

# Master Thesis

## Financial Economics

ERASMUS UNIVERSITY ROTTERDAM  
Erasmus School of Economics

### Traditional Asset Pricing Models' Accuracy During Times of Distress

This research studies the time-varying accuracy and mispricing of the traditional asset pricing models during times of distress. The CAPM, Fama & French' Three-Factor, and Fama & French' Five-Factor models will be evaluated in terms of ability to accurately price individual assets and possible mean reversion during times of distress. This research shows evidence on the differences in model accuracy and mispricing during wars, financial crises, trade wars, pandemics, and natural disasters, and shows which model has the best predictive and practical use in times of distress. This paper shows that in normal times, the Fama & French' Five-Factor model has the best accuracy and practical use, but in times of distress the CAPM outperforms the Five-Factor model in terms of practical use.

Name Student: Viresh Ramcharan  
Student ID number: 401125

Supervisor: Joris Kil

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## 1. Introduction

As long as economics have been around, the pricing of assets has been a topic of interest. The interest in a well-functioning asset pricing model increased even more, with the exponential growth observable in the US stock market in the last decades. The US stock market took off around 1990, followed by a sharp decline in stock price in 2000. The sharp rise and fall of the stock market, deviating from its fundamental value, is called a 'bubble'. The bubble at the change of the millennium is often referred to as the 'dotcom bubble', which is, said by many, caused by investor irrationality and a too high valuation of tech companies. The S&P500 reached a high of \$1552, followed by a sharp decline to \$769, in just a short period of time. The most recent bubble in the US market started to collapse in late 2007, where the price reached a high of \$1561 and quickly fell to a low of \$667. Academics argue that CDS mispricing and recklessness of the financial institutions had caused this (Murhpy, 2008; Fried & Posner, 2011).

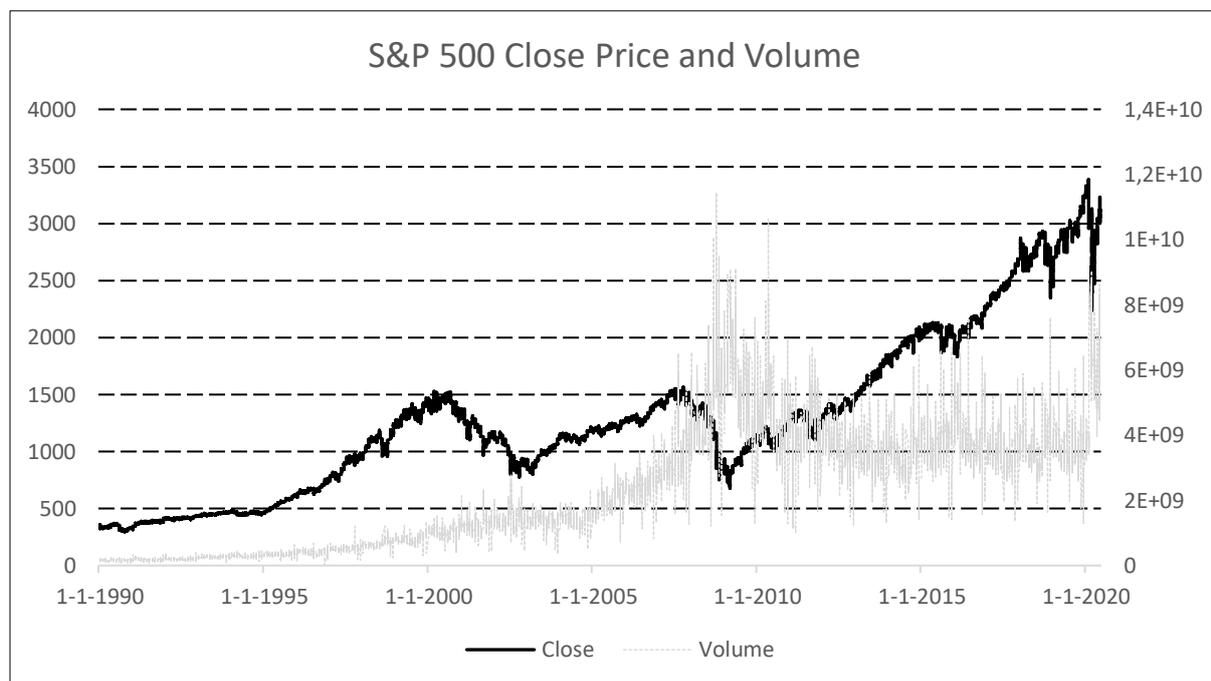


Figure 1. S&P500 monthly close price and monthly volume from, 01-1990 till 06-2020.

In history, we have observed many periods of high volatility in many countries in many stock markets. Academics are still not fully certain behind the reason of waves in volatility, in which they appear to come, even though many strongly believe that change in expectation or investor irrationality has to do with this (Bakshi & Lu, 2006; Blanchard et al., 1982; Lei et al., 2001). In volatile times, the one who is able project the fundamental value of a stock, is deemed as winner. If a stock is overvalued, one should adopt a sell strategy. If a stock would be projected as undervalued, buying the stock is profitable. This paper investigates the accuracy of traditional asset pricing models, during times of global distress. As previous literature has shown that in

times of financial distress, the volatility rises (Chen et al., 2010). In times of volatility a good strategy using a (or the most) correct asset pricing model is profitable on the long term simply by buying or selling stocks.

Throughout history academics have tried to model the stock market using several different mathematical and empirical models. The most famous of the asset pricing models are the capital asset pricing model (CAPM) by Treynor (1962), Sharpe (1964) & Lintner (1965) and the Fama & French Three-Factor Model (FF3) (Fama & French, 1992). These models both have one thing in common, both models implicitly assume that riskier stocks have higher returns. The first (CAPM) model states that stock prices are based on market-wide, or systemic, price fluctuation. Where different stocks differ in sensitivity to the market. The latter states that not only systemic risk plays a role in pricing the assets, but also risk factor related to the size and book-to-market ratio of a stock. This paper will test whether these models, amongst others, do hold (best) in times of distress such as pandemics, wars, natural disasters and financial crises.

Some academics (Chan & Lakonishok, 2004; Tversky & Kahneman, 1973) however, state that the stock market is not a perfect market and that the participants of the stock markets do not process the information the same. They state that the market as a whole can be irrational, skewing the asset prices. The asset pricing models based on risk, mentioned earlier state that the volatility in stock prices has to do with the change in riskiness of the underlying stock. The behavioralists however, argue that the stock market is not completely rational, and that the risk-return models should be complemented with behavioral aspects such as anchoring, information biases, and misinterpreting information (Chan & Lakonishok, 2004; Tversky & Kahneman, 1973).

If the risk models are the correct predictors of fundamental asset pricing, the difference between the actual price of a stock and the predicted value is the market mispricing, or model misspecification. This paper will dive deeper in the mispricing (or market irrationality), given as the difference between the actual and predicted value, of different models throughout the time. Models will also be tested during times of distress. The primary research question of this paper follows:

*Which traditional asset pricing model holds best during time of distress?*

In order to answer this question, it is necessary to investigate how the market reacts during times of distress. Therefore, this paper first puts the emphasis on the market reaction throughout time. This will be done by several analysis on global crises throughout time and factors determining market reaction such as volatility, price, and volume. The findings are that each individual type of event reacts differently, some show stronger reactions than others. The price reaction in terms of volatility, cumulated abnormal returns, and volume are especially large in times of war,

pandemics, financial crises, and trade wars. The market does not seem to get affected by natural disasters.

Next, to get a good estimation how different the estimations of the models are in non-distress times and distress times a thorough investigation of model accuracy needs to be done. This paper follows up by investigating several asset-pricing models and how accurate these are during the long run. The findings are that for the entire sample period, 1990 till mid 2020, the most extended model holds best, which is in line with Fama & French' findings (2015).

At last, this paper will further elaborate on the research question and investigate whether asset pricing models hold in times of global crises, at all, and if so, which models are best used to model asset prices during these times. The paper tests which model to choose in periods of distress in order to make the most profit. The findings are that the CAPM seem to be the best holding model during distress periods. This paper does have academic value as the accuracy of different models have never been tested in specific time periods of distress. The paper also shows how traditional methodology does not hold for this specific problem, and which models is best for in investors looking to profit off zero-investment strategies where you buy overvalued stocks and sell undervalue stocks.

## 2. Theoretical Framework

### 2.1 CAPM

The search for the model which is best used for asset pricing has been going on since the start of economic exchanges. As primary start point is the relation between risk and return. The combined work of Treynor (1962), Sharpe (1964), and Lintner (1965) resulted in the first generally accepted asset pricing model had been created, with regards to the risk-return view. Treynor (1962) did research on the relationship between asset riskiness and their return. Treynor created the Capital Asset Pricing Model (CAPM) by quantifying risk and its relation. He used a very mathematical approach. Even though Treynor's work was not officially published, his work was truly the base of the CAPM model.

William Sharpe (1964) however, did publish a more polished version of the CAPM. He also investigated the relationship between asset pricing and riskiness. In William Sharpe's theoretical work, he shows that there is a relationship between the return of an asset and the volatility of the return of the asset. He argues that the linear relationship between asset pricing and such asset's return volatility starts at the interest rate, with a volatility of zero, and crosses the point where the market has achieved an efficient risk-return:  $\varphi$ .  $\varphi$  is the combination of most efficient risky assets with regards to the risk-return relationship. This line then can be drawn indefinitely. He argues that this is possible by lending the risk-free rate and buying the portfolio. The investors will decide for themselves how much risk, and thus return, they want to take or achieve in their investment decision depending on the level of risk aversion they possess. The slope of such line is called the "Sharpe-ratio", which is the excess return of the portfolio (the portfolio returns over the risk-free rate) divided by the standard deviation of the returns of the portfolio.

Lintner (1965) did similar research as Sharpe did, with similar results. He, however, argued that the optimal portfolio with regards to risk-return is the portfolio which includes the entire stock market (M). He, just like Sharpe, argues that you can benefit of this optimal risk-return line by either selling or buying the risk-free rate and either buying or selling the M-portfolio, according to your risk preference. He mentions that individual stock prices move together with the market portfolio, whether is being a positive correlation of negative correlation. This is called the systemic risk of a stock. Each stock moves with the market, some move different than others. In more statistical terms, it means that there is a correlation between the return of an asset and the return of the stock market. This correlation,  $\beta$ , is quantified by dividing the covariance between the historical returns of the market and the historical returns of the asset and the variance of the market.

The biggest problem with the CAPM is that, despite it being a sound model in theory, there is not very much empirical evidence of the CAPM holding throughout time. Fama & French (1992) found consistent mispricing in the CAPM.

## **2.2 Fama & French Models**

Fama & French (1992) found that the price fluctuation of certain stocks were inconsistent with the rules provided by the CAPM and did not move along with the market according to the market beta ( $\beta$ ), which indicates the firm's systemic risk. Fama & French (1992) did empirical research on the stock returns of companies listed on the NYSE, AMEX, and NASDAQ from 1962 till 1989. They used cross-section data to find expected stock returns, more accurate than the CAPM could. Fama & French did not look at the simple relationship between the single variate test of the CAPM but looked further in the data and analyzed multivariate relations between returns, size, leverage, earnings per share, and book to market ratio. The empirical data showed that there are anomalies in CAPM, and that there is a negative relationship between firm size, and its stock return. They also found that book to market ratio positively relates to the firm's stock return. Fama & French (1992) argue that the higher returns for firms where the market judges them with a poor prospect are riskier, therefore require a higher stock return. Their explanation for smaller stocks having higher returns is that small stocks are more prone to financial distress than bigger stocks, thus being riskier and yielding a higher stock return. The findings of (Fama & French, 1992) are in support of the risk-return theory.

One year later, Fama & French (1993) improved the CAPM by implementing the anomalies they found with regards to the CAPM into extensions of the CAPM. Their best model was the Fama & French Three-Factor Model. In this research they added unexpected change in interest rates (TERM) and a proxy for a default factor (DEF). This is the difference between the return portfolio including all long-term corporate bonds and one including the long-term government bonds. They quantified the effect of smaller stocks having higher returns by adding a variable to the CAPM: SMB. SMB is computed by measuring the difference in return between the stocks in the bottom 30% and the stocks in the top 70% with regards to market capitalization. This is called the size premium. They also quantified the premium on firms with higher book to market ratio: HML. HML is the difference in return between the top 50% firms and the bottom 50% firms with regards to book-to-market ratio. Their findings are that the unexpected changes in interest rates (TERM) and the proxy for default (DEF) do not significantly improve the CAPM. However, incorporating SMB and HML in the CAPM does improve the model. Not only does adding these two factors improve the model, the added variables correlate with the economic reasoning behind them. They show that the three-factor model also captures the effect of earnings, cash flow, and sales growth of a firm, which all are related to the stock return. The reasoning behind this is

that the market does account for these in terms of asset pricing. The state of these traditional firm fundamentals therefore are already incorporated in the market price, which is directly related to the book-to-market ratio of a firm. Firms with low E/P (earnings per share price), low C/P, and high sales growth tend to have a more negative slope on the HML factor. Smaller firms have higher sensitivity to SML, and firms with higher book-to-market ratios have higher sensitivity to HML (Fama & French, 1993).

Most notable evidence against the Three-Factor model of Fama & French (1993) came from Novy-Marx (2013) and Titman, Wei, and Xie (2004). Titman, Wei, and Xie (2004) take empirical evidence from the AMEX, NYSE, and NASDAQ to further investigate stock returns and follow the assumptions and data mutations Fama & French (1992, 1993) applied in their research. Titman, Wei, and Xie (2004) use data from 1973 till 1996. Their findings are that firms with greater capital investments achieve more negative (future) stock returns than firms with lower capital investments. This negative relation lasts for 5 years after initial capital investment mutation, which is evidence of initial market underreaction to changes in capital investments. Novy-Marx (2013) also did empirical research on the stock return. In this paper anomalies with regards to returns of CAPM and FF3 were investigated. The paper covers more than 4000 firms listed on the NYSE from 1963 till late 2010. The findings in this paper are profitable firms, on average, yield higher stock returns than firms who are less profitable, which is in contrast to Fama & French (1993) who state that firm fundamentals are captured by SMB and HML.

Motivated by evidence provided by others (Titmal et al., 2004 & Novy-Marx, 2013), Fama & French further expanded their three-factor model in 2015 (Fama & French, 2015), in which they included two more factors, creating the Fama & French Five Factor Model (FF5). In this model they added a factor which accounts for profitability and a factor which accounts for investments. They quantify firm profitability in a similar way they did with size (SMB) and book-to-market (HML) ratio. RMW is the difference between profitable stocks' return and unprofitable stocks' return. The top breakpoint being the top 70%, and the bottom breakpoint being the bottom 30% of profitable firms. CMA, the factor accounting for firm investments is the difference in return of firms with high investment versus firms with low investments, using the same 70% & 30% breakpoints as mentioned with the RMW. The FF5 models shows a significant improvement over the FF3 (and CAPM) in empirical research using stock returns from 1963 till 2013 on the NYSE. This paper will investigate the difference of these models (CAPM, FF3, FF5), with regards to accuracy and robustness during different times.

## 2.3 Irrationality

CAPM and the Fama & French models all build on the risk-return view as mentioned earlier. Riskier stocks, according to this view, require higher returns. However, the opposite of this view is the behavioral view of the market. The behavioral view of asset pricing assumes that markets and the participants of these markets can react irrational as a whole, without arbitrageurs trading the irrationality away, as Fama & French (1992, 1993, 2015) assume. Tversky and Kahneman (1981), both psychologists, did research on the behavioral and decision making of people. Up until that point it was generally accepted that people would make rational choices and that the expected utility or expected gains were the main determinants of human decision-making. Tversky and Kahneman found that expected value and perceived utility is not a linear function of each other. They found that people are risk averse: people do not like risk. The reasoning behind this is that a loss, or a negative return, is weighted more heavily than a profit of the same amount, or positive return. They also found that probabilities are weighted different than the actual probabilities, with an overvaluation of probabilities near 0% and an undervaluation of higher probabilities. Using these two findings the psychologists Tversky and Kahneman (1981) developed the prospect theory, which had great impact on economics.

Research building on Tversky's and Kahneman's (1981) found evidence of market irrationality (Daniel et al., 1998). Daniel, Hirshleifer, and Subrahmanyam found that there are anomalies to the risk-return view where they found that the market can be irrational. Their research focusses on investor overconfidence of private information and biased self-attribution. DeBondt and Thaler (1995) did research on overconfidence in psychology, where they can be quoted saying: "perhaps, *the most robust finding in the psychology of judgment is that people are overconfident*". Daniel, Hirshleifer, and Subrahmanyam's (1998) research found that the markets shift asymmetrically. They show that overconfidence results in excess volatility, higher turnover in overconfident agents being one of the reasons for this. This is not directly in contrast to Fama & French' (1992, 1993, 2015) view, as the excess volatility term, also known as the error term, is zero on average due to the statistical nature of the multivariate regression used by Fama & French (1993, 2015). However, Daniel et al. (1998) also show that investors have biased self-attribution. Biased self-attribution is an irrational judgement of the agent's own impact or knowledge. Agents with biased self-attribution have a positive short-lag autocorrelation but a more negative long-term return. Self-attribution skews the market return and the accuracy of the risk-return view of the CAPM and FF3/5.

Further research (Sprenger & Welppe, 2011) on market irrationality show that the market reacts differently to different types of news and information relevant for future stock expectations. The market does overreact and underreact, depending on the news.

## 2.4 Volatility Index

The market over- and underreaction is visible when looking at the 30-day volatility of the S&P 500 over time. One way to quantify this is to look at the difference in historical volatility of the S&P500 in different times. Past volatility is a given but explains little about the predictability of future returns using traditional models. The CBOE, Chicago Board Options Exchange, (2020) came with a methodology which captures the market's predicted future volatility. This is called the VIX (CBOE Volatility Index) index. The VIX index, calculated the expected value of the 30-day future volatility of the stock market in the US. This index is derived from mid-quote prices of the S&P500's put and call options. CBOE's (2020) calculations are pretty in depth, however, it works as follows: if the market expects volatility to be higher, this will be seen in the change in volume of put and call options. As implied volatility (VIX) are aggregated market volatility, and stock prices are aggregated future market predictions, one would say the two have a lot in common. One could also say that in volatile times, which are presumably times the traditional asset pricing models do not predict as accurate as in relatively non-volatile times (Fama & French, 1992; 1993; 2015), that the VIX could say something about the accuracy of the model used.

Bekaert & Hoerova (2014) found that CBOE's (2020) the VIX index shows peaks around times of crises. More interesting is that non financially related certain global events such as the gulf wars, 9/11, scandals, seem to affect volatility. In the same paper they find that the VIX was a great predictor of future volatility. They also found that the VIX, thus volatility is negatively correlated with industrial production and positively correlated with financial instability. One would argue that firms which have lower industrial production and higher financial instability are firms which are riskier. The risk-view of the asset pricing models would therefore argue that in times of higher implied volatility (VIX), stock returns would be higher on average for the short-term. However, in contrast to the risk-view, empirical data for the period 1991-2011 show that there is a negative relationship between the implied volatility and stock returns on the S&P500 (Sarwar, 2012). Banerjee et al. (2007) did research on the long-term effect of the VIX index and stock returns on the S&P500. When looking at the 30-day and the 60-day return, implied volatility does positively relate to the stock market returns for the S&P 500 constituents. Smaller firms seem to be more sensitive to change in implied volatility than bigger firms which makes sense as smaller firms are more sensitive to the market. When including the VIX in the existing Fama & French models, the models improve, in terms of a lower constant and higher R-squared, which implies that in times of high volatility, the models are less accurate (Banerjee et al., 2007).

## **2.5 Pricing Bubbles**

In times of volatility or misvaluation, traders are able to make the most profit if the asset pricing models which traders use are right. The most volatile times are often times where financial bubbles occur: quick increases in price followed by quick decreases (Bekaert & Hoerova, 2014). Little research has been done in terms of asset pricing in these certain times. O'Brien & Tian (2006) find that the Fama & French (1993) risk factors did not have high prediction power in the dotcom bubble and also did overvalue the market, along with many financial analysts. This paper will investigate the predicted returns of models and whether real-time stock prices fluctuate around the model predictions.

### 3. Research Question

#### ***Q1: Which traditional asset pricing models hold best under time of distress?***

The main research question that will be answered in this paper is “which traditional asset pricing models hold best under time of distress?”. Different models have been tested throughout different times. This paper will add to that by testing, model mispricing and real-time returns during times of distress. This is especially important in times of distress (pandemic, (trade)wars, natural disasters, financial crises) as the volatility in such times are higher than in non-distress times, and so are the profits to be made. The “best” model is quantified by two different measures: how well a model predicts the returns, in absolute terms of mispricing, and how much mean reversion the model has. If the price of an asset is beneath the model-predicted price, the asset is undervalued, and the stock returns will revert on itself. Models with the highest stock return correction with regard to model mispricing and highest accuracy are deemed as the best holding model during times of distress.

*Hypothesis 1.1: as the more elaborate models incorporate more variables, the most extended model, the FF5, will predict the returns best during times of distress.*

*Hypothesis 1.2: The CAPM is expected to show the biggest mean reversion during distress.*

The current models will be evaluated in a time-series analysis with quantified measures of determining what a “best holding” model is. This paper will look at the market’s reaction to, this paper will first try to answer to sub-questions. The first question to be answered is:

#### ***Q2: How does the market react during times of distress?***

The market shows under and overreaction in certain times. To understand which models will hold better than others, it is necessary to understand how the market does react in different adverse stress scenarios. Market reaction can be quantified with different output variables, such variables are stock returns, volume, and volatility. In order to correctly answer the given question, this paper will look at event-studies analysis of the cumulative returns and similar analysis on the volume and volatility of the market (S&P 500). However, tests on how different industry sectors react during times of distress are scarce and this paper will add to the academic knowledge in that way as well.

Hypothesis 2.1: *The cumulative abnormal returns will show a decrease after announcement of the distress events.*

Hypothesis 2.2: *The volatility of the market will rise after announcement of the events.*

Hypothesis 2.3: *The trading activity (volume) will rise after announcement of the events.*

Hypothesis 2.4: *Different types of firms will show different price reactions to event types.*

The last sub-question before answering the main research question in this paper will be as follows:

***Q3: Which of the traditional asset pricing models holds best for individual firms?***

A model can hold during times of distress, but if the model is not accurate in normal times at all, the model will fail as well. A model needs to be relatively predictable in normal times, in order to test the model's validity in times of distress. The accuracy of the three tested models will be reviewed in terms of difference between the predicted and real values for all the S&P500 constituents in the time-period given. The "best" holding model is the model with the highest accuracy (lowest absolute mispricing) and the model showing the biggest mean reversion.

Hypothesis 3.1: *The most expanded, the FF5 model, will show the lowest mispricing in the long-term.*

Hypothesis 3.2: *The CAPM is expected to show the biggest mean reversion during distress.*

## 4. Data

The S&P 500 is a value-weighted stock market index which lists the 500 largest publicly traded firms in the US, in terms of market capitalization. Market capitalization is the total value of the outstanding shares in the market. The S&P 500 is not free to enter for any company however, there is a set of qualifications a company needs to meet in order to join the S&P 500. The biggest restriction is that it must belong to the 500 biggest companies in the US and that the company must be free floating, meaning that at least 50% of its shares are publicly tradeable. As of 2020, this means that the market capitalization of the outstanding shares must be \$5,2 billion or higher. The S&P 500 is often seen as a reflection of the US stock market or even the US economy by investors due the portfolio diversity, including the most impactful companies in the US, in the index. One problem with the S&P 500 however, is that the S&P 500 tends to overrepresent IT companies. 27,5% of the S&P 500's weight is consisting of IT companies (SPGlobal Factsheet, 2020). The descriptive statistics of the S&P 500 daily returns and volume are to be found below, in table X. The average daily return of the S&P 500 since 1990 is 0,03%, annualizing this makes it an average yearly return of 7,34%.

	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Daily Return	7.682	0,0278%	1,1511%	-12,7652%	10,9572%
Volume	7.682	\$2,24 billion	\$1,80 billion	\$15,0 million	\$11,5 billion

Table 1. Daily descriptive data of the S&P500 from 1990-2020.

This paper assumes the S&P 500 as the US Market and as benchmark as the tested companies in the papers are/were all constituents of the S&P 500, meaning that they are firms with relatively large market capitalization. For large cap firms, the S&P 500 fits perfect as a benchmark due to the diversified portfolio of large impactful companies (Battaglia Jr & Musar, 2020). The stock data of the S&P 500 are freely available and downloaded from their website, with additional data downloaded from Compustat. The time-period investigated in this paper is 1990 till June 2020, making use of daily and monthly stock data. The reasoning behind using this particular time-period, instead of the entire period of existence of stock exchanges, is that the stock market has changed in recent years. The biggest changes in the stock market are the availability and liquidity of its shares. This change caused the stock markets to be more prone to psychological biases of (uninformed) investors and altered the market reactions. Prior (to 1990) it was hard to trade on the stock exchanges, today anyone can buy a stock within a few seconds (Gammil & Perold, 1989; Zhichao et al., 2015).

The traditional asset pricing models (CAPM, FF3, FF5) will be tested during different events. All 3 models use factors to determine the returns of an asset, with each asset having different sensitivity (also called factor loading) to these factors. The values of these factors can be found on Kenneth R. French' Data Library (2020). The factor loadings on these factors for every individual constituent are obtained through regression analyses, which are further explained in the methodology section. In addition to Kenneth French' Data Library's (2020) factor data, additional stock data required for the tested models, such as S&P 500 constituent prices and trading volume, are retrieved from Compustat.

The events that will be investigated are US related wars, pandemics, trade wars, natural disasters, and financial crises, where the period of distress is classified with a dummy variable. To ensure sound quantitative analysis on the effect between global events/disasters and the market reaction, a set of rules need to apply for the global events.

A war is a US-related war if the United States of America is either the aggressor of a war, or there is a (potential) threat of an imminent attack or war declaration on the US. The start date of this war is set as the date of the first invasion, first casualty or attack, reported by the US Department of State (U.S. DEPARTMENT of STATE, 2020). The end date of a war, however, is more difficult to determine. In order to deal with this problem, the end date of dummy variable capturing the war is set at 3 months after the start of the war ( $t=+3$  for monthly data,  $t=+63$  for daily data). This, however, is not a big problem as the largest portion of the market reaction is the initial reaction, roughly 2 days before and a week after the event (Barrett et al. 1987).

For pandemics, the start date of the event is the date the World Health Organization (WHO, 2020) calls out a global pandemic or a Public Health Emergency of International Concern (PHEIC), the end date is the date at which the total number of cases of such particular disease falls under the amount of cases at the start date.

Currently the United States has one on-going trade war: the one with China. The start date of this trade war is the 22nd of March 2018. This is the date the United States listed over 1.300 categories of Chinese imports that would gain additional import tariffs (CNN, 2018). As the end date of this trade war is unclear, the same methodology has been applied here as with the wars: the end date is three months after the event initiation.

US-related natural disasters were sorted on the total damage cost the natural disasters had caused, listed by US official reports (U.S. DEPARTMENT of STATE, 2020). The natural disasters included in this research are the ones which had caused more than \$100 billion of damage in total, adjusted for inflation. The start date of these disasters, all three being hurricanes, are the dates at

which a Hurricane Warning had been dispatched by a state of the US. The end dates of the natural disaster events are the dates at which the last warning had been discontinued by a US state.

The last global distress dummy, “Financial Crises” is sorted on the two-year returns of the S&P 500 if the two-year return had fallen below 40% that period would be classified as a period of financial crises. The exact start dates of these financial crises would be set according to key events, argued with economic reasoning of academics (Hoshi, 2011; Griffin et al., 2011). A large return period had been set to ensure that this research would only capture crises which have had an impact on the real economy and not only the stock markets, as small volatility changes or small periods of negative returns on stock markets are often not reflected in the real economy (Cochrane, 2005).

Table 2, below, lists an overview of the events used and investigated in this paper. If the date of the start of the event occurred on a non-trading day, the event start date (t=0) would be the next trading day.

<b>Disaster</b>	<b>Start Date Disaster</b>	<b>Disaster Type</b>
COVID-19	30-1-2020	Pandemic
ZIKA	1-2-2016	Pandemic
EBOLA	8-8-2014	Pandemic
POLIO	1-5-2014	Pandemic
Swine Flu	26-4-2009	Pandemic
Iran	8-1-2020	War
Syria	14-4-2018	War
Iraq	20-3-2003	War
Afghanistan	7-10-2001	War
Gulf War	2-8-1990	War
China Trade War	22-3-2018	Trade War
Dotcom Bubble	1-3-2000	Financial Crisis
Housing Crash (US)	1-9-2008	Financial Crisis
Hurricane Maria	25-9-2017	Natural Disaster
Hurricane Harvey	23-8-2017	Natural Disaster
Hurricane Katrina	25-8-2004	Natural Disaster

Table 2. Disaster events listed with start dates and type of event it belongs to.

Figure 2 visualizes the S&P 500 price in US dollars from 1990 till mid-2020, where the vertical striped lines illustrated are disaster events.

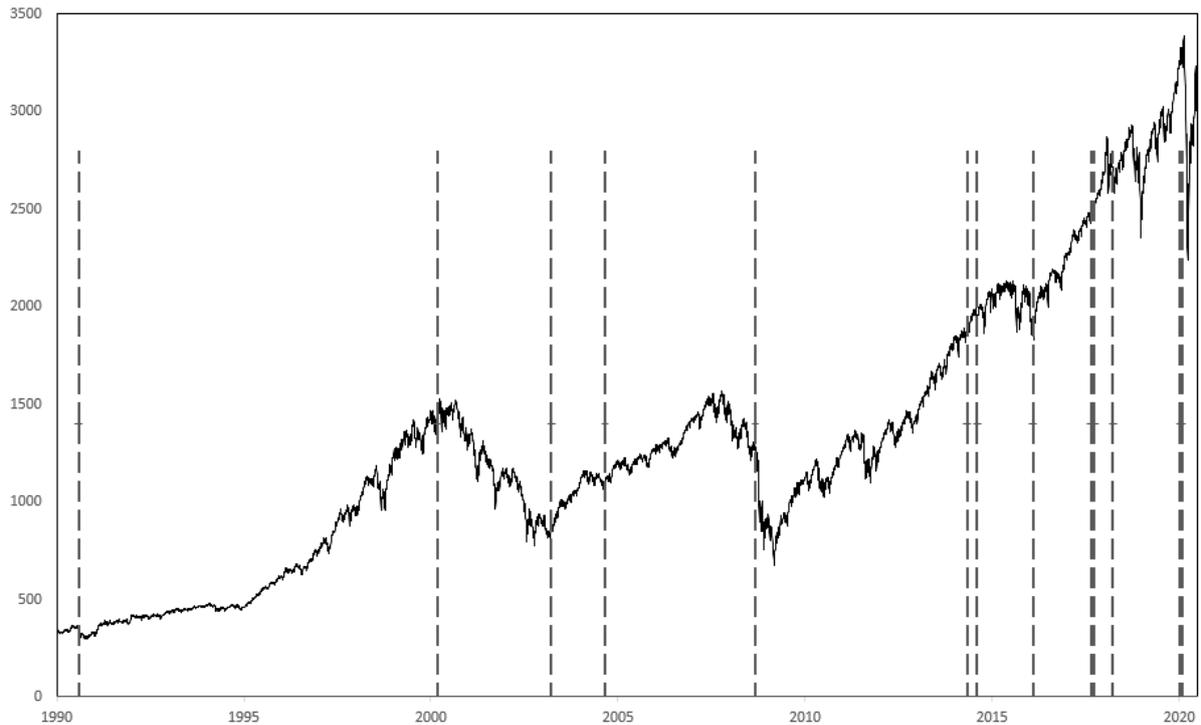


Figure 2. S&P 500 value over time, with the dollar value on the y-axis. The dotted vertical lines indicate the start dates of a disaster/distress event.

When taking a first glance over **figure 2**, there are no noticeable stock price effects before or after the striped lines, except for the obvious financial crises at March 2000 and September 2008. One thing to take in mind when analyzing the events and the market's reaction, which is also made visible in this graph, is that events are ill-distributed and lean more towards modern times. This means that in some cases events are happening within a short period of each other and the correlation between the event and the market reaction might become more troubled to determine due to the statistical nature of regressions and the multicollinearity between the dummy variables. To mitigate this problem, the dummy variables of the events have been sorted in 5 different portfolios of events. There is no single "disaster" dummy, but 5 different dummies sorted by disaster type.

## 5. Methodology

### 5.1 Event Studies

In order to answer the first research question, the market's reaction needs to be measured in times of global distress. A market can react in numerous ways. In this paper three different market reactions are investigated: the price reaction (change in market sentiment), change in trading activity, and the change in return volatility. In order to make the market reaction shortly prior and after the start date of disaster events visible, event study analyses will be applied for this particular research. The return of an asset is the relative difference in price between  $t$  and  $t-1$ . The cumulative abnormal return will be calculated from the start of tested event period ( $t = -30$ ), till 120 trading days after the event date ( $t = 120$ ). The cumulative abnormal return ( $CAR$ ), is the relative return at period  $t$  on the asset had one bought the asset on the base date, or index date, as seen below:

$$CAR_t = \sum_{i=-30}^t AR_t$$

The cumulative abnormal return ( $CAR$ ) is the cumulated abnormal returns on the asset(s) from the start of the event time  $t$ . Where  $AR_t$  is the abnormal return at time  $t$ . The abnormal return is the difference between the realized or actual return and the normal return.

$$AR_t = R_t - R_{normal}$$

The normal return can be measured in many different ways. Since the normal return of a benchmark or market portfolio (S&P 500) needs to be acquired, it is best to look at the historical mean of daily return as the daily normal return (Peterson, 1989). The event study has a maximum value of  $t = 120$ . The test period for mean normal return is the average in daily return between the start at the event period ( $t = -30$ ) and one year prior to the event start date ( $t = -250$ ). The  $CARs$  are calculated for the pandemics, wars, trade war & natural disasters. The financial crises are left out as it would be obvious that the  $CAR$  would be a downward sloping line.

Event studies style calculations follow for the analysis on volatility and volume as well. However, the change in event studies analysis for these two is that nor the volatility nor the volume will be cumulated. A buy-and-hold strategy for volume or realized volatility is not possible. In the event studies for the abnormal monthly trading volume, the monthly abnormal volume (21 trading days) are drawn on the graph. The monthly abnormal trading volume ( $MATV$ ) is difference between the realized monthly trading volume ( $MTV$ ) and the monthly normal trading volume

(*MNTV*). The normal monthly trading volume is the average monthly trading volume of the past 250 trading days.

$$MATV_t = MTV_t - MNTV_t$$

Volatility is also measured in a monthly unit; volatility is measured as the standard deviation of the returns for the past month:

$$Volatility = \sqrt{\frac{\sum_{i=t-21}^t (R_t - \bar{R})^2}{n-1}}$$

Monthly abnormal volatility is the realized volatility minus the normal volatility. The normal volatility is the mean of the monthly volatility of the past year ( $t - 250$ ). Monthly abnormal volatility is also drawn in a line-graph over the event period. To keep the event study uncluttered, each event has been grouped by its event type. The graphs will show the average market reaction of the grouped event types, which is the equally weighted average of each event per group.

## 5.2 Market reaction in different industry sectors

Economic reasoning had brought up that different types of companies will be hit differently in different types of crises (Schwert, 2011). For example, transport companies will bear with more negative (business-technical) consequences than financial institutions, in times of natural disasters (Altay & Ramirez, 2010). In such way, the market might also react differently to different companies in times of different disasters. The initial aggregated price reaction of the 47 different sectors will be tested against times of distress. A simple time-series regression on each 47 sectors will be ran against 5 different event ( $j$ ) dummies:

$$R_{industry,t} = \alpha_{industry} + \delta_{industry,j}Event_{j,t} + \varepsilon_{industry,t}$$

The dummy will hold value 1 around the start of an event. Three different periods around the start of the event will be tested for initial price reaction: two days prior up until one week after the event, one week prior up until one month after the event, and two weeks prior and up until two months after the event ( $t-2 \sim t+5$ ,  $t-5 \sim t+21$ ,  $t-10 \sim t+42$ ).

## 5.3 Testing traditional asset pricing models

Traditionally, the CAPM and especially the FF3 & FF5 are tested and regressed per portfolio returns with each portfolio having different but not overlapping portfolio sorting. The traditional asset pricing models all are regressions on the portfolio returns using a set of factors:

$$R_{i,t} - R_{f,t} = \alpha_i + \gamma_{j,i}Factor_{j,t} + \varepsilon_{i,t}$$

The excess return  $R_{i,t} - R_{f,t}$  is determined by the factor loadings, the factor values, the constant  $\alpha$  & and the error term  $\varepsilon$ .  $\gamma_{j,i}$  are the factor loadings of portfolio  $i$  on the price determining factor ( $Factor_{j,t}$ )  $j$ . The CAPM uses one factor, the FF3 uses 3, and 5 different factors are used in order to build the FF5 model. The risk premium  $R_m - R_f$  is the difference between the whole market portfolio return ( $R_m$ ) and the risk-free rate ( $R_f$ ). The size premium  $SMB$  is the difference in return of the small firm portfolio (bottom 30%) and the large firm portfolio (top 30%) at time  $t$ . The value premium  $HML$  is the difference in return between portfolio of firms with the highest (top 50%) book-to market ratio and lowest (bottom 50%) ones. The profitability  $RMW$  and investment  $CMA$  premium are the difference between the portfolio of the firms with the highest (top 70%) and lowest (bottom 30%) profitability and investments, respectively. The three models are written as following:

CAPM:  $R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_m - R_f) + \varepsilon_{i,t}$

FF3:  $R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_m - R_f) + s_iSMB_t + h_iHML_t + \varepsilon_{i,t}$

FF5:  $R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_m - R_f) + s_iSMB_t + h_iHML_t + r_iRMW_t + c_iCMA_t + \varepsilon_{i,t}$

As empirical evidence suggest, different types of companies will be economically hit differently by different distress events. If, hypothetically, only a select type of firms is economically hit by a disaster, chances are that this will result in a lowered stock price. The S&P 500 is a list consisting of 500 firms with the largest market capitalizations (*stock price x outstanding shares*). Firms which are hit relatively harder by a disaster than other firms in the market, might not meet the requirements anymore of being in the top 500 in terms of market capitalization. Each company has different factor loadings (Ang et al., 2009), and by replacing stocks in the S&P 500, the traditional approach of calculating the factor loadings using one regression on a portfolio would result in corrupted factor loadings. The factor loadings are dependent on the constituents of the portfolio and if the constituents change intertemporal, the aggregated factor loadings might fit for the total period, but not per year. This is a problem as the paper will look at the time-varying mispricing or errors of the models.

As this paper will look at the time-varying mispricing of traditional models, the factor loadings need to be correct on a yearly basis. The only way to achieve such condition is to calculate the factor loadings for each company tested in this paper separately. From 1990 to mid-2020, there have been 1053 constituents in the S&P 500. All these companies will have their own regressions with each having different factor loadings, and every model tested being different in factor loadings as well (1053\*3 regressions). Once the factor loadings are calculated, the difference

between the realized excess return ( $R_{i,t} - R_{f,t}$ ), and the expected excess return ( $\alpha_i + \gamma_{j,i}Factor_{j,t}$ ), the model mispricing or error term, will be analyzed in this paper.

$$Mispricing_{i,t} = R_{i,t} - R_{f,t} - \alpha_i + \gamma_{j,i}Factor_{j,t}$$

Traditionally, academics would look at the intercept of the models and the (adjusted)  $R^2$  levels of the models to determine the performance of a model (Daniel & Titman, 1997; Fama & French, 1992, 1993, 2015). The reasoning behind this is that the intercept is a fixed residual of the model explanatory variables. Theoretically the asset's return, according to the traditional models, depend only on the variation in the factors used. By having an intercept of zero, such condition is met. However, this paper will look at it differently. This paper puts no interest in the explanatory power of the factors, but the model prediction, which does include the intercept. Therefore, to test which model predicts the returns best on individual firm level, the model mispricing will be analyzed over time. As the average error term of every regression is zero, and the interest of this paper lies at the accuracy of the model and not its direction of error, the average (time-varying) absolute mispricing ( $|Mispricing_t|$ ) will be analyzed as well. The average of the absolute mispricing at time  $t$  of all the different firms, is the sum of the weight ( $w_i$ ) times the absolute mispricing of firm  $i$  at time  $t$ . This average is equally weighted: every firm has the same weight at time  $t$ .

$$|Mispricing_t| = \sum w_i |Mispricing_{i,t}|$$

Models with higher average absolute mispricing are less accurate than models with lower average absolute mispricing.

#### 5.4 Model accuracy in times of global distress

One of the goals of this paper is to understand whether models' accuracy depend on time varying variables, in this case disaster events. To test this, the absolute mispricing will be regressed against distress type dummy variables, with the dummy variables being 1 in times of the distress event and 0 in times of non-distress event times. The regression shows as following:

$$|Mispricing_t| = \alpha + \delta_j Event_{j,t} + \varepsilon_t$$

This regression will formally test whether the accuracy of the model prediction differs in times of distress ( $Event_{j,t}$ ) and how the mispricing, and thus accuracy, differs from the mean ( $\alpha$ ) in such times.

## 5.5 Mean reversion of model mispricing

For investors, it is important to know if stocks which are deemed as undervalued by the chosen model perform better than average. A stock is undervalued (by such model CAPM/FF3/FF5) if the mispricing ( $Mispricing_{i,t}$ ) is negative. If the mispricing is mean reverting, undervalued stocks will perform better than overvalued stocks. A simple way to test if mispricing is mean reverting is to regress the average mispricing ( $Mispricing_t$ ) against the lagged average mispricing in a autoregressive model with P lags:

$$Mispricing_t = \alpha + \sum_{i=y}^P \delta_i Mispricing_{t-y} + \varepsilon_t$$

Mean reversion implies that a negative or positive lagged mispricing ( $Mispricing_{t-y}$ ) will have a positive or negative, respectively, effect on the mispricing at time  $t$ . This paper will focus on the short-term mean reversion (3/6 month reversion). If mean reversion is true, investors would be able to profit off a short-term zero-investment strategy where you buy undervalued stocks and sell overvalued stocks.

## 5.6 Tests during distress times

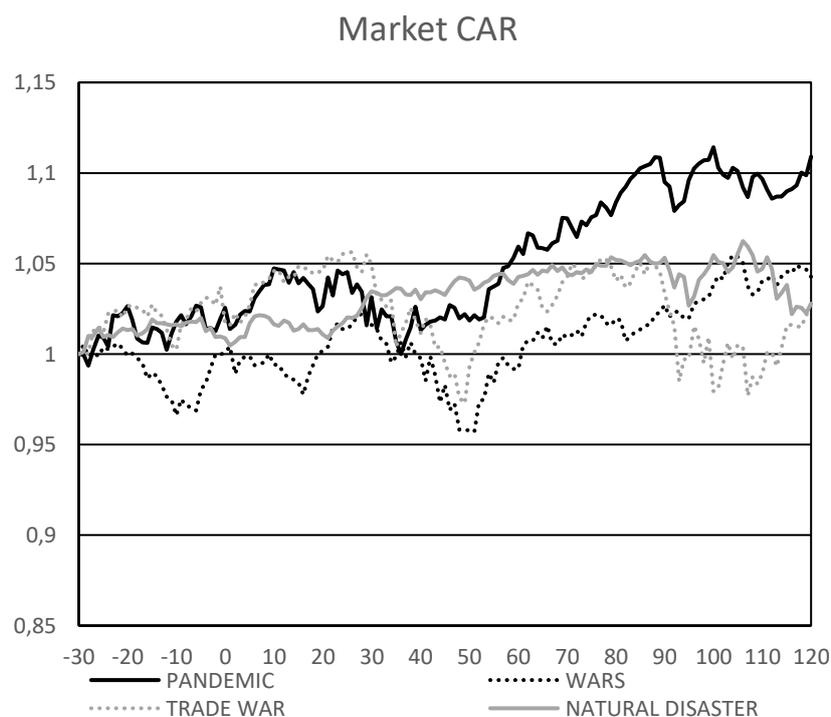
To know which model holds best during times of distress the model accuracy, mispricing reversion, and the absolute mispricing tests will be performed conditioned on the fact that there is a distress event going on. A general distress dummy will hold the value 1 if any of the mentioned distress events ( $Event_{j,t}$ ) are going on and hold the value 1.

## 6. Results

It is most essential for this research that the data available is used in such a way that it provides answers for the questions asked. The findings in the empirical data from 1990 till June 2020 are evaluated and analyzed in such way to provide answers to such questions.

### 6.1 Market Reaction

The first graph below shows the market reaction of the S&P 500 around the event dates. Figure 3 shows the cumulated abnormal return from  $t = -30$  till  $t = +120$ , with  $t = 0$  being the start of the event. The events are grouped in four types. The event type “Financial Crises” has not been included in this figure. Taking a quick glance at figure 3, no initial reaction is observed for the natural disasters, there is a small decrease in return around the start of the event, this could also be noise. However, when looking at the other 3 types of events, pandemics, trade war, and wars, a large reaction is observed. For pandemics, the stock returns lower roughly 30 days after the event start date. The CAR reaches from almost 5% positive returns to 0% returns in a matter of 10 trading days. Reason behind this could be that the market underreacts to the declaration of a PHEIC (Sprenger & Welpel, 2010) or that the pandemic PHEICs are called out before the pandemics become an actual real threat.

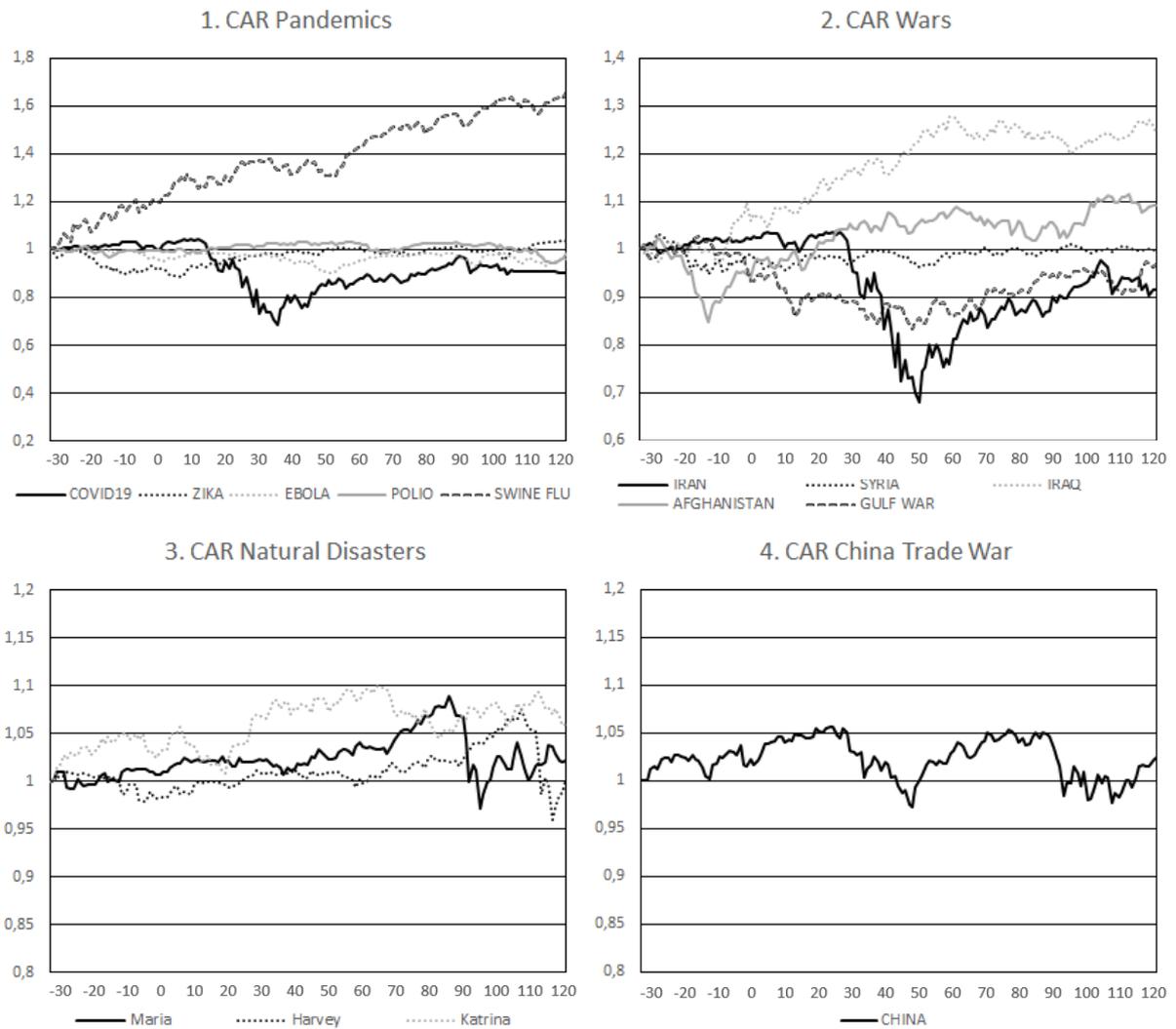


**Figure 3.** Event studies with equally weighted cumulated abnormal return of the S&P500 over time, with % CAR on the y-axis and time after event on the x-axis.

The market did react immediately but only marginally to the US-China trade war, at the time of the declaration of the import tariffs by Trump's administration. The day before declaration of the tariffs the CAR held at 3,7% positive return, the day after declaration the returns lowered by 1,5%-points to 2,2% positive returns. These reactions are marginal and could be noise, however, 30 days after the event, a very large decrease in S&P 500 returns are observed. The CAR went from +4,98% to - 2,73%, which is a decrease of 7,71%-points. The import tariffs made importing specific goods from China into the US more expensive (U.S. DEPARTMENT of STATE, 2020) and the market might have reacted to this. The S&P 500 reacts very volatile to wars: the cumulated return fall and rise during the entire period, especially 20 days prior till 70 days after the start of the war event. One possible reason for this is perhaps due to the transparent nature of state news, the public (thus investors) are kept relatively informed about possible decisions regarding the wars, with respect to other company events. The returns from t-20 till t-10 is -3,11%: the market initially reacts negatively to possible war events but reverts quickly. However, the biggest decrease in returns can be found 30 days after the start of the event. A decrease of 6.4%-points of CAR in just 20 trading days is observable.

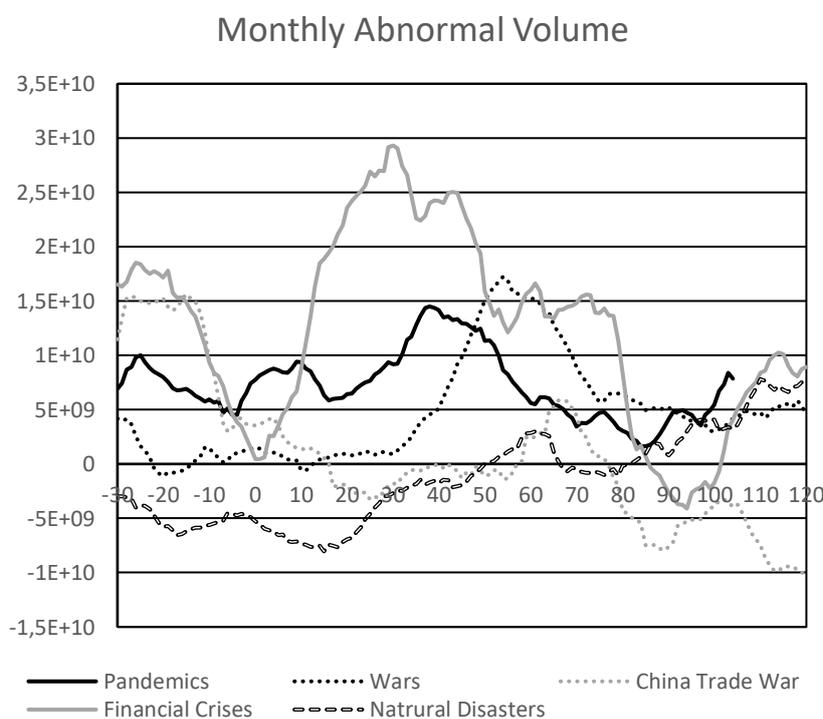
However, when the price reactions of individual events are evaluated, it is clear that only a few of the events play a large role in moving the average price reaction of the event type. Figure 4 presents the price reaction of the individual events. The most noteworthy price movement here is the price reaction roughly 40 days after the COVID-19 announcement and 60 days after the Iran assault. One thing to consider is that these two events overlap and that it is unclear which of the two caused the price reaction, or even if one of the two caused them at all, as this research does not provide proof for causality. All other individual events do not show large shocks in cumulative abnormal return surrounding the event date.

The event study analysis of the price reaction of the S&P 500 shows that the market reacts different to different types of events. Most events eventually result in a short negative shock in returns, except for natural disasters. However, the shocks in price reaction mostly disappear when the individual events are considered, and it has been made visible that most of the negative shocks observed at the aggregated group price reaction are due to individual events. The biggest outlier in terms of negative shock is the reaction of the S&P 500 at 40 days after COVID 19 announcement and 60 days after the Iran assault, which have the same date.



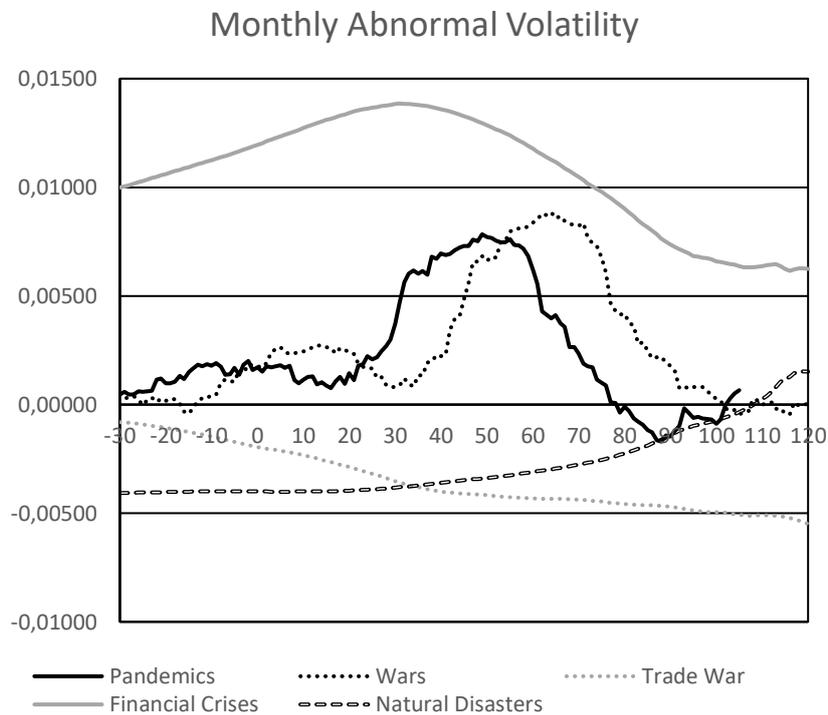
**Figure 4.** Event studies with equally weighted cumulated abnormal return of the S&P500 over time, with % CAR on the y-axis and time after event on the x-axis. Different y-axes on 1, 2 and 3 & 4.

It is also necessary to investigate the trading activity surrounding such events. Figure 5 presents the average price reaction of different grouped events. One must note that in this analysis that the volume is not cumulative, but the abnormal at time  $t$  over the event periods is drawn. The most outstanding change in trading activity is visible when looking at the trading activity surrounding the financial crises, at the times where the stock bubbles burst. The volume is already higher than the average monthly return of the past year 30 days before the event date. Even more noteworthy is that the abnormal trading activity lowers, going from 30 days prior till event date. Possible reasons for this are that mostly the institutional investors increase their sell-side activity (Brunnermeier & Pedersen, 2009) and possible risk aversion (Huang & Wang, 2009) of unsure investors. Wars also show a change in trading activity after initiation of the event, but the market has a delayed reaction in terms of trading activity: the abnormal volume starts to rise 30 days after initiation of the war event, on average. The initial abnormal returns prior to the import tariffs declaration seems to be relatively high as well but after the initial build up the abnormal volume decreases. When the individual events are observed it becomes clear that a select few events cause the change in abnormal volume. Appendix figure A1 presents the abnormal volume over the individual events. The events seeming to drive the group average are the 2008 Housing crisis, COVID-19, and the Iran war, as the other individual events in the same group do not have such strong reaction. The dotcom bubble does not show any change in abnormal volume, as this bubble was spread over a very long period, in which the trading activity was close to the trading activity at the burst of the bubble.



**Figure 5.** Event studies with equally weighted monthly abnormal volume of the S&P500 over time, with the monthly abnormal volume (in US dollars) on the y-axis and time after event on the x-axis.

The monthly abnormal trading activity is presented in figure 6. The volume is mostly in line with the results obtained at figure 4, with the financial crises showing the largest abnormal volatility surrounding the event dates. Appendix figure A2 presents the abnormal volatility over the event period of the individual events. The main factors seeming to drive the group averages are the 2008 housing crisis, COVID-19, and the Iran war.



**Figure 6.** Event studies with equally weighted monthly abnormal volatility of the S&P500 over time, with the monthly abnormal volume (in std. dev of the return) on the y-axis and time after event on the x-axis.

The market reacts differently to different events in terms of volatility and trading activity. Up until now the entire portfolio, the S&P 500, had been analyzed. Previous research suggest that different types of firms react differently to certain events (Schwert, 2011; Altay & Ramirez, 2010). To test this formally, the difference in daily return of the 47 industry sectors inside the event period and outside the event period have been tested. The periods tested are: two days prior up until one week after the event, one week prior up until one month after the event, and two weeks prior and up until two months after the event ( $t-2 \sim t+5$ ,  $t-5 \sim t+21$ ,  $t-10 \sim t+42$ ). Table 3 shows the results of the sectors with the most noteworthy changes in returns or industries which are related to disaster events (Pandemic-MedEq & War-Guns). The results of all the regressions can be found in appendix table A1, A2 & A3.

Due to the statistical nature, significance is hard to realize due to the limited disaster events being tested. Despite this limitation, significant changes in returns during said periods are observed. The biggest changes in daily returns are observed in Panel A and panel B of table 3.

Panel A: Daily change in return two days prior up until one week after event, per industry						
Industry	Pandemic	War	TradeWar	FinancialCrisis	NaturalDisasters	Constant
Agric	0,0076**	0,0009	-0,0016	-0,0149*	0,0009	0,0004*
Banks	-0,0014	-0,0026	-0,0061	0,0146	0,0015	0,0005*
Coal	0,0087	0,0014	-0,0035	-0,0534***	0,0031	0,0003
Drugs	0,0000	0,0008	-0,0050	-0,0027	0,0025	0,0005***
Gold	0,0072	-0,0005	0,0053	-0,0263*	0,0029	0,0003
Guns	0,0027	0,0006	0,0006	0,0017	0,0016	0,0006***
MedEq	-0,0006	-0,0003	-0,0021	-0,0025	0,0004	0,0005***
Oil	-0,0001	0,0030	0,0032	-0,0162*	0,0024	0,00040*
Softw	-0,0006	-0,0004	-0,0063	-0,0115	0,0011	0,0007***
Steel	0,0038	-0,0006	-0,0074	-0,0286**	0,0050	0,0003
Panel B: Daily change in return one week prior up until one month after event, per industry						
Industry	Pandemic	War	TradeWar	FinancialCrisis	NaturalDisasters	Constant
Agric	0,0001	0,0001	0,0005	-0,0065*	0,0007	0,0005*
Banks	-0,0005	0,0003	-0,0017	0,0054	0,0007	0,0005*
Coal	0,0041	0,0000	0,0005	-0,0190***	0,0020	0,0003
Drugs	-0,0005	0,0007	-0,0033	-0,0032	0,0005	0,0005***
Gold	0,00443*	-0,0004	0,0028	-0,0051	0,0007	0,0003
Guns	-0,0002	0,0008	0,0014	-0,0027	0,0003	0,0006***
MedEq	-0,0008	-0,0001	-0,0005	-0,0042	0,0007	0,0006***
Oil	-0,0010	0,0003	0,0038	-0,0048	0,0023	0,0004*
Softw	-0,0003	0,0022	-0,0030	-0,0050	0,0007	0,0007***
Steel	0,0012	-0,0001	0,0004	-0,0143***	0,0022	0,0003
Panel C: Daily change in return two weeks prior up until two months after event, per industry						
Industry	Pandemic	War	TradeWar	FinancialCrisis	NaturalDisasters	Constant
Agric	-0,0010	0,0001	0,0005	-0,0034	0,0004	0,0005**
Banks	-0,0010	-0,0010	-0,0011	-0,0013	0,0000	0,0006**
Coal	0,0000	-0,0012	0,0011	-0,0101**	0,0015	0,0004
Drugs	-0,0002	0,0004	-0,0033	-0,0035*	-0,0006	0,0006***
Gold	0,0018	-0,0004	0,0028	-0,0074*	0,0009	0,0003
Guns	-0,0003	-0,0011	0,0022	-0,0058**	0,0000	0,0007***
MedEq	-0,0002	0,0001	-0,0006	-0,0056***	0,0003	0,0006***
Oil	-0,0024*	-0,0008	0,0043	-0,0036	0,0012	0,0005*
Softw	-0,0003	0,0004	-0,0024	-0,0060**	0,0007	0,0007***
Steel	0,0000	-0,0001	0,0004	-0,0121***	0,0003	0,0004

**Table 3.** Regression on the change in returns during event types. Panel A: used event period t-2: t+5, Panel B uses event period t-5:t+21, Panel C uses event period t-10: t+42.  $R_{industry,t} = \alpha_{industry} + \delta_{industry,j}Event_{j,t} + \varepsilon_{industry,t}$  Is regressed with  $R_{i,t}$  being the daily returns. Reported coefficients are the coefficients which capture the difference in return during this period. Stars are used to show significance levels: \*\*\* p<0,01, \*\* p<0,05, \* p<0,1.

Table 3 shows evidence that different sectors have different initial reaction for different disaster events. For example, the oil industry reacts positively to a war announcement, which for the US were mainly wars with oil-exporting countries (Shaffer, 2016), whilst the gold, steel, and banks industry reacts negatively to these. The results, however, are not significant at a 10% level or less. Shockingly, the agricultural industry seems to react positively to the announcement of a global

pandemic, with a change of +0,755% in daily returns in Panel A's time period, significant at the 5% level. Possible explanations would be found in the surge in demand for foods and beverages during these events. This means that the agricultural industry has less trouble in selling its produce in such times (Montgomery & Biklé, 2020).

The market seems to have different price reactions for each event type, with individual events causing the largest variation in grouped events. The volatility during pandemics, financial crises and wars seem to be abnormally high, whilst the abnormal volume of the market rises for pandemics, financial crises, and wars. The market's price reaction also is very dependent on the type of industry with regards to the event type. Firms belonging to different industries do react differently during different types of events

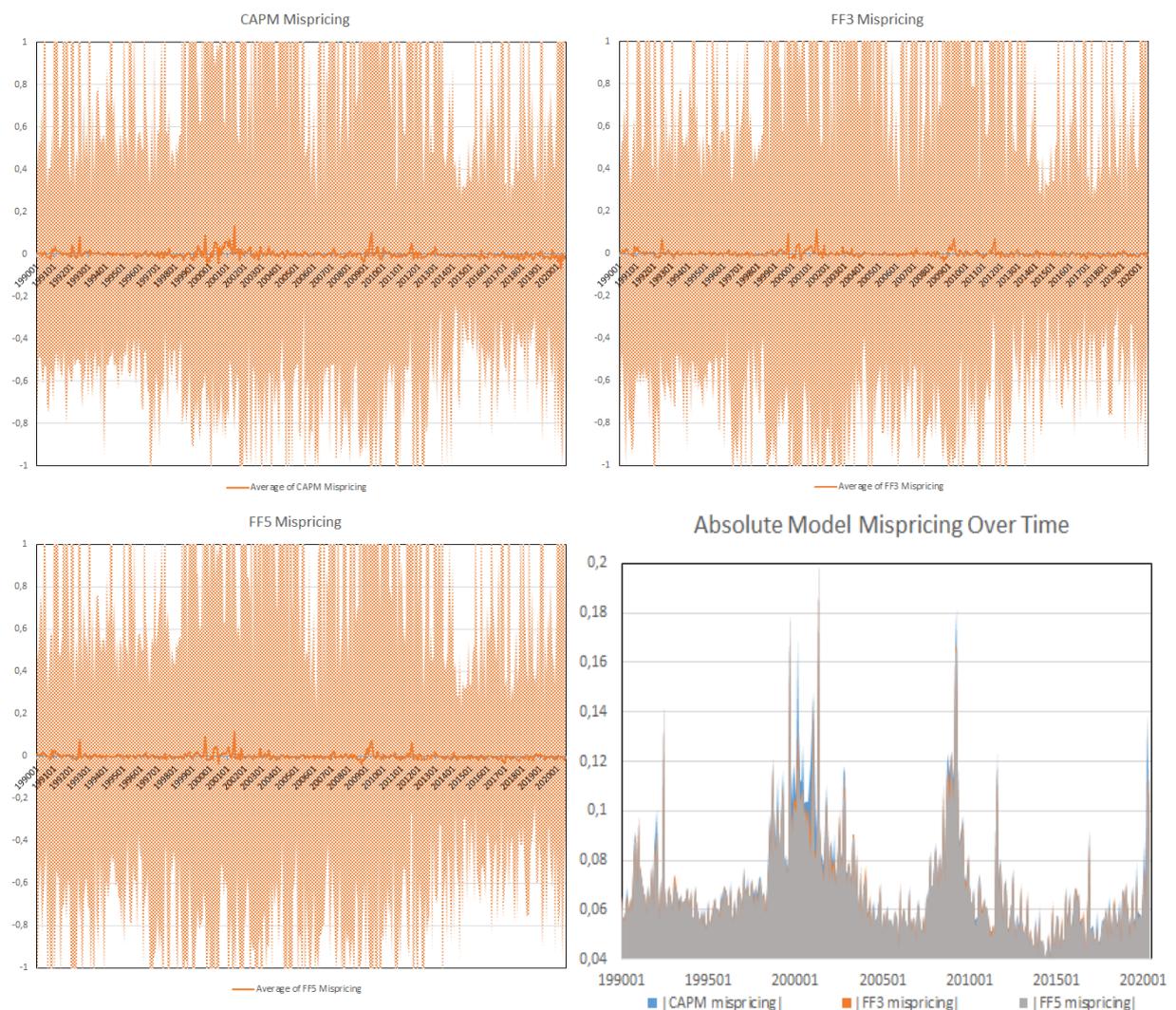
## 6.2 Model Accuracy

Table 4 shows the traditional asset pricing models calculated in the traditional way. As mentioned earlier, there are some statistical errors with regards to the calculation of the factor loadings. The biggest difference between a portfolio analysis and an individual firm analysis, is that the portfolio analysis mostly captures the systematic risk, whilst the analyses on individual firms consist of idiosyncratic risk or noise. This means that regressions on individual firm level will show lower R<sup>2</sup> naturally.

	Dependent variables		
	CAPM	FF3	FF5
Alpha	0,0051*** (0,0010)	0,0048*** (0,0008)	0,0042*** (0,0008)
R <sub>m</sub> -R <sub>f</sub>	1,0606*** (0,0237)	1,0421*** (0,0194)	1,0643*** (0,0221) ***
SMB		0,2537*** (0,0276)	0,2926*** (0,0299) ***
HML		0,3176*** (0,0266)	0,2773*** (0,0372)
RMW			0,1292*** (0,0400)
CMA			0,0191 (0,0008)
Adjusted R <sup>2</sup>	0,8456	0,9039	0,9061

**Table 4.** Time-series regression on CAPM, FF3 & FF5 factors on portfolio consisting of all the S&P 500 constituents from period 1990 till mid 2020, using monthly data. Stars are used to show significance levels: \*\*\* p < 0,01; \*\* p < 0,5; \* p < 0,1

As explained earlier, the correct way to run analysis on the different firms, is to analyze each firm separately each having a regression of its own. By doing so you exclude possible errors in the calculation made by intertemporal weight changes (especially adding and removing firms) of each firm in the portfolio. Figure 7 shows a visual presentation on the average, minimal, and maximal error terms or mispricing of the three different models of the 1053 different firms over time. At first glance the differences in model accuracy is hard to separate from each other. What is observable, is that the three models all become less accurate during both the financial crises. This is made clearer when the average absolute mispricing over time is drawn. Throughout the tested period, the absolute mispricing of the FF5 and FF3 seems to be lower than CAPM, on average. The absolute mispricing shows how far off a model is, in terms of difference between actual and expected returns.



**Figure 7.** Average CAPM, FF3 & FF5 mispricing over time and absolute mispricing of the three models over time, using monthly data. Mispricing on the y-axis, and time on the x-axis.

The results of the mispricing obtained from the aggregated individual absolute mispricing, are presented in table 5 for every model. These are obtained using the factors and factor loadings, which are obtained by regressing each of the individual firm. The factor loadings of each individual firm obtained by these regressions are presented in appendix table A4. The average of the absolute mispricing of the models provide formal evidence of the visible interpretation. The average abnormal mispricing of the CAPM, during the entire period, is 0,07154. FF3 has an average absolute mispricing of 0,07014 and the FF5 of 0,06968. All three average mispricing are significant, and all significant different from each other at a significance level of 1%.

	N	Mean	Std. Dev
$ R_{i,t} - E(R_{CAPM}) $	278.801	0,07154***	0,31463
$ R_{i,t} - E(R_{FF3}) $	278.801	0,07014***	0,31299
$ R_{i,t} - E(R_{FF5}) $	278.801	0,06968***	0,31223

**Table 5.** Average absolute mispricing of the models, calculated by using the factor loadings, retrieved from the regressions on every constituent, using monthly data. Stars are used to show significance: \*\*\*  $p < 0,1$ , \*\*  $p < 0,05$ , \*  $p < 0,01$ .

The results from the three different models provide evidence on the accuracy of each model. As expected, the most extended model (FF5) is the most accurate, followed by FF3 and at last the CAPM. The difference in absolute mispricing between FF5 and FF3 is only 0,00046, whilst the difference between FF3 and CAPM is 0,00140. This is additional evidence on the fact that adding a factor which accounts for risk associated with small firms (SML) and a factor which accounts for risk associated with market over- or undervaluation in terms of book-value (HML) do improve the model significantly, statistically. The difference between the daily mispricing of the models seem to be very small, however, there are statistically significant differences between the models.

However, for investors the accuracy of the model might not be as important if the model shows mean reversion around its mispricing. Table 6 presents the results from the autoregressive models from the different model mispricing. The autoregressive models take the lags of the mispricing of firm  $i$  and is performed per firm individually. If a firm has a mean reverting mispricing, the coefficient of the lags would be negative. A mean reverting model provides opportunity for investors to profit off buying undervalued and selling overvalued stocks. However, none of the three traditional asset pricing models show short term (within 3 or 5 months) mean reversion. For all the models, the two-month lagged mispricing has a negative coefficient, however there is no mean reversion as the mispricing from the one-month and the three-month lagged periods have larger coefficients. The positive relationship, over all the

models, between the lagged mispricing and the mispricing insinuates that there are mispricing waves where periods of positive mispricing follow periods of negative mispricing. Such is also observed in Figure 7. One thing to keep in mind is that the fit of the models are relatively low, with an adjusted R<sup>2</sup> ranging between 0,0021 and 0,0023. Most likely, other factors than the lagged mispricing determine the mispricing.

	Dependent Variables					
	CAPM	CAPM	FF3	FF3	FF5	FF5
	Mispricing (1)	Mispricing (2)	Mispricing (1)	Mispricing (2)	Mispricing (1)	Mispricing (2)
Mispricing <sub>t-1</sub>	0,0436*** (0,0019)	0,0436*** (0,0019)	0,0413*** (0,0019)	0,0414*** (0,0019)	0,0402*** (0,0019)	0,0402*** (0,0019)
Mispricing <sub>t-2</sub>	-0,0109*** (0,0019)	-0,0107*** (0,0019)	-0,0122*** (0,0019)	-0,0122*** (0,0019)	-0,0122*** (0,0019)	-0,0120*** (0,0019)
Mispricing <sub>t-3</sub>	0,0173*** (0,0019)	0,0141*** (0,0024)	0,0175*** (0,0019)	0,0188*** (0,0024)	0,0173*** (0,0019)	0,0154*** (0,0024)
Mispricing <sub>t-4</sub>		0,0049** (0,0024)		-0,0023 (0,0024)		0,0027 (0,0024)
Mispricing <sub>t-5</sub>		-0,0083*** (0,0019)		-0,0126*** (0,0019)		-0,0129*** (0,0019)
Constant	-0,0001 (0,0006)	-0,0001 (0,0006)	-0,0002 (0,0006)	-0,0003 (0,0006)	-0,0002 (0,0006)	-0,0003 (0,0006)
Adj. R <sup>2</sup>	0,0022	0,0023	0,0021	0,0022	0,0020	0,0021

**Table 6.** Short-term mispricing mean reversion. Autoregressive models on the mispricing of different companies per firm using monthly data. The lags used are a 1 till 3-month period lag, and a 1 till 5-month period lag. Stars are used to show significance: \*\*\* p<0,1, \*\* p<0,05, \* p<0,01. Regression as following:  $Mispricing_t = \alpha + \sum_{i=y}^t \delta_i Mispricing_{t-y} + \varepsilon_t$

Table 6 provides evidence that investors are not able to profit off the short-term strategy of buying undervalued and selling overvalued stocks, by means of valuation of the chosen model. Knowing that the accuracy of the three models do significantly differ from each other, with the Fama & French 5 factor model (FF5) being the most accurate, and the evidence of no models showing mean reversion, the FF5 model is the most accurate model to price individual firms.

### 6.3 Model Accuracy During Distress

To test which model holds best during time of distress, a regression with a dummy which holds the value 1 when a distress event is going on and 0 when none of the grouped events are going on. Table 7 presents the results of this regression. This table provides evidence that the absolute mispricing of the tested models is different in times of distress than in non-distress times. During

pandemics, the models do not get significantly more or less accurate, whilst during natural disasters and during the US-China trade war the models do get more accurate, significant on a 1% level. As shown in figure 6 abnormal volatility does not change drastically and even lessens during the trade war and natural disasters, which proves that the models get more accurate than average during these periods. The models get less accurate during wars and financial crises, which are times where volatility rises, as the coefficient of the dummy variables which indicate an ongoing distress event are negative. On average, the absolute mispricing of the monthly returns of the CAPM is 0,0709 whilst during the wars the average was 0,0841 and during the financial crises it was 0,0892.

A relationship between returns and implied volatility was found in empirical data (Banerjee et al., 2007). In the same table, the VIX index has been regressed against the absolute mispricing of the models. Noteworthy is that the expected volatility and absolute mispricing have a negative relationship at a 5% significance level for the FF3 and the FF5. An increase of 1% in expected future 30-day volatility (VIX) leads to roughly 0,1% higher than average accuracy model accuracy for the FF3 and FF5.

	$ R_{i,t} - E(R_{CAPM}) $ (1)	$ R_{i,t} - E(R_{CAPM}) $ (2)	$ R_{i,t} - E(R_{FF3}) $ (1)	$ R_{i,t} - E(R_{FF3}) $ (2)	$ R_{i,t} - E(R_{FF5}) $ (1)	$ R_{i,t} - E(R_{FF5}) $ (2)
Pandemics	0,0039 (0,0029)		0,0018 (0,0029)		0,0018 (0,0029)	
Wars	0,0132*** (0,0029)		0,0122*** (0,0029)		0,0112*** (0,0029)	
Trade War	-0,0253*** (0,0065)		-0,022*** (0,0065)		-0,0210*** (0,0065)	
Financial Crises	0,0183*** (0,0040)		0,0183*** (0,0040)		0,0181*** (0,0040)	
Natural Disasters	-0,0137*** (0,0039)		-0,0127*** (0,0039)		-0,0117*** (0,0038)	
dVIX		-0,0041 (0,0029)		-0,0061** (0,0028)		-0,0063** (0,0028)
Constant	0,0709*** (0,0006)	0,0716*** (0,0006)	0,0695*** (0,0006)	0,0703*** (0,0006)	0,0691*** (0,0006)	0,0698*** (0,0028)
Adj. R <sup>2</sup>	0,0002	0,0000	0,0002	0,0000	0,0002	0,0000

**Table 7.** regression testing the accuracy of different models throughout time. Absolute mispricing is plotted against event dummies, using monthly data. Stars are used to show significance: \*\*\* p<0,1, \*\* p<0,05, \* p<0,01. Regression as following:  $|Mispricing_t| = \alpha + \delta_j Event_{j,t} + \varepsilon_t$

Table 8 shows the mean reversion of the different model during global distress events. The regression is conditioned on the occurrence of at least one distress event. In contrast to the mean reversion results during the entire period in table 6, mean reversion is observed during distress periods. During the events, the CAPM shows the strongest short-term mean reversion with coefficients of -0,0205, -0,077, and -0,0135 for respectively one-, two-, and three-month lags. The coefficients are significant at a 1% level. The 3-lag autoregressive models of the FF3 and the FF5 show evidence that said models show less mean reversion than the CAPM's as the combined coefficients of these models are less than CAPM's. The same is the case the models using 5-month lags are observed. The 5-month lagged mispricing has a positive relation across all models with current-day mispricing with a positive, significant at 1%, coefficient 0,0171, 0,0226, and 0,0241 for the CAPM, FF3, and FF5, respectively.

	Dependent Variables					
	CAPM	CAPM	FF3	FF3	FF5	FF5
	Mispricing (1)	Mispricing (2)	Mispricing (1)	Mispricing (2)	Mispricing (1)	Mispricing (2)
Mispricing <sub>t-1</sub>	-0,0205*** (0,0029)	-0,0206*** (0,0029)	-0,0079*** (0,0029)	-0,0077*** (0,0029)	-0,0123*** (0,0029)	-0,0123*** (0,0029)
Mispricing <sub>t-2</sub>	-0,0077*** (0,0029)	-0,0075** (0,0029)	-0,0094*** (0,0029)	-0,0093*** (0,0029)	-0,0131*** (0,0029)	-0,0125*** (0,0029)
Mispricing <sub>t-3</sub>	-0,0135*** (0,0030)	-0,0136** (0,0030)	-0,0064** (0,0029)	-0,0062* (0,0029)	-0,0031 (0,0019)	-0,0028 (0,0030)
Mispricing <sub>t-4</sub>		-0,0068*** (0,0030)		-0,0008 (0,0029)		0,0083*** (0,0030)
Mispricing <sub>t-5</sub>		0,0171*** (0,0061)		0,0226*** (0,0060)		0,0241*** (0,0061)
Constant	-0,0031*** (0,0007)	-0,0031*** (0,0007)	-0,0022*** (0,0007)	-0,0002*** (0,0007)	-0,0021*** (0,0007)	-0,0020*** (0,0007)
Adj. R <sup>2</sup>	0,0019	0,0022	0,0005	0,0008	0,0009	0,0015

**Table 8.** Short-term mispricing mean reversion. Autoregressive models on the mispricing of different companies per firm during distress events, using monthly data. The lags used are a 1 till 3-month period lag, and a 1 till 5-month period lag. Stars are used to show significance: \*\*\* p<0,1, \*\* p<0,05, \* p<0,01. Regression as following:

Table 9 presents the model accuracy in terms of absolute mispricing during the events. During distress events, the average absolute mispricing of the models does not significantly differ from each other. This means that during distress events, the models do not perform significantly different from each other and that the FF3 nor the FF5 are more accurate than the Capital Asset Pricing Model, introduced as early as 1961 (Treynor, 1961).

	N	Mean	Std. Dev
$ R_{i,t} - E(R_{CAPM}) $	38.055	0,0749	0,1129
$ R_{i,t} - E(R_{FF3}) $	38.055	0,0735	0,1107
$ R_{i,t} - E(R_{FF5}) $	38.055	0,0730	0,1107

**Table 9.** Average absolute mispricing of the models during distress events, calculated by using the factor loadings, retrieved from the regressions on every constituent, using monthly data. Stars are used to show significance: \*\*\*  $p < 0,1$ , \*\*  $p < 0,05$ , \*  $p < 0,01$ .

## 7. Conclusion

This paper evaluated empirical data with regards to the market and large-firm behavior during distress events. In this paper the traditional asset pricing models were evaluated during such events. Even though the traditional models examined in this empirical review were already investigated and researched amongst academics in significant amount of literature, no literature provided evidence in the way this paper presents its evidence. Previous literature mostly undermine the traditional models on portfolio-based results. A problem when following their methodology occurs due to the intertemporal constituent changes of the portfolio. This paper looks at the time-varying mispricing or errors of the models, with focus on distress times. Changing constituents would result in faulty results due to the factor loadings changing over time.

Firstly, the market reaction in terms of cumulated abnormal returns, volatility and trading activity are evaluated. This paper shows that the market reacts differently to different distress events. Negative price shocks are observed at some point for the events, except for natural disasters. However, when the individual events are taken into consideration, it becomes clear that a select number of events drive the reactions of the event groups. Different types of firms, in terms of industry group, also show different types of initial reaction to event initiations. High abnormal trading activity is observed at the start dates of financial crises and wars. Trading activity is abnormally high before the trade war but returns to normal level after the announcement. There are no shocks in absolute volume visible in terms of trading activity for the other event types. The change in volatility is also investigated around the event dates. Financial crises, wars, and pandemics show a large increase in abnormal volatility. For pandemics and wars, the shocks seem to be driven by individual events. The largest increase in abnormal trading activity have the same date, as two events showing the most abnormal volatility are overlapping: COVID-19 and the Iran war.

Secondly, the three different traditional asset pricing models have been evaluated. The absolute mispricing is an indication of how far off the prediction is from the realized return. CAPM shows an absolute mispricing of 0,07154, FF3 of 0,07014, and FF5 of 0,06968. The absolute mispricing of all these models have been calculated making use of 3159 different regressions (1053x3) and 278.801 observations of monthly returns. The results, the absolute mispricing, of these models are significant at a 1% level, and all differ from each other at a 1% level. FF5 is significantly more accurate than the other models. Even though the differences in average mispricing are small on a daily basis, in a longer time period the differences would add up. However, none of the models show any sign of mean reversion in the short-term (up until 5 months) and the empirical evidence

show that perhaps there could be waves of mispricing. This proves that the FF5 model holds best on individual level for the S&P 500 constituents from 1990 till 2020.

At last, the model's accuracy and mean reversion are tested during times of distress. The evidence shows that the models have significant different mispricing during different types of events. All three models are significantly (at a 1% level) more accurate during the trade war and natural disasters, but significantly (at a 1% level) less accurate during the financial crises, wars, and pandemics. The accuracy of the three models are evaluated in times of distress. The accuracy of the models in these times do not seem to significantly differ from each other. When looking at the mean reversion of the models during distress, the CAPM shows the largest mean reversion in terms of the relation between monthly mispricing at time  $t$  and the mispricing 3 till 5 months prior to time  $t$ . With CAPM's high mean reversion during distress events, and the insignificant differences between the accuracy of the three models during distress events, the conclusion is that the CAPM does hold best during distress events compared to the FF3 and the FF5.

## 8. Discussion

This research did have some limiting factors to it, in terms of interpretation of the results and in terms of limiting factors in the methodology. The biggest limitation of this paper is that the results found in the research could be hard to extrapolate to firms which do not relate to the S&P 500. The empirical evidence is based on firms which all have been part of the S&P 500 in order to benchmark the entire market. However, the S&P 500 seems to relate most to larger firms (Roll, 1981). This means that all the firms used in this research are relatively large in terms of market capitalization, and that the results obtained in this paper could possibly not be extrapolated to small(er) firms. In order to understand how smaller firms react to the distress events, and how their stock price valuation hold during these events using different traditional models, further research including smaller firms is suggested.

Another limitation of this paper is that the start and end dates of the events could be set at different times if one would follow different rules. Within an event, multiple steps are going on which means that there could be multiple ways to classify and set the start and end dates of such events. Such differences in start dates would be setting a start dates corresponding to a fixed number of ground soldiers (wars), casualties (pandemics & natural disasters), or bankrupt companies (financial crises). These are just examples, and there are infinite different set of rules to indicate event start and end dates. It is interesting to know how the results of this paper would differ from results following the same methodology in this paper but with altered start and end dates.

The last limiting factor of the performed research is the number of distress events going on. The limited number of events happening or tested in this research makes the grouped events very sensitive to outliers in the group. However, even though the limited number of events usually are a limiting factor in terms of the significance of the findings, it was not a problem in this research as most of the findings were significant.

Recommendations for future research, is to better understand how the market of smaller firms react to such events. In this paper the S&P 500 and its constituents were used as a benchmark for the entire market. The recommendation of this paper would be to find such benchmarks which also hold for smaller and mid-sized capitalized firms. One such thing could be to use an equal-weighted benchmark of the whole market, or a portfolio representing the entire market better than the S&P 500. One could also have a different set of rules for the start and end dates and look at the relation between the results and the start and end dates of the events.

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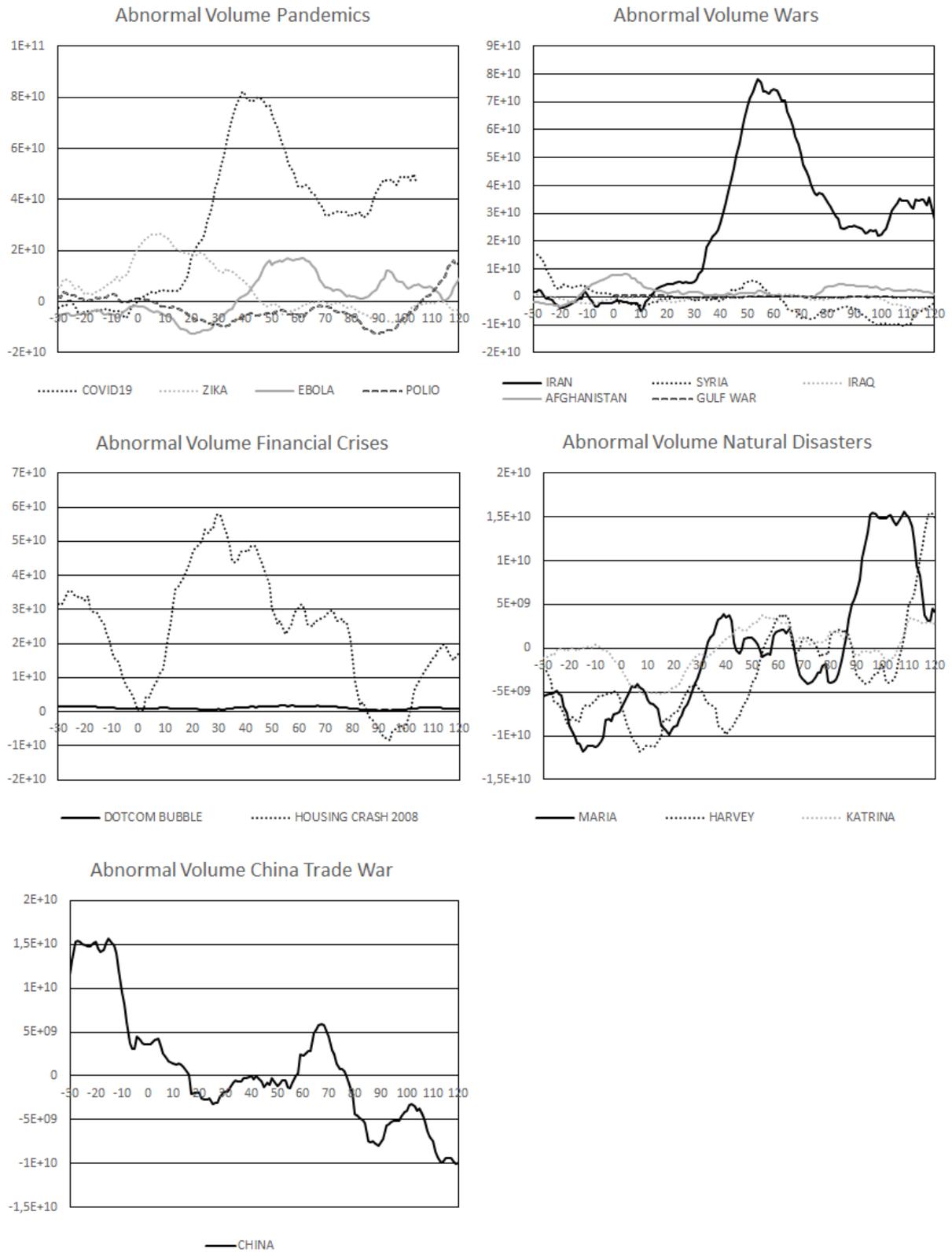
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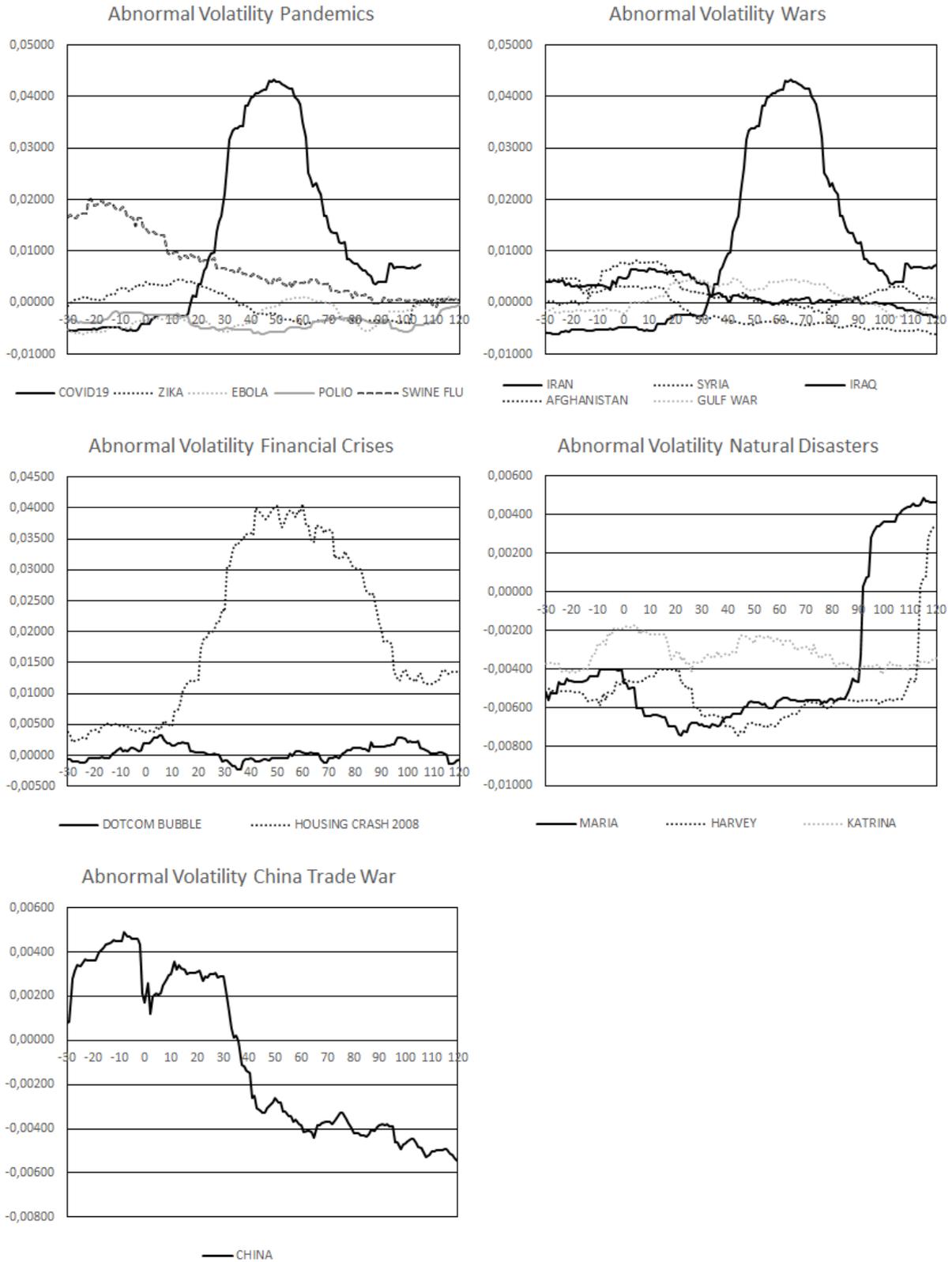
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# 10. Appendix



**Figure A1.** Event studies with individual events showing monthly abnormal volume of the S&P500 over time, with the monthly abnormal volume (in US dollars) on the y-axis and time after event on the x-axis.



**Figure A2.** Event studies with individual events showing monthly abnormal volatility of the S&P500 over time, with the monthly abnormal volume (in std. dev of the return) on the y-axis and time after event on the x-axis.

<i>Daily change in return two days prior up until one week after event, per industry</i>						
<b>Industry</b>	<b>Pandemic</b>	<b>War</b>	<b>TradeWar</b>	<b>FinancialCrisis</b>	<b>NaturalDisasters</b>	<b>Constant</b>
(1) SP500	0.000702	-0.0000244	-0.00356	-0.00257	0.00106	0.000344**
(2) Agric	0.00755**	0.000920	-0.00156	-0.0149*	0.000929	0.000421*
(3) Food	0.000365	-0.00222	-0.00261	0.00272	-0.00110	0.000421***
(4) Soda	0.00264	-0.000690	-0.000386	0.00309	-0.000661	0.000511**
(5) Beer	0.000463	-0.00184	-0.00134	0.00440	-0.00127	0.000518***
(6) Smoke	-0.000395	-0.00441	-0.00145	0.00501	0.000278	0.000567**
(7) Toys	0.00229	-0.00283	-0.00251	0.00287	0.00171	0.000326
(8) Fun	0.00134	0.000263	-0.00539	-0.00834	0.000245	0.000578**
(9) Books	0.000719	-0.000864	-0.00214	0.00958	0.00197	0.000275
(10) Hshld	0.00141	-0.000366	0.000485	0.00723	0.000336	0.000428***
(11) Clths	-0.00284	-0.00270	0.00105	0.00666	-0.000199	0.000503**
(12) Hlth	0.000155	-0.00214	-0.00550	0.00203	0.00176	0.000392*
(13) MedEq	-0.000583	-0.000255	-0.00206	-0.00245	0.000358	0.000547***
(14) Drugs	-0.0000464	0.000773	-0.00501	-0.00267	0.00246	0.000510***
(15) Chems	0.00348	0.00119	-0.00433	-0.0108	0.00258	0.000427**
(16) Rubbr	0.000888	-0.000202	-0.00191	0.00535	0.000605	0.000473**
(17) Txtls	0.00172	0.000607	-0.00514	0.00935	0.00278	0.000269
(18) BldMt	0.00180	-0.000754	-0.00228	-0.00156	0.00265	0.000443**
(19) Cnstr	-0.00277	0.00142	-0.00293	-0.0158	0.00290	0.000516*
(20) Steel	0.00378	-0.000558	-0.00741	-0.0286**	0.00502	0.000301
(21) FabPr	0.00290	0.000478	-0.000136	-0.0148	0.00229	0.000273
(22) Mach	0.00348	0.0000908	-0.00436	-0.0206**	0.00207	0.000474**
(23) ElcEq	0.00246	-0.00127	-0.00297	-0.0106	0.000439	0.000565**
(24) Autos	0.00519	-0.000977	-0.00524	0.00322	0.00235	0.000364
(25) Aero	0.00246	-0.00199	-0.00185	-0.00432	0.00186	0.000541**
(26) Ships	0.00357	0.000165	-0.000457	-0.0137	0.00287	0.000532**
(27) Guns	0.00270	0.000646	0.000603	0.00174	0.00158	0.000597***
(28) Gold	0.00715	-0.000453	0.00525	-0.0263*	0.00292	0.000324
(29) Mines	0.00282	-0.0000598	-0.00143	-0.0330***	0.00372	0.000454*
(30) Coal	0.00870	0.00139	-0.00352	-0.0534***	0.00308	0.000328
(31) Oil	-0.0000548	0.00297	0.00319	-0.0162*	0.00239	0.000360*
(32) Util	0.00224	0.000590	0.000604	-0.00892	0.000967	0.000383**
(33) Telcm	0.00203	-0.00125	-0.00317	-0.000484	0.0000512	0.000344*
(34) PerSv	-0.00127	-0.000975	-0.00300	0.00598	0.00420	0.000316*
(35) BusSv	0.000637	0.00153	-0.00476	-0.000372	0.00145	0.000452**
(36) Hardw	0.000169	0.00125	-0.00599	-0.00879	0.00277	0.000550**
(37) Softw	-0.000609	-0.000444	-0.00627	-0.0115	0.00111	0.000698***
(38) Chips	0.00136	0.00147	-0.00466	-0.0170*	0.00119	0.000639**
(39) LabEq	0.00174	0.000435	-0.00497	-0.00769	0.00115	0.000546**
(40) Paper	0.00161	-0.000304	-0.00476	0.00410	0.00124	0.000364**
(41) Boxes	0.00172	-0.0000644	-0.00188	-0.00751	0.000621	0.000447**
(42) Trans	0.00117	0.000935	-0.00371	-0.00754	0.00137	0.000438**
(43) Whlsl	0.00106	-0.0000478	-0.00383	-0.00161	0.00218	0.000372**
(44) Rtail	-0.000639	-0.0000307	-0.00303	0.00898	-0.000352	0.000539***
(45) Meals	-0.00233	-0.000450	-0.00199	0.00483	0.000657	0.000506***
(46) Banks	-0.00136	-0.00261	-0.00610	0.0146	0.00151	0.000503*
(47) Insur	0.000758	-0.000781	-0.00322	0.00582	0.000780	0.000484**
(48) REst	0.000980	-0.000587	-0.00103	0.00820	0.00252	0.000195
(49) Fin	-0.000337	0.000238	-0.00453	0.00476	0.00126	0.000581**
(50) Other	0.00261	0.00115	-0.00333	0.00456	0.000771	0.000138

**Table A1.** Regression on the change in returns during event types. The table uses event period t-2: t+5. Regresses  $R_{industry,t} = \alpha_{industry} + \delta_{industry,j}Event_{j,t} + \varepsilon_{industry,t}$  with  $R_{i,t}$  being the daily returns. Reported coefficients are the coefficients which capture the difference in return during this period. Stars are used to show significance levels: \*\*\* p<0,01, \*\* p<0,05, \* p<0,1.

<i>Daily change in return one week prior up until one month after event, per industry</i>						
<b>Industry</b>	<b>Pandemic</b>	<b>War</b>	<b>TradeWar</b>	<b>FinancialCrisis</b>	<b>NaturalDisasters</b>	<b>Constant</b>
(1) SP500	-0.000100	0.00103	-0.00178	-0.00384	0.000484	0.000343*
(2) Agric	0.0000603	0.000144	0.000478	-0.00645*	0.000704	0.000463*
(3) Food	0.000736	-0.0000540	-0.00309	-0.00113	-0.00119	0.000422***
(4) Soda	0.00102	-0.000125	-0.000610	-0.0000452	-0.000820	0.000516**
(5) Beer	-0.000147	-0.000169	-0.00293	-0.000260	-0.00197	0.000545***
(6) Smoke	0.000564	-0.00238	-0.00576	-0.00196	-0.00165	0.000621***
(7) Toys	-0.000912	0.000661	-0.00270	-0.00315	0.000885	0.000343
(8) Fun	0.00126	0.00115	-0.000469	-0.00661	0.00119	0.000547**
(9) Books	-0.000255	0.000402	-0.000976	-0.00572*	0.000229	0.000303
(10) Hshld	0.000333	-0.0000660	-0.00179	-0.000559	-0.000893	0.000451***
(11) Clths	-0.000176	-0.000430	0.000207	-0.000789	0.000512	0.000489**
(12) Hlth	0.000750	-0.00133	-0.00127	-0.00401	-0.000240	0.000414*
(13) MedEq	-0.000797	-0.000128	-0.000508	-0.00417	0.000731	0.000565***
(14) Drugs	-0.000499	0.000654	-0.00326	-0.00316	0.000540	0.000528***
(15) Chems	0.000487	0.000420	-0.00130	-0.00808**	0.00195	0.000443**
(16) Rubbr	0.000791	0.000603	-0.000576	-0.00380	0.000381	0.000467**
(17) Txtls	0.00216	-0.000542	-0.00174	-0.00226	0.00120	0.000263
(18) BldMnt	0.000525	0.000143	-0.00164	-0.00437	0.00142	0.000448**
(19) Cnstr	-0.000478	0.00150	-0.00232	-0.00598	0.00238	0.000492*
(20) Steel	0.00115	-0.0000663	0.000436	-0.0143***	0.00223	0.000312
(21) FabPr	0.000573	-0.000624	0.00325	-0.00854*	0.00205	0.000286
(22) Mach	0.000586	0.000884	-0.00233	-0.0102***	0.00198	0.000477**
(23) ElcEq	0.0000951	0.000255	-0.00120	-0.00822**	0.000934	0.000580**
(24) Autos	0.00101	0.00111	-0.00158	-0.00615	0.00118	0.000366
(25) Aero	0.0000994	0.000646	-0.000404	-0.00627*	0.000663	0.000548**
(26) Ships	0.00124	-0.000395	0.000214	-0.00877**	0.00150	0.000549**
(27) Guns	-0.000235	0.000768	0.00136	-0.00270	0.000326	0.000611***
(28) Gold	0.00443*	-0.000396	0.00277	-0.00512	0.000680	0.000285
(29) Mines	0.000304	-0.000898	0.000433	-0.0134***	0.00184	0.000493*
(30) Coal	0.00408	-0.000000196	0.000474	-0.0190***	0.00204	0.000322
(31) Oil	-0.000995	0.000250	0.00379	-0.00481	0.00226	0.000368*
(32) Util	0.000195	0.000771	-0.000241	-0.00487*	0.000142	0.000394**
(33) Telcm	-0.0000390	-0.000917	-0.00135	-0.00484*	-0.000889	0.000391**
(34) PerSv	-0.000783	-0.000341	0.0000559	-0.00378	0.000545	0.000345*
(35) BusSv	-0.000219	0.00153	-0.00219	-0.00469*	0.00121	0.000450**
(36) Hardw	-0.000615	0.00287	-0.00302	-0.00857*	0.000993	0.000544*
(37) Softw	-0.000316	0.00222	-0.00300	-0.00504	0.000708	0.000670***
(38) Chips	-0.000136	0.00303	-0.00408	-0.00869*	0.000428	0.000630**
(39) LabEq	-0.000732	0.00128	-0.00229	-0.00557*	0.00150	0.000552**
(40) Paper	0.000838	-0.000766	-0.00230	-0.00243	0.000908	0.000377**
(41) Boxes	0.000280	0.000553	-0.000521	-0.00612*	0.000435	0.000455**
(42) Trans	0.0000625	0.00109	-0.00109	-0.00353	0.000761	0.000431**
(43) Whlsl	0.000466	-0.00108	-0.000954	-0.00488*	0.000692	0.000402**
(44) Rtail	-0.000205	0.00136	-0.00180	-0.00276	0.000207	0.000531***
(45) Meals	-0.0000765	0.000446	-0.000614	-0.00251	0.000853	0.000492***
(46) Banks	-0.000523	0.000257	-0.00168	0.00538	0.000725	0.000475*
(47) Insur	0.0000744	0.000379	-0.000193	-0.00468	0.000640	0.000489**
(48) RLEst	0.000857	-0.000391	-0.000316	-0.00214	0.00155	0.000194
(49) Fin	-0.0000925	0.00167	-0.00234	-0.00345	0.000973	0.000566**
(50) Other	0.000587	0.00126	-0.00137	-0.00126	0.000281	0.000132

**Table A2.** Regression on the change in returns during event types. The table uses event period t-5: t+21. Regresses  $R_{industry,t} = \alpha_{industry} + \delta_{industry,j}Event_{j,t} + \varepsilon_{industry,t}$  with  $R_{i,t}$  being the daily returns. Reported coefficients are the coefficients which capture the difference in return during this period. Stars are used to show significance levels: \*\*\* p<0,01, \*\* p<0,05, \* p<0,1.

<i>Daily change in return two weeks prior up until two months after event, per industry</i>						
<b>Industry</b>	<b>Pandemic</b>	<b>War</b>	<b>TradeWar</b>	<b>FinancialCrisis</b>	<b>NaturalDisasters</b>	<b>Constant</b>
(1) SP500	-0,000344	0,000242	-0,00157	-0,00504**	0,00014	0,000387**
(2) Agric	-0,000964	0,0000745	0,000455	-0,00337	0,000353	0,000499**
(3) Food	0,000226	-0,000169	-0,00303	-0,00292*	-0,00046	0,000444***
(4) Soda	0,00027	-0,000365	-0,000496	-0,00491*	-0,00032	0,000564**
(5) Beer	0,0000853	-0,000323	-0,00283	-0,00386*	-0,000924	0,000569***
(6) Smoke	0,0000795	-0,00154	-0,00582	-0,00304	-0,000881	0,000649***
(7) Toys	-0,000907	-0,000216	-0,0024	-0,00710***	0,0000287	0,000423*
(8) Fun	-0,000116	0,00102	-0,000681	-0,0110***	0,000726	0,000614**
(9) Books	-0,000784	-0,000392	-0,000674	-0,00842***	0,000214	0,000381*
(10) Hshld	0,0000517	-0,000215	-0,00172	-0,00327*	-0,000684	0,000484***
(11) Clths	-0,000644	-0,000471	0,000254	-0,00498*	0,000247	0,000549**
(12) Hlth	0,000378	-0,000458	-0,00154	-0,00554**	-0,000841	0,000443**
(13) MedEq	-0,00023	0,0000958	-0,000628	-0,00559***	0,000333	0,000581***
(14) Drugs	-0,000155	0,000382	-0,00325	-0,00346*	-0,000633	0,000553***
(15) Chems	-0,000843	0,00016	-0,00129	-0,00748***	0,0013	0,000504**
(16) Rubbr	0,0000835	-0,000654	-0,0000407	-0,00621***	0,0000171	0,000541***
(17) Txtls	-0,000316	-0,00035	-0,00183	-0,00751**	0,0013	0,000348
(18) BldMnt	-0,000898	-0,000233	-0,00155	-0,00903***	0,00084	0,000545**
(19) Cnstr	-0,00144	0,00119	-0,00249	-0,00716**	0,00137	0,000552*
(20) Steel	-0,0000289	-0,000129	0,00041	-0,0121***	0,00034	0,000387
(21) FabPr	-0,00123	-0,00178	0,0039	-0,00906***	0,000895	0,000420*
(22) Mach	-0,000316	-0,000461	-0,00181	-0,0105***	0,000795	0,000571**
(23) ElcEq	-0,000678	-0,000244	-0,00104	-0,00877***	0,000125	0,000656***
(24) Autos	-0,000451	0,000719	-0,00167	-0,0110***	-0,000241	0,000466*
(25) Aero	-0,00184	-0,000223	-0,000136	-0,00557**	-0,000245	0,000657***
(26) Ships	-0,00043	-0,00143	0,000774	-0,00859***	0,000367	0,000660***
(27) Guns	-0,000281	-0,00111	0,00221	-0,00579**	-0,000009	0,000697***
(28) Gold	0,00182	-0,000366	0,00279	-0,00735*	0,000934	0,000329
(29) Mines	-0,000736	-0,000227	0,000153	-0,0111***	0,000378	0,000559*
(30) Coal	-0,0000136	-0,00122	0,00107	-0,0101**	0,00152	0,000428
(31) Oil	-0,00242*	-0,000805	0,00425	-0,00361	0,00123	0,000472*
(32) Util	0,000244	0,000048	0,0000162	-0,00376*	0,000293	0,000406**
(33) Telcm	-0,000327	0,000058	-0,00175	-0,00526**	-0,000717	0,000409**
(34) PerSv	-0,00112	-0,000453	0,000137	-0,00313	-0,000141	0,000394**
(35) BusSv	-0,000684	0,000853	-0,00215	-0,00705***	0,000543	0,000505***
(36) Hardw	-0,000181	0,00103	-0,00254	-0,00698**	0,000475	0,000576**
(37) Softw	-0,000262	0,000407	-0,00243	-0,00604**	0,000728	0,000717***
(38) Chips	0,000104	0,00121	-0,00363	-0,00790**	0,000776	0,000653**
(39) LabEq	-0,00047	0,000329	-0,00204	-0,00797***	0,000763	0,000605***
(40) Paper	0,000136	-0,000353	-0,00244	-0,00498**	0,0000681	0,000420**
(41) Boxes	-0,000161	0,0000821	-0,000404	-0,00688***	-0,00000269	0,000503**
(42) Trans	-0,000421	0,00000547	-0,000714	-0,00386*	0,0006	0,000476**
(43) Whlsl	-0,000377	-0,00111	-0,000811	-0,00658***	-0,000453	0,000483***
(44) Rtail	-0,000305	0,000738	-0,00172	-0,00416*	0,000665	0,000548***
(45) Meals	-0,000865	-0,000447	-0,000252	-0,00428*	0,000659	0,000560***
(46) Banks	-0,00104	-0,000977	-0,00111	-0,00129	0,0000457	0,000570**
(47) Insur	-0,000375	-0,000256	0,0000184	-0,00761***	-0,00068	0,000572***
(48) REst	-0,000267	-0,00116	0,000106	-0,00848***	0,00128	0,000293
(49) Fin	-0,00025	0,0000301	-0,00179	-0,00727**	0,000513	0,000639**
(50) Other	-0,000294	-0,000128	-0,000895	-0,00448*	-0,000527	0,000215

**Table A3.** Regression on the change in returns during event types. The table uses event period t-10: t+42. Regresses  $R_{industry,t} = \alpha_{industry} + \delta_{industry,j}Event_{j,t} + \varepsilon_{industry,t}$  with  $R_{i,t}$  being the daily returns. Reported coefficients are the coefficients which capture the difference in return during this period. Stars are used to show significance levels: \*\*\* p<0,01, \*\* p<0,05, \* p<0,1.

**Table A4:** the factor loadings obtained from the CAPM, FF3 and FF5 regressions.  $\beta$ ,  $s$ ,  $h$ ,  $r$ ,  $c$  &  $\alpha$  are the factor loadings or coefficients for the factors Mrkt- $r_f$ , SMB, HML, RMW, CMA, respectively.

Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
3COM CORP	1,716	0,0162	1,296	1,643	-1,207	0,0184	1,077	1,462	-0,805	-0,642	-0,535	0,0229
3M CO	0,715	0,00497	0,741	-0,0184	0,29	0,00467	0,92	0,109	-0,124	0,498	0,709	0,000708
ABBVIE INC	0,928	0,00754	0,941	-0,0658	0,0323	0,00745	1,02	-0,15	-0,0705	-0,406	0,455	0,00726
ACCENTURE PI	1,066	0,00889	1,088	0,213	-0,565	0,00776	1,04	0,185	-0,496	-0,191	-0,138	0,0089
ACTIVISION BL	0,652	0,0084	0,939	-0,542	-0,683	0,00327	0,88	-0,638	-0,604	-0,585	-0,241	0,00525
ACUITY BRANI	1,33	0,00607	1,048	1,104	0,254	0,00662	1,133	1,141	0,122	0,343	0,356	0,0047
ADIANT PLC	3,469	-0,0269	3,082	0,39	1,132	-0,00973	2,28	0,85	1,962	2,206	-3,531	-0,00974
ADOBE INC	1,469	0,0147	1,322	0,587	-0,604	0,0153	1,151	0,34	-0,267	-0,84	-0,308	0,0199
ADT CORP	1,009	-0,00234	0,944	0,401	0,0858	-0,00117	1,064	1,31	-0,921	1,967	2,046	0,000306
ADTALEM GLO	0,794	0,0111	0,842	-0,076	0,513	0,0103	0,867	0,00334	0,497	0,236	-0,114	0,00956
ADVANCE AUT	0,841	0,00854	0,655	0,91	-0,109	0,00827	0,887	1,041	-0,386	1,058	0,606	0,00304
ADVANSIX INC	2,005	-0,017	1,598	0,36	1,257	0,00133	1,575	0,276	1,425	-0,329	-0,425	0,00195
AES CORP (THE	1,502	0,00447	1,446	0,448	0,22	0,00408	1,344	0,304	0,402	-0,474	-0,139	0,00655
AETNA INC	0,881	0,00615	0,97	-0,223	0,44	0,00515	1,093	0,000302	0,299	0,691	-0,0412	0,00195
AGILENT TECH	1,728	0,00406	1,563	0,735	-0,835	0,00292	1,449	0,272	-0,758	-1,096	0,84	0,00691
AIRTOUCH CO	0,891	0,0135	0,622	-0,0961	-1,001	0,0176	0,07	-0,38	0,0668	-1,206	-2,026	0,027
AKAMAI TECH	2,06	0,00752	1,883	0,741	-1,738	0,00668	1,326	-0,117	-0,723	-2,443	-0,357	0,0211
ALLEGHENY TI	1,592	-0,00145	1,558	0,695	1,087	-0,00256	1,671	0,942	0,906	0,801	-0,0529	-0,00608
ALLEGION PLC	1,103	0,00384	0,991	0,457	-0,1	0,00555	1,04	0,358	-0,0858	-0,389	0,119	0,00585
ALLERGAN PLC	0,671	0,0106	0,646	0,0979	-0,148	0,0108	0,742	0,0654	-0,422	-0,00998	0,69	0,00895
ALPHA NATUR	1,44	-0,0396	1,001	1,799	0,147	-0,0385	1,202	1,865	-0,526	0,319	2,353	-0,0431
ALPHABET INC	1,016	0,0144	1,233	-0,442	-0,557	0,0115	1,151	-0,444	-0,247	0,112	-1,083	0,0121
ALTICE USA IN	1,391	0,00744	1,407	0,0175	0,233	0,00722	1,302	-0,117	0,449	-0,464	-0,233	0,00991
ALTRIA GROUPE	0,472	0,0106	0,531	-0,262	0,187	0,0104	0,825	-0,00733	-0,471	0,949	1,028	0,00363
AMCOR PLC	0,728	0,00311	0,739	0,0132	0,176	0,00293	0,704	-0,0104	0,257	-0,0932	-0,142	0,00369
AMERICAN AIR	1,994	0,00478	2,033	0,373	1,322	0,00342	2,096	0,124	1,04	-0,683	1,12	0,00385
AMERICAN CA	1,447	0,00854	1,427	0,637	0,931	0,00476	1,369	0,638	1,084	-0,0615	-0,319	0,00588
AMERICAN TO	1,174	0,0131	1,07	0,364	-0,794	0,0126	0,98	-0,311	-0,855	-1,711	1,684	0,0161
AMERIPRISE FI	1,829	0,00142	1,675	0,176	0,571	0,0045	1,629	0,149	0,686	-0,154	-0,375	0,00549
ANDEAVOR	1,17	0,0125	1,165	0,525	0,588	0,0106	1,236	0,465	0,332	-0,0882	0,639	0,00975
ANSYS INC	0,975	0,0142	0,82	0,827	-0,213	0,0144	0,867	0,87	-0,314	0,149	0,132	0,0133
AON PLC	0,718	0,00764	0,835	-0,487	0,44	0,00717	0,872	-0,362	0,4	0,393	-0,146	0,00573
APARTMENT IN	0,803	0,0043	0,798	0,328	0,863	0,00402	0,741	0,312	1,001	-0,0899	-0,275	0,00519
APPLIED MICRO	2,416	0,00821	2,168	0,901	-1,041	0,0094	1,746	0,231	-0,546	-1,854	0,368	0,0171
APTIV PLC	1,373	0,00347	1,338	0,324	0,589	0,00254	1,271	0,384	0,758	0,0808	-0,532	0,00362
ARTHUR J GAL	0,575	0,00882	0,609	0,0239	0,492	0,00831	0,722	0,155	0,257	0,462	0,291	0,00551
ASSURANT INC	1,016	0,00499	0,926	0,0728	0,394	0,00654	0,83	-0,0632	0,497	-0,856	-0,247	0,00969
AT&T INC	0,603	0,00353	0,714	-0,52	0,291	0,00322	0,918	-0,421	-0,2	0,433	0,939	-0,001
AT&T WIRELES	1,752	0,00596	1,651	-1,007	-0,628	0,0242	1,448	-1,129	-0,59	-0,394	0,163	0,027
AUTONATION J	1,146	0,0125	1,077	0,611	0,452	0,012	1,184	0,832	0,278	0,714	-0,0209	0,00881
AVATEX CORP	0,449	0,521	0,994	-7,156	-3,757	0,542	-2,303	-5,757	5,948	0,185	-22,48	0,598
BAKER HUGHES	1,975	-0,0257	1,516	1,298	0,36	-0,00967	2,038	1,541	-0,638	-0,528	3,417	-0,0132
BALLY ENTERI	2,01	0,0028	1,995	2,013	1,016	0,000866	2,247	2,21	0,289	0,437	1,727	-0,00346
BANK ONE COI	1,106	0,00645	1,453	-0,347	0,908	0,00157	1,41	-0,142	1,172	0,401	-0,801	0,00177
BANKBOSTON	1,502	0,0066	1,914	0,425	1,736	0,00164	2,074	0,489	1,323	0,0949	0,85	-9,74E-06
BAXALTA INC	0,354	0,0306	0,384	-0,479	-0,0284	0,0283	0,327	-0,768	-0,701	-1,699	1,352	0,0305
BBVA COMPAS	0,468	0,0154	0,812	-0,101	0,984	0,00982	0,896	0,0706	0,837	0,508	-0,0472	0,00773
BESTFOODS	0,566	0,0101	0,704	-0,486	0,229	0,00781	0,845	-0,305	-0,216	0,58	0,573	0,0046
BIOGEN INC	1,224	0,0169	1,002	0,855	-1,21	0,0186	1,012	0,844	-1,241	-0,0216	0,0911	0,0184
BLACKROCK IN	0,956	0,0148	0,902	0,308	0,469	0,0142	1,013	0,378	0,211	0,27	0,427	0,0116
BOOKING HOLI	1,95	0,0144	1,904	0,142	-1,028	0,014	1,52	-0,0444	-0,143	-0,839	-1,543	0,0228
BOSTON PROPE	0,776	0,00572	0,747	0,324	0,669	0,0055	0,755	0,379	0,673	0,143	-0,139	0,0052
BOSTON SCIEN	0,897	0,00584	0,916	-0,0578	0,143	0,00568	0,902	-0,127	0,132	-0,203	0,168	0,00618
BRIGGS & STRA	1,033	-0,00197	1,055	0,392	1,146	-0,00315	1,111	0,55	1,073	0,502	-0,132	-0,00513
BRIGHTHOUSE	1,707	-0,0294	1,616	-0,418	0,992	-0,0168	1,788	-0,922	1,44	-2,134	-0,498	-0,0135
BRINKS CO	0,935	0,00378	0,891	0,527	0,585	0,00318	0,953	0,541	0,427	0,0849	0,337	0,00199
BRISTOL-MYER	0,73	0,00922	0,821	-0,492	0,0943	0,00911	0,904	-0,482	-0,12	0,0866	0,475	0,00758
BROADCOM CC	2,264	0,018	1,929	0,815	-1,94	0,0198	1,531	0,362	-1,307	-1,381	-0,305	0,0271
BROADCOM IN	0,958	0,016	0,972	0,21	-0,423	0,0143	0,9	0,0998	-0,0755	-0,432	-0,985	0,0167
BROADRIDGE F	0,836	0,00985	0,921	0,0307	-0,454	0,00722	0,895	0,0475	-0,333	0,155	-0,402	0,0073
BROADVISION	2,14	0,00621	1,86	0,655	-2,864	0,00802	1,502	-0,676	-2,514	-3,662	2,164	0,0198
BROADWAY ST	1,477	-0,0232	1,496	2,057	1,535	-0,0273	1,151	1,324	1,885	-3,369	-2,688	-0,0108
BROOKFIELD P	1,371	0,00856	1,398	0,204	1,002	0,00791	1,389	0,284	1,072	0,206	-0,331	0,00783
BROWN FORME	0,594	0,00828	0,663	-0,277	0,286	0,00798	0,813	-0,0354	0,00428	0,809	0,19	0,00384
BROWNING-FEI	1,055	-0,00278	1,141	-0,155	0,269	-0,00446	1,374	-0,0319	-0,266	0,386	1,156	-0,00759
BRUNOS INC	1,508	-0,0332	1,424	-0,747	-0,548	-0,0328	1,495	-0,562	-0,765	0,521	0,343	-0,0338
BRUNSWICK CO	1,852	0,00245	1,794	0,863	1,153	0,00127	2	1,191	0,764	1,101	0,273	-0,0044
BURLINGTON I	0,79	0,00963	0,905	-0,226	0,505	0,00789	1,004	-0,0288	0,396	0,278	-0,11	0,00515
BURLINGTON F	0,437	0,00726	0,799	-0,275	0,971	0,00164	0,844	-0,216	0,874	0,192	0,0673	0,000634
C & S SOVRAN	1,495	0,00333	1,552	0,295	0,453	0,00378	0,962	0,203	1,786	0,327	-2,805	0,00342

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
CH ROBINSON	0.574	0.0111	0.475	0.565	0.148	0.011	0.577	0.601	-0.0938	0.187	0.45	0.00882
CA INC	1.446	0.0073	1.321	0.306	-0.631	0.00874	1.161	0.271	-0.216	-0.238	-0.834	0.0116
CABOT OIL & G	0.72	0.00888	0.732	0.0788	0.335	0.00853	0.864	0.153	0.0277	0.308	0.565	0.00573
CADENCE DESI	1.534	0.00576	1.45	0.214	-0.607	0.0064	1.523	0.272	-0.772	0.221	0.268	0.00475
CAESARS ENTE	1.323	0.00872	1.32	0.759	0.555	0.00776	1.472	1.04	0.167	0.904	0.244	0.00386
CALERES INC	1.386	0.00123	1.299	1.08	1.242	-0.000369	1.384	1.374	1.152	0.92	-0.352	-0.00338
CALIBER SYSTI	1.181	-0.000454	1.267	0.685	0.58	-0.00286	1.128	0.658	1.03	0.13	-0.894	-0.00268
CALPINE CORP	1.602	0.0062	1.559	0.45	0.189	0.00523	1.429	-0.241	-0.0715	-1.578	1.815	0.00916
CAMERON INTI	1.216	0.012	1.215	0.185	0.239	0.0111	1.088	0.155	0.56	-0.196	-0.601	0.0138
CAMPBELL SOU	0.455	0.00475	0.539	-0.401	0.21	0.00452	0.731	-0.217	-0.211	0.671	0.619	-0.000137
CAPITAL CITIE	0.904	0.00608	0.88	0.0626	-0.0725	0.00639	0.857	0.0622	0.0203	0.0627	-0.153	0.00634
CAPITAL ONE F	1.52	0.0057	1.611	-0.0764	1.354	0.00491	1.364	-0.224	1.922	-0.592	-0.953	0.0103
CAPRI HOLDIN	1.844	-0.0152	1.519	0.658	1.03	-0.00608	1.386	1.212	0.888	2.144	-0.194	-0.00552
CARDINAL HEA	0.676	0.00776	0.695	-0.0462	0.14	0.00761	0.867	0.182	-0.207	0.786	0.366	0.00316
CAREFUSION C	0.891	0.00647	0.859	0.193	-0.117	0.00651	0.826	0.118	-0.146	-0.348	-0.101	0.00768
CAREMARK RX	0.641	0.019	1.072	0.767	1.295	0.00734	1.171	0.73	0.966	0.0588	0.623	0.00551
CARMAX INC	1.511	0.00898	1.442	0.536	0.51	0.00862	1.577	0.871	0.313	0.958	-0.321	0.005
CARNIVAL COF	1.161	0.00146	1.187	0.169	0.699	0.00074	1.245	0.357	0.633	0.591	-0.204	-0.00146
CARRIER GLOB	0.228	0.0564	-2.25	5.635	0	0.175	-0.308	0	0	0	-4.763	0.0168
CASE CORP	0.782	0.0105	1.133	1.317	1.386	0.015	1.572	1.316	0.444	-0.574	2.325	0.00862
CATERPILLAR	1.169	0.00598	1.219	0.0488	0.757	0.00519	1.357	0.146	0.438	0.38	0.548	0.00215
CATTLESALE C	1.005	-0.00775	0.876	2.053	0.257	-0.0118	0.534	1.767	1.101	-1.092	-0.999	-0.00509
CBOE GLOBAL	0.501	0.00881	0.421	0.0567	0.441	0.0121	0.411	0.0691	0.486	0.0798	-0.147	0.0122
CBRE GROUP IN	2.087	0.00322	1.777	0.833	0.521	0.00649	1.632	0.742	0.883	-0.523	-1.242	0.00896
CBS CORP -OLE	1.061	-0.00105	1.07	0.0385	0.0435	-0.0011	1.173	-0.156	-0.0521	-0.398	0.433	-0.00205
CBS INC	0.591	0.00981	0.796	-0.176	0.889	0.00627	0.732	-0.096	1.215	0.534	-0.358	0.00464
CDW CORP	1.409	0.0212	1.368	-0.325	-0.449	0.0217	1.351	-0.0585	-0.379	0.691	-0.812	0.0207
CELANESE COR	1.863	0.00362	1.765	0.219	0.23	0.00497	1.687	0.225	0.526	0.131	-1.031	0.0056
CELGENE CORF	1.178	0.0213	0.756	1.691	-1.378	0.0237	0.643	1.257	-1.398	-1.259	0.738	0.028
CENTENE CORF	0.849	0.0168	0.739	0.979	-0.769	0.0149	0.796	1.038	-0.783	0.359	-0.103	0.0135
CENTERPOINT	0.56	0.00489	0.613	-0.0427	0.577	0.00429	0.753	0.0286	0.239	0.307	0.641	0.00136
CENTEX CORP	1.393	0.0064	1.53	0.542	1.136	0.000834	1.667	0.836	0.999	0.847	-0.221	-0.00288
CENTRAL & SO	0.122	0.00613	0.315	-0.204	0.519	0.00385	0.445	-0.0824	0.194	0.375	0.607	0.00184
CENTURYLINK	0.863	0.000776	0.936	-0.405	0.0512	0.000711	1.161	-0.227	-0.46	0.676	0.838	-0.00437
CEPHALON INC	1.236	0.0144	0.873	1.564	-1.152	0.0159	0.867	1.422	-1.276	-0.319	0.486	0.0165
CERIDIAN COR	1.092	0.00618	1.098	0.461	0.168	0.00477	1.123	0.523	0.131	0.177	-0.0469	0.00409
CERNER CORP	1.094	0.017	0.894	0.956	-0.475	0.0175	0.847	0.996	-0.332	0.0829	-0.404	0.0181
CF INDUSTRIES	1.073	0.0135	1.029	0.381	-0.256	0.0131	0.944	0.346	-0.0157	-0.167	-0.795	0.0146
CHAMPION INT	0.674	0.00397	0.87	0.0884	0.632	0.00192	0.844	0.133	0.653	0.0937	-0.108	0.00213
CHAMPIONX CO	3.403	-0.0436	2.289	2.428	1.308	0.00482	2.155	3.531	0.302	2.533	2.037	-0.00134
CHARMING SHC	1.618	0.00963	1.572	1.656	1.47	0.00276	1.844	2.096	1.13	1.373	-0.0259	-0.00476
CHARTER COM	1.982	-0.00909	1.86	0.614	0.533	-0.0104	1.794	-0.133	0.349	-1.64	2.051	-0.00648
CHARTER ONE	0.947	0.0164	1.341	-0.169	1.082	0.0102	1.5	0.0812	0.783	0.746	0.114	0.00616
CHASE MANHA	1.838	0.00635	2.076	0.939	1.791	0.000465	1.948	0.952	2.311	0.411	-0.835	-0.000352
CHEMFIRST INC	0.566	0.0133	0.744	0.693	0.584	0.00938	0.779	0.751	0.496	0.193	0.0362	0.00828
CHESAPEAKE E	1.152	0.00309	1.025	1.112	0.984	0.00237	1.099	1.039	0.744	-0.138	0.697	0.00112
CHEVRON COR	0.73	0.00465	0.799	-0.188	0.478	0.00414	0.876	-0.12	0.307	0.25	0.266	0.00237
CHIPOTLE MEX	0.987	0.0166	0.95	0.821	-0.836	0.0141	1.045	0.979	-0.875	1.122	0.0646	0.0104
CHIRON CORP	0.989	0.01	0.711	0.326	-0.706	0.014	0.919	0.316	-1.323	0.224	1.125	0.0108
CHRYSLER COF	1.013	0.0137	1.351	0.623	1.547	0.00825	1.226	0.551	1.87	-0.095	-0.721	0.00949
CHUBB CORP	0.644	0.00776	0.784	-0.469	0.562	0.00653	0.916	-0.358	0.293	0.401	0.392	0.00371
CHUBB LTD	0.733	0.00611	0.793	-0.173	0.5	0.00576	0.861	-0.123	0.351	0.192	0.23	0.00428
CHURCH & DW	0.417	0.011	0.452	-0.204	-0.00129	0.011	0.544	0.0261	-0.137	0.738	-0.124	0.00791
CIENA CORP	2.088	0.00341	1.72	1.705	-1.246	0.00309	1.33	0.564	-0.752	-3.199	1.481	0.0141
CIGNA CORP	0.992	0.00862	1.005	0.114	0.412	0.00819	1.038	0.143	0.339	0.107	0.113	0.00743
CIMAREX ENER	1.57	-0.00187	1.29	0.527	1.023	0.00177	1.459	0.769	1.038	1.314	-0.508	-0.00183
CINCINNATI FII	0.498	0.00712	0.59	-0.174	0.8	0.00629	0.742	-0.112	0.428	0.289	0.736	0.00321
CINERGY CORP	0.0255	0.0109	0.361	0.072	0.901	0.00409	0.459	0.0511	0.597	0.0888	0.537	0.00245
CINTAS CORP	1.055	0.00801	1.108	-0.127	0.401	0.00759	1.195	0.143	0.296	0.85	-0.271	0.00437
CIRCUIT CITY S	2.103	-0.007	2.129	0.971	1.199	-0.0121	1.73	1.09	2.341	-0.114	-2.557	-0.00572
CISCO SYSTEM	1.476	0.0142	1.417	0.0163	-0.726	0.0149	1.297	-0.075	-0.456	-0.349	-0.447	0.0176
CIT GROUP INC	1.607	-0.0212	1.395	0.00291	1.332	-0.0169	0.987	-0.449	1.88	-2.45	-1.431	-0.00815
CIT GROUP INC	0.902	0.0119	1.869	-0.351	1.553	0.000779	1.177	-0.0652	2.795	-0.0686	-2.636	0.0157
CITICORP	1.103	0.0092	1.515	0.978	2.079	0.00179	1.529	0.998	2.065	0.0721	0.0574	0.00139
CITIGROUP GLC	0.685	0.00585	0.619	-0.153	-0.228	0.00803	0.557	-0.159	-0.0394	-0.0936	-0.328	0.00923
CITIGROUP INC	1.768	-0.000527	1.909	-0.296	1.177	-0.00176	1.647	-0.47	1.788	-0.694	-1.073	0.00397
CITIZENS FINA	1.783	-0.0061	1.452	0.521	1.242	0.00804	1.341	0.343	1.688	-0.689	-1.218	0.0097
CITRIX SYSTEM	1.425	0.0208	1.193	0.863	-1.375	0.0213	1.103	0.68	-1.231	-0.553	0.0893	0.0238
CLARK EQUIPM	1.215	0.0116	1.312	0.564	0.855	0.00859	1.353	0.141	0.281	-2.47	-0.174	0.019
CLEVELAND-CI	1.454	0.00603	1.4	0.827	1.11	0.0049	1.533	1.089	0.881	0.857	0.0329	0.000917

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
CLOROX CO/DE	0.456	0.00934	0.504	-0.312	-0.0687	0.0094	0.665	-0.155	-0.419	0.573	0.506	0.00558
CME GROUP IN	0.633	0.00785	0.623	-0.116	0.223	0.00846	0.454	-0.211	0.633	-0.665	-1.388	0.0117
CMS ENERGY C	0.529	0.00381	0.637	-0.454	0.388	0.0034	0.716	-0.47	0.171	0.00717	0.529	0.0021
CNA FINANCIA	1.051	-0.00207	1.165	-0.23	0.962	-0.00307	1.113	-0.183	1.122	0.103	-0.457	-0.00245
CNO FINANCIA	1.877	-0.00621	1.837	0.626	0.846	-0.00707	1.934	0.515	0.536	-0.259	0.923	-0.0081
CNX RESOURCI	1.182	0.00822	1.043	0.744	0.494	0.00664	1.404	1.082	-0.263	1.127	0.942	-0.00223
COCA-COLA CC	0.563	0.0061	0.64	-0.415	0.084	0.00601	0.847	-0.218	-0.368	0.718	0.667	0.00114
COCA-COLA EU	0.859	0.00652	0.899	-0.09	0.31	0.00619	1.014	0.0735	0.0815	0.558	0.215	0.00313
COGNIZANT TE	1.401	0.0225	1.318	0.291	-0.62	0.0219	1.204	0.348	-0.311	0.0175	-0.807	0.0241
COLGATE-PALM	0.618	0.00761	0.709	-0.573	-0.0801	0.00767	0.862	-0.398	-0.403	0.619	0.411	0.00387
COLUMBIA ENI	0.301	0.00885	0.429	-0.164	0.296	0.0068	0.631	-0.209	-0.135	0.0641	0.919	0.00357
COLUMBIA PIP	2.661	-0.00662	2.8	-0.256	0.924	-0.00559	2.934	-0.0398	-0.359	-0.257	2.301	-0.00939
COMCAST COR	1.001	0.00608	1.009	-0.000483	0.1	0.00597	1.067	0.0571	-0.0266	0.209	0.182	0.00459
COMERICA INC	1.111	0.00235	1.218	-0.0441	1.279	0.00101	1.206	0.0357	1.347	0.225	-0.308	0.000726
COMMERCE BA	0.616	0.0163	0.866	0.327	0.858	0.0114	0.994	0.454	0.548	0.458	0.328	0.0088
COMPAQ COMF	1.392	0.012	1.08	0.0128	-0.763	0.017	0.58	0.398	0.0968	0.738	-2.449	0.0217
COMPUWARE C	1.77	0.00449	1.629	0.481	-0.624	0.0062	1.553	0.461	-0.445	-0.125	-0.333	0.00774
COMVERSE TEC	1.606	0.00803	1.439	0.674	-0.511	0.00885	1.333	0.376	-0.499	-0.845	0.451	0.0121
CONAGRA BRA	0.562	0.00552	0.661	-0.444	0.309	0.00519	0.868	-0.175	-0.111	0.93	0.457	-0.000138
CONCHO RESO	1.352	0.00597	1.204	0.53	0.11	0.00762	1.286	0.642	0.0567	0.838	0.14	0.00471
CONCORD EFS	1.287	0.0237	1.482	-0.119	0.529	0.0207	1.522	0.195	0.6	0.767	-0.657	0.0192
CONDUENT INC	1.574	-0.0475	1.271	1.157	-0.12	-0.0404	1.047	1.158	0.184	0.464	-1.185	-0.0409
CONEXANT SY	3.054	0.0115	2.753	1.636	-0.292	0.00284	1.958	0.368	0.443	-3.187	1.293	0.0179
CONOCO INC	0.346	0.007	0.888	-0.375	0.966	0.0072	0.689	-0.426	1.415	-0.319	-0.553	0.0124
CONOCOPHILL	-1.284	0.28	-3.318	11.67	-0.636	0.281	-3.19	10.8	-1.382	-2.466	3.369	0.285
CONRAIL INC	1.126	0.0115	1.261	0.0697	0.576	0.00849	1.158	0.159	0.988	0.5	-0.642	0.00663
CONSECO FINA	2.161	0.0221	2.198	1.164	0.578	0.0218	1.681	0.433	1.513	-2.511	-2.975	0.0358
CONSOLIDATEI	0.122	0.00745	0.21	-0.359	0.34	0.00708	0.349	-0.234	0.0306	0.465	0.473	0.00383
CONSOLIDATEI	0.604	0.00146	0.696	-0.0978	0.283	0.00796	0.846	-0.192	0.012	-0.199	0.698	-0.00125
CONSTELLATIC	0.663	0.0158	0.635	0.35	0.41	0.0154	0.714	0.451	0.249	0.352	0.178	0.0134
CONSTELLATIC	0.563	0.00603	0.631	-0.0749	0.418	0.00484	0.739	-0.138	0.0789	-0.0459	0.804	0.00316
CONTINENTAL	1.629	-0.00602	1.59	0.126	-0.0991	-0.00564	1.107	-0.43	0.838	-2.492	-3.376	0.0073
CONVERGYS C	1.188	0.0024	1.115	0.453	0.0552	0.00132	1.109	0.321	-0.0438	-0.273	0.456	0.00156
CON-WAY INC	1.114	0.00286	1.123	0.648	0.799	0.0000317	1.229	0.908	0.747	0.759	-0.308	-0.00301
COOPER COS IN	0.554	0.0163	0.429	0.761	0.0509	0.0163	0.599	1.048	-0.263	0.957	0.179	0.0115
COOPER INDUS	1.066	0.0054	1.113	0.264	0.642	0.003	1.374	0.493	0.162	0.834	0.627	-0.00305
COOPER TIRE &	1.445	0.00282	1.433	0.506	0.947	0.00185	1.555	0.785	0.756	0.899	-0.088	-0.00204
COPART INC	1.036	0.0149	0.981	0.23	-0.262	0.0151	0.945	0.106	-0.232	-0.36	0.208	0.0163
CORESTATES F	1.27	0.00855	1.41	-0.144	0.534	0.00497	1.216	-0.208	1.126	0.0611	-1.231	0.00574
CORNING INC	1.607	0.00286	1.497	0.347	-0.662	0.00355	1.353	-0.217	-0.543	-0.347	0.797	0.00962
CORROON & BI	0.69	0.00141	1.156	-2.009	0.422	-0.0154	1.196	-1.772	0.501	0.668	0.423	-0.0159
CORTEVA INC	0.824	0.00111	0.649	0.576	-0.0363	0.00654	0.84	1.148	-0.505	-0.955	1.315	0.00421
COSTCO WHOL	0.774	0.00959	0.773	-0.0771	-0.235	0.0097	0.818	0.0288	-0.292	0.321	-0.107	0.0084
COTY INC	0.972	-0.017	0.765	0.354	0.718	-0.00932	0.655	0.937	0.283	2	0.485	-0.0114
COUNTRYWIDE	1.163	0.00941	1.492	0.157	1.075	0.00357	1.717	0.471	0.642	0.997	0.26	-0.00154
COVANTA ENE	1.095	-0.0276	1.27	0.492	0.625	-0.0323	0.696	0.246	2.144	-1.231	-2.279	-0.0205
COVENTRY HE	0.933	0.0167	0.934	0.85	0.906	0.0115	1.13	1.132	0.699	0.837	-0.0158	0.00725
COVETRUS INC	2.686	-0.0498	2.342	3.445	-2.058	-0.0641	3.464	2.585	-1.441	-7.587	0.725	-0.0441
COVIDIEN PLC	0.862	0.00968	0.841	0.369	-0.262	0.00869	0.727	0.322	-0.128	-0.489	-0.556	0.012
CRANE CO	1.25	0.00198	1.267	0.19	0.638	0.00132	1.389	0.326	0.381	0.482	0.332	-0.00167
CRAY RESEARC	1.178	-0.00775	1.042	1.239	0.358	-0.00824	0.67	0.617	1.051	-2.295	-2.64	0.00591
CROSS & TRECI	1.775	0.0121	0.677	3.424	-1.086	0.00598	0.679	3.18	-1.029	-0.792	-0.439	0.00951
CROWN CASTL	1.038	0.0133	0.978	0.088	-1.014	0.0128	0.928	0.0229	-0.915	-0.205	-0.0704	0.014
CROWN HOLDI	1.079	0.00674	1.067	0.254	0.401	0.00633	1.139	0.327	0.244	0.261	0.223	0.00461
CSRA INC	1.004	0.00295	0.673	1.399	0.0222	0.00347	0.555	1.496	0.338	0.0743	-0.86	0.00282
CSX CORP	0.975	0.0071	1.004	0.0638	0.514	0.00657	1.084	0.284	0.404	0.699	-0.164	0.00378
CUMMINS INC	1.354	0.00733	1.377	0.134	0.591	0.00672	1.525	0.235	0.248	0.399	0.596	0.00348
CVS HEALTH C	0.735	0.00456	0.788	-0.159	0.331	0.00421	0.977	0.00474	-0.0915	0.611	0.66	-0.000148
CYPRUS AMAX	0.85	-0.00292	0.993	0.222	0.572	-0.00398	0.767	-0.00847	1.044	-0.982	-0.963	-0.000302
D R HORTON IN	1.261	0.00973	1.211	0.496	0.567	0.00912	1.382	0.748	0.29	0.834	0.109	0.00502
DANA INC	2.437	-0.0141	2.476	0.627	1.868	-0.016	2.469	0.711	1.924	0.243	-0.288	-0.0164
DANAHER COR	0.91	0.0116	0.937	-0.113	0.103	0.0115	1.118	0.118	-0.269	0.8	0.418	0.00686
DARDEN REST/	0.718	0.00959	0.742	0.045	0.541	0.00932	0.845	0.372	0.437	0.943	-0.495	0.00599
DATA GENERA	2.278	-0.00145	1.96	0.882	-0.923	0.00429	1.878	1.163	-0.305	2.151	-1.049	0.000357
DAVITA INC	0.885	0.0116	0.846	0.328	0.302	0.0115	1.006	0.694	0.0679	1.088	-0.296	0.00695
DEAN FOODS C	0.479	0.00765	0.511	-0.21	-0.0785	0.00772	0.645	-0.217	-0.422	0.0991	0.786	0.00518
DEAN WITTER	1.861	0.00113	2.209	-0.411	0.967	-0.00779	2.126	-0.503	1.21	-0.238	-0.613	-0.00544
DEERE & CO	0.983	0.00629	1.014	0.0786	0.564	0.00571	1.102	0.188	0.382	0.382	0.209	0.00346
DELL TECHNOL	1.46	0.0191	1.384	0.102	-0.77	0.0202	1.173	0.362	-0.116	0.59	-2.004	0.023
DELPHI TECHN	2.585	-0.0419	2.253	1.348	-0.278	-0.036	2.076	0.73	0.575	-0.642	-2.351	-0.0303

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
DELTA AIR LIN	1.169	-0.00953	1.236	-0.107	0.636	-0.0102	1.303	-0.144	0.443	-0.0612	0.513	-0.0111
DELUXE CORP	1.076	0.000183	1.07	0.401	0.796	-0.000634	1.242	0.657	0.462	0.866	0.284	-0.00526
DENBURY RESC	1.523	0.00262	1.427	1.066	1.415	0.00206	1.631	1.467	1.11	1.244	-0.205	-0.00344
DENTSPLY SIRC	0.745	0.00913	0.734	0.239	0.379	0.000874	0.865	0.484	0.146	0.808	0.073	0.00489
DEVON ENERG	1.201	0.00125	1.23	0.338	1.113	0.000104	1.301	0.469	0.987	0.433	0.0406	-0.00196
DEXCOM INC	0.996	0.0262	0.941	1.317	-1.451	0.022	0.5	0.922	-0.626	-2.61	-2.656	0.0327
DIAMOND OFFS	1.019	-0.00546	1.005	0.291	0.627	-0.00575	0.827	0.104	0.996	-0.635	-0.411	-0.00154
DIAMONDBACI	2.088	-0.0015	1.677	0.768	1.325	0.0109	1.59	1.04	1.242	1.008	-0.0527	0.0111
DIGITAL EQUIP	1.12	-0.00595	0.918	0.0906	-0.807	-0.00103	0.671	-0.303	-0.408	-1.4	-1.404	0.0066
DIGITAL REALI	0.608	0.0135	0.615	0.11	-0.187	0.0129	0.606	0.0768	-0.22	-0.246	0.132	0.0135
DILLARDS INC	1.167	0.00165	1.131	0.69	1.044	0.000581	1.285	0.88	0.726	0.662	0.372	-0.00332
DIRECTV	1.055	0.00744	1.005	0.159	-0.204	0.00787	0.814	-0.132	0.0497	-0.919	-0.0626	0.0126
DISCOVER FIN/	1.55	-0.000705	1.277	0.268	1.021	0.00581	1.27	0.322	1.146	0.424	-0.426	0.0051
DISCOVERY IN	1.15	0.0031	1.219	-0.303	0.0313	0.00267	1.278	-0.29	-0.158	0.0156	0.631	0.0018
DISH NETWORK	1.564	0.00994	1.537	0.045	-0.324	0.0101	1.29	-0.228	0.182	-0.916	-0.535	0.016
DISNEY (WALT	1.067	0.00351	1.104	-0.0683	0.316	0.00318	1.161	-0.0678	0.164	0.0417	0.349	0.00216
DOLLAR GENEI	0.849	0.0156	0.795	0.192	-0.142	0.0159	0.871	0.384	-0.322	0.618	-0.00871	0.0135
DOLLAR TREE I	1.007	0.0131	0.992	0.0111	-0.214	0.0132	1.138	0.22	-0.487	0.667	0.151	0.00951
DOMINION ENE	0.291	0.00796	0.366	-0.283	0.348	0.00759	0.523	-0.197	-0.0256	0.361	0.695	0.00428
DOMINO'S PIZZ	0.93	0.0204	0.769	0.893	-0.392	0.0206	0.716	0.816	-0.331	-0.477	-0.151	0.0222
DONNELLEY (R	0.928	-0.00312	0.964	0.133	0.76	-0.00391	1.129	0.301	0.405	0.605	0.499	-0.00786
DOVER CORP	1.121	0.00474	1.143	0.0403	0.369	0.00436	1.235	0.0951	0.153	0.224	0.393	0.0024
DOW INC	1.873	-0.0193	1.327	1.035	0.56	0.0104	0.973	1.361	0.31	2.496	-0.099	0.00383
DOW JONES & C	0.547	0.00272	0.675	0.099	0.414	0.000316	0.657	0.0421	0.433	-0.157	0.0688	0.000854
DRESSER INDU.	1.47	-0.00355	1.581	0.441	0.65	-0.00547	1.375	0.176	0.951	-0.867	-0.979	-0.000226
DSC COMMUNI	1.366	0.0176	1.167	1.968	0.0261	0.0245	0.913	1.608	0.346	-1.228	-1.162	0.0317
DTE ENERGY C	0.318	0.00743	0.395	-0.249	0.445	0.00696	0.519	-0.181	0.148	0.284	0.553	0.00434
DU PONT (E I) I	0.846	0.00483	0.933	-0.148	0.542	0.00354	1.011	-0.113	0.355	0.166	0.345	0.00201
DUKE ENERGY	0.265	0.00717	0.364	-0.415	0.363	0.00678	0.494	-0.383	0.0359	0.184	0.691	0.00428
DUKE REALTY	0.77	0.00598	0.76	0.39	0.724	0.00524	0.759	0.368	0.717	-0.0638	0.0556	0.0054
DUPONT DE NE	1.355	-0.000286	1.408	0.141	0.988	-0.00131	1.49	0.249	0.822	0.374	0.175	-0.00343
DXC TECHNOL	1.4	0.00132	1.414	-0.0501	0.0722	0.00124	1.39	0.0153	0.166	0.175	-0.338	0.00126
DYNEGY INC	1.072	-0.00961	1.071	0.26	0.346	-0.0107	0.972	0.00859	0.354	-0.667	0.447	-0.00821
E TRADE FINAN	2.402	0.0027	2.297	0.557	-0.209	0.00269	1.601	0.14	1.381	-1.662	-2.635	0.0176
EASTERN ENTE	0.515	0.00585	0.517	-0.0852	-0.0205	0.0058	0.626	-0.0428	-0.307	0.209	0.48	0.00371
EASTMAN CHEI	1.281	0.00158	1.31	0.134	0.888	0.0011	1.442	0.305	0.639	0.567	0.181	-0.00214
EASTMAN KOD	1.325	-0.0151	1.393	-0.00133	0.872	-0.016	1.537	-0.0867	0.452	-0.149	1.126	-0.018
EATON CORP P	1.068	0.00524	1.051	0.281	0.391	0.00484	1.239	0.401	-0.0491	0.481	0.785	0.000766
EBAY INC	1.718	0.0156	1.743	-0.24	-0.548	0.0156	1.606	-0.362	-0.255	-0.424	-0.367	0.0189
ECHLIN INC	0.926	0.0105	1.075	-0.19	0.551	0.00678	0.983	-0.0617	1.034	0.73	-0.705	0.00371
ECHO BAY MIN	0.0359	-0.00158	0.0771	1.053	0.286	-0.00397	-0.0977	0.954	0.736	-0.422	-0.626	0.000155
ECOLAB INC	0.691	0.00981	0.757	-0.25	0.305	0.00949	0.889	-0.0439	0.0512	0.695	0.191	0.00587
EDISON INTERN	0.382	0.00619	0.422	-0.0919	0.311	0.00587	0.56	-0.0681	-0.0423	0.166	0.767	0.00328
EL PASO CGP C	0.326	0.00565	0.505	0.0417	0.438	0.00287	0.672	-0.0812	0.149	-0.195	0.787	0.000971
EL PASO CORP	1.097	0.00723	1.144	0.077	0.47	0.00539	1.208	0.049	0.277	0.00774	0.438	0.00416
ELECTRONIC A	1.199	0.0147	1.035	0.715	-0.543	0.0153	1.002	0.753	-0.438	0.0894	-0.315	0.0156
ELECTRONIC D	0.913	0.00487	1.017	-0.183	0.263	0.00374	1.266	-0.0325	-0.377	0.648	0.931	-0.00078
EMC CORP/MA	1.5	0.0191	1.398	-0.0804	-0.901	0.0217	1.073	-0.602	-0.47	-1.627	-0.0917	0.0297
EMCOR GROUP	1.198	-0.00233	1.094	0.8	0.433	-0.00278	1.203	0.901	0.193	0.369	0.36	-0.00531
EMERSON ELEC	1.053	0.00265	1.11	-0.142	0.414	0.00221	1.268	0.0243	0.0746	0.596	0.464	-0.00161
ENCOMPASS HI	1.399	0.0164	1.315	0.73	0.518	0.0158	1.688	0.793	-0.435	0.443	2.07	0.00888
ENDO INTERN	0.653	0.00657	0.515	0.674	0.196	0.00558	0.739	0.76	-0.325	0.477	0.984	0.000354
ENERGY FUTUF	-0.1	0.0159	0.151	0.0422	0.766	0.0116	0.113	0.125	0.928	0.152	-0.444	0.0118
ENGELHARD C	0.728	0.0104	0.981	0.215	0.798	0.00489	1.096	0.422	0.581	0.63	0.012	0.00211
ENRON CORP	0.628	-0.000285	0.883	0.462	0.847	-0.00632	0.672	0.0454	1.19	-1.18	0.0863	-0.000641
ENTERASYS NE	2.145	0.0142	1.522	1.534	-1.356	0.0198	1.044	0.868	-0.348	-2.123	-0.614	0.0307
ENTERGY CORI	0.31	0.00748	0.406	-0.384	0.403	0.00705	0.56	-0.25	0.0618	0.497	0.531	0.00351
ENVISION HEA	0.411	0.0124	0.387	0.614	0.826	0.0101	0.469	0.624	0.626	0.12	0.381	0.00862
EOG RESOURCI	0.931	0.00765	0.981	0.107	0.87	0.00674	1.042	0.244	0.771	0.444	-0.0346	0.0048
EQT CORP	0.708	0.00501	0.71	0.0957	0.23	0.00478	0.924	0.25	-0.263	0.6	0.841	0.000338
EQUIFAX INC	0.878	0.00792	0.918	-0.0973	0.292	0.00762	1.074	0.135	-0.0117	0.788	0.256	0.00341
EQUINIX INC	2.059	0.015	1.98	0.586	-1.309	0.0149	1.099	-0.00461	-0.195	-3.357	-0.601	0.0356
EQUITY OFFICE	0.231	0.00768	0.386	0.169	0.452	0.00387	0.406	0.217	0.434	0.111	-0.0767	0.00371
EQUITY RESIDE	0.597	0.00497	0.596	0.223	0.622	0.00469	0.626	0.251	0.559	0.1	0.0786	0.00399
ESSEX PROPER	0.566	0.0101	0.544	0.315	0.533	0.00991	0.565	0.342	0.494	0.0884	0.0271	0.0094
E-SYSTEMS INC	0.76	0.012	0.857	-0.458	0.156	0.0113	0.816	-0.543	0.195	-0.432	-0.323	0.0134
EVEREST RE GF	0.433	0.00838	0.5	-0.154	0.678	0.00805	0.636	-0.0345	0.383	0.425	0.397	0.0049
EVERGY INC	0.489	0.00543	0.532	-0.106	0.323	0.00509	0.614	-0.117	0.102	0.0223	0.531	0.00372
EVERSOURCE E	0.398	0.00599	0.441	-0.181	0.16	0.00582	0.52	-0.115	-0.0181	0.247	0.285	0.00401
EW SCRIPPS -C	1.404	0.00346	1.428	0.414	1.221	0.0022	1.536	0.502	0.979	0.332	0.389	-0.000238

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
EXELON CORP	0,319	0,00238	0,376	-0,237	0,213	0,00216	0,443	-0,2	0,0538	0,156	0,295	0,00074
EXPEDIA GROU	1,638	0,0158	1,647	-0,0466	0,00314	0,0159	1,701	0,568	0,113	1,381	-1,59	0,0133
EXPEDITORS IN	0,959	0,0105	0,914	0,265	0,0109	0,0105	1,009	0,491	-0,133	0,726	-0,0976	0,00747
EXPRESS SCRIP	0,777	0,0201	0,715	0,481	0,109	0,0195	0,861	0,681	-0,0728	0,63	0,042	0,0165
EXTRA SPACE S	0,845	0,0106	0,752	0,241	0,167	0,0117	0,725	0,176	0,14	-0,462	0,133	0,013
EXXON MOBIL	0,62	0,00349	0,671	-0,134	0,358	0,00311	0,777	-0,0487	0,119	0,324	0,387	0,00071
FS NETWORKS I	2,011	0,0153	1,896	0,448	-1,676	0,0142	1,694	0,215	-1,269	-0,726	-0,394	0,0193
FACEBOOK INC	1,078	0,0155	1,108	0,28	-0,681	0,0126	1,111	0,109	-0,533	-0,587	-0,279	0,0129
FAMILY DOLL	0,703	0,0134	0,683	0,0441	-0,113	0,0137	0,887	0,336	-0,401	0,932	0,134	0,00873
FASTENAL CO	1,005	0,0135	0,955	0,452	0,343	0,0132	1,168	0,753	-0,0787	1,029	0,397	0,00755
FEDDERS CORP	0,726	-0,0142	0,851	0,105	0,472	-0,0167	0,87	0,391	0,613	0,708	-0,779	-0,0187
FEDERAL HOMI	1,744	0,00987	1,858	0,123	1,728	0,00807	1,879	0,0225	1,625	-0,279	0,426	0,00832
FEDERAL NATI	1,711	0,00788	1,866	-0,138	1,691	0,00611	1,981	-0,208	1,356	-0,127	0,905	0,00453
FEDERAL PAPE	1,343	0,00682	1,461	-0,184	0,436	0,00535	1,361	-0,108	0,925	0,693	-0,61	0,00346
FEDERAL REAL	0,616	0,00418	0,608	0,323	0,603	0,00356	0,632	0,461	0,603	0,42	-0,262	0,00228
FEDERATED HE	0,875	0,00417	0,849	0,214	0,361	0,00414	0,856	0,228	0,351	0,041	-0,0109	0,00397
FEDEX CORP	0,983	0,00407	0,987	0,149	0,375	0,00368	1,079	0,322	0,215	0,569	0,0407	0,000988
FIDELITY NATI	0,688	0,00902	0,699	0,157	-0,252	0,00813	0,78	0,153	-0,545	-0,119	0,979	0,00696
FIFTH THIRD B	1,279	0,00356	1,426	-0,28	1,276	0,00223	1,333	-0,23	1,544	0,0833	-0,711	0,00355
FIRST CHICAGC	1,898	0,00532	2,163	0,443	1,614	-0,000593	1,634	0,154	3,152	-0,708	-3,566	0,00696
FIRST CHICAGC	1,31	0,00345	1,479	-0,206	0,596	-0,000409	1,277	-0,275	1,201	0,0986	-1,264	0,000601
FIRST DATA CC	1,048	0,00882	1,057	-0,123	-0,0198	0,00897	1,157	0,117	-0,118	0,669	-0,271	0,00685
FIRST FIDELITY	1,557	0,0116	1,665	-0,0234	0,52	0,00955	1,293	-0,113	1,854	0,368	-2,512	0,0121
FIRST HORIZON	0,871	0,00339	0,974	-0,0968	1,106	0,00223	0,995	-0,00256	1,092	0,29	-0,148	0,00126
FIRST INTERST	1,981	-0,000161	2,124	0,22	0,836	-0,00293	1,848	0,0126	1,664	-0,44	-1,945	0,0013
FIRST REPUBLI	1,029	0,00903	1,14	0,252	0,856	0,00731	1,218	0,48	0,692	0,701	-0,104	0,00488
FIRST SOLAR IN	1,403	0,00766	1,512	-0,381	-0,0959	0,00636	1,329	-0,355	0,623	0,468	-2,342	0,00828
FIRSTENERGY C	0,279	0,0059	0,383	-0,431	0,393	0,00548	0,558	-0,264	0,01	0,61	0,564	0,00135
FISERV INC	0,844	0,0122	0,923	-0,384	0,17	0,012	0,942	-0,247	0,183	0,414	-0,288	0,0108
FISHER SCIENT	0,267	0,0215	0,389	0,495	0,429	0,0169	0,425	0,51	0,342	0,0734	0,132	0,0163
FLEETBOSTON	1,32	0,00772	1,744	-0,125	1,188	0,00104	1,831	0,0047	1,017	0,392	0,088	-0,0012
FLEETCOR TEC	1,334	0,00814	1,406	-0,176	-0,152	0,00639	1,354	-0,215	0,0436	-0,02	-0,546	0,00716
FLEETWOOD EP	2,331	-0,0115	2,382	0,517	0,801	-0,0153	3,001	0,587	-0,689	0,72	2,993	-0,0253
FLEMING COMF	0,566	-0,0116	0,768	0,849	0,775	-0,0176	0,568	0,492	1,125	-1,032	-0,0258	-0,0124
FLIR SYSTEMS I	0,839	0,0134	0,777	0,458	0,251	0,0132	0,981	0,743	-0,112	0,934	0,194	0,00829
FLORIDA PROG	0,072	0,0114	0,232	-0,156	0,382	0,00884	0,349	-0,0983	0,0675	0,255	0,507	0,00654
FLOWSERVE CC	1,399	0,00339	1,396	0,303	0,614	0,00276	1,543	0,48	0,308	0,618	0,371	-0,000945
FLUOR CORP	1,329	-0,00192	1,351	0,215	0,752	-0,00269	1,672	0,594	0,0811	1,333	0,824	-0,0107
FMC CORP	1,049	0,0056	1,044	0,188	0,347	0,00525	1,155	0,338	0,124	0,516	0,228	0,00235
FMC TECHNOL	1,102	0,01	0,992	0,545	-0,0328	0,00889	1,018	0,592	0,0872	0,194	-0,489	0,0088
FOOT LOCKER	0,65	0,0134	0,751	-0,382	0,462	0,0129	0,907	-0,339	0,0706	0,236	0,817	0,00991
FORD MOTOR C	1,445	-0,000594	1,504	0,127	1,037	-0,00167	1,49	0,125	1,071	-0,0155	-0,0739	-0,00142
FOREST LABOR	0,735	0,0121	0,74	-0,241	-0,238	0,0132	0,945	-0,147	-0,713	0,428	0,844	0,00895
FORT JAMES CC	0,891	0,00135	1,328	0,111	1,191	-0,00536	1,269	0,531	0,99	1,046	-0,37	-0,00653
FORTIVE CORP	1,184	-0,00433	1,032	0,393	0,111	-0,000788	0,919	0,443	0,248	0,227	-0,547	-0,000521
FORTUNE BRA	1,485	0,00355	1,366	0,479	-0,0869	0,00539	1,331	0,596	-0,0788	0,468	-0,164	0,00554
FOSSIL GROUP	1,356	0,00518	1,246	0,744	0,262	0,00502	1,359	1,073	0,158	0,983	-0,478	0,00175
FOSTER WHEEL	1,517	-0,0019	1,599	0,214	0,89	-0,00497	1,557	0,132	0,932	-0,243	0,043	-0,00386
FOUR CORNER	0,717	0,0101	0,633	0,226	0,0803	0,0122	0,452	0,383	0,216	0,735	-0,657	0,0128
FOX CORP	1,453	-0,0186	1,404	0,224	-0,0571	-0,017	1,689	-0,256	0,385	-2,48	-0,498	-0,0102
FRANKLIN RES	1,364	0,00349	1,415	-0,0183	0,614	0,00285	1,525	0,115	0,386	0,468	0,271	0,000073
FREEMPORT-MC	1,423	0,00546	1,352	0,649	0,516	0,00494	1,485	0,721	0,2	0,301	0,591	0,00215
FREESCALE SE	1,559	0,023	2,262	-1,175	-0,612	0,0252	2,554	-1,03	-1,271	1,512	-0,272	0,0254
FRONTIER COM	0,779	-0,0191	0,76	-0,0106	0,766	-0,0194	0,693	-0,0302	0,943	-0,106	-0,373	-0,0179
FRONTIER COR	0,742	0,00808	0,686	0,196	-0,159	0,00936	0,638	0,0511	-0,306	-1,118	0,0933	0,0128
FRUIT OF THE I	1,118	-0,0196	1,112	0,258	0,0358	-0,02	0,159	0,374	2,041	-0,446	-3,898	-0,00469
FURNITURE BR	-1,563	0,215	-0,0625	-3,551	7,691	0,192	-4,471	-7,41	16,25	-13,86	-11,68	0,29
GALEN HEALTH	1,06	0,00153	0,968	0,103	-0,293	0,00287	1,24	0,12	-1,064	-0,289	1,455	0,00319
GAMESTOP COI	0,981	-0,000587	0,864	0,378	0,219	0,0000417	1,019	0,414	-0,134	0,501	1,148	-0,0036
GAP INC	1,319	0,00376	1,278	0,313	0,167	0,0036	1,217	0,437	0,385	0,32	-0,736	0,0039
GARMIN LTD	1,11	0,0109	0,971	0,67	0,0378	0,01	1,016	0,68	-0,0837	0,0772	0,288	0,00903
GARTNER INC	1,141	0,00955	1,1	0,31	0,192	0,00951	1,069	0,423	0,336	0,276	-0,578	0,00967
GATEWAY INC	2,125	-0,00279	1,759	0,266	-0,964	0,00261	1,301	-0,105	0,036	-1,342	-0,894	0,0108
GENENTECH IN	0,688	0,0167	0,423	0,669	-0,923	0,019	0,167	0,152	-0,589	-1,516	0,259	0,0262
GENERAL DYN.	0,788	0,00955	0,852	-0,105	0,599	0,00892	0,92	0,0355	0,485	0,458	-0,00468	0,00684
GENERAL ELEC	1,137	-0,00147	1,222	-0,296	0,442	-0,00194	1,203	-0,335	0,474	-0,128	0,00271	-0,00137
GENERAL INSTI	1,488	0,0246	1,511	0,275	0,18	0,0249	1,374	-0,11	0,54	-1,013	-0,505	0,0253
GENERAL MILL	0,32	0,00761	0,363	-0,228	0,0524	0,00755	0,523	-0,0423	-0,284	0,653	0,422	0,00356
GENERAL MOT	0,772	-0,00985	0,829	-0,0467	0,63	-0,0105	0,621	-0,3	1,061	-0,885	-0,51	-0,00525
GENERAL RE C	0,853	0,00234	1	-0,443	0,393	-0,00117	0,933	-0,477	0,586	-0,0468	-0,398	-0,000722



Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
GENESCO INC	1.601	0.003	1.524	0.766	0.69	0.0023	1.598	1.152	0.676	1.179	-0.699	-0.0014
GENESIS WORL	-0.222	0.144	-0.76	0.448	-3.056	0.154	-1.185	0.856	-1.709	0.636	-3.552	0.159
GENON ENERG'	1.642	0.00778	1.633	0.0815	0.676	0.00427	1.096	-0.197	0.894	-1.683	0.581	0.0132
GENUINE PART	0.66	0.0041	0.692	0.0675	0.556	0.00352	0.85	0.218	0.209	0.549	0.514	-0.000211
GENWORTH FIN	2.225	-0.00659	1.98	0.126	1.178	-0.00214	1.434	-0.484	2.059	-3.809	-2.636	0.0119
GENZYME COR	0.9	0.014	0.814	-0.00308	-0.577	0.0161	0.937	0.00868	-0.885	0.152	0.624	0.0137
GEORGIA-PACII	1.392	0.00486	1.656	0.177	0.818	-0.00059	1.756	0.103	0.477	-0.0516	0.735	-0.00181
GERBER PRODU	0.907	0.0166	0.936	-1.284	-0.783	0.0209	1.128	-1.105	-1.197	0.724	1.307	0.0162
GIANT FOOD IN	0.506	0.00311	0.5	0.0591	0.00053	0.00332	0.419	0.141	0.425	0.587	-0.688	0.00136
GIDDINGS & LE	1.397	0.00343	1.497	0.778	0.679	0.000106	1.338	0.811	1.263	0.4	-1.055	-0.000989
GILEAD SCIENC	0.964	0.0152	0.782	0.724	-0.907	0.0166	0.801	0.569	-1.064	-0.414	0.67	0.0167
GILLETTE CO	0.705	0.0118	0.724	-0.44	-0.0696	0.0129	1.012	-0.192	-0.771	0.924	0.807	0.00704
GLOBAL CROSS	1.917	-0.00208	1.869	-0.313	-0.961	0.00118	1.269	-0.78	0.141	-1.632	-1.101	0.0144
GLOBAL PAYM	0.923	0.014	0.895	0.204	-0.199	0.0135	0.925	0.259	-0.106	0.335	-0.438	0.0127
GOLDEN WEST	0.769	0.0132	1.148	-0.129	1.055	0.00658	1.291	0.092	0.763	0.695	0.122	0.00329
GOLDMAN SAC	1.502	0.00219	1.48	0.115	0.068	0.00197	1.304	-0.0219	0.453	-0.491	-0.556	0.00625
GOODRICH COI	1.064	0.00832	1.113	0.0203	0.385	0.00713	1.155	0.114	0.354	0.275	-0.0902	0.00584
GOODYEAR TIF	1.733	-0.00471	1.747	0.49	1.256	-0.006	1.791	0.543	1.165	0.183	0.11	-0.0071
GPU INC	0.247	0.00892	0.527	-0.272	0.617	0.00502	0.765	-0.184	0.0469	0.421	0.893	0.000807
GRACE (W R) &	1.549	0.00849	1.507	0.598	0.769	0.0077	1.617	0.669	0.514	0.285	0.452	0.00532
GRAHAM HOLI	0.701	0.000651	0.718	0.143	0.533	0.000101	0.836	0.301	0.295	0.543	0.248	-0.00297
GRAINGER (W \	0.814	0.0068	0.84	-0.00879	0.314	0.00647	0.983	0.196	0.0326	0.697	0.258	0.00268
GREAT ATLAN!	1.254	-0.0134	1.162	0.796	0.188	-0.0151	1.051	0.941	0.604	0.247	-1.1	-0.0139
GREAT LAKES C	0.9	0.00113	1.043	0.0419	0.424	-0.0016	1.157	0.186	0.181	0.466	0.183	-0.00422
GREAT NORTHI	0.529	0.0144	1.288	1.766	3.157	0.0691	1.195	1.517	4.097	1.31	-0.603	0.075
GREAT WESTER	1.814	0.00537	2.099	0.264	1.232	-0.00105	2.054	0.466	1.575	0.975	-0.289	-0.00584
GRUMMAN COI	0.0842	0.0376	0.222	-0.102	0.529	0.0354	-0.0962	-0.289	1.492	-0.359	-2.167	0.0383
GTE CORP	0.635	0.00392	0.785	-0.463	0.3	0.00187	0.873	-0.238	-0.0113	0.601	0.439	0.000104
GUIDANT CORF	0.739	0.0218	0.666	0.086	-0.171	0.00229	0.543	-0.145	-0.00404	-0.605	0.203	0.0252
HALLIBURTON	1.452	-0.0005	1.475	0.127	0.584	-0.0011	1.499	0.0949	0.508	-0.0777	0.235	-0.00131
HANCOCK JOH	0.286	0.0225	0.607	-0.135	0.764	0.0161	0.633	-0.255	0.469	-0.0317	0.56	0.0136
HANDLEMAN C	1.607	0.0548	1.451	2.415	1.503	0.0464	1.138	2.454	2.356	-0.217	-1.84	0.0523
HANESBRANDS	1.614	0.000337	1.396	0.313	0.712	0.00503	1.367	0.402	0.997	0.754	-0.961	0.00428
HARCOURT BR	2.192	-0.0621	0.61	2.483	-4.897	-0.0992	0.191	2.047	-3.79	-0.282	-2.46	-0.0977
HARCOURT GEI	0.544	0.00688	0.664	0.14	0.3	0.00483	0.707	0.268	0.0852	0.407	0.104	0.00311
HARLAND JOH	0.369	0.00703	0.514	0.711	0.638	0.00192	0.56	0.857	0.589	0.401	-0.177	0.000531
HARLEY-DAVII	1.492	0.00481	1.479	0.354	0.61	0.00418	1.513	0.575	0.622	0.671	-0.447	0.00219
HARMAN INTEI	1.435	0.00869	1.359	1.053	0.686	0.00573	1.376	1.056	0.644	0.0232	0.0856	0.00543
HARTFORD FIN	1.599	0.00184	1.772	-0.515	1.396	0.00126	1.767	-0.546	1.393	-0.0854	0.0763	0.00148
HARTMARX CO	1.923	0.0251	2.05	1.392	2.526	0.0145	1.134	0.735	4.324	-2.534	-2.733	0.0346
HASBRO INC	0.969	0.00594	0.992	-0.0247	0.242	0.00569	1.051	0.0356	0.112	0.218	0.183	0.00426
HBO & CO	1.799	0.0253	1.544	0.539	-0.741	0.0311	1.582	0.496	-0.949	-0.352	0.324	0.0321
HCA HEALTHC.	0.683	0.00966	0.801	0.172	0.768	0.00767	0.951	0.436	0.398	0.853	0.247	0.0037
HEALTH MANA	1.232	0.0121	1.281	0.347	0.796	0.00837	1.513	0.692	0.532	1.03	-0.0112	0.00313
HEALTHPEAK I	0.517	0.00728	0.539	0.111	0.521	0.00674	0.586	0.125	0.404	0.0735	0.241	0.00583
HELMERICH &	1.167	0.00353	1.132	0.557	0.77	0.00274	1.118	0.582	0.817	0.0637	-0.155	0.00282
HENRY (JACK)	0.76	0.0221	0.644	0.617	-0.144	0.0222	0.773	0.665	-0.462	0.233	0.639	0.0196
HENRY SCHEIN	0.679	0.00832	0.611	0.458	0.185	0.00817	0.686	0.551	0.0362	0.307	0.125	0.00633
HERCULES INC	0.897	0.00535	1.082	0.106	0.723	0.00198	1.351	0.409	0.213	0.983	0.494	-0.0039
HERSHEY CO	0.0882	0.00563	0.12	-0.135	0.11	0.00552	0.214	-0.0535	-0.102	0.303	0.334	0.00334
HESS CORP	0.846	0.00269	0.878	0.0904	0.619	0.00205	0.928	0.18	0.53	0.296	0.0348	0.000616
HEWLETT PACI	1.197	-0.00518	1.101	0.0124	0.458	-0.000451	0.909	0.144	0.644	0.652	-0.787	0.000424
HEXION INC	0.683	-0.0134	0.529	0.318	-0.529	-0.0114	0.654	0.618	-0.585	1.627	1.061	-0.0195
HFS INC	0.976	0.0412	1.206	1.102	0.66	0.0362	1.466	1.376	0.0921	0.564	1.516	0.0304
HILLSHIRE BR	0.634	0.00718	0.73	-0.429	0.252	0.00677	0.977	-0.18	-0.199	0.861	0.539	0.00118
HILTON WORLI	0.978	0.00329	1.038	0.203	0.435	0.00249	1.109	0.455	0.222	0.779	-0.108	-0.000285
HOLIDAY CORI	1.855	-0.0225	2.024	0	0.714	-0.0163	2.024	0	0.714	0	0	-0.0163
HOLLYFRONTII	0.809	0.0112	0.716	0.738	0.414	0.0108	0.863	0.914	0.109	0.618	0.367	0.00712
HOLOGIC INC	1.339	0.00992	1.154	0.941	-0.332	0.0103	1.245	0.945	-0.571	0.0753	0.54	0.00865
HOME DEPOT II	1.051	0.0108	1.038	0.0497	-0.0616	0.0108	1.061	0.128	-0.0848	0.245	-0.0949	0.00993
HOMESTAKE M	0.133	0.0000284	0.117	0.239	0.00974	-0.0000892	0.0658	0.177	0.162	-0.217	-0.149	0.00121
HONEYWELL IN	1.015	0.00843	1.074	0.295	0.3	0.00828	1.262	0.398	-0.114	0.376	0.872	0.00566
HONEYWELL IN	1.114	0.00589	1.204	-0.317	0.47	0.0054	1.341	-0.261	0.135	0.258	0.663	0.00263
HORMEL FOOD	0.378	0.00958	0.403	-0.139	0.0181	0.00955	0.526	-0.00854	-0.245	0.467	0.358	0.00657
HOSPIRA INC	0.757	0.00738	0.826	-0.167	-0.158	0.00715	0.704	-0.21	0.119	-0.413	-1.11	0.00902
HOST HOTELS &	1.365	0.000112	1.348	0.624	1.152	-0.00107	1.45	0.78	0.955	0.526	0.158	-0.00385
HOWMET AERC	1.69	-0.0103	2.011	-1.573	0.658	-0.0113	1.772	-1.592	1.108	0.189	-1.412	-0.00959
HP INC	1.386	0.00258	1.274	0.52	-0.301	0.00291	1.18	0.324	-0.145	-0.64	0.0149	0.00579
HSBC FINANCE	1.169	0.00857	1.534	0.0405	1.01	0.00304	1.567	0.276	1.01	0.622	-0.449	0.00139
HSBC USA INC	1.179	0.00488	1.361	0.082	0.67	0.00324	1.643	0.208	0.0421	0.428	1.331	-0.000573

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Company Na	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	s (FF3)	h (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	s (FF5)	h (FF5)	r (FF5)	c (FF5)	$\alpha$ (FF5)
HUDSON C	0,555	0,0107	0,562	0,213	0,65	0,00841	0,543	0,103	0,587	-0,204	0,346	0,00867
HUMANA I	0,916	0,0128	0,96	-0,0252	0,66	0,0123	1,088	0,0885	0,393	0,414	0,358	0,00949
HUNT (JB)	1,086	0,00825	1,08	0,188	0,34	0,00791	1,06	0,342	0,463	0,436	-0,575	0,0073
HUNTINGT	1,077	0,00199	1,138	0,238	1,303	0,000636	1,038	0,258	1,575	-0,00949	-0,664	0,00227
HUNTINGT	1,248	0,00616	1,25	-0,0838	0,146	0,00669	1,278	-0,213	0,122	-0,557	0,209	0,00734
IAC/INTER	1,126	0,0177	1,094	0,19	-0,00425	0,0177	1,035	0,0235	0,0433	-0,501	0,238	0,0193
IDEX CORP	1,081	0,008	1,048	0,352	0,348	0,00764	1,213	0,578	0,0178	0,774	0,332	0,00333
IDEXX LAB	0,844	0,0175	0,651	1,011	-0,425	0,018	0,538	0,856	-0,219	-0,513	-0,174	0,0207
IHEARTME	1,455	0,0166	1,482	0,261	0,913	0,0157	1,222	0,162	1,552	-0,469	-1,281	0,0209
IHS MARKI	0,696	0,0122	0,776	0,194	-0,652	0,00945	0,766	0,23	-0,546	0,3	-0,367	0,00906
IKON OFFI	1,001	0,00864	0,969	0,795	0,213	0,0066	0,791	0,941	0,764	0,197	-1,377	0,00839
ILLINOIS T	0,975	0,00676	1,01	-0,0477	0,336	0,00641	1,084	0,0881	0,203	0,449	0,0491	0,00424
ILLUMINA	1,398	0,0196	1,076	1,818	-1,645	0,0187	0,5	1,434	-0,868	-2,134	-0,507	0,0324
IMMUNEX	1,994	0,0281	1,423	0,964	-1,27	0,0352	1,914	0,643	-2,198	-0,491	2,362	0,0304
IMS HEALT	0,833	0,00535	0,905	-0,228	0,288	0,00478	1,161	-0,0293	-0,166	0,648	0,539	0,00047
INCO LTD	1,041	0,0029	1,247	0,321	0,696	-0,00213	1,281	0,295	0,579	-0,0202	0,256	-0,00256
INCYTE CC	1,841	0,0193	1,333	2,479	-1,557	0,0207	1,077	1,588	-1,396	-2,601	1,626	0,0292
INGERSOLI	0,976	0,0153	0,933	0,544	0,74	0,0147	1,104	0,616	0,352	0,336	0,695	0,0108
INGEVITY	2,334	-0,000648	1,949	0,762	0,619	0,0112	1,731	1,462	-0,0157	3,059	1,103	0,00863
INTEGRYS	0,356	0,00764	0,436	-0,0319	0,6	0,00591	0,569	0,0411	0,303	0,309	0,51	0,0032
INTEL COR	1,301	0,00928	1,281	-0,112	-0,506	0,00981	1,176	-0,223	-0,283	-0,396	-0,303	0,0123
INTERCON	0,905	0,0138	0,927	-0,0682	-0,0271	0,0135	0,797	-0,137	0,315	-0,35	-1,112	0,0163
INTERGRA	0,937	0,00761	0,939	0,69	0,219	0,00512	0,758	0,614	0,701	-0,395	-0,733	0,00834
INTERLAK	1,276	-0,0035	0,943	0,408	-1,09	0,00334	0,994	0,351	-1,384	-0,573	0,471	0,00487
INTERPUB	1,356	0,000182	1,363	0,159	0,439	-0,00027	1,434	0,198	0,27	0,164	0,313	-0,00176
INTL BUSI	0,964	0,00308	0,999	-0,294	-0,202	0,00328	0,941	-0,344	-0,0733	-0,187	-0,2	0,00461
INTL FLAV	0,767	0,00384	0,846	-0,326	0,297	0,00353	0,93	-0,145	0,158	0,587	-0,0241	0,000912
INTL GAM	1,068	0,0129	1,08	0,597	0,795	0,00988	1,184	0,903	0,791	0,87	-0,479	0,00668
INTL PAPE	1,278	-0,00116	1,358	-0,0422	0,938	-0,00214	1,421	0,0611	0,822	0,345	0,0708	-0,00388
INTUIT INC	1,195	0,0142	1,143	-0,0166	-0,898	0,0148	1,084	0,0261	-0,719	0,0662	-0,498	0,0159
INTUITIVE	1,135	0,0255	0,905	1,144	-0,344	0,0239	0,875	1,274	0,126	0,617	-1,634	0,0244
INVESCO L	1,711	-0,00279	1,731	0,00742	0,368	-0,00297	1,631	-0,211	0,502	-0,669	0,186	-0,000134
IPG PHOTO	1,626	0,00908	1,508	0,734	-0,268	0,00906	1,396	0,77	0,211	0,441	-1,561	0,01
IQVIA HOL	1,196	0,00579	1,078	0,663	-0,398	0,00582	1,001	0,66	-0,223	0,112	-0,585	0,00576
IRON MOU	0,695	0,00832	0,7	0,0512	0,231	0,0082	0,778	0,146	0,0751	0,311	0,139	0,00629
ITT CORPO	0,578	0,0094	0,618	-0,132	0,141	0,00741	0,903	0,0784	-0,334	0,182	1,282	0,00336
ITT INC	1,009	0,00614	1,067	-0,0333	0,675	0,00544	1,185	0,206	0,477	0,782	0,00198	0,00187
JABIL INC	1,992	0,0114	1,868	0,548	-0,524	0,0117	1,631	0,532	0,0839	-0,239	-1,346	0,0163
JACOBS EN	1,035	0,00816	1,034	0,129	0,271	0,00788	1,142	0,307	0,0704	0,593	0,126	0,00487
JANUS CAF	2,217	-0,0058	2,16	0,364	0,399	-0,00815	2,031	0,323	0,661	-0,269	-0,452	-0,00545
JBG SMITH	0,645	-0,00643	0,467	0,211	0,539	0,00386	0,729	0,192	0,225	-0,738	1,324	0,00317
JEFFERIES	1,044	0,00518	1,062	0,3	0,891	0,00426	1,068	0,376	0,909	0,228	-0,186	0,00367
JEFFERSON	0,549	0,0107	0,826	-0,301	0,714	0,00675	0,904	-0,174	0,559	0,39	0,0496	0,00488
JOHNSON	0,566	0,00798	0,66	-0,561	-0,0297	0,00799	0,828	-0,357	-0,38	0,714	0,418	0,00374
JOHNSON C	1,137	0,00467	1,141	0,232	0,56	0,0041	1,126	0,316	0,639	0,236	-0,341	0,00384
JONES GRC	1,78	0,00399	1,844	0,657	1,246	-0,00207	1,79	1,041	1,795	0,796	-1,75	-0,00165
JOSTENS IN	0,841	0,00989	0,916	0,209	0,254	0,00825	1,22	0,428	-0,497	0,847	0,000982	
JOY GLOB	1,578	-0,00419	1,489	0,711	0,156	-0,00526	1,308	0,542	0,501	-0,605	-0,469	-0,00126
JPMORGAN	1,272	0,00459	1,312	0,138	0,817	0,00375	1,064	-0,113	1,355	-0,909	-0,759	0,0097
JUNIPER N	2,073	0,00606	1,88	0,843	-1,682	0,00424	1,428	-0,217	-1,044	-2,795	0,948	0,0174
KANSAS CI	1,052	0,0128	1,027	0,297	0,326	0,0124	1,075	0,379	0,236	0,272	0,0537	0,0111
KATE SPA	1,556	0,00222	1,545	0,567	0,611	0,0000311	1,759	0,964	0,383	1,214	-0,132	-0,00558
KB HOME	1,6	0,00354	1,533	0,762	0,803	0,00273	1,589	1,01	0,77	0,765	-0,394	0,000184
KELLOGG C	0,363	0,00534	0,387	-0,0885	0,117	0,00521	0,523	0,109	-0,148	0,672	0,236	0,00159
KERR-MCG	0,713	0,00657	0,951	0,00232	0,686	0,00215	0,911	0,0711	0,84	0,117	-0,403	0,00249
KEURIG DF	0,674	0,0272	0,605	0,4	-0,0262	0,0273	0,758	0,533	-0,354	0,482	0,421	0,0236
KEYCORP	0,897	0,00153	0,994	-0,0688	1,095	0,000389	1,013	-0,0161	1,068	0,167	-0,0391	-0,00028
KEYSIGHT	1,123	0,0122	1,03	0,66	-0,545	0,00993	0,907	0,68	-0,316	0,206	-0,803	0,0101
KEYSPAN C	0,292	0,00867	0,562	-0,305	0,705	0,0049	0,703	-0,217	0,341	0,377	0,497	0,0023
KIMBERLY	0,412	0,00707	0,518	-0,496	0,272	0,00677	0,726	-0,318	-0,195	0,665	0,734	0,00198
KIMCO RE	0,89	0,00358	0,88	0,439	0,897	0,00219	0,902	0,515	0,885	0,225	-0,12	0,00149
KINDER M	0,566	0,00704	0,617	0,308	0,546	0,00586	0,742	0,266	0,2	-0,0352	0,839	0,00403
KING PHAF	0,768	0,0183	0,716	0,226	-0,124	0,0176	1,008	0,268	-0,782	0,443	1,147	0,0116
KING WOR	0,836	0,00486	0,862	-0,0146	0,085	0,00457	0,982	-0,0631	-0,278	-0,467	0,785	0,00406
KLA CORP	1,948	0,00985	1,792	0,6	-0,694	0,0106	1,754	0,57	-0,609	-0,112	-0,138	0,0114
KNIGHT-RI	0,739	0,00295	0,898	-0,0532	0,445	0,000146	1,028	0,0751	0,141	0,459	0,312	-0,00246
KOHL'S CO	1,06	0,00592	1,066	0,164	0,543	0,00531	1,079	0,328	0,621	0,463	-0,513	0,00451
KONTOOR	0,904	-0,0376	0,296	-1,233	2,737	0,0259	-0,0242	-2,423	3,73	1,379	-2,649	0,0317
KRAFT FOC	0,295	0,0208	0,14	0,862	-0,0164	0,0231	0,17	1,311	-0,0719	1,301	0,114	0,0256
KRAFT HEI	0,529	0,00242	0,6	-0,27	0,305	0,00204	0,82	-0,0513	-0,157	0,8	0,643	-0,00338

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$a$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$a$ (FF5)
KROGER CO	0,551	0,00784	0,605	-0,229	0,198	0,00763	0,829	-0,0394	-0,306	0,71	0,797	0,00249
L BRANDS INC	1,289	0,00298	1,254	0,334	0,284	0,00269	1,263	0,568	0,37	0,691	-0,643	0,00108
L3 TECHNOLOG	0,673	0,0117	0,718	0,0346	0,563	0,0111	0,84	0,148	0,328	0,389	0,251	0,00851
L3HARRIS TECH	0,92	0,00855	0,838	0,471	-0,0245	0,00859	0,9	0,616	-0,12	0,466	-0,0539	0,0066
LABORATORY I	0,663	0,00629	0,599	0,459	0,189	0,00611	0,701	0,635	0,00383	0,585	0,0928	0,00322
LAIDLAW INTE	0,544	-0,0107	0,333	0,402	-0,5	-0,00828	0,00077	0,282	0,406	-0,68	-1,423	-0,00243
LAM RESEARCH	2,002	0,0141	1,801	0,798	-0,842	0,015	1,451	0,582	-0,0208	-0,876	-1,478	0,0225
LAMB WESTON	0,714	0,0104	0,745	-0,758	0,902	0,0163	0,555	-0,699	1,175	0,312	-1,008	0,0167
LAS VEGAS SA	2,648	-0,000553	2,363	0,569	0,764	0,00367	2,188	0,457	1,181	-0,678	-1,386	0,00716
LAUDER (ESTE	0,607	0,0068	0,628	-0,0959	0,0742	0,00677	0,739	0,0623	-0,135	0,506	0,115	0,00399
LEGG MASON II	1,336	0,00533	1,289	0,356	0,173	0,00516	1,281	0,346	0,19	-0,0364	-0,019	0,00538
LEGGETT & PL	1,093	0,00461	1,099	0,292	0,716	0,00387	1,239	0,523	0,455	0,772	0,164	-0,000382
LEHMAN BROT	1,829	0,000807	2,027	-0,0828	1,523	-0,00336	1,363	-0,766	2,587	-2,22	-0,736	0,012
LEIDOS HOLDI	0,745	0,00459	0,76	0,27	-0,389	0,00291	0,752	0,289	-0,32	0,17	-0,228	0,00271
LENNAR CORP	1,296	0,00659	1,279	0,464	0,804	0,00577	1,321	0,641	0,778	0,548	-0,277	0,00394
LEVEL 3 COMM	1,686	0,00817	1,732	-0,795	-0,973	0,0114	1,328	-1,455	-0,511	-1,8	0,361	0,0192
LEXMARK INTL	1,266	0,00682	1,163	0,608	-0,0842	0,00625	1,074	0,442	-0,00376	-0,464	0,161	0,00812
LIFE TECHNOL	0,997	0,0187	0,649	1,629	-0,916	0,0138	0,624	1,445	-1,04	-0,354	0,637	0,0136
LILLY (ELI) & C	0,531	0,00757	0,595	-0,429	-0,124	0,00769	0,762	-0,33	-0,518	0,407	0,717	0,00412
LIN BROADCAST	1,502	-0,0012	1,526	0,0913	0,185	-0,00182	1,156	-0,281	1,047	-1,372	-2,588	0,00641
LINCOLN NATI	1,345	0,00756	1,448	0,177	1,717	0,00578	1,621	0,244	1,291	0,317	0,85	0,0023
LINDE PLC	0,83	0,00772	0,894	-0,25	0,337	0,00736	1,009	-0,111	0,131	0,477	0,183	0,00471
LINEAR TECHN	1,513	0,0111	1,448	-0,0575	-0,607	0,013	1,374	-0,177	-0,512	-0,377	-0,0159	0,0148
LITTON INDUS	0,519	0,0114	1,067	-0,284	1,224	0,00328	1,043	-0,0487	1,067	0,665	-0,235	0,00197
LIVE NATION E	1,584	0,00533	1,26	0,924	0,504	0,00951	1,045	0,731	0,919	-1,213	-1,307	0,0154
LKQ CORP	1,095	0,00846	0,981	0,52	-0,109	0,00894	1,004	0,63	0,00549	0,679	-0,493	0,00699
LOCKHEED MA	0,538	0,0109	0,584	-0,0442	0,505	0,0104	0,677	0,204	0,375	0,789	-0,173	0,00718
LOEWS CORP	0,775	0,00115	0,871	-0,208	0,789	0,000319	0,926	-0,0919	0,699	0,378	-0,0124	-0,00137
LONE STAR IN	0,738	0,0565	1,354	0,717	2,565	0,0503	1,802	1,002	1,652	1,219	2,068	0,0431
LONGS DRUG S	0,374	0,0101	0,583	0,0695	0,799	0,00641	0,927	0,35	0,0828	0,991	0,956	-0,000422
LORAL CORP	0,753	0,024	0,845	-0,631	-0,0151	0,0242	0,909	-0,68	-0,326	-0,438	0,391	0,0253
LORILLARD IN	0,565	0,0159	0,625	-0,275	-0,0246	0,0164	0,764	-0,21	-0,125	0,498	0,213	0,0137
LOTUS DEVELC	2,331	0,0145	1,829	2,288	-0,785	0,0169	1,58	2,311	0,0285	0,464	-1,438	0,0161
LOUISIANA LA	0,504	0,00584	0,65	-0,236	0,521	0,00271	0,81	-0,401	-0,207	-0,987	1,093	0,00684
LOUISIANA-PA	1,759	0,000458	1,695	0,804	0,944	-0,000503	1,637	0,74	1,068	-0,228	-0,162	0,000923
LOWE'S COS IN	1,198	0,0115	1,172	0,231	0,177	0,0113	1,21	0,434	0,172	0,617	-0,371	0,00939
LSI CORP	2,077	0,00631	1,812	1,056	-0,88	0,00814	1,432	0,769	-0,104	-1,081	-1,162	0,0165
LUBYS INC	0,996	-0,00591	0,959	0,645	0,94	-0,00687	0,954	0,683	0,972	0,106	-0,145	-0,007
LUCENT TECHN	2,347	-0,00301	2,05	-0,506	-0,885	0,0053	2,098	-0,91	-1,323	-0,689	1,536	0,00453
LYONDELLBAS	1,588	0,00218	1,374	0,409	0,689	0,00836	1,333	0,325	0,881	-0,337	-0,512	0,00975
M & T BANK CC	0,739	0,00691	0,828	-0,0305	1,079	0,00579	0,77	0,0156	1,253	0,0942	-0,487	0,00652
M/A-COM INC	1,896	0,0101	1,976	-0,497	0,0333	0,00998	2,146	-0,805	-0,822	-1,993	0,687	0,0178
MACERICH CO	1,216	0,00305	1,132	0,99	1,41	0,00258	1,216	1,239	1,321	0,731	-0,355	-0,0000113
MACY'S INC	1,33	-0,0014	1,278	0,605	0,813	-0,00256	1,386	0,859	0,709	0,797	-0,278	-0,00534
MALLINCKROE	0,935	0,00551	0,905	0,135	-0,0431	0,00604	0,957	0,527	-0,465	1,063	0,127	0,00318
MALLINCKROE	3,025	-0,0364	2,793	1,502	-1,143	-0,0383	2,737	1,426	-0,925	-0,152	-0,599	-0,038
MANITOWOC C	1,813	0,00423	1,756	0,806	1,035	0,00317	1,846	0,967	0,874	0,532	0,0641	0,000597
MANOR CARE I	0,798	0,0148	1,304	0,0317	1,426	0,00476	1,622	0,485	0,99	1,295	0,0309	-0,000653
MANOR CARE I	1,273	0,00781	1,091	0,084	-0,718	0,012	1,064	-0,0061	-0,766	-0,385	-0,051	0,0139
MANUFACTURI	1,81	-0,0058	1,602	0,835	-0,36	-0,00864	1,55	0,33	0,24	-1,91	-1,591	0,00372
MARATHON OI	1,371	-0,00139	1,389	0,316	0,986	-0,00285	1,473	0,538	0,899	0,671	-0,226	-0,00534
MARATHON PE	2,143	-0,00575	1,936	0,224	1,006	0,0013	1,851	0,266	1,235	0,325	-0,765	0,00179
MARKETAXESS	0,786	0,0176	0,744	0,481	-0,428	0,0167	0,772	0,522	-0,451	0,285	0,056	0,0158
MARRIOTT INT	1,165	0,00672	1,2	0,0698	0,813	0,00632	1,233	0,188	0,794	0,344	-0,221	0,00521
MARSH & MCLI	0,853	0,00478	0,979	-0,567	0,372	0,00438	0,981	-0,5	0,398	0,197	-0,186	0,00393
MARSHALL & I	0,968	0,00451	1,167	-0,0753	1,272	0,000409	1,025	-0,122	1,601	-0,26	-0,603	0,00321
MARTIN MARIE	0,94	0,0119	0,899	-0,15	-0,293	0,0129	0,542	-0,303	0,658	-0,426	-2,275	0,0168
MARTIN MARIE	0,888	0,00526	0,935	-0,0462	0,67	0,00493	1,025	0,0323	0,48	0,283	0,253	0,00286
MASCO CORP	1,392	0,00152	1,435	0,174	0,943	0,000542	1,547	0,377	0,743	0,67	0,0755	-0,00269
MASSEY ENERC	1,863	0,027	1,704	0,991	-0,43	0,0222	2,094	1,152	-0,641	1,183	-0,147	0,0155
MASTERCARD I	0,9	0,019	1,052	-0,223	-0,501	0,0159	1,084	-0,144	-0,463	0,584	-0,154	0,0143
MATTEL INC	0,776	0,00283	0,787	0,251	0,686	0,00212	1,015	0,533	0,216	0,983	0,547	-0,00366
MAXIM INTEGR	1,547	0,0102	1,461	0,175	-0,728	0,011	1,389	0,014	-0,611	-0,52	0,036	0,0133
MAXUS ENERG	0,747	-0,00856	1,253	-1,172	1,587	-0,0141	1,594	-0,983	0,715	0,58	2,161	-0,018
MAY DEPARTM	0,75	0,00612	1,022	0,0906	0,811	0,000867	1,174	0,328	0,513	0,726	0,117	-0,00282
MAYTAG CORP	1,091	0,00254	1,354	-0,0067	0,763	-0,00223	1,507	0,169	0,419	0,592	0,302	-0,00555
MBIA INC	1,41	0,00156	1,52	0,0226	1,47	0,0000282	1,634	0,112	1,213	0,342	0,419	-0,00253
MBNA CORP	1,419	0,0142	1,758	-0,123	0,897	0,00764	1,829	0,00145	0,816	0,341	-0,0617	0,00602
MCA INC	0,71	0,0214	0,969	-1,481	-0,777	0,00566	1,026	-1,296	-1,006	0,369	0,597	0,00376
MCAFFEE INC	1,498	0,021	1,331	-0,0751	-1,281	0,0265	1,27	0,0261	-1,023	0,16	-0,712	0,0277

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$a$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$a$ (FF5)
MCCA W CELLU	2.485	0.00175	2.453	0.761	0.384	-0.0000756	2.267	0.324	0.5	-2.237	-1.562	0.0117
MCCORMICK &	0.367	0.00836	0.383	-0.0767	0.0341	0.00832	0.581	0.14	-0.387	0.771	0.558	0.00348
MCDERMOTT II	1.323	-0.00228	1.232	0.812	0.612	-0.00289	1.189	0.772	0.708	-0.147	-0.143	-0.00188
MCDONALD'S C	0.659	0.00755	0.759	-0.491	0.222	0.00731	0.877	-0.381	-0.0369	0.404	0.385	0.00455
MCDONNELL D	0.433	0.0252	0.396	0.228	-0.0771	0.0257	0.556	0.22	-0.633	-0.293	1.045	0.0263
MCI COMMUNI	1.139	0.00403	1.226	-0.0638	0.332	0.00202	1.518	0.273	-0.156	1.038	1.444	-0.00455
MCI INC	1.86	-0.00379	1.755	0.179	-0.25	-0.00257	1.44	-0.73	0.137	-2.494	0.926	0.00679
MCKESSON COI	0.667	0.01	0.683	-0.0602	0.0634	0.00993	0.765	0.0558	-0.101	0.397	0.158	0.00775
MEAD CORP	1.043	0.00324	1.393	-0.109	0.817	-0.00213	1.374	0.0758	0.737	0.519	-0.261	-0.00357
MEAD JOHNSON	0.849	0.00393	1.067	-0.391	-0.537	0.00175	1.159	-0.328	-0.785	0.513	0.808	-0.0007
MEADWESTVA	1.142	0.00241	1.224	-0.0435	0.594	0.00787	1.4	0.0625	0.209	0.435	0.637	-0.00282
MEDCO HEALT	0.932	0.0213	1.01	-0.0572	-0.628	0.0219	1.001	-0.0926	-0.704	-0.24	0.119	0.023
MEDIAONE GRC	0.909	0.0142	0.952	-0.0137	0.103	0.0138	0.562	-0.432	1.262	-1.321	-1.503	0.0195
MEDIMMUNE II	1.448	0.0262	0.914	0.095	-1.476	0.0368	0.829	-0.14	-1.474	-0.569	0.377	0.0386
MEDTRONIC PI	0.757	0.00908	0.776	-0.154	-0.0975	0.00918	0.825	-0.0833	-0.193	0.241	0.086	0.00788
MELLON FINAN	1.019	0.00959	1.273	-0.201	0.689	0.0057	1.28	-0.243	0.643	-0.0926	0.161	0.00577
MERCANTILE B	0.97	0.00843	1.172	0.279	0.872	0.00617	1.031	0.261	1.319	0.251	-0.855	0.00673
MERCANTILE S	0.973	0.0031	0.881	0.345	-0.215	0.00542	0.841	0.409	0.00927	0.362	-0.326	0.00394
MERCK & CO	0.559	0.00655	0.699	-0.838	-0.0335	0.00656	0.897	-0.753	-0.516	0.386	0.947	0.00253
MERCURY INTE	2.079	0.0195	1.491	0.288	-1.52	0.0297	1.261	-0.395	-1.519	-1.619	1.373	0.0337
MEREDITH COF	0.716	0.00413	0.672	0.47	0.458	0.00366	0.714	0.542	0.38	0.242	0.0422	0.00246
MERRILL LYN	1.287	0.00531	1.368	-0.142	0.272	0.00449	1.345	-0.182	0.303	-0.118	0.00593	0.00507
METLIFE INC	1.275	0.00349	1.247	0.133	1.064	0.00229	1.267	0.15	1.042	0.0854	-0.00675	0.0018
METROPCS COI	0.932	-0.00401	0.957	1.006	-1.012	-0.00796	1.2	0.984	-0.851	1.378	-0.0122	-0.0144
METTLER-TOLE	1.114	0.0111	1.076	0.159	-0.194	0.011	1.193	0.149	-0.492	0.0907	0.679	0.00871
MEYER (FRED)	1.025	0.00951	1.039	0.136	0.107	0.0095	1.142	0.316	0.0883	1.021	0.264	0.00555
MGIC INVESTM	1.9	-0.0000493	1.946	0.372	1.549	-0.00235	2.136	0.478	1.112	0.443	0.793	-0.00632
MGM RESORTS	1.801	0.00466	1.756	0.917	1.426	0.0032	1.753	1.132	1.532	0.628	-0.653	0.0019
MICROCHIP TE	1.381	0.0147	1.261	0.621	-0.251	0.0149	1.093	0.51	0.124	-0.439	-0.609	0.0185
MICRON TECH	1.766	0.0124	1.613	0.644	-0.565	0.013	1.332	0.443	0.0816	-0.782	-1.104	0.0192
MICROSOFT CO	1.149	0.0133	1.152	-0.337	-0.707	0.0141	1	-0.247	-0.264	0.158	-1.188	0.0162
MID-AMERICA	0.563	0.00843	0.536	0.29	0.366	0.00829	0.545	0.298	0.347	0.0302	0.0224	0.00809
MILACRON INC	1.575	0.00859	1.64	0.474	1.018	0.00453	1.664	0.728	1.181	0.653	-0.747	0.00308
MILLIPORE COI	0.881	0.01	0.793	0.468	-0.177	0.00989	0.927	0.497	-0.487	0.184	0.605	0.00761
MOBIL CORP	0.824	0.0127	0.702	-0.356	-0.548	0.0133	-0.0963	-0.816	1.284	-1.566	-3.84	0.024
MOHAWK INDU	1.492	0.00457	1.439	0.64	0.893	0.00357	1.57	0.943	0.76	0.951	-0.323	0.000125
MOLEX INC	1.434	0.00383	1.401	0.156	-0.0728	0.00386	1.425	0.209	-0.0886	0.155	-0.0508	0.00319
MOLSON COOR	0.429	0.00749	0.486	-0.213	0.266	0.0072	0.59	-0.0986	0.0472	0.406	0.287	0.00467
MONDELEZ INT	0.518	0.00474	0.6	-0.501	0.232	0.00544	0.72	-0.436	0.0629	0.466	0.34	0.00261
MONEYGRAM I	1.283	-0.00338	1.207	0.635	0.408	-0.00379	1.284	0.812	0.287	0.571	-0.057	-0.00625
MONSANTO CO	0.896	0.0114	0.899	-0.0159	0.142	0.0111	0.856	-0.0562	0.128	-0.18	0.143	0.0119
MONSTER BEVI	0.759	0.0259	0.704	0.226	-0.236	0.0261	0.704	0.415	-0.128	0.53	-0.604	0.0249
MONSTER WOR	2.328	0.000922	2.211	0.671	-0.119	0.0000579	1.929	0.4	0.387	-0.889	-0.495	0.00556
MOODY'S CORP	0.997	0.0122	0.965	0.158	-0.00579	0.012	1.043	0.242	-0.00372	0.468	-0.316	0.01
MOORE WALLA	0.815	0.00237	0.979	0.465	0.571	-0.00174	1.042	0.502	0.411	0.157	0.219	-0.00321
MORGAN (J P) &	1.091	0.00705	1.406	-0.455	0.696	0.00247	1.455	-0.488	0.608	-0.0473	0.23	0.00189
MORGAN STAN	1.562	0.00405	1.593	-0.192	-0.0126	0.00405	1.393	-0.37	0.431	-0.659	-0.682	0.00869
MORRISON KNI	0.905	-0.042	0.626	1.138	-0.34	-0.0392	0.569	1.156	-0.104	0.204	-0.389	-0.0398
MORTON INTEF	0.633	0.0114	0.732	-0.0564	0.354	0.00967	0.997	-0.0538	-0.519	-0.525	1.618	0.00915
MOSAIC CO	1.358	-0.00218	1.316	0.131	0.0473	-0.00175	1.308	0.204	0.222	0.579	-0.648	-0.0028
MOTOROLA MC	-0.973	0.0365	0.581	-4.162	-2.665	0.0058	0.723	-4.532	-7.673	-2.229	4.72	-0.0125
MOTOROLA SO	1.245	0.00287	1.133	0.539	-0.264	0.00316	1.026	0.409	-0.0438	-0.455	-0.26	0.00586
MSCI INC	1.117	0.0129	1.229	0.312	-0.916	0.00851	1.156	0.294	-0.691	-0.0481	-0.735	0.00987
MURPHY OIL C	1.153	0.00192	1.155	0.405	0.909	0.000982	1.288	0.569	0.636	0.572	0.316	-0.00238
MYLAN NV	0.83	0.00452	0.833	0.0562	0.155	0.00436	0.898	0.232	0.0646	0.56	-0.126	0.00211
NABISCO GROU	0.551	0.00351	0.827	-0.227	0.608	-0.00145	1.19	0.308	-0.472	1.58	1.154	-0.00854
NABORS INDUS	1.739	0.00118	1.637	0.946	0.757	0.000414	1.61	0.963	0.838	0.0314	-0.217	0.000789
NACCO INDUSI	0.764	0.00129	0.726	0.574	0.77	0.000505	0.74	0.603	0.745	0.0932	0.0026	0.0000742
NALCO CHEMIC	0.904	0.00241	0.894	0.213	0.0296	0.00281	0.955	0.349	-0.081	0.629	0.203	0.00146
NASDAQ INC	0.866	0.0101	0.822	0.241	-0.0958	0.01	0.716	0.124	0.0484	-0.635	-0.38	0.0123
NATIONAL CIT	0.588	-0.0000514	0.747	-0.204	0.553	-0.00183	0.891	-0.0899	0.269	0.397	0.397	-0.00469
NATIONAL EDU	1.98	0.00673	1.889	0.957	0.07	0.00814	1.46	0.843	1.354	-0.014	-2.709	0.0111
NATIONAL OIL	1.56	0.00381	1.435	0.803	0.223	0.00357	1.467	0.959	0.21	0.419	-0.322	0.00247
NATIONAL SEM	1.617	0.0126	1.305	1.615	-0.554	0.0118	1.257	1.364	-0.635	-0.673	0.586	0.0142
NATIONAL SER	0.77	0.000103	1.153	0.0433	1.058	-0.00571	1.377	-0.0064	0.418	0.111	1.247	-0.0104
NAVIENT CORP	1.121	0.000477	1.178	-0.152	0.399	0.0000575	1.363	0.0757	0.0161	0.794	0.449	-0.00463
NEKTAR THER	1.448	0.0133	1.16	1.41	-0.829	0.014	1.042	0.84	-0.819	-1.609	1.248	0.0185
NETAPP INC	1.969	0.0121	1.646	1.431	-1.278	0.0126	1.448	0.85	-1.051	-1.685	0.8	0.0186
NETFLIX INC	1.091	0.034	1.014	0.928	-0.907	0.0319	0.6	0.534	-0.384	-2.311	-1.333	0.0411
NEW CENTURY	0.0587	0.00991	0.343	-0.121	0.812	0.00639	0.478	0.0614	0.431	0.538	0.62	0.00399

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$a$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$a$ (FF5)
NEW YORK TIM	0,613	0,00136	0,586	0,259	0,22	0,00114	0,582	0,301	0,25	0,119	-0,149	0,000957
NEWELL BRAN	1,019	0,000478	1,069	-0,0701	0,49	-0,000336	1,166	0,101	0,314	0,567	0,08	-0,00281
NEWFIELD EXP	1,089	0,00395	1,065	0,485	0,471	0,00273	1,167	0,675	0,375	0,556	-0,158	0,000306
NEWMARKET C	1,227	0,00578	1,183	0,208	-0,118	0,0059	1,31	0,315	-0,405	0,401	0,457	0,00299
NEWMONT COF	0,361	0,00594	0,321	0,236	-0,00327	0,00595	0,378	0,293	-0,127	0,207	0,175	0,00459
NEWS CORP	1,437	-0,0116	1,5	-0,292	0,108	-0,0122	1,454	-0,153	0,0492	0,509	-0,0342	-0,0127
NEXTEL COMM	2,222	0,0111	1,662	0,194	-1,449	0,0229	1,189	0,0587	-0,302	-0,855	-1,758	0,0306
NEXTERA ENEF	0,281	0,01	0,362	-0,351	0,281	0,00973	0,501	-0,304	-0,0634	0,235	0,702	0,00698
NIAGARA MOH	0,28	0,00397	0,501	-0,107	0,507	0,000641	0,477	0,0323	0,468	0,384	-0,237	-0,000285
NICOR INC	0,328	0,00759	0,419	-0,144	0,514	0,00621	0,577	-0,0843	0,147	0,311	0,659	0,00292
NIELSEN HOLD	0,913	-0,00134	0,86	0,396	0,0649	-0,00118	0,767	0,153	0,266	-0,705	0,144	0,00123
NIKE INC -CL E	0,59	0,00926	0,623	-0,186	0,00871	0,00925	0,737	0,0917	-0,162	0,892	-0,134	0,00551
NISOURCE INC	0,385	0,00791	0,512	-0,482	0,582	0,00729	0,638	-0,413	0,282	0,289	0,557	0,00464
NL INDUSTRIES	0,972	0,0036	0,911	0,802	0,973	0,00261	1,025	0,88	0,708	0,309	0,458	0,000106
NOBLE CORP P	1,336	-0,00687	1,256	0,727	0,555	-0,00743	1,254	0,654	0,527	-0,216	0,204	-0,00693
NOBLE ENERGY	1,061	0,00193	1,101	0,119	0,774	0,00113	1,181	0,24	0,621	0,41	0,123	-0,00104
NORAM ENERG	0,752	-0,00515	0,765	0,0862	0,0763	-0,00549	0,633	-0,282	0,192	-1,302	-0,834	0,00236
NORDSTROM IN	1,437	0,000563	1,424	0,399	0,698	-0,000152	1,467	0,657	0,704	0,787	-0,505	-0,00253
NORFOLK SOUT	0,878	0,00636	0,939	-0,0584	0,667	0,00567	0,988	0,152	0,636	0,649	-0,327	0,0035
NORTEL NETWORKS	2,327	-0,0167	2,435	-0,486	0,299	-0,0172	1,836	-1,456	1,068	-3,019	-0,0656	-0,00219
NORTH FORK B	0,681	0,0126	1,086	0,217	1,236	0,00412	1,199	0,375	0,999	0,51	0,143	0,00164
NORTHERN TRIP	1,009	0,00504	1,074	-0,193	0,424	0,0046	0,962	-0,263	0,689	-0,283	-0,477	0,00703
NORTHTROP GROUP	0,636	0,0115	0,71	-0,175	0,567	0,0109	0,794	-0,00373	0,424	0,56	0,00301	0,00832
NORTON CO	0,692	0,0665	-1,065	1,288	-5,787	0,00877	-0,73	6,058	-2,732	11,78	6,688	0,0114
NORTONLIFELINE	1,261	0,0117	1,112	0,462	-0,906	0,0127	1,02	0,489	-0,653	0,0157	-0,633	0,0141
NORWEGIAN CRUISE	2,238	-0,0182	2,213	-0,164	0,435	-0,0157	1,927	0,097	0,842	1,363	-1,758	-0,0154
NOVELL INC	1,826	0,00523	1,589	0,526	-1,095	0,00816	1,207	0,165	-0,395	-1,287	-0,845	0,0171
NOVELLUS SYS	2,044	0,0157	1,772	0,805	-1,154	0,018	1,733	0,822	-1,041	0,00344	-0,262	0,0186
NRG ENERGY INC	0,674	0,00662	0,628	0,185	0,186	0,00639	0,7	0,206	0,0337	0,143	0,278	0,00486
NUCOR CORP	1,215	0,00482	1,195	0,293	0,382	0,00443	1,264	0,355	0,23	0,228	0,232	0,00284
NVENT ELECTRIC	1,476	-0,0088	0,813	1,577	0,572	0,0171	0,995	0,856	1,132	-1,95	-0,899	0,0202
NVIDIA CORP	2,006	0,027	1,845	0,705	-1,082	0,0256	1,577	0,212	-0,659	-1,421	0,224	0,0323
NVR INC	1,031	0,0133	0,922	1,019	0,831	0,0125	1,023	1,368	0,729	1,091	-0,426	0,00854
NYNEX CORP	0,687	0,0017	0,798	-0,536	0,28	-0,000147	0,971	-0,322	-0,11	0,68	1,132	-0,00471
NYSE EUROZONE	1,588	-0,00584	1,487	-0,136	0,571	-0,00463	1,216	-0,162	0,911	-1,037	-1,616	0,00433
OCCIDENTAL PETROLEUM	0,96	0,00104	1,022	0,0748	0,96	0,0000405	1,051	0,25	0,963	-0,339	-0,00157	
OFFICE DEPOT	2,166	0,000334	2,043	1,051	0,717	-0,000383	2,169	1,179	0,443	0,463	0,386	-0,00342
OFFICEMAX INC	1,597	-0,00182	1,657	0,817	1,405	-0,00768	1,792	1,041	1,249	0,69	-0,0279	-0,0112
O-I GLASS INC	1,578	-0,00333	1,572	0,387	0,808	-0,00465	1,538	0,469	0,947	0,195	-0,476	-0,00432
OLD DOMINION	0,63	0,0146	0,54	0,672	0,0141	0,649	0,773	0,053	0,364	0,317	0,0117	
OLD KENT FINANCIAL	0,494	0,0149	1,03	-0,343	1,173	0,00681	1,128	-0,0824	0,695	0,813	0,329	0,00376
OMNICOM GROUP	1,064	0,00559	1,072	0,0115	0,119	0,00547	1,084	-0,00364	0,079	-0,0355	0,12	0,00534
ONEOK INC	0,877	0,00861	0,93	0,0659	0,823	0,00776	1,097	0,226	0,456	0,583	0,542	0,0038
ORACLE CORP	1,408	0,0112	1,25	0,515	-0,901	0,0121	1,098	0,386	-0,56	-0,484	-0,537	0,0156
O'REILLY AUTOCENTER	0,738	0,0149	0,703	0,245	0,108	0,0148	0,856	0,492	-0,147	0,794	0,0441	0,011
ORYX ENERGY	1,065	-0,0177	1,15	0,358	0,461	-0,0181	1,303	0,428	0,01	0,00764	0,905	-0,019
OSHKOSH B'GO	0,304	0,00684	0,433	0,631	0,546	0,00231	0,559	0,958	0,381	0,899	-0,274	-0,00135
OTIS WORLDWIDE	0,0912	0,017	-0,367	1,041	0	0,0389	-0,00787	0	0	0	-0,88	0,00968
OUTBOARD MARINE	1,512	-0,00952	1,467	1,665	0,396	-0,0109	1,443	1,837	0,659	0,798	-0,195	-0,0148
OWENS CORNING	2,439	0,0173	2,303	1,534	1,606	0,0156	1,985	1,063	2,224	-1,597	-0,528	0,0242
PACCAR INC	1,206	0,00716	1,18	0,366	0,463	0,00669	1,326	0,505	0,142	0,507	0,475	0,00325
PACIFIC TELEVISION	0,652	0,00332	0,704	-0,449	-0,0255	0,00266	0,942	-0,255	-0,732	0,434	1,664	-0,00137
PACIFICORP	0,099	0,00302	0,116	-0,063	0,0573	0,00293	0,127	-0,0434	0,0443	0,0603	-0,00573	0,00262
PACKAGING CORP	0,995	0,00975	1,001	-0,0359	0,542	0,00936	1,168	0,187	0,209	0,655	0,272	0,00494
PACTIV CORP	0,641	0,0103	0,73	0,0051	0,897	0,00673	1,024	0,238	0,374	0,742	0,536	0,00273
PAINE WEBBER	1,445	0,0158	1,843	0,0608	1,073	0,00964	1,931	0,241	0,725	0,55	0,351	0,00719
PALL CORP	1,009	0,0068	0,99	0,258	0,144	0,00613	1,181	0,458	-0,199	0,688	0,402	0,00186
PALM INC	1,654	0,0125	1,155	2,38	-2,199	0,0169	0,982	2,533	-1,575	0,112	-1,623	0,0195
PAN AM CORP	-0,235	-0,0828	0,828	1,152	6,529	-0,0361	1,556	2,597	4,155	2,52	5,718	-0,048
PANENERGY CORP	1,166	0,0016	1,399	0,146	1,002	-0,00352	1,437	0,139	0,875	-0,0712	0,235	-0,00341
PARAMOUNT COMM	0,63	0,0093	0,63	0,541	0,395	0,00731	0,518	0,553	0,803	0,287	-0,672	0,0065
PARKER-HANNIFIN	1,243	0,00601	1,275	0,0815	0,583	0,0054	1,462	0,324	0,203	0,838	0,415	0,000594
PATTERSON CORP	0,6	0,00739	0,621	0,0761	0,538	0,00682	0,813	0,373	0,231	0,972	0,0799	0,00227
PAYCHEX INC	0,875	0,0116	0,84	0,176	-0,0582	0,0117	0,904	0,217	-0,207	0,164	0,265	0,0103
PAYCOM SOFTWARE	1,767	0,0356	1,827	0,442	-1,257	0,0269	1,623	0,291	-0,677	-0,361	-1,714	0,028
PAYPAL HOLDING	1,127	0,0173	1,284	-0,144	-0,706	0,00988	1,122	-0,035	-0,525	0,507	-0,772	0,0101
PEABODY ENERGY	0,873	-0,00418	0,718	-0,437	2,007	-0,000224	0,47	-0,471	2,674	-0,459	-1,989	0,00554
PENNEY (J C) CO	1,151	-0,0108	1,141	0,513	1,001	-0,0118	1,227	0,733	0,879	0,704	-0,137	-0,0147
PENNZENERGY	0,539	-0,00464	0,619	0,354	0,455	-0,00529	0,814	0,423	-0,0556	0,0805	1,039	-0,00717
PENTAIR PLC	1,045	0,00532	1	0,414	0,326	0,00499	1,074	0,543	0,189	0,426	0,0729	0,00288

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
PEOPLES ENER	0.206	0.00802	0.457	-0.0643	0.708	0.00355	0.64	0.0102	0.213	0.395	0.758	0.000355
PEOPLE'S UNIT	0.72	0.00991	0.71	0.528	1.031	0.00885	0.734	0.504	0.959	-0.0531	0.211	0.00859
PEOPLESOFT IN	1.988	0.0205	1.714	0.399	-0.655	0.0246	1.937	0.762	-0.836	0.913	-0.269	0.021
PEP BOYS-MAN	1.097	0.005	1.103	0.822	1	0.00163	1.259	1.116	0.837	0.894	-0.131	-0.00245
PEPCO HOLDIN	0.344	0.00466	0.443	-0.304	0.439	0.00366	0.581	-0.239	0.108	0.291	0.594	0.000823
PEPSI BOTTLIN	0.772	0.0147	0.911	-0.159	0.947	0.0118	1.184	-0.0683	0.451	0.444	0.782	0.00728
PEPSIAMERICA	0.758	0.00636	0.815	0.314	0.574	0.00344	1.084	0.588	0.116	0.906	0.505	-0.00232
PEPSICO INC	0.623	0.00639	0.692	-0.399	0.018	0.00636	0.875	-0.221	-0.382	0.648	0.582	0.00201
PERKINELMER	1.172	0.00519	1.077	0.402	-0.338	0.00555	1.074	0.107	-0.468	-0.864	0.857	0.00744
PERRIGO CO PL	0.667	0.0041	0.641	0.266	0.255	0.00367	0.697	0.371	0.174	0.334	-0.021	0.00223
PERSPECTA INC	1.403	-0.00722	1.666	-0.943	0.268	-0.011	1.422	-1.29	0.839	0.234	-1.939	-0.00799
PET INC	1.278	0.00489	1.066	-0.172	-0.906	0.0123	0.858	0.112	0.432	1.11	-2.164	0.00708
PETSMART INC	1.155	0.00895	1.063	0.522	-0.163	0.00875	1.152	0.737	-0.171	0.571	-0.395	0.00679
PFIZER INC	0.691	0.00715	0.795	-0.598	0.0266	0.00711	0.92	-0.497	-0.257	0.383	0.46	0.00426
PG&E CORP	0.425	0.00364	0.472	-0.0983	0.385	0.00323	0.602	0.0187	0.0953	0.433	0.444	0.000202
PHARMACIA &	0.864	0.0043	0.903	-0.423	-0.00269	0.00316	1.069	-0.295	-0.395	0.401	0.767	0.000794
PHARMACIA CI	0.503	0.0108	0.562	-0.341	0.0956	0.0107	0.587	-0.233	0.0688	0.295	-0.157	0.00972
PHELPS DODGE	1.079	0.0111	1.416	0.258	1.052	0.00397	1.496	0.32	0.851	0.241	0.253	0.00241
PHILIP MORRIS	0.778	0.00198	0.913	-0.683	0.135	0.00158	0.989	-0.604	0.0208	0.543	0.368	-0.000795
PHILIPS INDUS	1.536	0.029	1.649	1.102	1.061	0.0534	2.4	4.913	-4.47	-3.53	8.962	0.0138
PHILLIPS 66	1.572	-0.0007	1.437	0.116	0.69	0.00401	1.477	0.283	0.444	0.508	0.594	0.00327
PINNACLE WES	0.416	0.00791	0.471	-0.141	0.399	0.00749	0.613	-0.0658	0.058	0.32	0.642	0.0045
PIONEER HI-BR	0.71	0.0162	0.722	-0.0148	0.0404	0.016	0.626	-0.0948	0.211	-0.395	-0.407	0.0179
PIONEER NATU	0.976	0.00891	0.954	0.492	0.786	0.00811	0.984	0.557	0.737	0.212	-0.0116	0.00717
PITNEY BOWES	1.136	0.000069	1.084	0.578	0.599	-0.00601	1.224	0.651	0.264	0.311	0.632	-0.00353
PITTSBON CO-C	0.228	-0.00146	0.249	0.0596	0.0936	-0.00158	0.439	0.0764	-0.347	-0.0486	0.953	-0.00382
PLACER DOME	0.423	0.00618	0.593	0.467	0.634	0.00124	0.522	0.338	0.767	-0.387	-0.00553	0.00301
PLUM CREEK T	0.703	0.0082	0.723	0.28	0.485	0.00665	0.743	0.341	0.486	0.173	-0.0997	0.00603
PMC-SIERRA IN	2.573	0.00907	2.216	1.302	-1.497	0.0129	2.007	0.705	-1.566	-1.589	1.11	0.0179
PNC FINANCIAL	0.772	0.00628	0.86	-0.17	0.757	0.00549	0.849	-0.0979	0.819	0.202	-0.279	0.00524
POTLATCHDEL	1.003	0.00097	0.999	0.26	0.529	0.000427	1.031	0.349	0.488	0.28	-0.0735	-0.000672
POWER-ONE IN	2.672	0.0177	2.349	1.123	-1.353	0.0189	2.466	1.085	-1.67	0.0703	0.691	0.0162
PPG INDUSTRIE	1.024	0.00425	1.056	0.0595	0.552	0.00367	1.184	0.178	0.27	0.434	0.423	0.000686
PPL CORP	0.447	0.00585	0.515	-0.269	0.285	0.00554	0.611	-0.194	0.0665	0.283	0.362	0.00339
PRECISION CAS	0.999	0.011	1.088	0.0624	0.775	0.00884	1.217	0.208	0.548	0.487	0.245	0.00594
PREMARK INTE	1.381	0.0144	1.484	0.373	0.489	0.0141	1.676	0.545	0.0928	0.743	0.817	0.0109
PRICE (T. ROW)	1.452	0.00773	1.486	-0.0411	0.354	0.00736	1.561	0.0261	0.187	0.249	0.256	0.00562
PRICE CO	1.306	-0.00333	0.933	1.096	-0.673	-0.00148	0.539	0.658	0.437	-1.49	-3.089	0.00637
PRIMARY PDC	0.993	-0.0257	0.74	0.283	-0.656	-0.0222	0.861	-0.187	-1.275	-0.945	1.885	-0.0245
PRIME HOSPITAL	1.931	-0.0016	2.372	1.753	1.704	-0.0153	2.67	2.201	1.127	1.352	0.276	-0.0228
PRINCIPAL FIN	1.855	-0.00109	1.646	0.205	1.141	0.00186	1.664	0.27	1.284	0.327	-0.652	0.00138
PROCTER & GA	0.429	0.00792	0.493	-0.318	0.12	0.00778	0.686	-0.185	-0.326	0.524	0.772	0.00355
PROGRESS ENE	0.258	0.00809	0.352	-0.19	0.495	0.00685	0.53	-0.155	0.0625	0.265	0.839	0.00328
PROGRESSIVE C	0.771	0.0116	0.907	-0.581	0.477	0.0111	1.028	-0.488	0.203	0.357	0.453	0.00842
PROLOGIS INC	1.114	0.00883	1.087	0.421	0.74	0.00855	0.956	0.457	1.098	-0.0139	-0.888	0.011
PROVIDENT CC	1.042	0.00602	1.128	0.494	0.516	0.00531	1.158	0.542	0.511	0.277	0.0749	0.0042
PROVIDIAN CO	1.72	-0.000744	1.867	-0.568	0.402	-0.00319	1.857	-0.514	0.494	0.256	-0.0776	-0.00443
PROVIDIAN FIN	1.626	0.0218	2.226	-0.346	1.499	0.0132	1.812	-0.612	2.475	-1.028	-0.924	0.0194
PRUDENTIAL F	1.724	-0.000536	1.528	0.0577	1.271	0.00241	1.416	0.0566	1.593	-0.26	-1.106	0.00514
PSI RESOURCES	0.607	0.00722	0.665	-0.148	0.164	0.00683	0.73	-0.182	-0.0893	-0.302	0.354	0.00785
PTC INC	1.761	0.00815	1.652	0.333	-0.674	0.00886	1.59	0.141	-0.601	-0.605	0.195	0.0112
PUBLIC SERVIC	0.361	0.00707	0.439	-0.277	0.394	0.00665	0.581	-0.197	0.058	0.331	0.622	0.00365
PUBLIC STORA	0.296	0.00864	0.276	0.223	0.24	0.0084	0.322	0.247	0.13	0.102	0.207	0.00744
PULTEGROUP I	1.202	0.00848	1.203	0.37	0.824	0.00763	1.362	0.629	0.525	0.867	0.197	0.00321
PVH CORP	1.37	0.00321	1.299	0.874	0.998	0.0022	1.444	1.253	0.791	1.211	-0.245	-0.00273
QEP RESOURCE	3.413	-0.0401	2.799	1.466	1.393	-0.0237	2.77	2.108	1.358	2.904	-0.337	-0.0265
QLOGIC CORP	2.025	0.018	1.671	1.296	-1.54	0.0209	1.324	0.86	-1.043	-1.346	-0.188	0.0284
QORVO INC	2.302	0.0152	2.127	0.692	-1.211	0.0148	1.885	0.335	-0.759	-1.101	-0.178	0.0205
QUAKER OATS	0.345	0.0118	0.442	-0.447	0.139	0.0107	0.743	-0.226	-0.727	0.868	1.118	0.00404
QUALCOMM IN	1.391	0.0148	1.305	0.284	-0.563	0.0157	1.174	0.121	-0.322	-0.551	-0.236	0.0188
QUALITY CARE	-1.726	0.0463	-1.868	1.808	-0.00323	0.0451	-1.968	1	-0.378	-2.299	1.573	0.0597
QUANTUM CHE	1.698	-0.00653	1.925	0.357	1.166	-0.0123	1.607	0.0266	2.031	-1.077	-2.383	-0.00602
QUEST DIAGNC	0.575	0.0132	0.577	0.115	0.425	0.0131	0.737	0.351	0.121	0.735	0.146	0.00918
QUESTAR CORI	0.526	0.0102	0.626	-0.333	0.403	0.00933	0.744	-0.244	0.155	0.335	0.386	0.00682
QUINTILES TR	0.972	0.0142	1.049	1.172	0.341	0.01	1.12	1.179	0.149	0.102	0.297	0.00809
QWEST COMMU	1.215	0.00299	1.245	-0.292	-0.0689	0.00378	1.047	-0.612	0.188	-1.002	0.014	0.00899
RALPH LAUREN	1.144	0.00228	1.063	0.606	0.636	0.00189	1.083	0.74	0.643	0.346	-0.325	0.00112
RALSTON PURI	0.534	0.014	0.721	0.121	0.408	0.0111	0.918	0.18	-0.0403	0.33	0.62	0.00706
RALSTON PURI	0.102	-0.000232	0.0863	-0.0233	-0.0548	0.0000866	0.153	0.0366	-0.221	0.224	0.19	-0.00124
RANGE RESOU	1.086	0.007	1.052	0.535	0.747	0.00624	1.321	0.809	0.175	0.983	0.789	-0.000202

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
RATIONAL SOF	2.535	0,0257	2,095	0,933	-1,015	0,0302	1,938	0,56	-0,629	-1,165	0,0876	0,0361
RAYCHEM COR	1,132	0,00357	1,082	0,553	0,0173	0,00521	1,447	0,931	-0,53	1,866	1,477	-0,00329
RAYMOND JAM	1,337	0,00869	1,293	0,389	0,285	0,0084	1,239	0,37	0,42	-0,0931	-0,276	0,00948
RAYTHEON CO	0,681	0,00778	0,748	-0,127	0,622	0,00706	0,832	0,0641	0,491	0,615	-0,0661	0,00447
REALTY INCON	0,416	0,0083	0,393	0,255	0,357	0,00819	0,464	0,324	0,211	0,243	0,174	0,00652
RED HAT INC	1,648	0,0132	1,422	0,8	-1,352	0,0134	0,987	0,399	-0,503	-1,302	-0,99	0,0229
REEBOK INTER	0,839	0,00858	1,143	0,474	1,021	0,00136	1,318	0,818	0,71	1,01	-0,0564	-0,00309
REGENCY CEN	0,709	0,00351	0,68	0,395	0,647	0,00325	0,763	0,548	0,518	0,48	-0,0524	0,00103
REGENERON PF	1,502	0,0234	0,83	3,364	-1,874	0,0256	0,456	2,127	-1,626	-3,668	1,797	0,0379
REGIONS FINA	1,041	0,00177	1,143	-0,0581	1,188	0,000533	1,107	-0,0707	1,275	-0,0614	-0,176	0,00123
REPUBLIC SER	0,666	0,00767	0,683	0,0217	0,503	0,00788	0,818	0,246	0,258	0,671	0,0203	0,00445
RESMED INC	0,802	0,0187	0,636	0,764	-0,532	0,0189	0,61	0,738	-0,476	-0,0905	-0,0685	0,0195
REYNOLDS AM	0,341	0,0197	0,417	-0,215	0,584	0,0191	0,555	-0,156	0,278	0,277	0,519	0,0162
REYNOLDS ME	1	-0,00251	1,13	-0,0422	0,398	-0,00374	1,138	-0,136	0,433	-0,217	0,0188	-0,00365
RITE AID CORP	1,188	-0,000934	1,145	0,579	0,71	-0,00166	1,215	0,595	0,534	0,0939	0,377	-0,00299
ROBERT HALF	1,073	0,00854	1,026	0,524	0,547	0,00798	1,066	0,478	0,419	-0,106	0,381	0,00756
ROCKWELL AU	1,096	0,00621	1,102	0,271	0,667	0,00553	1,283	0,365	0,231	0,399	0,824	0,00174
ROCKWELL CO	1	0,00722	0,925	0,253	0,259	0,00684	0,928	0,292	0,404	0,137	-0,5	0,00697
ROHM AND HA	0,952	0,0108	1,055	0,00399	0,531	0,00885	1,087	-0,0118	0,453	-0,0171	0,2	0,00854
ROLLINS INC	0,426	0,0107	0,363	0,383	0,0264	0,0107	0,527	0,536	-0,335	0,564	0,54	0,00685
ROPER TECHN	0,903	0,0135	0,868	0,228	0,073	0,0134	0,948	0,355	-0,0471	0,418	0,0161	0,0115
ROSS STORES II	0,928	0,0153	0,9	0,281	0,258	0,015	1,018	0,602	0,0951	1,02	-0,234	0,0109
ROWAN COMP	1,511	-0,00121	1,493	0,503	0,497	-0,0026	1,561	0,425	0,244	-0,142	0,665	-0,0033
ROYAL CARIBE	2,008	0,00358	2,013	0,397	1,171	0,00283	2,038	0,411	1,114	0,0595	0,0998	0,00229
ROYAL DUTCH	0,594	0,00463	0,715	-0,176	0,3	0,00308	0,833	-0,162	-0,0413	0,173	0,582	0,00114
RUBBERMAID I	1,076	-0,000232	1,044	-0,425	-0,31	-0,000555	1,262	-0,268	-0,849	0,427	1,167	-0,00305
RUSSELL CORP	0,452	0,000985	0,641	0,257	0,625	-0,00341	0,734	0,446	0,462	0,559	-0,051	-0,00573
RYAN'S RESTA	0,508	0,00662	0,67	0,488	0,62	0,0018	0,732	0,748	0,594	0,692	-0,424	-0,000282
RYDER SYSTEM	1,266	-0,000203	1,296	0,188	0,803	-0,00103	1,366	0,402	0,718	0,673	-0,209	-0,0036
RYERSON HOLI	1,237	0,000573	1,363	0,827	1,183	-0,00162	1,416	0,793	1,047	-0,0602	0,369	-0,00221
S&P GLOBAL IN	0,886	0,00901	0,918	-0,186	-0,000795	0,00901	0,945	-0,121	-0,0427	0,208	-0,0264	0,00812
SABRE HOLDIN	1,458	0,000481	1,88	0,728	1,261	-0,0115	1,904	0,651	1,133	-0,106	0,366	-0,0121
SAFECO CORP	0,496	0,00913	0,767	-0,396	0,79	0,00587	0,912	-0,201	0,501	0,631	0,198	0,00258
SAFETY-KLEEN	1,621	-0,00591	0,905	2,353	-1,524	-0,000865	-0,499	2,706	2,709	-0,775	-8,052	0,0309
SAFETY-KLEEN	0,816	0,000616	0,761	-0,0513	-0,241	0,00197	0,897	0,314	-0,295	1,447	0,705	-0,00538
SAFEWAY INC	0,769	0,00813	0,774	0,041	0,0848	0,00782	1,015	0,226	-0,399	0,684	0,72	0,00254
SALESFORCE.C	1,418	0,0158	1,397	0,672	-0,846	0,0139	1,202	0,517	-0,42	-0,923	-1,416	0,0177
SANDISK CORP	2,28	0,0178	2,113	0,512	-0,835	0,0195	1,835	0,241	-0,338	-0,887	-0,482	0,0252
SANMINA CORI	2,339	0,00535	2,256	0,569	0,219	0,00522	1,963	0,135	0,731	-1,416	-0,221	0,0123
SANTA FE PACI	1,559	0,019	1,579	-0,514	-0,274	0,0197	1,389	-0,801	0,0488	-1,226	-1,386	0,0261
SANTA FE PACI	0,605	0,00138	1,187	1,831	2,048	-0,00547	2,117	2,181	-1,491	0,232	7,438	-0,0196
SANTA FE SNYI	0,454	0,00274	0,677	0,0158	0,652	0,0000102	0,649	-0,153	0,796	-0,426	-0,11	0,000876
SANTANDER H	1,003	0,007	1,114	0,626	0,832	0,00341	1,123	0,571	0,782	-0,129	0,206	0,00363
SAPIENT CORP	2,143	0,0117	2,03	-0,165	-1,227	0,0154	1,604	-0,229	-0,177	-0,604	-1,986	0,0242
SBA COMMUNI	1,452	0,0255	1,318	0,564	-1,458	0,0242	0,902	-0,224	-0,776	-2,165	0,237	0,0357
SCANA CORP	0,285	0,00628	0,344	-0,165	0,282	0,00568	0,514	-0,106	-0,146	0,313	0,821	0,0025
SCHERING-PLO	0,702	0,0093	0,794	-0,941	-0,148	0,0111	1,008	-0,725	-0,506	0,705	0,402	0,00663
SCHLUMBERGE	1,293	-0,000988	1,282	0,254	0,404	-0,0014	1,247	0,19	0,465	-0,21	-0,019	-0,0004
SCHWAB (CHA	1,648	0,00939	1,682	-0,151	0,113	0,00927	1,477	-0,326	0,574	-0,654	-0,727	0,014
SCIENTIFIC-ATI	1,972	0,013	1,557	0,623	-1,019	0,0181	1,16	0,362	-0,00267	-1,079	-1,35	0,0258
SCOTT PAPER C	1,211	0,00914	1,261	0,0934	0,31	0,00803	1,251	0,199	0,488	0,621	-0,00253	0,00569
SCRIPPS NETW	1,074	0,00255	1,069	0,0254	-0,00331	0,00254	1,197	0,0826	-0,231	0,504	0,837	-0,00058
SEAGATE TECH	1,866	0,00596	1,767	0,869	-0,706	0,00448	1,653	0,763	-0,502	-0,63	-0,626	0,00702
SEAGATE TECH	1,819	0,0123	1,8	0,17	-0,00233	0,0126	1,478	0,131	0,773	-0,391	-1,437	0,0184
SEAGRAM CO L	0,87	0,00407	0,834	0,0091	-0,093	0,0046	0,939	-0,216	-0,157	-0,508	0,531	0,00416
SEALED AIR CC	1,267	0,00576	1,259	0,254	0,46	0,00529	1,373	0,164	0,118	-0,184	0,956	0,00385
SEARS HOLDIN	1,747	-0,0167	1,618	0,932	0,379	-0,0171	1,476	1,008	0,79	0,125	-1,09	-0,015
SEARS ROEBUC	0,824	0,00984	1,244	0,522	1,352	0,00079	1,231	0,578	1,428	0,109	-0,228	0,000784
SECURITY PAC	2,152	0,00543	2,445	0,68	1,76	0,00556	2,631	0,479	1,536	-1,012	0,269	0,0108
SEMPRA ENERC	0,422	0,00594	0,477	-0,195	0,279	0,00564	0,626	-0,0946	-0,067	0,398	0,605	0,00238
SERVICE CORP	0,999	0,00813	1,009	0,217	0,607	0,00751	0,949	0,218	0,766	-0,0403	-0,368	0,00857
SERVICENOW I	1,195	0,021	1,242	0,526	-1,213	0,016	1,195	-0,0144	-0,532	-1,596	-1,597	0,0164
SHARED MEDIC	0,702	0,0151	0,758	-0,0563	0,154	0,0144	0,873	0,471	-0,38	1,353	0,569	0,0117
SHAWMUT NAT	1,872	0,00956	2,215	0,713	2,19	0,00162	2,281	0,601	1,822	-0,708	0,342	0,00396
SHERWIN-WILL	0,853	0,00978	0,893	-0,0749	0,349	0,00941	1,028	0,0564	0,0558	0,478	0,424	0,00622
SHONEY'S INC	1,497	-0,0159	1,048	1,195	-0,848	-0,011	0,609	1,622	-0,171	0,912	-2,217	-0,00768
SIEBEL SYSTEM	2,833	0,0238	2,192	0,463	-1,551	0,0345	1,796	0,0298	-0,699	-1,322	-0,476	0,0411
SIGMA-ALDRIC	0,535	0,00941	0,62	-0,133	0,517	0,00806	0,805	0,102	0,215	0,767	0,263	0,00375
SIGNET JEWEL	1,382	-0,000249	1,352	0,626	0,984	-0,00126	1,254	0,626	1,243	-0,0669	-0,597	0,000476
SILICON GRAP	1,577	-0,00604	1,169	2,443	-0,533	-0,00774	1,389	2,523	-0,989	0,374	0,839	-0,0115



Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
SIMON PROPER	0,734	0,00563	0,706	0,501	0,973	0,00517	0,756	0,606	0,902	0,324	-0,0756	0,00379
SITE CENTERS C	1,081	-0,00203	1,073	0,513	1,277	-0,0031	1,141	0,664	1,195	0,47	-0,137	-0,00483
SKYLINE CORP	0,93	0,006	0,914	0,454	0,422	0,00446	0,866	0,423	0,527	-0,124	-0,176	0,00541
SKYWORKS SO	1,847	0,0164	1,651	0,829	-0,717	0,0172	1,498	0,396	-0,515	-1,37	0,355	0,0225
SL GREEN REAL	1,243	0,00409	1,162	0,71	1,066	0,00363	1,155	0,796	1,122	0,207	-0,326	0,00354
SMITH (A.O.)	0,781	0,0121	0,741	0,437	0,446	0,0117	0,963	0,717	-0,00884	0,974	0,514	0,00599
SMITH INTERN.	1,162	0,0137	1,175	0,184	0,248	0,0125	1,075	-0,0277	0,357	-0,626	0,148	0,0153
SMUCKER (JM)	0,395	0,00622	0,371	0,128	-0,0202	0,00624	0,528	0,276	-0,363	0,544	0,507	0,00255
SNAP-ON INC	1,109	0,00295	1,158	0,0285	0,699	0,00223	1,242	0,162	0,538	0,448	0,117	-0,000925
SOLECTRON CC	2,191	0,0124	2,056	0,13	-0,362	0,0142	2,162	-0,00824	-0,756	-0,203	0,965	0,0132
SONAT INC	0,424	0,00607	0,609	0,0806	0,724	0,00395	0,714	-0,0242	0,277	-0,936	0,832	0,00495
SOUTHERN CO	0,14	0,0095	0,208	-0,227	0,377	0,0091	0,345	-0,123	0,0626	0,399	0,526	0,00602
SOUTHTRUST C	0,706	0,0157	1,051	-0,232	0,932	0,0104	1,103	-0,0635	0,89	0,439	-0,205	0,00871
SOUTHWEST AI	1,044	0,00744	1,103	-0,0976	0,553	0,00686	1,14	-0,0319	0,488	0,217	0,0258	0,00581
SOUTHWESTER	0,694	0,00684	0,631	0,676	0,668	0,00616	0,817	0,899	0,279	0,78	0,472	0,00148
SPECTRA ENER	0,81	0,00324	0,836	-0,0352	-0,0913	0,003	0,864	-0,0459	-0,219	-0,0195	0,419	0,00242
SPRINGS INDUS	0,477	0,00414	0,811	0,339	0,855	-0,000994	0,746	0,59	0,814	0,669	-0,471	-0,00215
SPRINT CORP	0,721	0,003	0,728	-0,15	-0,246	0,00327	0,706	-0,248	-0,242	-0,299	0,181	0,00416
SPRINT PCS GR	2,751	0,0312	2,191	-1,301	-1,439	0,0509	1,873	-1,832	-1,356	-0,99	0,664	0,0539
SPX CORP	1,29	0,00407	1,218	0,529	0,241	0,00383	1,268	0,591	0,139	0,215	0,117	0,00258
SPX CORP-OLD	0,818	0,00428	0,857	0,893	0,536	0,00465	1,131	1,435	0,448	2,1	0,987	-0,00637
SQUARE D CO	1,597	0,0256	2,004	0,638	2,745	0,0453	1,794	0,572	3,254	0,346	-0,947	0,0439
ST JUDE MEDIC	0,762	0,00892	0,715	0,325	0,0191	0,00857	0,825	0,487	-0,141	0,52	0,081	0,00591
ST PAUL COS	0,679	0,00796	1,04	-0,483	0,929	0,0034	1,216	-0,343	0,505	0,519	0,513	-0,000755
STANLEY BLAC	1,083	0,00333	1,11	0,149	0,683	0,00262	1,275	0,352	0,343	0,708	0,398	-0,00156
STAPLES INC	1,256	0,00613	1,108	0,737	-0,298	0,00638	1,241	0,824	-0,586	0,35	0,477	0,00368
STARBUCKS CC	1,044	0,0148	0,99	0,352	0,0965	0,0146	1,018	0,485	0,113	0,389	-0,312	0,0137
STARWOOD HC	1,235	0,00756	1,263	0,764	1,114	0,00374	1,361	0,809	0,881	0,201	0,425	0,00179
STATE STREET	1,348	0,00357	1,447	-0,303	0,611	0,00292	1,412	-0,311	0,7	-0,0492	-0,188	0,0036
STEEL EXCEL I	1,362	0,00142	1,223	0,528	-0,486	0,0025	1,017	0,482	0,0367	-0,31	-1,047	0,00631
STERICYCLE IN	0,364	0,0128	0,331	0,229	0,1	0,0128	0,524	0,555	-0,252	0,99	0,064	0,00785
STERIS PLC	0,645	0,0142	0,613	0,166	-0,053	0,0143	0,757	0,511	-0,197	1,067	-0,383	0,0104
STONE CONTAI	1,632	-0,00906	1,495	0,984	-0,148	-0,00469	1,366	1	0,335	0,365	-0,905	-0,00532
STRIDE RITE CC	1,054	0,00251	1,256	-0,00623	0,596	-0,000976	1,408	0,475	0,424	1,329	-0,569	-0,00554
STRYKER CORP	0,955	0,0112	0,997	-0,265	-0,0496	0,0112	1,132	-0,0137	-0,29	0,828	0,0771	0,00727
SUMMIT BANCI	0,914	0,0102	1,489	0,311	1,405	0,001	1,281	0,453	1,774	0,219	-0,991	0,00336
SUN MICROSYS	2,001	0,00832	1,814	0,261	-0,88	0,0114	1,496	-0,0798	-0,351	-1,111	-0,542	0,0183
SUNAMERICA I	0,844	0,0118	0,925	0,0689	0,333	0,0105	0,945	0,159	0,401	0,432	-0,0179	0,0087
SUNEDISON INC	2,112	-0,00451	2,012	0,0552	-0,86	-0,00223	1,797	-0,249	-0,569	-0,894	-0,0354	0,00255
SUNGARD DAT.	0,751	0,0134	0,976	0,119	0,684	0,00885	1,044	0,115	0,483	0,0727	0,362	0,00772
SUNOCO INC	0,67	0,00691	0,681	0,0518	0,136	0,0064	0,884	0,236	-0,232	0,663	0,466	0,00172
SUNTRUST BAN	1,04	0,00444	1,19	-0,127	1,145	0,00201	1,167	-0,0328	1,281	0,232	-0,445	0,00191
SUPERVALU IN	0,96	-0,000921	0,989	0,193	0,464	-0,00223	1,321	0,404	-0,275	0,852	1,255	-0,00899
SVB FINANCI	1,544	0,00939	1,419	0,821	0,188	0,00922	1,27	0,574	0,464	-0,828	-0,166	0,0134
SYMBOL TECHI	1,845	0,0104	1,33	0,564	-1,318	0,018	1,316	0,405	-1,371	-0,395	0,384	0,0189
SYNCHRONY F	1,609	-0,00771	1,315	0,609	0,835	0,00323	1,162	0,499	1,284	-0,353	-1,337	0,00442
SYNOPSIS INC	1,162	0,00679	1,163	-0,117	-0,299	0,00723	1,259	0,00104	-0,471	0,406	0,153	0,00508
SYNOVUS FINA	1,106	0,00109	1,189	0,0556	1,195	-0,000147	1,179	0,064	1,226	0,0175	-0,087	-0,0000184
SYNTEX CORP	1,361	0,00168	1,296	-0,63	-0,752	0,00447	1,553	-0,501	-1,462	0,323	1,678	0,00138
SYSCO CORP	0,722	0,00617	0,774	-0,134	0,376	0,00578	0,959	0,0752	-0,0134	0,739	0,499	0,00122
TAKE-TWO INT	1,105	0,0157	0,955	0,663	-0,687	0,0154	0,903	0,719	-0,536	0,0901	-0,465	0,0161
TANDEM COMF	1,662	-0,00174	1,502	1,235	-0,224	0,000642	0,96	1,008	1,412	-0,14	-3,529	0,00399
TAPESTRY INC	1,328	0,00735	1,138	0,852	0,474	0,00616	1,308	0,996	0,347	0,802	-0,21	0,00197
TE CONNECTIV	1,624	-0,000176	1,463	0,491	0,213	0,00203	1,399	0,509	0,456	0,167	-0,801	0,00271
TECHNIPFMC P	1,458	-0,000942	1,434	0,287	0,694	-0,000927	1,546	0,281	0,413	0,1	0,631	-0,00316
TECO ENERGY	0,404	0,00576	0,503	-0,287	0,45	0,00476	0,701	-0,207	-0,0307	0,385	0,889	0,000748
TEGNA INC	1,332	-0,000693	1,365	0,235	0,94	-0,00166	1,514	0,367	0,608	0,489	0,512	-0,00512
TEKTRONIX INC	1,501	0,00878	1,244	0,7	-0,543	0,011	1,281	0,556	-0,739	-0,297	0,614	0,0111
TELE-COMM TC	1,537	0,00901	1,394	0,186	-0,468	0,012	1,138	-0,0258	0,108	-0,694	-1,302	0,0155
TELEFLEX INC	0,833	0,00832	0,832	0,165	0,354	0,00795	1,059	0,41	-0,13	0,875	0,648	0,00242
TELLABS INC	1,448	0,00867	1,468	-0,491	-0,408	0,0107	1,442	-0,574	-0,414	-0,233	0,145	0,0115
TEMPLE-INLAN	1,456	0,0079	1,51	0,507	0,936	0,00426	1,561	0,726	0,983	0,599	-0,462	0,00204
TENET HEALTH	1,272	0,00136	1,294	0,358	1,059	0,000266	1,474	0,684	0,737	1,08	0,122	-0,00494
TENNECO INC	1,951	-0,001	1,957	0,608	1,409	-0,00245	1,984	0,735	1,397	0,389	-0,212	-0,00371
TERADATA COI	0,956	-0,00361	0,922	0,48	-0,396	-0,00492	0,862	0,441	-0,276	-0,275	-0,382	-0,00342
TERADYNE INC	2,072	0,00671	1,898	0,768	-0,549	0,00731	1,868	0,737	-0,482	-0,112	-0,095	0,00804
TEREX CORP	1,782	0,00177	1,787	0,681	1,559	0,000169	1,903	0,929	1,369	0,806	-0,0339	-0,00342
TEXACO INC	0,295	0,00905	0,507	-0,227	0,462	0,00608	0,615	-0,227	0,226	0,0824	0,444	0,00445
TEXAS INSTRU	1,495	0,00807	1,414	0,263	-0,466	0,00856	1,376	0,0611	-0,46	-0,617	0,369	0,0105
TEXTRON INC	1,219	0,00319	1,226	0,313	0,78	0,00238	1,305	0,411	0,618	0,341	0,186	0,000383

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$a$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$a$ (FF5)
THE UNILEVER	0.53	0.0066	0.618	-0.396	0.269	0.0063	0.795	-0.2	-0.105	0.696	0.489	0.00196
THERMO FISHE	0.993	0.00727	0.991	-0.0354	-0.111	0.00739	1.063	0.0509	-0.261	0.302	0.179	0.00558
THOMAS & BET	1.085	0.00448	1.171	-0.00746	0.634	0.00258	1.233	0.199	0.643	0.579	-0.362	0.00026
TIFFANY & CO	1.49	0.00562	1.42	0.345	-0.14	0.00578	1.417	0.408	-0.103	0.18	-0.203	0.00544
TIME WARNER	0.978	0.0101	0.827	0.438	0.312	0.0114	0.865	0.443	0.165	0.0248	0.477	0.0104
TIME WARNER	1.736	0.0165	1.732	-0.413	-0.574	0.0186	1.424	-0.54	0.123	-0.623	-1.252	0.0243
TIME WARNER	1.282	0.00638	1.325	-0.0763	0.0857	0.00573	1.075	-0.24	0.844	-0.671	-1.06	0.0107
TIMES MIRROR	0.434	0.00436	0.642	-0.295	0.538	0.00182	0.546	-0.0961	0.594	0.427	-0.393	0.0025
TIMKEN CO	1.425	0.0023	1.403	0.499	0.802	0.00148	1.465	0.678	0.72	0.566	-0.149	-0.000738
TITANIUM MET	1.503	0.0166	1.39	1.083	0.39	0.0133	1.385	1.487	0.733	0.813	-1.461	0.0134
TJX COS INC (T	0.813	0.0125	0.863	-0.174	0.261	0.0122	1.022	0.102	-0.0311	0.92	0.146	0.00767
T-MOBILE US IN	0.349	0.0173	0.408	-0.189	-0.0474	0.016	0.294	-0.148	0.161	0.309	-0.767	0.0158
TONKA CORP	0.783	-0.0159	-0.381	4.757	0.371	-0.00759	-1.727	4.606	3.219	3.128	-5.284	-0.026
TOSCO CORP	0.746	0.0137	1.122	0.304	0.943	0.008	1.437	0.301	0.222	0.239	1.345	0.00302
TOTAL SYSTEM	0.745	0.0115	0.818	-0.218	0.349	0.0108	0.904	-0.152	0.162	0.254	0.298	0.00897
TOYS R US INC	1.058	0.000465	1.235	0.497	0.65	-0.00449	1.175	0.486	0.821	-0.0977	-0.284	-0.00339
TRACTOR SUPP	0.973	0.0142	0.846	0.777	0.0689	0.0143	0.897	0.768	-0.0667	0.016	0.328	0.0134
TRANE INC	0.673	0.0145	0.96	0.192	0.866	0.00899	1.125	0.29	0.474	0.4	0.474	0.0061
TRANE TECHN	1.352	0.00483	1.395	-0.0262	0.491	0.00432	1.545	0.128	0.168	0.555	0.45	0.000712
TRANSAMERIC	0.87	0.00724	0.985	-0.0236	0.434	0.0053	1.112	0.0032	0.0686	-0.0755	0.715	0.00446
TRANSCO ENEF	0.625	-0.00692	0.768	-0.172	0.598	-0.00938	1.245	-0.0428	-0.732	0.173	2.94	-0.0128
TRANSDIGM GF	0.905	0.0185	0.957	-0.159	-0.0726	0.0178	0.913	-0.141	0.121	0.196	-0.653	0.0182
TRANSITIONAL	1.614	-0.014	1.56	0.399	-0.0797	-0.0134	1.822	0.676	-0.703	0.801	1.686	-0.019
TRANSOCEAN I	1.473	-0.00636	1.403	0.585	0.48	-0.00663	1.286	0.481	0.723	-0.377	-0.324	-0.00396
TRAVELERS CC	1.535	-0.00124	1.387	1.192	0.318	-0.00396	1.308	0.892	0.48	-1.264	-1.025	0.00148
TRIBUNE MEDI	0.715	0.0012	0.757	-0.139	0.0891	0.000839	0.735	-0.106	0.17	0.0633	-0.219	0.001
TRIPADVISOR I	1.479	-0.00925	1.279	0.931	-0.286	-0.00648	1.293	0.779	-0.191	-0.545	-0.124	-0.00637
TRUIST FINANC	0.846	0.005	0.962	-0.102	1.268	0.00368	0.942	-0.0547	1.344	0.124	-0.263	0.00375
TRW INC	0.688	0.012	0.893	0.274	0.591	0.00855	1.221	0.584	-0.252	1.14	0.892	0.000317
TUPPERWARE I	1.31	-0.00605	1.266	0.584	0.979	-0.00662	1.564	0.901	0.357	1.066	0.69	-0.0136
TWENTY-FIRST	1.417	0.00475	1.329	0.492	-0.0933	0.00472	1.169	0.239	0.143	-0.814	-0.111	0.0088
TWITTER INC	0.875	-0.000368	0.724	0.891	-0.643	-0.000688	0.511	0.745	-0.023	-0.236	-1.838	0.0000735
TXU GAS CO	0.799	-0.00479	0.965	-0.0482	0.662	-0.00852	1.146	-0.289	-0.21	-1.339	1.239	-0.00266
TYCO INTERNA	1.165	0.00528	1.253	-0.308	0.336	0.00462	1.16	-0.382	0.527	-0.272	-0.29	0.00661
TYSON FOODS	0.405	0.00238	0.434	-0.0496	0.272	0.00209	0.49	0.0442	0.168	0.314	0.0618	0.000516
U S BANCORP	0.425	0.0217	0.611	-0.802	0.647	0.021	0.383	-0.83	1.237	-0.242	-1.301	0.0252
U S BANCORP/I	0.85	0.0129	1.365	-0.294	1.15	0.00474	1.292	-0.0306	1.112	0.646	-0.455	0.00456
U S BANCORP-C	1.192	0.00838	1.332	0.0681	0.595	0.0052	1.261	0.19	0.963	0.65	-0.483	0.00232
U S HEALTHCA	0.643	0.0164	0.482	0.112	-0.601	0.0187	0.46	0.134	-0.49	0.152	-0.153	0.0182
U S HOME COR	0.951	0.0285	1.97	4.468	4.853	0.0239	1.847	4.745	4.943	0.581	-0.51	0.025
U S SURGICAL C	1.009	0.0101	0.806	-0.174	-0.891	0.0141	0.878	-0.0368	-0.923	0.528	0.269	0.0113
UDR INC	0.562	0.00467	0.544	0.341	0.517	0.00414	0.511	0.375	0.62	0.0758	-0.3	0.00451
ULTA BEAUTY	1.359	0.0111	1.114	0.834	0.219	0.0137	1.161	0.955	0.297	0.924	-0.291	0.0111
UNDER ARMOU	1.248	0.0056	0.896	1.04	0.506	0.01	0.935	1.115	0.507	0.537	-0.0338	0.0084
UNICOM CORP	0.0997	0.00934	0.244	0.0116	0.386	0.00733	0.484	-0.0825	-0.0447	-0.068	1.07	0.00397
UNION CAMP C	0.961	0.00284	0.927	0.235	-0.0321	0.00389	1.066	0.223	-0.566	-0.437	0.957	0.0043
UNION CARBID	0.76	0.0122	1.135	0.0511	0.888	0.00622	1.148	0.0985	0.814	0.143	0.0365	0.00573
UNION PACIFIC	0.8	0.00763	0.852	-0.0774	0.504	0.0071	0.925	0.0543	0.375	0.435	0.0483	0.005
UNION PACIFIC	0.708	0.00192	1.405	-0.338	1.681	-0.00558	1.191	0.105	1.552	0.948	-0.853	0.000174
UNION PLANTE	0.726	0.01	1.046	-0.0244	0.906	0.00463	1.128	0.18	0.801	0.554	-0.153	0.00225
UNISYS CORP	2.16	-0.00319	1.975	1.58	1.085	-0.00427	1.947	1.505	1.125	-0.24	0.0519	-0.0033
UNITED AIRLIN	1.375	-0.00697	1.422	0.107	0.834	-0.00784	1.441	0.0122	0.739	-0.264	0.4	-0.00759
UNITED PARCE	0.506	0.00183	0.544	-0.171	0.202	0.00209	0.66	-0.0345	-0.036	0.412	0.241	-0.000849
UNITED RENTA	2.045	0.00827	1.912	0.918	0.955	0.00801	1.985	0.961	0.793	0.179	0.256	0.00647
UNITED STATE:	1.946	-0.00341	1.947	0.417	0.977	-0.00487	2.091	0.578	0.692	0.554	0.343	-0.00822
UNITEDHEALT	0.911	0.0171	0.916	-0.032	-0.00224	0.0171	1.059	0.211	-0.265	0.809	0.143	0.0131
UNIVERSAL HE	0.572	0.013	0.595	0.0942	0.499	0.0125	0.759	0.313	0.17	0.753	0.343	0.00828
UNIVISION COM	1.268	0.0106	1.319	0.0818	0.149	0.00923	1.1	-0.0133	0.728	-0.478	-0.736	0.013
UNOCAL CORP	0.477	0.00602	0.795	-0.091	0.893	0.00561	0.742	-0.148	1.012	-0.195	-0.113	0.00172
UNUM GROUP	1.18	-0.000183	1.312	-0.2	1.261	-0.0015	1.242	0.0105	1.542	0.565	-1.044	-0.00158
URBAN OUTFIT	1.17	0.00975	1.069	0.816	0.628	0.00958	1.2	1.098	0.448	0.864	-0.223	0.00593
US AIRWAYS G	1.479	-0.0156	2.012	-0.139	1.5	-0.0247	1.844	0.00713	2.064	0.177	-1.291	-0.0232
USF&G CORP	0.881	-0.00284	1.229	0.533	1.617	-0.012	1.392	0.501	1.028	-0.415	1.065	-0.0109
USG CORP	1.991	0.000242	2.005	0.864	1.224	-0.003	1.97	0.933	1.377	0.147	-0.434	-0.00281
USLIFE CORP	1.04	0.00603	1.16	0.141	0.545	0.00336	1.163	0.0658	0.471	-0.327	0.0101	0.00501
UST INC	0.346	0.0125	0.443	-0.148	0.361	0.0115	0.705	0.0378	-0.156	0.664	0.771	0.00645
USX CORP-CON	0.556	0.00647	1.141	-0.444	2.174	0.0207	0.934	-0.541	2.714	0.439	-0.966	0.0173
VALARIS PLC	1.416	-0.00774	1.332	0.958	1.028	-0.00878	1.29	0.823	1.077	-0.425	0.145	-0.00719
VALERO ENERC	1.241	0.0085	1.232	0.23	0.382	0.00811	1.265	0.26	0.309	0.113	0.109	0.00733
VAREX IMAGIN	1.14	-0.0147	1.173	-0.536	0.566	-0.00931	1.542	-0.351	-0.195	-0.148	2.447	-0.0107

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Company Name	$\beta$ (CAPM)	$\alpha$ (CAPM)	$\beta$ (FF3)	$s$ (FF3)	$h$ (FF3)	$\alpha$ (FF3)	$\beta$ (FF5)	$s$ (FF5)	$h$ (FF5)	$r$ (FF5)	$c$ (FF5)	$\alpha$ (FF5)
VARIAN MEDIC	0,75	0,0116	0,688	0,429	0,141	0,0114	0,799	0,512	-0,112	0,32	0,426	0,00897
VARITY CORP	0,908	0,00701	0,966	1,288	1,146	0,00366	0,846	0,985	1,305	-1,134	-0,879	0,01
VENTAS INC	0,626	0,0103	0,586	0,436	0,987	0,0103	0,633	0,656	0,964	0,577	-0,457	0,00876
VERISK ANALY	0,504	0,0104	0,518	0,0711	-0,211	0,00931	0,519	0,147	-0,212	0,371	-0,0378	0,00874
VERITAS SOFTV	2,571	0,0302	1,838	0,317	-1,911	0,0428	1,562	0,126	-1,3	-0,718	-0,627	0,0481
VERIZON COM	0,558	0,00433	0,676	-0,668	0,0524	0,00426	0,887	-0,552	-0,451	0,487	0,936	-0,00202
VERSUM MATE	1,608	0,0115	1,321	1,102	-0,316	0,016	1,032	1,009	0,637	-0,878	-2,311	0,0196
VERTEX PHARM	1,185	0,0162	0,905	1,127	-1,411	0,018	0,823	0,909	-1,327	-0,659	0,224	0,0204
VF CORP	0,901	0,00647	0,932	0,0679	0,557	0,00589	1,062	0,28	0,312	0,71	0,161	0,00227
VIACOM INC	1,153	-0,00672	1,162	-0,072	0,0453	-0,00669	1,199	-0,0737	-0,0893	0,00377	0,414	-0,00734
VIACOMCBS IN	1,617	-0,00168	1,59	0,334	0,39	-0,00208	1,541	0,396	0,549	0,147	-0,482	-0,0016
VIAVI SOLUTIC	2,209	0,00706	2,03	0,699	-1,048	0,00778	1,528	0,0335	-0,116	-2,198	-0,621	0,0201
VISA INC	0,494	0,00636	0,622	-0,213	-0,352	0,00392	0,589	-0,192	-0,198	0,216	-0,51	0,00418
VISTEON CORP	2,244	0,0208	2,011	1,032	1,429	0,0185	1,935	0,899	1,31	-0,666	0,776	0,0204
VITESSE SEMIC	2,92	0,00132	2,49	1,69	-1,62	0,00567	2,108	0,536	-1,884	-3,013	2,409	0,0145
VORNADO REA	0,775	0,00577	0,768	0,474	0,956	0,00479	0,814	0,524	0,859	0,177	0,131	0,00367
VULCAN MATE	0,863	0,00449	0,871	0,251	0,663	0,0038	0,994	0,28	0,354	0,171	0,654	0,00146
WABTEC CORP	1,112	0,0053	1,035	0,66	0,631	0,00497	1,169	1,003	0,452	1,009	-0,361	0,00094
WACHOVIA CO	0,694	0,0061	0,838	-0,491	0,355	0,00547	0,914	-0,456	0,194	0,147	0,279	0,00413
WACHOVIA CO	0,732	0,00934	1,025	-0,291	0,637	0,005	0,9	-0,172	0,824	0,24	-0,614	0,00605
WALGREENS B	0,718	0,00662	0,764	-0,244	0,0644	0,00655	0,995	-0,035	-0,446	0,771	0,776	0,00118
WALMART INC	0,533	0,00818	0,609	-0,512	-0,142	0,00832	0,674	-0,318	-0,222	0,612	-0,182	0,00597
WANG LABS IN	1,032	0,00474	1,761	2,697	3,81	-0,00358	1,923	2,339	2,582	-2,849	1,791	0,00407
WARNER-LAME	0,735	0,0184	0,738	-0,519	-0,17	0,0178	0,875	-0,292	-0,576	0,634	0,658	0,0155
WASHINGTON I	0,975	0,012	1,156	-0,444	0,841	0,00998	1,051	-0,339	1,207	0,154	-0,93	0,0114
WASTE MANAC	0,577	0,0145	0,587	0,0765	0,291	0,0142	0,68	0,202	0,102	0,432	0,197	0,0118
WASTE MANAC	1,091	-0,00315	1,002	-0,0905	-0,436	-0,000994	1,017	-0,0699	-0,454	0,07	0,0677	-0,00142
WATERS CORP	0,965	0,0123	0,853	0,485	-0,473	0,0125	0,89	0,267	-0,676	-0,539	0,95	0,0125
WEATHERFORI	1,487	-0,00769	1,49	0,43	0,601	-0,00906	1,534	0,442	0,487	0,0746	0,227	-0,00993
WEC ENERGY C	0,178	0,00908	0,238	-0,232	0,268	0,0088	0,407	-0,121	-0,125	0,442	0,691	0,00513
WELLCARE HE	1,573	0,0179	1,425	0,549	0,098	0,019	1,315	0,572	0,527	-0,00134	-1,438	0,0198
WELLPOINT HE	0,477	0,015	0,665	0,426	0,569	0,00979	1,071	0,799	-0,114	1,163	0,552	0,00254
WELLS FARGO .	0,766	0,0076	0,906	-0,424	0,867	0,00669	0,955	-0,285	0,802	0,44	-0,114	0,00496
WELLS FARGO .	1,245	0,00893	1,538	0,293	1,249	0,00373	1,408	0,27	1,675	0,172	-0,85	0,00391
WELLTOWER I	0,473	0,00816	0,478	0,157	0,404	0,00775	0,516	0,227	0,336	0,232	0,0233	0,00663
WENDY'S INTEI	0,556	0,013	0,739	-0,109	0,593	0,0102	1,024	0,259	0,103	1,205	0,442	0,00384
WEST PHARMA	0,715	0,00976	0,668	0,388	0,243	0,00952	0,779	0,507	0,00582	0,426	0,319	0,00682
WESTERN ATL/	0,779	0,00575	1,121	0,871	1,694	0,00145	1,084	0,824	1,723	-0,16	-0,09	0,00242
WESTERN DIGI	1,527	0,011	1,386	0,619	-0,464	0,0115	1,109	0,515	0,218	-0,499	-1,367	0,017
WESTERN UNIC	1,202	-0,00325	1,096	0,34	0,125	-0,00187	1,044	0,318	0,269	-0,112	-0,463	-0,000818
WESTMORELAN	0,952	0,00413	0,914	0,464	0,552	0,00352	1,135	0,62	0,0418	0,61	0,872	-0,00132
WESTROCK CO	0,956	0,00395	0,901	0,514	0,532	0,00381	0,932	0,631	0,511	0,338	-0,212	0,00274
WETTERAU INC	1,072	0,000294	1,299	-0,687	0,446	0,00387	1,692	-0,852	-0,389	-1,093	1,486	0,00795
WEYERHAEUSE	1,277	-0,00012	1,314	0,0838	0,661	-0,000805	1,401	0,226	0,496	0,476	0,11	-0,00323
WHIRLPOOL CC	1,458	0,00152	1,456	0,483	1,03	0,000462	1,563	0,596	0,8	0,405	0,316	-0,00214
WHOLE FOODS	0,987	0,0121	0,985	0,293	0,374	0,0105	1,149	0,441	0,11	0,517	0,31	0,00737
WILLAMETTE II	0,732	0,0111	1,151	0,356	1,07	0,00343	1,038	0,73	1,073	1,017	-0,867	0,0016
WILLIAMS COS	1,348	0,0048	1,338	0,264	0,443	0,00435	1,255	0,0263	0,55	-0,751	0,204	0,00728
WILLIS TOWER	0,621	0,00664	0,552	0,172	0,249	0,00705	0,704	0,268	0,0696	0,655	0,283	0,00343
WINDSTREAM I	1,291	-0,0221	1,289	0,141	-0,155	-0,0226	1,511	0,452	-0,349	2,199	0,532	-0,0304
WINN-DIXIE ST	0,595	-0,00352	0,787	-0,501	0,864	-0,0055	1,061	-0,192	0,401	1,05	0,444	-0,0124
WORTHINGTON	1,039	0,00313	0,991	0,462	0,404	0,00272	1,028	0,616	0,379	0,475	-0,233	0,00111
WPX ENERGY II	3,037	-0,0255	2,488	1,12	1,722	-0,0102	2,455	1,244	1,697	0,487	-0,0652	-0,01
WRIGLEY (WM)	0,271	0,00881	0,361	-0,325	0,196	0,00839	0,549	-0,108	-0,159	0,699	0,334	0,00425
WYETH	0,573	0,0081	0,646	-0,712	-0,114	0,0096	0,895	-0,652	-0,644	0,343	1,036	0,00566
WYNDHAM DE	2,345	0,00132	1,926	1,146	0,734	0,0078	1,96	1,333	0,988	1,466	-0,89	0,00473
WYNN RESORT	2,129	0,00501	1,855	0,75	0,53	0,00762	1,956	0,954	0,605	0,988	-0,624	0,00541
XCEL ENERGY I	0,305	0,00693	0,346	-0,184	0,122	0,0068	0,436	-0,14	-0,0935	0,19	0,414	0,00495
XEROX HOLDIN	1,527	-0,00278	1,492	0,238	0,0604	-0,00284	1,368	0,167	0,353	-0,296	-0,537	-0,000203
XILINX INC	1,591	0,00999	1,417	0,661	-0,788	0,011	1,221	0,334	-0,439	-1,092	-0,163	0,0163
XL GROUP LTD	1,192	0,0035	1,343	-0,164	1,068	0,000362	1,408	0,0209	1,086	0,502	-0,325	-0,0013
XTO ENERGY II	0,76	0,0232	0,826	0,068	0,53	0,0211	1,16	0,43	0,0307	1,124	0,273	0,0144
XYLEM INC	0,968	0,000876	0,949	-0,00583	0,144	0,00169	0,872	0,101	0,259	0,51	-0,487	0,00246
YOUNG & RUBI	0,841	0,0228	0,406	-0,162	-0,8	0,0215	-0,387	0,611	-0,312	0,93	-2,753	0,044
YRC WORLDWI	1,852	-0,0146	1,823	0,742	1,257	-0,0158	1,755	0,731	1,43	-0,0819	-0,376	-0,0146
YUM BRANDS I	0,665	0,0103	0,717	-0,215	0,263	0,0104	0,891	0,0553	-0,0537	0,826	0,078	0,00632
YUM CHINA HC	0,8	0,0114	0,725	0,227	0,0114	0,0132	0,695	0,418	-0,221	0,824	0,457	0,0118
ZEBRA TECHN	1,145	0,00984	1,008	0,702	-0,325	0,0102	0,964	0,751	-0,177	0,0993	-0,433	0,0109
ZENITH ELECTI	1,361	-0,0319	1,097	0,981	-0,568	-0,0275	0,639	1,169	0,82	1,804	-3,006	-0,0255
ZIMMER BIOME	0,873	0,00438	0,804	0,193	0,207	0,00476	0,922	0,287	0,0975	0,574	0,0822	0,00193
ZIONS BANCOR	1,009	0,0061	1,055	0,3	1,249	0,00481	1,016	0,226	1,318	-0,245	-0,0173	0,00597
ZOETIS INC	0,741	0,0113	0,796	0,0461	-0,431	0,00822	0,761	0,155	-0,473	0,399	-0,0269	0,00802