Two dimensional panel data regressions and yearly cross-sectional regression analysis has been used to reveal if there is explanatory predictive power within these ratios. The factors we examine are market beta, ME, B/P, E/P, S/P, EBITDA/EV, FCFF/ME, Cash/FV and E/A.

Value stocks are commonly shown to outperform stocks classified as growth stocks. While some claim this to be sample-specific, evidence to the contrary has not been presented. Our results, however, indicate a premium associated with growth stocks in our data sample. Both B/P and EBITDA/EV are negatively related to the excess TRS across all examined years and segments. We also find similar results regarding the E/P ratio, though this effect seems to be incorporated by the two other ratios for most of the individually segments. The S/P ratio show a different result as it is positive in the regression models when the other ratios are included as explanatory variables. Further examination with graphical tools and correlation estimates show that this is presumably a result of risks associated with the S/P ratio is incorporated in the other ratios.

The size premium of smaller firms is debated as to whether it still holds or whether it diminished after 1981. Our findings indicate it still holds for some of the examined years in our data sample. The results also indicate a negative relation between a company's market capitalization and excess TRS in the years prior the financial crisis in 2008. However, within these years the larger companies yielded higher returns. This result proposes that the size factor still could be a proxy for illiquidity or distress risks. Indications of significantly deviations between segments are also found as the Utls model show a positive relation between size and excess TRS. Industries exposed to high entry costs and monopoly effects could therefore yield a premium to larger firms.

Differences between segments were also found with the FCFF/ME ratio, but only a few segments showed a significant effect. It seems that the ratio is only significant in sectors mainly consisting of highly cash flow driven companies, for instance the Shops and NoDur segments. Otherwise, there is limited evidence of a FCFF/ME effect in our study indicating that this is a less reliable ratio in regards of predicting future return in general.

Another finding is that companies are penalized by having high cash reserves measured by the Cash/FV ratio. We believe this is due to companies with extensive cash reserves failing to fully utilize their cash resources and obtain a competitive return on this capital.

The findings regarding the effect of a company's capital structure give indications of a diminished premium connected to higher leveraged companies. In previous studies, a positive relation between leverage and stock returns are found. In our data set, the effect is only found significant during turbulent financial times when highly leveraged firms are punished. Over the whole data set, investing in companies with high E/A values would yield higher returns on average. This effect seems to be manifested within most segments as well.

Finally in this report we construct an investment strategy portfolio based on the yearly regression results and find that it is possible to yield considerably higher returns than a random selected portfolio, even on a risk-reward basis. We are aware that these results could be sample-specific and therefore encourage further studies on topic.

BIBLIOGRAPHY

Alexander, C., 2008. *Market Risk Analysis Volume II.* Chichester: John Wiley & Sons Ltd.
Ang , A. & Chen , J., 2007. CAPM Over the Long Run: 1926-2001. *Journal of Empirical Finance,* 14(1), pp. 1-40.
Banz, R. W., 1981. The relationship between return and market value of common stocks. *Journal of Financial Economics,* 9(1), pp. 3-18.
Basu, S., 1977. Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis. *The Journal of Finance,* 32(3), pp. 663-682.
Basu, S., 1983. The relationship between earnings' yield, marketvalue and return for NYSE commonn stocks: Further evidence. *Journal of Financial Economics,* 12(1), pp. 129-156.
Beaver, W. H., 1970. The Time Series Behavior of Earnings. *Journal of Accounting Research,* 8(1), pp. 62-99.
Bhandari, L. C., 1988. Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence. *The Journal of Finance,* 43(2), pp. 507-528.
Black, F., 1993. Beta and Return. *Journal of Portfolio Management,* 20(1), pp. 8-18.
Black, F. & Scholes, M., 1974. The effects of dividendyield and dividendpolicy on common stock prices and returns. *Journal of Financial Economics,* 1(1), pp. 1-22.
Brennana, M. J., Chordiac, T. & Subrahmanyam, A., 1998. Alternativefactorspecifications, securitycharacteristics, and the cross-section of expected stock returns. *Journal of Financial Economics,* 49(3), pp. 345-373.
Breusch, T. S. & Pagan, A. R., 1979. A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica,* 47(5), pp. 1287-1294.
Brooks, C., 2008. *Introductory Econometrics for Finance.* Cambridge: Cambridge University Press.
Campbell, J. Y., Hilscher, J. & Szilagyi, J., 2008. In Search of Distress Risk. *The Journal of Finance,* 63(6), pp. 2899-2939.
Chan , K. C. & Chen, N.-F., 1991. Structural and Return Characteristics of Small and Large Firms. *The Journal of Finance,* 46(4), pp. 1467-1484.
Chan, K., Chan, L. K. C., Jegadeesh, N. & Lakonishok, J., 2006. Earnings Quality and Stock Returns. *Journal of Business,* 73(3), pp. 1041-1082.
Chan, L. K. C., Hamao, Y. & Lakonishok, J., 1991. Fundamentals and Stock Returns in Japan. *The Journal of Finance,* 46(5), pp. 1739-1764.
Charest, G., 1978. Dividend information, stock returns and market efficiency-II. *Journal of Financial Economics,* 6(2-3), pp. 297-330.
Chen, N.-F., Roll, R. & Ross, S. A., 1986. Economic Forces and the Stock Market. *Journal of Buisness,* 59(3), pp. 383-403.
Connor, G. & Korajczyk, R. A., 1988. Risk and return in an equilibrium APT: application of a new test methodology. *Journal of Financial Economics,* 21(2), pp. 255-289.
Cummins, C., 2012. *Econometric Benchmarks.* [Online]
Available at: http://www.stanford.edu/~clint/bench/dwcrit.htm
[Accessed 11 May 2012].
Damodaran, A., 2012. *The Data Page.* [Online]
Available at: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html
[Accessed 11 May 2012].
Dann, L. Y., 1981. Common stock repurchases: An analysis of returns to bondholders and stockholders. *Journal of Financial Economics,* 9(2), pp. 113-138.
Davis, J. L., 1994. The Cross-Section of Realized Stock Returns: The Pre-COMPUSTAT Evidence. *The Journal of Finance,* 49(5), pp. 1579-1593.
Dichev, I. D., 1998. Is the Risk of Bankruptcy a Systematic Risk?. *The Journal of Finance,* 53(3), pp. 1131-1147.
Durbin, J. & Watson, G. S., 1951. TrustTesting for Serial Correlation in Least Squares Regression. II. *Biometrika Vol. 38 no.1/2,* pp. 159-177.

Eakins, S. G. & Stansell, S. R., 2003. Can value-based stock selection criteria yield superior risk-adjusted returns: an application of neural networks. *International Review of Financial Analysis,* 12(1), pp. 83-97.

Fama, E. F., 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance,* 25(2), pp. 383-417.

Fama, E. F. & French, K. R., 1992. The Cross-Section of Expected Stock Returns. *The Journal of Finance,* 47(2), pp. 427-465.

Fama, E. F. & French, K. R., 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics,* 33(1), pp. 3-56.

Fama, E. F. & French, K. R., 1995. Size and Book-to-Market Factors in Earnings and Returns. *The Journal of Finance,* 50(1), pp. 131-155.

Fama, E. F. & French, K. R., 1996. Multifactor Explanations of Asset Pricing Anomalies. *The Journal of Finance,* 51(1), pp. 55-84.

Fama, E. F. & French, K. R., 1997. Industry costs of equity. *Journal of Financial Economics,* 43(2), pp. 153-193.

Fama, E. F. & French, K. R., 1998. Value versus Growth: The International Evidence. *The Journal of Finance,* 56(6), p. 1975–1999.

Fama, E. F. & MacBeth, J. D., 1973. Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy,* 81(3), pp. 607-636.

Fernandez , P., 2001. *valuation using multiples. How do analysts reach their conclusions?.* [Online] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=274972 [Accessed 5 May 2012].

French, K. R., 2012. *Detail for 12 Industry Portfolios.* [Online] Available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html [Accessed 9 May 2012].

Haugen, R. A., 1999. *The New Finance: The Case Against Efficient Markets.* 2nd ed. Upper Saddle River: Prentice Hall.

Heston, S. L., Rouwenhorst, K. G. & Wessels, R. E., 1999. The Role of Beta and Size in the Cross-Section of European Stock Returns. *European Financial Management,* 5(1), pp. 9-27.

Jaffe, J., Keim, D. B. & Westerfield, R., 1989. Earnings Yields, Market Values, and Stock Returns. *The Journal of Finance,* 44(1), pp. 135-148.

Klein, R. W. & Bawa, V. S., 1977. The effect of limited information and estimati on risk on optimal portfolio diversification. *Journal of Financial Economics,* 6(1), pp. 89-111.

Knez, P. J. & Ready, M. J., 1997. On the Robustness of Size and Book-to-Market in Cross-Sectional Regressions. *The Journal of Finance,* 52(4), pp. 1355-1382.

Koenker, R., 1981. A note on studentizing a test for heteroscedasticity. *Journal of Econometrics,* 17(1), pp. 107-112.

Koller, T., Goedhart, M. & Wessels, D., 2010. *Valuation.* 5th ed. Hoboken: John Wiley & Sons.

Lakonishok, J., Vishny, R. W. & Shleifer, A., 1994. Contrarian Investment, Extrapolation, and Risk. *Journal of Finance,* 49(5), pp. 1541-1578.

Lintner, J., 1965a. Security Prices, Risk, and Maximal Gains From Diversification. *The Journal of Finance,* 20(4), pp. 587-615.

Lintner, J., 1965b. The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *The Review of Economics and Statistics,* 47(1), pp. 13-37.

Litzenberger, R. H. & Ramaswamy, K., 1979. The effect of personal taxes and dividends on capital asset prices: Theory and empirical evidence. *Journal of Financial Economics,* 7(2), pp. 163-195.

Lo, A. W. & MacKinlay, A. C., 1990. Data-snooping biases in tests of financial asset pricing models. *Review of Financial Studies,* 3(3), pp. 431-467.

MacKinlay, A. C., 1995. Multifactor models do not explain deviations from the CAPM. *Journal of Financial Economics,* 38(1), pp. 3-28.

Maringer, D. G., 2004. Finding the relevant risk factors for asset pricing. *Computational Statistics & Data Analysis, Vol. 47, no. 2,* pp. 339-352.

Maroney, N. & Protopapadakis, A., 2002. The Book-to-Market and Size Effects in a General Asset Pricing Model: Evidence from Seven National Markets. *European Finance Review,* 6(2), pp. 189-221.

Merton, R. C., 1973. An Intertemporal Capital Asset Pricing Model. *Econometrica,* 41(5), pp. 867-887.

Miller, M. H. & Scholes, M. S., 1982. Dividends and Taxes: Some Empirical Evidence. *Journal of Political Economy,* 90(6), pp. 1118-1141.

Minjina, D., 2008. P/E and P/B multiples and company's financial structure. *Analele Stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi.,* 55(11), pp. 103-110.

Mossin, J., 1966. Equilibrium in a Capital Asset MarketAuthor. *Econometrica,* 34(4), pp. 768-783.

O'Shaughnessy, J., 2005. *What Works On Wall Street: A Guide to the Best-Performing Investment Strategies of all Time.* 3rd ed. New York: McGraw-Hill.

Perez-Quiros, G. & Timmermann, A., 2000. Firm Size and Cyclical Variations in Stock Returns. *The Journal of Finance,* 55(3), pp. 1229-1262.

Porta, R. L., 1996. Expectations and the Cross-Section of Stock Returns. *The Journal of Finance,* 51(5), pp. 1715-1742.

Rayburn, J., 1986. The Association of Operating Cash Flow and Accruals with Security Returns. *Journal of Accounting Research,* 24(1), pp. 112-133.

Roll, R., 1977. Acritique of the assetpricingtheory's tests Part I: On past and potentialtestability of the theory. *Journal of Financial Economics,* 4(2), pp. 129-176.

Ross, S. A., 1976. The arbitrage theory of capital asset pricing. *Journal of Economic Theory,* Volume 13, pp. 341-360.

Sandvik, S. H., Frydenberg, S., Westgaard, S. & Heitmann, R. K., 2011. Hedge Fund Performance in Bull and Bear Markets: Alpha Creation and Risk Exposure. *The Journal of Investing,* 20(1), pp. 52-77.

Sharpe, W. F., 1964. Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance,* 19(3), pp. 425-442.

Sloan, R. G., 1996. Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?. *The Accounting Review,* 71(3), pp. 289-315.

Stattman, D., 1980. Book Values and Stock Returns. *The Chicago MBA: A Journal of Selected Papers,* 4(1), pp. 25-45.

Subrahmanyam, A., 2010. The Cross-Section of Expected Stock Returns: What Have We Learnt from the Past Twenty-Five Years of Research?. *European Financial Management,* 16(1), pp. 27-42.

White, H., 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica,* 48(4), pp. 817-838.

Wilcox, J. W., 1999. *Investing by the Numbers.* 1st ed. New Hope: John Wiley & Sons.

APPENDIX I

The following appendix is devoted to perform tests on our data sample and regression estimation to assure that the OLS assumption is not violated without taking appropriate precautions. If the assumptions are violated, the model would be estimated inefficient, or the result might even be biased.

The first assumption of the OLS is that the mean error should be zero. This would by design never be violated if the constant term is included in the regression.

Regression model assumes homoscedasticity in the error term, meaning the variance of the error should have a finite variance. If this is violated, it is said that the error is heteroscedastic. We used a Koenker (1981) modification of the Breusch–Pagan (1979) heteroscedasticity test (BPK), with the null hypothesis of homoscedasticity. By running robust standard error regression, this phenomenon is compensated for.

If there is proven covariance between the disturbance terms, it is said that they are autocorrelated. Since the disturbance cannot be observed a test on the residuals is used. We use a Durbin-Watson (DW) test (1951). The null hypothesis is no evidence of autocorrelation, the rejection and non-rejecting area is given by Cummins (2012). If autocorrelation is present a White's regression model or robust standard error regression model can be applied to compensate for this effect.

The forth assumption is that the independent variables is non-stochastic. It turns out that the OLS estimator is consistent and unbiased even with stochastic independent variables. Hence, the assumption collapses down to the independent variables need to be uncorrelated with the error term (Brooks, 2008).

The last assumption is that the disturbances are normally distributed. In order to test for this we use a Berra-Jarque (BJ) test. The test checks if there is evidence for a leptokurtic and unsymmetrical distribution (Brooks, 2008). The null hypothesis is that the series is symmetric and mesokurtic. The test statistic follows a chi-squared distribution with two degree of freedom.

In addition, we perform an F and Wald test on the yearly cross-sectional and panel data regressions respectively. The null hypothesis, of both tests, is that all estimated coefficients in the regression are not simultaneous zero. The Wald-test is preformed both at the time dummies and the regressors. If it is not rejected, the independent variables in the respective regression cannot explain the variation in the dependent variable.

The Exhibits below gives a summary of the discussed tests.

	BusEq	Chems	Durbl	Enrgy	Hlth	Manuf	Money
Heteroscedasticity	0.000	0.000	0.408	0.004	0.008	0.000	0.001
No autocorrelation	0.258	0.142	0.569	0.187	0.110	0.014	0.028
No correlation	ok	ok	ok	ok	ok	ok	ok
Normal distributed	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Wald-regressors	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald-time dummy	0.000	0.000	0.000	0.000	0.000	0.000	0.000

	NoDur	Others	Shops	Telcm	Utils	Whole
Heteroscedasticity	0.000	0.000	0.000	0.000	0.000	NA
No autocorrelation	0.001	0.000	0.011	0.101	0.036	0.000
No correlation	ok	ok	ok	ok	ok	ok
Normal distributed	0.033	0.001	0.001	0.001	0.001	0.001
Wald-regressors	0.000	0.000	0.000	0.000	0.000	0.000
Wald-time dummy	0.000	0.000	0.000	0.000	0.000	0.000

Whole segment	2001	2002	2003	2004	2005
Heteroscedasticity	0.000	0.000	0.000	0.000	0.000
No autocorrelation	not ok	ok	not ok	not ok	ok
No correlation	ok	ok	ok	ok	ok
Normal distributed	0.001	0.001	0.001	0.001	0.001
F-test	0.000	0.000	0.000	0.000	0.000

Whole segment	2006	2007	2008	2009	2010
Heteroscedasticity	0.000	0.000	0.000	0.000	0.017
No autocorrelation	not ok	not ok	not ok	ok	ok
No correlation	ok	ok	ok	ok	ok
Normal distributed	0.001	0.001	0.001	0.001	0.001
F-test	0.000	0.000	0.000	0.000	0.000

APPENDIX II

The companies are divided into twelve different portfolios. These are grouped by their four digits SIC codes and arranged by the following way:

Short name	Full Segment name	SIC code
NoDur	Consumer Non-Durables	0100-0999, 2000-2399, 2700-2749, 2770-2799, 3100-3199, 3940-3989
Durbl	Consumer Durables	2500-2519, 2590-2599, 3630-3659, 3710-3711, 3714-3714, 3716-3716, 3750-3751, 3792-3792, 3900-3939, 3990-3999
Manuf	Manufacturing	2520-2589, 2600-2699, 2750-2769, 3000-3099, 3200-3569, 3580-3629, 3700-3709, 3712-3713, 3715-3715, 3717-3749, 3752-3791, 3793-3799, 3830-3839, 3860-3899
Enrgy	Oil, Gas, and Coal Extraction and Products	1200-1399, 2900-2999
Chems	Chemicals and Allied Products	2800-2829, 2840-2899
BusEq	Business Equipment	3570-3579, 3660-3692, 3694-3699, 3810-3829, 7370-7379
Telcm	Telephone and Television Transmission	4800-4899
Utils	Utilities	4900-4949
Shops	Wholesale, Retail, and Some Services (Laundries, Repair Shops)	5000-5999, 7200-7299, 7600-7699
Hlth	Healthcare, Medical Equipment, and Drugs	2830-2839, 3693-3693, 3840-3859, 8000-8099
Money	Finance	6000-6999
Others	Others	1000, 1041, 1521, 1629, 3800, 4200, 4400, 4510, 4610, 4619, 4953, 7000, 7300, 7310, 7363, 7380, 7900, 7950, 8299, 8900, 9913, 9970, 9975

APPENDIX III

The tables bellow presents the correlation matrixes for the respective segments. The correlation is calculated from the whole data period. The grey color indicates correlation above 0.71, and the factor with less explanatory power is omitted from the respective regression analysis.

	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
	NoDur									Durbl								
Beta	1									1								
ME	-0.05	1								0.19	1							
FCFF/ME	0.03	-0.16	1							0.11	-0.07	1						
Cash/FV	0.10	-0.16	-0.03	1						0.09	0.06	0.04	1					
EBITDA/EV	0.01	-0.32	0.63	0.27	1					-0.03	-0.19	0.63	0.22	1				
E/P	0.05	-0.04	0.38	0.08	0.43	1				0.08	-0.01	0.43	0.09	0.43	1			
B/P	0.10	-0.47	0.39	0.13	0.51	0.22	1			-0.05	-0.27	0.32	0.14	0.44	0.26	1		
S/P	0.06	-0.42	0.52	-0.02	0.58	0.25	0.66	1		0.16	-0.24	0.58	0.04	0.57	0.41	0.62	1	
E/A	-0.11	0.11	-0.56	0.25	-0.25	-0.24	-0.41	-0.62	1	-0.21	-0.04	-0.59	-0.01	-0.24	-0.38	-0.41	-0.70	1

	Manuf									Enrgy								
Beta	1									1								
ME	0.13	1								-0.01	1							
FCFF/ME	0.03	-0.17	1							-0.02	-0.01	1						
Cash/FV	0.11	-0.01	0.03	1						0.18	-0.07	0.15	1					
EBITDA/EV	0.02	-0.21	0.64	0.21	1					0.07	0.11	0.47	0.30	1				
E/P	0.08	-0.05	0.31	0.11	0.42	1				-0.03	0.17	0.31	0.14	0.43	1			
B/P	0.00	-0.34	0.43	0.18	0.61	0.23	1			0.09	0.08	0.28	0.17	0.64	0.33	1		
S/P	0.02	-0.35	0.55	0.05	0.64	0.28	0.64	1		0.14	0.23	0.35	0.34	0.57	0.33	0.55	1	
E/A	-0.03	0.12	-0.50	0.10	-0.32	-0.19	-0.45	-0.59	1	-0.06	0.08	-0.34	0.01	-0.26	-0.11	-0.49	-0.42	1

	Chems									BusEq								
Beta	1									1								
ME	0.00	1								0.10	1							
FCFF/ME	0.06	-0.24	1							-0.07	-0.15	1						
Cash/FV	0.17	-0.21	0.08	1						0.10	-0.07	0.02	1					
EBITDA/EV	0.01	-0.33	0.73	0.30	1					-0.07	-0.17	0.75	0.26	1				
E/P	0.15	-0.12	0.41	0.16	0.44	1				-0.13	-0.06	0.48	0.06	0.53	1			
B/P	0.13	-0.52	0.39	0.34	0.55	0.22	1			-0.01	-0.33	0.42	0.35	0.61	0.31	1		
S/P	0.16	-0.50	0.61	0.12	0.61	0.37	0.62	1		-0.07	-0.37	0.57	0.03	0.65	0.40	0.63	1	
E/A	-0.15	0.20	-0.55	0.09	-0.30	-0.26	-0.32	-0.67	1	-0.05	0.10	-0.43	0.15	-0.28	-0.21	-0.31	-0.54	1

	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
	Telcm									Utils								
Beta	1									1								
ME	0.00	1								0.05	1							
FCFF/ME	-0.16	0.00	1							0.01	-0.17	1						
Cash/FV	0.22	-0.26	-0.17	1						0.24	-0.01	0.15	1					
EBITDA/EV	-0.27	-0.06	0.71	0.01	1					0.03	-0.16	0.40	0.26	1				
E/P	-0.20	-0.08	0.38	-0.03	0.46	1				0.04	-0.04	0.17	0.06	0.24	1			
B/P	-0.04	-0.28	0.25	0.24	0.43	0.16	1			0.11	-0.08	0.11	0.25	0.41	0.21	1		
S/P	-0.11	-0.34	0.52	-0.01	0.63	0.40	0.57	1		0.05	-0.07	0.26	0.26	0.45	0.16	0.57	1	
E/A	0.19	-0.03	-0.53	0.37	-0.36	-0.22	-0.16	-0.46	1	-0.12	-0.04	-0.30	-0.21	-0.27	-0.15	-0.54	-0.60	1
	Shops									Hlth								
Beta	1									1								
ME	0.02	1								-0.20	1							
FCFF/ME	0.02	-0.36	1							0.00	-0.08	1						
Cash/FV	0.09	-0.11	0.06	1						0.13	-0.06	0.04	1					
EBITDA/EV	-0.05	-0.39	0.62	0.26	1					-0.04	-0.15	0.76	0.17	1				
E/P	0.02	-0.11	0.32	0.07	0.45	1				-0.03	0.02	0.54	0.04	0.56	1			
B/P	0.00	-0.48	0.46	0.17	0.59	0.30	1			0.08	-0.31	0.46	0.21	0.64	0.34	1		
S/P	0.01	-0.36	0.50	0.03	0.57	0.36	0.69	1		0.02	-0.29	0.56	0.04	0.69	0.40	0.63	1	
E/A	-0.10	0.23	-0.49	0.19	-0.23	-0.22	-0.44	-0.61	1	-0.09	0.05	-0.43	0.12	-0.32	-0.25	-0.38	-0.50	1
	Money									Others								
Beta	1									1								
ME	0.17	1								0.07	1							
FCFF/ME	0.21	-0.15	1							0.06	-0.24	1						
Cash/FV	0.16	0.04	0.05	1						0.12	-0.13	0.01	1					
EBITDA/EV	0.23	-0.11	0.42	0.47	1					-0.03	-0.24	0.64	0.22	1				
E/P	0.16	-0.14	0.48	0.04	0.45	1				0.04	-0.10	0.45	0.03	0.47	1			
B/P	0.17	-0.27	0.49	0.08	0.38	0.40	1			0.03	-0.30	0.43	0.15	0.49	0.27	1		
S/P	0.20	-0.33	0.59	0.14	0.58	0.49	0.60	1		0.07	-0.39	0.55	0.09	0.61	0.38	0.52	1	
E/A	-0.08	0.20	-0.66	0.14	-0.06	-0.36	-0.43	-0.46	1	-0.09	0.15	-0.57	0.17	-0.23	-0.29	-0.42	-0.45	1

APPENDIX IV

The tables bellow shows the yearly correlation matrixes for the Whole segments. The grey color indicates correlation above 0.71, and the factor with less explanatory power is omitted from the respective regression analysis.

	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
	2001									2002								
Beta	1									1								
ME	0.09	1								0.08	1							
FCFF/ME	-0.08	-0.28	1							-0.22	-0.21	1						
Cash/FV	0.26	-0.13	-0.05	1						0.21	-0.10	-0.08	1					
EBITDA/EV	-0.11	-0.34	0.67	0.12	1					-0.27	-0.17	0.80	0.05	1				
E/P	-0.23	-0.16	0.38	-0.07	0.41	1				-0.30	-0.08	0.46	-0.11	0.47	1			
B/P	-0.03	-0.44	0.49	0.12	0.57	0.23	1			-0.12	-0.31	0.47	0.11	0.55	0.20	1		
S/P	-0.12	-0.38	0.60	-0.03	0.64	0.37	0.62	1		-0.19	-0.32	0.64	-0.06	0.65	0.36	0.57	1	
E/A	0.09	0.15	-0.60	0.21	-0.28	-0.33	-0.47	-0.52	1	0.12	0.09	-0.56	0.21	-0.32	-0.26	-0.37	-0.48	1

	2003									2004								
Beta	1									1								
ME	0.08	1								0.01	1							
FCFF/ME	-0.07	-0.07	1							0.01	-0.09	1						
Cash/FV	0.24	-0.11	-0.01	1						0.27	-0.12	0.06	1					
EBITDA/EV	-0.16	-0.12	0.71	0.05	1					-0.02	-0.12	0.62	0.10	1				
E/P	-0.22	-0.07	0.36	-0.08	0.44	1				-0.06	-0.06	0.39	-0.04	0.53	1			
B/P	-0.02	-0.24	0.42	0.13	0.59	0.19	1			0.07	-0.27	0.34	0.12	0.53	0.25	1		
S/P	-0.12	-0.28	0.50	-0.04	0.64	0.32	0.56	1		0.01	-0.28	0.43	-0.04	0.62	0.36	0.58	1	
E/A	0.04	0.01	-0.51	0.19	-0.31	-0.21	-0.34	-0.43	1	0.02	0.02	-0.42	0.19	-0.30	-0.21	-0.36	-0.45	1

	2005									2006								
Beta	1									1								
ME	-0.09	1								-0.03	1							
FCFF/ME	-0.01	-0.11	1							0.03	-0.16	1						
Cash/FV	0.17	-0.14	-0.06	1						0.14	-0.17	-0.04	1					
EBITDA/EV	-0.09	-0.02	0.49	0.04	1					-0.01	-0.13	0.58	0.11	1				
E/P	-0.07	0.07	0.42	-0.11	0.52	1				-0.01	-0.02	0.48	-0.01	0.54	1			
B/P	-0.01	-0.28	0.31	0.14	0.47	0.17	1			-0.02	-0.35	0.36	0.18	0.50	0.26	1		
S/P	-0.06	-0.25	0.40	-0.06	0.58	0.30	0.55	1		-0.02	-0.33	0.49	-0.01	0.61	0.39	0.59	1	
E/A	0.09	-0.02	-0.45	0.24	-0.19	-0.14	-0.30	-0.35	1	0.03	0.06	-0.48	0.22	-0.19	-0.22	-0.34	-0.42	1

2007	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
Beta	1								
ME	-0.15	1							
FCFF/ME	0.35	-0.24	1						
Cash/FV	0.23	-0.12	-0.03	1					
EBITDA/EV	0.33	-0.16	0.50	0.33	1				
E/P	0.41	-0.09	0.58	0.04	0.50	1			
B/P	0.34	-0.40	0.50	0.14	0.47	0.41	1		
S/P	0.31	-0.36	0.61	-0.01	0.51	0.46	0.68	1	
E/A	-0.28	0.21	-0.58	0.22	-0.07	-0.38	-0.54	-0.58	1

2008	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
Beta	1								
ME	-0.06	1							
FCFF/ME	0.16	-0.17	1						
Cash/FV	0.02	-0.12	-0.02	1					
EBITDA/EV	0.04	-0.17	0.53	0.16	1				
E/P	-0.12	-0.05	0.27	-0.08	0.38	1			
B/P	0.03	-0.33	0.28	0.06	0.41	0.13	1		
S/P	0.16	-0.32	0.46	-0.07	0.55	0.26	0.47	1	
E/A	-0.21	0.10	-0.46	0.23	-0.17	-0.24	-0.20	-0.44	1

2009	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
Beta	1								
ME	-0.04	1							
FCFF/ME	0.02	-0.13	1						
Cash/FV	0.08	-0.14	0.04	1					
EBITDA/EV	-0.01	-0.19	0.62	0.18	1				
E/P	-0.03	-0.01	0.36	0.01	0.48	1			
B/P	-0.02	-0.30	0.24	0.15	0.48	0.20	1		
S/P	0.10	-0.30	0.42	0.06	0.61	0.30	0.48	1	
E/A	-0.14	0.03	-0.42	0.22	-0.23	-0.19	-0.26	-0.42	1

2010	Beta	ME	FCFF/ME	Cash/FV	EBITDA/EV	E/P	B/P	S/P	E/A
Beta	1								
ME	-0.01	1							
FCFF/ME	0.15	-0.08	1						
Cash/FV	0.16	-0.13	0.13	1					
EBITDA/EV	0.17	-0.18	0.62	0.31	1				
E/P	0.09	-0.01	0.39	0.07	0.50	1			
B/P	0.12	-0.33	0.35	0.21	0.55	0.25	1		
S/P	0.19	-0.31	0.44	0.09	0.60	0.32	0.56	1	
E/A	-0.16	0.05	-0.44	0.20	-0.18	-0.19	-0.35	-0.44	1