Expected risk premium dynamics across the business cycle and the stock market's response to macroeconomic news

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Abstract

We analyze the impact of macroeconomic announcements on expected risk-premia, earnings growth and risk-free rates, i.e., the main drivers of stock valuations. While during recessions expected risk-premia are higher on average, we find that they decline when surprisingly good economic news are released in a downturn. In contrast, during expansions risk-premia are lower, but increase after good news. No such asymmetries are observed for risk free rates and expected earnings: both rise after good news, irrespective of the state of economy. Hence the stock market's asymmetric reaction to economic news is explained exclusively by the asymmetric risk-premia response.

Keywords: asset pricing, information processing, macroeconomic news, implied cost-of-capital, expected risk-premia

JEL classification: E 44, G14

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I. Introduction

Previous empirical studies find that the stock market's reaction to macroeconomic news, in particular unemployment rates, depends on whether the economy is in a recession or an expansion. The explanation offered so far is that the informational content of macroeconomic news is time-varying: risk-free rates, earnings expectations and expected risk-premia, the main value drivers of stocks, are differently strongly affected during expansions and recessions. In contrast, we document that the asymmetric stock market reaction is solely due to an asymmetric reaction of expected risk-premia. Specifically, we combine implied risk-premia at the individual firm level and revisions of analysts' earnings forecasts around a broad set of macroeconomic news releases covering a period of almost three decades. Our analysis shows that all three value drivers are affected by macroeconomic news in recessions and expansions, but only expected risk-premia react asymmetrically.[1] During recessions, risk-premia are elevated on average but decrease following surprisingly positive economic news. During expansions, risk-premia are generally lower but increase in response to the same news. In contrast risk-free rates and earnings expectations react positively to good news irrespective of the current state of the economy.

The crucial point of our analysis is a reliable estimation of expected risk-premia, earnings growth and risk-free rates. In contrast to previous studies, we use substantially improved measures of risk-premia applying the recently developed implied cost-of-capital technique (e.g. Gebhardt, Lee, and Swaminathan (2001), Claus and Thomas (2001) and Daske, Gebhardt, and Klein (2006)). Estimating ex-ante expected risk-premia and earnings growth at a sufficiently high frequency is generally difficult, mainly due to the low frequency of accounting data. However, we use regularly updated data of individual analysts' earnings

[1] Analyzing individual financial analyst forecasts Hess and Kreutzmann (2009) also document a significant influence of surprising news in scheduled macroeconomic announcements.

expectations.[2] Deriving implied cost-of-capital estimates using analysts' forecasts enables us to estimate expected risk-premia on a higher frequency and at the firm-level. In addition, analysts' forecasts provide a direct measure of expected earnings growth at the firm-level. In contrast previous studies use much more remote proxies of earnings growth, such as aggregate industrial production. Analysts' forecasts are available at firm-level and on a higher than monthly frequency. On top, we use a broad set of seven influential macroeconomic headlines to examine if and how each of the three valuation driver is affected by overall economic news.

The main difference of our approach compared to related studies is that we focus on expected risk-premia implied in current stock prices rather than (future) realized excess returns. Nevertheless, our findings contribute to the literature on a countercyclical behavior of realized risk-premia across the business cycle (Fama and French (1989), Ferson and Harvey (1991), Harrison and Zhang (1999)). Based on ex-post business cycle classifications, this literature indicates that on average realized excess returns are higher during recessions than during expansions. This is supported by studies analyzing predictors of future excess stock market returns. For example, Lettau and Ludvigson (2001) find that the consumption wealth ratio has a strong predictive power, Campbell and Diebold (2009) find that expected business conditions, as measured by the Livingston business conditions survey, can as well forecast excess stock market returns.

With respect to the average level of risk-premia, our results are largely in line. Moreover, since implied risk-premia can be reliably estimated on a higher frequency we also study their short-run behavior. During a recession, when news is typically bad, we also find higher risk-premia. Nevertheless if surprisingly good news, i.e. not as bad as expected news, is released these elevated risk-premia come down immediately. On the other hand, during an expansion

[2] Subtracting the 3-month T-Bill as proxy for the risk-free interest rate yields the expected risk-premia.

news is good on average and required risk-premia are lower. If now an even better than expected news arises, market participants immediately raise their (depressed) risk-premia demands. A possible explanation could be that better than expected news in a booming environment is taken as a signal of overheating while in a recessionary environment it provides some relieve for investors.

Moreover, our results provide an alternative explanation why the stock market reacts asymmetrically to macroeconomic news. Previous research has analyzed the reaction of stock markets to macroeconomic news. They document a strong asymmetry of the reaction depending on the state of economy (e.g. McQueen and Roley (1993), Boyd, Hu, and Jagannathan (2005)). For stock markets, McQueen and Roley (1993) are the first to provide empirical evidence for an asymmetric reaction of the S&P 500 index to better than expected news, i.e., negative in expansions and positive in recessions.[3] Concerning bond markets, there is little evidence for a similar state dependency. For example, Beber and Brandt (2010) find that bonds react somewhat more strongly to news releases in expansions, but they do not find a change of signs. Most closely related to our approach is Boyd et al. (2005) suggesting that during recessions, stock price reactions are solely driven by growth expectations while during expansions, changes in risk free rates is the dominating impact factor. However, they focus on the aggregate market level and use indirect proxy measures of growth expectations and risk-premia, namely the aggregate industrial production and an intrinsic value-to-price ratio of Dow 30 stocks.[4] However, the value-to-price ratio is hardly applicable at the individual firm-level. In contrast, using more direct proxies of growth expectations and risk-premia, we show

[3] Research analyzing the stock market response comes, among others, from Pearce and Roley (1985), Boyd, Hu, and Jagannathan (2005), Boyd, Jagannathan, and Liu (2006), Andersen, Bollerslev, Diebold, and Vega (2007) and Cenesizoglu (2008).

[4] The intrinsic value-to-price ratio was developed by Lee, Myers, and Swaminathan (1999). A major shortcoming using this measure as a proxy for risk-premia is that changes of intrinsic values and prices are observed on different frequencies. Therefore, intrinsic values change only when new accounting data become available, i.e., at best quarterly, while market prices change every day.

that the expected risk-premia appears to be the decisive factor of the observed asymmetric stock market pattern.

The remainder of the paper is organized as follows. Section II describes the dataset and the estimation procedure for the valuation drivers. Section III introduces the research design and presents the empirical results along with several robustness tests. Concluding remarks are provided in Section IV.

II. Data Description

Our sample covers the period May 1982 to December 2009. Daily returns, prices and shares outstanding for S&P 500 index constituents are retrieved from the CRSP US daily stocks and index file. Firm- and analyst-specific earnings forecasts for different horizons are obtained from the Institutional Brokers' Estimate System (I/B/E/S). Additionally, accounting data, such as book value of equity, are provided by the COMPUSTAT quarterly fundamentals file. We include only firms with a history of at least one full business cycle, since we want to measure the differential stock price reactions over the cycle. Specifically, we exclude firms which have no record for at least six recession and 18 expansion months.

The focus of this study is on how macroeconomic news affects the three value drivers of stocks and especially expected risk-premia. Most importantly, that requires thorough calculation of expected risk-premia and expected earnings growth at the firm-level.[5] In the following, we provide a detailed explanation of the empirical methods for calculating these estimates.

[5] In a related study, Bestelmeyer and Hess (2010) also focus on the reaction of stock markets to unemployment rate news at the firm-level. However, their scope is to analyze the differential impact in the cross-section of stocks with a special focus on cyclicality.

A. Information Flow and Course of Events

A major element of our analysis is a precise alignment of macroeconomic news to the sequential updating process of individual analysts' forecasts. This is important since analyst forecasts enter our analysis in two ways: first, we use them as a proxy for market participants' expectations about future earnings growth. Second, they are an important input to estimating expected risk-premia. We identify individual changes (revisions) in the earnings forecasts for each company and analyst, and match the revisions to macroeconomic announcements released during the corresponding revision periods.

The intuition of this procedure is illustrated in Figure 1 for the time period from February 1998 to the fiscal year end in June 1998 and the release of the unemployment rate and consumer confidence.

[Insert Figure 1 here]

The revision period (τ) is the number of days between the time of the initial forecast or its last confirmation (time: $t-\tau$) and the time the forecast is revised (time: t).[6] The revision is the difference between the earnings forecast (the risk-premia and risk-free rate, respectively) made at time $t-\tau$ and the revised forecast at t.[7] We identify all macroeconomic announcements occurring during the revision period and match them to the revision. However, the selection of the revision period requires careful considerations. On the one hand, a longer event window naturally inhibits more new information and makes it more difficult to isolate the effect of the macroeconomic surprise. On the other hand, analysts usually update their forecasts only every few weeks. Hence an unusual short revision period is most probably due

[6] In our definition a revision is only made if the forecast for the next period end is changed or confirmed.
[7] Note that analysts can make several forecasts during one fiscal year. Therefore, whether a forecast is initial or revised depends on the point in time.

to either transmission errors or extraordinary firm specific events that make a timely correction of a forecast necessary. Hence, it is necessary to limit the considered revision period to a maximum and a minimum length. Following Hess and Kreutzmann (2009) we restrict it to a minimum of one week and a maximum length of four weeks for our standard analysis and repeat our analysis with two, six and eight weeks maximum for robustness checks.

B. Changes in Expected Risk-Premia

Establishing a risk-premia proxy on a sufficiently high frequency is a major challenge. Our approach uses expected risk-premia calculated as the difference between the implied cost-of-capital at firm- and analyst-specific level and the overall risk-free rate. The change in expected risk-premia is calculated as change in these two components:

$$\Delta RP_{i,k,t,t-\tau} = \left[(CoC_{i,k,t} - RF_t) - (CoC_{i,k,t-\tau} - RF_{r-\tau}) \right] \cdot 100, \tag{1}$$

where $CoC_{i,k,t}$ are the cost-of-capital of company k implied in the revised forecasts of analyst i in time t and $CoC_{i,k,t-\tau}$ are the respective cost-of-capital implied in the initial forecast in time $t-\tau$. *RF* denotes the risk-free rate, respectively. [8]

Our approach to calculate expected risk-premia refers to a strand of literature dealing with the implied cost-of-capital technique developed by Gebhardt, Lee, and Swaminathan (2001) and Claus and Thomas (2001). The basic idea is to invert the residual income formula using only information which is available for market participants in real-time, i.e. market

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[8] We obtained the 3-month T-Bill rate from the Federal Reserve H.15 release. The data is publicly available at the Federal Reserve Website (http://www.federalreserve.gov/RELEASES/H15/data.htm).

prices and analysts earnings forecasts.[9] Since the method of Gebhardt, Lee, and Swaminathan (2001) is limited to calculate implied risk-premia on a *yearly* basis, we adopt the approach from Daske et al. (2006). With this we consistently calculate implied cost-of-capital at a firm- and *daily*- level. Most important in our context is the advantage that cost-of-capital estimates are based on market expectations rather than on historical data.[10]

However, one potential shortcoming is left. While the frequency of the implied cost-of-capital is now on a daily level, it is important to notice that its variation is still caused to a great amount by the variation of the market price. Financial analysts do not renew their earnings forecasts every day or even every week. In fact, Clement and Tse (2003) find that usually analysts submit new forecasts only four times a year for each company on average. In this case, estimated implied daily cost-of-capital are based on "old" earnings forecasts and the variation in the implied cost-of-capital is largely due to price movements. Previous studies (e.g. Gebhardt, Lee, and Swaminathan (2001), Claus and Thomas (2001) and Daske et al. (2006)) calculating implied cost-of-capital base their analysis on consensus forecasts. Here, the disadvantage of using consensus forecast is that it consists of "old" and "new" forecasts which are aggregated to a median forecast. The changing composition of the consensus forecast over time makes it difficult to consistently measure changes in earnings expectations. Moreover, consensus forecasts are only available on a monthly basis. Since our analysis focuses on the effects of "new" information entering the market, it is essential to use implied cost-of-capital estimates that are based on "new", i.e. updated, forecasts.

Therefore, we follow Hess and Kreutzmann (2009) and use *individual* analysts' forecasts. The main advantage is that we can identify the announcement day of the revision for every

[9] A more detailed description of the approach is presented in the Appendix.
[10] For a detailed review on implied cost of capital techniques, as well as on advantages and disadvantages of this approach, see Easton (2007).

analyst updating his forecast for any company. This approach assures that implied cost-of-capital are only calculated when forecasts are updated. Moreover, the change in earnings expectations following macroeconomic announcements is estimated more precisely compared to consensus forecasts.

Table 1 reports descriptive statistics of the input data and the estimated daily implied cost-of-capital and risk premia for the period from 1982 to 2009. All observations having negative cost-of-capital or risk-premia are economically not meaningful and thus excluded.[11]

[Insert Table 1 here]

On average, implied cost-of-capital are 12,41%. This is comparable to previous results from Daske et al. (2006).[12] However, analyzing expected risk-premia and risk-free rates conditional on the state of the economy reveals an interesting pattern. In line with previous literature the median risk-premia in recessions is about 33% higher than in expansions (6,87% vs. 5,14%). In contrast risk-free rates sharply decline in recessions (1.36% vs. 4.92%). The net effect is a higher implied cost-of-capital during expansions, since the lower level in expected risk-premia is offset from the higher level in the risk-free rate on average.

C. Changes in Expected Earnings, Risk-free Rates and Stock Prices

Analogue to the expected risk-premia, the change in earnings expectations $(\Delta EE_{i,k,t,t-\tau})$ for the next fiscal year is defined as the difference between the revised forecast in time t minus the initial forecast in time t-τ. Consequently, the overall change in earnings

[11] Furthermore, to assure that our results are not driven from potential outliers, we drop observations in the top one percentile.
[12] In contrast to Daske, Gebhardt, and Klein (2006) we use the 3-month T-Bill which is on average lower than the 10-year treasury note. Therefore, our expected risk-premia is higher on average.

expectations is the sum of changes in earnings forecasts for the one to five future fiscal years (see equation (2)):[13]

$$\Delta EE_{i,k,t,t-\tau} = \frac{\sum_{f=1}^{5}(EPS^{f}_{i,k,t} - EPS^{f}_{i,k,t,t-\tau})}{P_{k,t-\tau}} \cdot 100, \tag{2}$$

where $EPS^{f}_{i,k,t}$ is the revised forecast of analyst *i* for the future fiscal year end *f=(1,...5)* of company *k* on time *t* and $EPS^{f}_{i,k,t-\tau}$ is the respective initial forecast in time $t-\tau$.[14] As pointed out, we restrict the revision length τ to a minimum length of one and a maximum length of four weeks.

Since risk-free rates are available on a higher frequency than earnings forecasts, we define the change in risk free rate expectations $(\Delta RF_{t,t-1})$ as the daily change of the 3-month T-Bill (RF_t) at the announcement day:

$$\Delta RF_{t,t-1} = (RF_{t-1} - RF_t) \cdot 100. \tag{3}$$

Similarly the change in stock prices is calculated according to equation (4):

$$\Delta P_{t,t-1} = \frac{(P_t - P_{t-1})}{P_{t-1}} \cdot 100 \tag{4}$$

where $\Delta P_{t,t-1}$ is the daily stock return. Again, to analyze the impact of macroeconomic announcements daily changes of the valuation drivers are aligned to macroeconomic news and treated as dependent variables.

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[13] We repeat our analysis with different definitions of the change in earnings expectations and obtain very similar results.

[14] If less than five forecasts are available for a given analyst, we follow the procedure described in the appendix and estimate forecasts for future 3-to 5-years using long-term growth, if available, or the implicit growth rate in 1-and 2-year forecasts, if the long-term growth is not available.

D. Macroeconomic News

We now turn to the independent variable of our analysis: macroeconomic news announcements. Following a fixed announcement schedule the government releases several indicators of macroeconomic growth every month. In our analysis, we consider seven headlines, namely consumer confidence index (CC), the institute of supply managers' index (ISM), nonfarm payrolls (NFP), civilian unemployment rate (UN), retail sales (RS), industrial production (IP) and capacity utilization (CU). These indicators provide information on overall economic growth and are the first to be announced in the monthly schedule. For that reason, they contain more valuable information than announcements made later in the release cycle.[15] Table 2 provides information about the data availability as well as descriptive statistics for the macroeconomic news.

[Insert Table 2 here]

Since the focus of this paper is on analyzing how news about overall macroeconomic growth affects stock markets, it is crucial to identify the news component, i.e., the unanticipated part of the information. For that, we employ survey data on the macroeconomic expectations provided by MMS (respectively Global Informa, its successor) and Bloomberg.[16] MMS regularly conducts surveys, asking academicians and practitioners to forecast macroeconomic figures released during the following week. It includes the median consensus forecasts for the macroeconomic headline that we use to calculate the surprise, i.e., the news

[15] Hess (2004) shows that the information value of an additional release decreases with the number of already available figures providing similar content.

[16] Money Market Service (MMS) is the most widely used data provider in studies of macroeconomic announcements. Studies that use MMS forecasts include, among others, Hardouvelis (1988), McQueen and Roley (1993), Balduzzi, Elton, and Green (2001), Flannery and Protopapadakis (2002), Chatrath, Christie-David, and Moore (2006) and Hautsch and Hess (2007).

component, as opposed to the actual released value.[17] In line with previous literature (Balduzzi et al. (2001), Andersen, Bollerslev, Diebold and Vega (2003) and Andersen et al. (2007)), we standardize the surprise with its sample standard deviation. Specifically, the standardized news S_m for macroeconomic announcement m is defined as:

$$S_m = \frac{A_m - F_m}{Std(A_m - F_m)} \tag{5}$$

where A_m denotes the actual released value, F_m the consensus market expectation and Std is the sample standard deviation.

E. Business Cycle Indicator

To identify periods of expansions and recessions, we need an appropriate classification scheme. Like previous studies (e.g., Basistha and Kurov (2008)) we use the Chicago Fed National Activity Index (CFNAI).[18] The CFNAI is the first principal component of 85 monthly indicators of national economic activity. Its construction follows the methodology in Stock and Watson (1999).[19] According to the Chicago Fed, a drop in the 3-month moving average of the CFNAI below -0.7 indicates an increasing probability that a recession has begun. An increase of the 3-month moving average of the CFNAI above 0.2 indicates a significant probability that a recession has ended. Applying this rule, our sample period spans five business cycles with a total of 124 recession and 236 expansion months.

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[17] The performance of these forecasts has been scrutinized, for example, by Pearce and Roley (1985), McQueen and Roley (1993), Almeida, Goodhart, and Payne (1998). These studies provide evidence that forecasts collected by MMS are either unbiased or exhibit only a very small bias. Moreover, MMS forecasts are found to be more accurate than time series models. For a recent study on the rationality of these forecasts, see Hess and Orbe (2010).

[18] Historical values of the CFNAI are obtained from the website of the Chicago Fed (www.chicagofed.org).

[19] The index is constructed to have an average value of zero and a standard deviation of one. A positive index corresponds to growth above trend and a negative index corresponds to growth below trend.

We also use the National Bureau of Economic Research (NBER) turning points to test our results for robustness. NBER-turning points have been frequently used in earlier studies. While they are easy to obtain, they have a drawback: they are not available in real-time. Consequently, they incorporate information not available to market participants at the announcement day, and thus are presumably not well suited to measure market participants' real-time assessment of the business cycle. Comparing NBER and CFNAI schemes, it is striking that CFNAI has almost twice as many recession months. However, most of this difference is due to the 1989 – 1992 and the 2001 – 2003 periods where the CFNAI suggests that the economy was for 42 (34) months in recession while NBER indicates 8 recession months. For the following analysis presented in Section III, we use the CFNAI as business cycle indicator. However, our results remain similar when the NBER business cycle classification is employed.

III. Decomposing the Change in Expectations

A. Research Design

We regress the change of each valuation driver on the macroeconomic surprises that occur during the revision period. To analyze the influence of the business cycle we include the CFNAI indicator as dummy variable. Hence, we use the following regression equations:

$$\begin{aligned}\Delta VP^{l}_{i,k,t,t-\tau} = \alpha_0 + \sum_{m=1}^{7}\beta_m^{rec} D_t^{rec} S_{m,t-1,t-\tau+1} + \sum_{m=1}^{7}\beta_m^{\exp}(1-D_t^{rec}) S_{m,t-1,t-\tau+1} \\ + \delta_1 ES_{i,k,t,t-\tau+1} + \delta_2 \Delta EPS_k^{-4q} + \delta_3 ret_k^{-3m} + \delta_4 dev_{i,k,t,t-\tau} + \varepsilon_{i,k,t,t-\tau}\end{aligned} \quad (6)$$

$$\Delta RF_{t,t-1} = \alpha_0 + \sum_{m=1}^{7}\beta_m^{rec} D_t^{rec} S_{m,t,t-1} + \sum_{m=1}^{7}\beta_m^{\exp}(1-D_t^{rec}) S_{m,t,t-1} + \varepsilon_{i,t,t-1} \quad (7)$$

where $\Delta VP^{l}_{i,k,t,t-\tau}(l=1,2)$ denotes the change in the value drivers ΔRP and ΔEPS. $S_{m,t-1,t-\tau+1}$ is the surprise component of the macroeconomic headline *m* that is arriving within the revision period of any analyst.[20] D^{rec}_{t} denotes a categorical variable with value one if the economy is in a recession and zero otherwise. All regressions are estimated using robust standard errors to control for heteroskedasticity caused by clustering on the company level. Furthermore, we test the regression coefficients of the macroeconomic surprises to depend on the state of economy. We therefore conduct Wald-tests with the null-hypotheses of no difference across recessions and expansions ($\beta^{rec}_{m}=\beta^{\exp}_{m}$).

In line with previous research (e.g. Abarbanell and Bernard (1992), Klein (1990), Lys and Sohn (1990), and Abarbanell (1991), Stickel (1990), Hess and Kreutzmann (2009)), we control for potential other influences on the earnings forecasts revisions. The first control-variable is the surprise in firms' earnings which is defined as:

$$ES_{i,k,t,t-\tau}=\frac{EPS_{k,t,t-\tau}-EPS^{f}_{i,k,t-\tau}}{P_{k,t-\tau}}, \tag{8}$$

where $EPS_{k,t,t-\tau}$ is the actual realized earnings per share on quarterly basis and $EPS^{f}_{k,t,t-\tau}$ is the forecast for the next fiscal quarter earnings per share. The difference between the forecasted earnings and the actual earnings serves as a proxy for firm specific information that enters the market during the revision period.[21] Moreover, previous literature shows that analysts tend to underreact to prior earnings changes as well as to past returns.[22] Therefore, we include the change in earnings from the estimation date to the previous year (ΔEPS^{-4q}_{k})

[20] In case that no new information arrives during the revision period, the surprise is set to zero. If more than one surprise of a given macroeconomic series arrives during a revision period, the relevant surprises are added up and the total surprise is used as independent variable.
[21] For a detailed description how to obtain earnings surprises see Hess and Kreutzmann (2009), pp 18-19.
[22] See Abarbanell and Bernard (1992), Klein (1990), Lys and Sohn (1990), Abarbanell (1991).

and the company's 3-month stock return preceding the initial forecast (ret_k^{-3m}) as control-variables. Finally, to control for potential herding of the analysts, we include the difference between the individual forecast of each analyst and the consensus forecast at the time of the initial forecast $dev_{i,k,t-\tau}$.[23]

B. Results

Table 3 reports the result of our main analysis.

[Insert Table 3 here]

Confirming previous findings, stock returns react negatively to positive macroeconomic surprises during expansions, while they react positively to the same news during recessions.[24] The Wald-test rejects the null hypothesis that regression coefficients are equal for expansion and recession at the 1% significance level. Most importantly, we see that the asymmetrical stock market reactions stems from an asymmetrical reaction of risk-premia. For six out of seven headlines the regression coefficients show opposite signs in recessions and expansions. The reaction of the implied risk-premia to positive macroeconomic surprises is negative in recessions for six out of seven headlines, implying that positive news cause the risk-premia to decrease. This is not the case during expansions where the reaction is either not significant (4/7) or positive (2/7). In addition, the results of the Wald-tests show that in six out of seven cases the null-hypothesis is rejected at the 1% significance level. Only the results for nonfarm-payrolls do not fit into this picture. Yet, for nonfarm-payrolls we find no evidence for an asymmetrical reaction of stock returns to macroeconomic news.

[23] Jegadeesh and Kim (2010) and Stickel (1990) show that analysts tend to revise their forecasts towards the consensus forecasts.
[24] See for example Pearce and Roley (1985), Boyd et al. (2005) or Andersen et al. (2007).

Turning to the change in earnings expectations we find no asymmetric reaction. Only in two out of seven cases the null hypothesis of the Wald-test can be rejected. Furthermore, we confirm previous results of Hess and Kreutzmann (2009) that earnings expectations increase with positive surprises. Seven out of fourteen regression coefficients show the expected positive (and significant) sign, while only three coefficients are significantly negative. Likewise, we find no evidence for an asymmetric reaction of bond prices which is in line with previous literature.[25] All regression coefficients show the same sign irrespective of the state of economy. Moreover, the hypothesis of equal regression coefficients can be rejected for all macroeconomic headlines, except for nonfarm-payrolls. Overall, positive macroeconomic surprises cause the risk-free rate to increase and therefore bond prices to fall.

Summarizing, the asymmetric reaction of the risk-premia seems to be the driving factor of the asymmetric stock return to macroeconomic news. The risk-premia react strongly asymmetric, while neither the risk-free rate nor the expected growth in future earnings does. During recession, a positive macroeconomic surprise causes the risk-free rate and the expected earnings growth to increase and the risk-premia to decrease. Hence, there are two adverse effects of the three valuation primitives on the stock prices. While the increase in expected growth and the decrease in risk-premia cause the stock prices to rise, the growth of the risk-free rate cause the stock prices to fall. Obviously, the effect on expected earnings and risk-premia is stronger than the effect of the increasing risk-free rate and therefore the overall effect is rising stock prices. On the other hand, in expansions positive macroeconomic surprises cause all valuation drivers to increase in general. In this case, the rise in risk-free rate and risk-premia cause the discount rate to increase and therefore the stock prices to fall, while the rise in expected earnings growth causes stock markets to increase. The reversal of

[25] For example, see Beber and Brandt (2010)

the risk-premia reaction in expansion is the driving factor for the change of the overall effect on stock markets.

Overall, our results suggest that there is little asymmetry in the reaction of risk-free rates and earnings expectations while risk-premia react strongly asymmetrically across expansions and recessions. How do these results fit into the previous literature? Veronesi (1999) develops a rational expectations model that explains different stock market reactions to macroeconomic news during good and bad times. His model predicts an increase of the risk-premia following good news during recessions. This result is based on the assumption that market participants are uncertain about the current state of economy. Correspondingly, good news in recessions increases the state uncertainty and therefore the risk-premia rises. Our results indicate that better than expected news lead to a decrease of the risk-premia during recession. This result partly contradicts the predictions of the model, however we do not differentiate between *good* and *bad* news and therefore we are not able to test the Veronesi Model consistently.

Boyd et al. (2005) also empirically observe the pattern that in good economic times surprisingly positive news from the macro economy are bad news for the stock market. Yet, their explanation is quite different from ours. They find a decrease in risk-premia following positive news in expansions and conclude that the risk-free rate effect dominates the risk-premia. However, our results suggest that in expansions the increase in the discount rate is strengthened, not diluted by the risk-premia. The change in the risk-free rate does not dominate the change in the expected risk-premia. Thus both components of the discount rate work in the same direction causing stock prices to decrease. Turning to recessions, our results imply that the positive stock price impact of an increase in earnings expectations is encouraged by the decreasing discount rate. In this case, the effects on the risk-free rate and on the risk-premia are contrary. The increases in the expected risk-free rate as well as the decrease in the expected risk-premia diminish if not cancel out the overall discount rate effect.

While Boyd et al. (2005) likewise find a positive effect on earnings growth following positive news, they do not find evidence for a change in interest-rate or risk-premia expectations.

Overall, the implications of our results are quite different: While Boyd et al. (2005) attribute the asymmetric stock market reaction to the varying dominance of one effect over the other in the course of the business cycle, we find that risk-premia solely drive the observed stock market pattern.

Finally, our findings contribute to the literature on a countercyclical behavior of realized risk-premia across the business cycle (Fama and French (1989), Ferson and Harvey (1991), Harrison and Zhang (1999)). This literature shows that on average realized excess returns are higher during recessions than during expansions. Regarding the average level of risk-premia, our results are largely in line. However, our results provide insights into the short-run behavior of risk-premia in response to macroeconomic news. During a recession, if surprisingly good news, i.e. not as bad as expected news, is released expected risk-premia drop immediately. On the other hand, during an expansion news is good on average and required risk-premia are lower and if now even better than expected news arise, market participants immediately raise their risk-premia demands.

C. Robustness

To evaluate the robustness we present alternative research design specifications. Our results might be sensitive with respect to three possible concerns: Firstly, the choice of the business cycle definition, secondly the data restriction to the S&P 500 and lastly the chosen revision period length. Therefore, we re-estimate equation (6) using the NBER turning points as an alternative business cycle classification. Moreover, we extend our sample to all available firms in the CRSP file and finally we alter the revision period length to two, six and eight weeks. This analysis reveals that the results are remarkably robust.

Concerning the business cycle, we substitute the CFNAI with the frequently used NBER-turning points. This facilitates a comparison to previous studies like Boyd et al. (2005). While the NBER business cycle classification yields some major shortcomings described in Section II, the results remain robust (see Table 4).

[Insert Table 4 here]

In four out of seven headlines, the asymmetric impact on the expected risk-premia is virtually unchanged. In case of the nonfarm-payrolls the results show the expected sign in favor of the asymmetric reaction of the risk-premia. Overall, the Wald-test rejects the null-hypothesis in five out of seven cases. Most importantly, the statistical significance is comparable or becomes even stronger for most (11/14) of the coefficients when we use the NBER business cycle classification. The significance decreases only for two coefficients measuring the impact of macroeconomic news in recessions. This is not surprising since comparing NBER and CFNAI, the number of recession months is substantially lower for NBER.

Another issue may be the sample selection. We analyze individual S&P 500 firms because large firms have been shown to have a greater sensitivity to macroeconomic news and to facilitate a comparison to previous studies. Therefore, we extend our sample to all firms available in the CRSP, Compustat and I/B/E/S databases matching our data needs. Estimation results are given in Table 5.

[Insert Table 5 here]

Most importantly, the coefficients remain remarkably robust. We observe only minor differences with respect to the size of the estimated coefficients and no sign reversals. Moreover, employing more firms enhances the significance of the coefficients slightly. In particular, the impact of consumer confidence news on the expected risk-premia is now significant in expansions.

Last but not least, we alter the revision period length to calculate the change in the expected risk-premia. As discussed before, forecast revisions of analysts' earnings expectations in the I/B/E/S database are not available on a daily basis. We acknowledge this fact by using a time window to calculate the change in expected earnings and risk-premia respectively. Therefore, we face a trade-off. Increasing the revision period yields more observations, but at the same time increases the effects of firm-specific news entering the market. As a reasonable compromise we decided to use a four-week revision window. However the revision window length seems to have little impact. Varying the window does not substantially alter the results (see Table 6).

[Insert Table 6 here]

Irrespective of the implemented revision window the results remain strong. While the signs and the coefficients hardly change, the significance increases for four out of seven macroeconomic headlines when extending the window to six weeks. Naturally, reducing the revision window to two weeks lowers the statistical significance somewhat. The rigidity of analysts' revision behavior reduces the number of observations substantially. Nonetheless, the sign of the coefficients and their size is remarkably stable across all robustness checks. Overall, the results strongly confirm the asymmetric impact of macroeconomic news on the expected risk-premia.

IV. Conclusions

Our results shed new light on the asymmetric behavior of stock prices surrounding macroeconomic releases. In particular, we investigate whether the impact of macroeconomic news on expected risk-premia, expected earnings growth and risk-free rates changes over the business cycle and whether this may explain the observed stock market pattern. In contrast to previous studies, we analyze disaggregated firm-level data and extract expected risk-premia and earnings growth using individual analysts' earnings forecasts and a state-of-the-art implied cost-of-capital technique.

Most importantly, we find that expected risk-premia are on average higher during recessions than in expansions. Good news in a recession seem to provide instant relief for investors and elevated risk-premia fall towards more normal levels after such news. On the other hand, better than expected news in an already prosperous environment has an opposite effect: risk-premia which are on average lower during expansions immediately rise after good news. These findings emphasize the importance of the economic state for the expected risk-premia of equity holders.

Moreover, we document that the asymmetric stock market reaction is mainly driven by the asymmetric reaction of risk-premia. In contrast, we do not find evidence for a state dependence of risk-free rates or expected earnings growth. Consistent with previous literature, we find that the risk-free rate increases with positive macroeconomic surprises having a negative effect on the stock prices during both recessions and expansions. In contrast, the expected earnings growth increases after positive surprises causing the stock prices to rise. Risk-premia appears to be the decisive factor for the stock market’s reactions. During expansions, risk-premia increase (or at least stay constant) causing stock prices to fall. In this case the effect of the risk-free rate is strengthened and both, risk-free rate and expected risk-premia effect cause the stock prices to fall. During recession however, risk-premia decrease after positive macroeconomic surprises leading to rising stock prices. Now, the risk-premia effect strengthens the expected cash flow effect and stock prices rise.

Overall, our findings provide strong implications for asset pricing. The fact that the average level and short-term reaction of implied risk-premia are strongly state dependent calls for the inclusion of macroeconomic state variables when modeling asset prices and estimating expected market risk-premia.

Appendix

Estimation of Implied Cost-of-Capital

Our approach to calculate expected risk-premia is primarily based on the implied cost-of-capital technique developed by Gebhardt, Lee, and Swaminathan (2001) and Claus and Thomas (2001). The basic idea is to invert the residual income formula (see equation (13)) in order to compute the implied cost-of-capital using real-time available market data.

$$P_t = bvps_t + \sum_{\tau=1}^{\infty} \frac{E_t\left[eps_{t+\tau} - r^e \cdot bpvs_{t+\tau-1}\right]}{(1+r^e)^\tau} \qquad (13)$$

The data embraces directly observable stock prices (P), accounting data such as total book equity $(bvps)$ as well as earnings expectations (eps) derived from financial analysts' forecasts. Using this data and assuming a flat term structure, implied cost-of-capital are calculated at firm level. The advantage of this approach is that cost-of-capital estimates are based on market expectations rather than on historical data.[26] Deducting a proxy for the risk free rate, we obtain the expected risk-premia at firm level.

The method of Gebhardt, Lee, and Swaminathan (2001a) is limited to calculate implied risk-premia at firm-level on a yearly basis. Therefore, Daske et al. (2006) extend this method and develop a technique to consistently calculate implied cost-of-capital on a daily basis. Adopting this approach we calculate daily implied cost-of-capital by solving the following equation (14):

[26] For a detailed review on implied cost-of-capital techniques, as well as on advantages and disadvantages of this approach, see Easton (2007).

$$P_t = bvps_t' + \frac{feps_t' - \left[(1+r^e)^{\frac{days(t, fiscal\ year\ end\ 1)}{365}} - 1 \right] \cdot bvps_t'}{(1+r^e)^{\frac{days(t, fiscal\ year\ end\ 1)}{365}}} + \sum_{n=2}^{5} \frac{feps_{t,n} - r^e \cdot bvps_{t,n-1}}{(1+r^e)^{\frac{days(t, fiscal\ year\ end\ n)}{365}}} + \sum_{n=6}^{11} \frac{(FROE_{t,n} - r^e) \cdot bvps_{t,n-1}}{(1+r^e)^{\frac{days(t, fiscal\ year\ end\ n)}{365}}} + \frac{(IROE_{t,12} - r^e) \cdot bvps_{t,11}}{r^e (1+r^e)^{\frac{days(t, fiscal\ year\ end\ 11)}{365}}} \tag{14}$$

$P_t =$	Market price per share at estimation time t
$bvps_t' =$	Adjusted book value (CEQ) per share at estimation time t
$bvps_{t,n} =$	Expected book value per share for the n-th full fiscal year
$feps_t' =$	Adjusted forecasted earnings per share for fiscal year at estimation time t
$feps_{t,n} =$	Forecasted earnings per share for the n-th full fiscal year
$FROE_{t,n} =$	Forecasted return on equity for the n-th full fiscal year
$IROE_{t,12} =$	Forecasted industry return on equity at estimation time t
$r^e =$	Cost-of-Capital
$days(t, year(n))$	Number of days between estimation time t and the n-th full fiscal year's end

This three-stage version of the residual income model uses an explicit forecast horizon of five years, followed by a six year fading period and a terminal value phase. We obtain data for the actual book value per share $bvps_0$ as well as for the dividend pay-out ratio from Compustat Active and Research files and daily market prices (P_t) from CRSP. Furthermore, we obtain firm- and analyst-specific earnings per share forecasts $feps_{t,n}$ for a maximum explicit forecast horizon of five years as well as long-term growth forecasts from I/B/E/S.[27] In case we have less than five years of forecasts, we require at least two years of earnings forecasts to be available. Missing forecasts for years three to five are estimated using the forecasted long term-growth (if available) from I/B/E/S.[28] In case long-term growth is not available, we approximate the forecasts for year three to five by using the implicit growth rate of year one and two:

$$feps_{t,3} = feps_{t,2} + \frac{(feps_{t,2} - feps_{t,1})}{1} \tag{15}$$

$$feps_{t,4} = feps_{t,3} + \frac{(feps_{t,3} - feps_{t,1})}{2} \tag{16}$$

$$feps_{t,5} = feps_{t,4} + \frac{(feps_{t,4} - feps_{t,1})}{3} \tag{17}$$

We then employ the forecasted earnings per share to calculate expected future book value by using the clean surplus relation and assuming a constant dividend pay-out ratio. For the fading period we estimate a median industry return on equity (ROE) for 48 industries.[29] We assume that during the fading period, the ROE fades from the ROE in period five to the industry ROE in period eleven.[30] The industry return on equity (IROE) is estimated by using a

[27] Thereby five years is the maximum of available forecasts in IBES.
[28] The missing forecast is estimated by $feps_{t,n+1}=feps_{t,n}*(1+g_t^{IBES})$.
[29] For the industry classification we use the Fama/French 48-industry portfolio definition. For further information please refer to Kenneth French website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[30] $feps_{t,n} = \left[ROE_{t,5} + \frac{n-5}{7} \cdot (IROE - ROE_{t,5})\right] \cdot bvps_{t,n-1}, n = 6, ..., 12 \; and \; IROE = Industry \; ROE.$

rolling window of five years and calculating the median ROE for each of the 48 Fama and French (1997) industry classifications.[31]

Finally, the terminal value is computed assuming that the ROE in period 12 is constant in perpetuity. To assure using accounting data that reflects only currently available information at the estimation date, we follow the adjustments introduced by Daske et al. (2006). Assuming that current book value is growing steadily over time we calculate an adjusted book value at the estimation time during the intra-year:

$$bvps_t = bvps_0 \cdot (1 + FROE_1)^{\frac{days(t, fiscal\ year\ end\ date\ 1)}{365}} \tag{18}$$

The book value at the estimation time is calculated as the book value of the previous fiscal year end $(bvps_0)$ plus a compound interest that is used as a proxy for the earnings realized from last fiscal year up to the estimation date. To compute the compound interest the expected future return on equity in t=1 $(FROE_1)$ which is based on the most recent earnings forecast for the next fiscal year end is used:

$$FROE_1 = \frac{feps_1}{bvps_0} \tag{19}$$

Consistent with the adjustments for the current book value, the proxy for the expected earnings from estimation date to the next fiscal year-end is calculated as:[32]

$$feps_t = feps_1 - [bvps_t - bvps_0] \tag{20}$$

[31] Some estimated earnings per share forecasts refer to a fiscal year end that lies in the past. This is the case when the fiscal year end has already past, but the annual report has not been announced yet. In this case there is one earnings estimator missing for the detailed planning period and therefore the fading period is extended by one additional year.

[32] This formula follows the definition of earnings as a change in shareholders equity, see Coenenberg (2003), pp. 6-8.

With this approach, we are able to calculate implied cost-of-capital on a daily-, firm- and individual analyst-level. The approach rests on the usual assumptions that individual firms do not deviate from the median industry return on equity in their terminal value growth and that market prices are efficient. Nonetheless, the implied cost-of-capital technique is the state-of-the-art method to estimate firm specific cost-of-capital.

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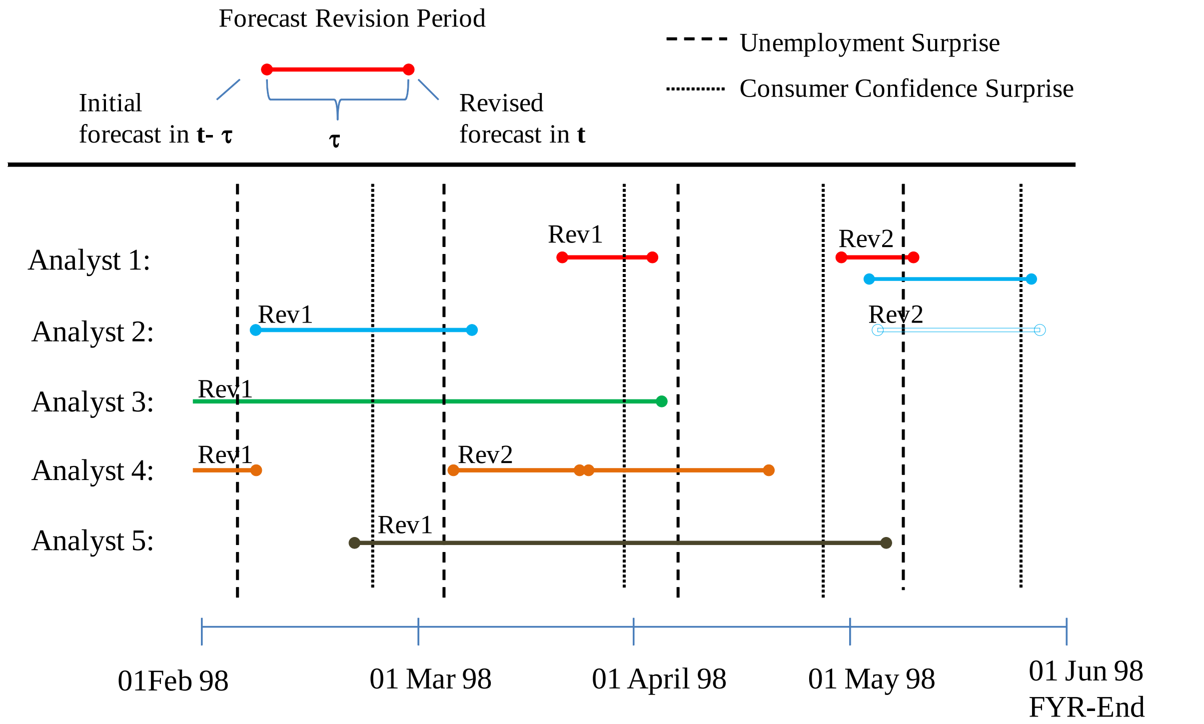
Figure 1: Information Flow and Data Selection



This figure illustrates the allocation of macroeconomic news announcements to revisions of analysts' earnings forecasts. In this example, there are five analysts providing their earnings per share forecasts for a given company and a given future fiscal year. The revision period (τ) is the number of days between the time of the initial forecast or its last confirmation (time: t-τ) and the time the forecast is revised (time: t). Revision is defined as the event when the forecast for the next period end is changed or confirmed. The revision value is the difference between the value of the earnings forecast in time t-τ and the revised value in time t. We identify all macroeconomic announcements (dotted lines) occur-ring during the revision periods and allocate them to the revision values. For example, analyst 1 makes an initial forecast at the end of March and revises this forecast at the beginning of April (revision 1). In the end of April he confirms his last forecast, but again revises this forecast in the beginning of May (revision 2). During such a revision period several macroeconomic announcements might occur. For instance, the revision period of analyst 2 lasts from the beginning of February to the begin-ning of March. During this period news about unemployment and consumer confidence arrives (dotted lines). The surprise components of the macroeconomic news are then assigned to the revision values and enter our analysis as independent variables. In case of a very long revision period, more than one macroeconomic announcement per headline might occur. For example, the revision period of analyst 5 spans the whole period of February to May with two pieces of unemployment news and three pieces of consumer confidence news arriving. In this case, the surprise component of the ma-croeconomic event is addsed up to a total surprise and this total surprise is aligned to with the revision value.

Table 1: Descriptive Statistics for Implied Cost-of-Capital, Risk-Free Rates and Expected Risk-Premia

	Num. of Obs.	Std. Dev	Median	Mean
Panel A: Implied Cost-of-Capital				
Expansion	549.338	10,92%	9,65%	13,27%
Recession	414.904	9,31%	8,79%	11,27%
All	964.242	10,31%	9,27%	12,41%
Panel B: Expected Risk-Premia				
Expansion	542.298	10,25%	5,14%	8,46%
Recession	407.825	8,57%	6,87%	9,04%
All	950.123	9,57%	5,93%	8,71%
Panel C: Risk-Free Rate				
Expansion	542.298	2,00%	4,92%	4,80%
Recession	407.825	2,39%	1,36%	2,24%
All	950.123	2,52%	3,83%	3,70%

This table contains descriptive statistics for the implied cost-of-capital, the risk-free rate and the expected risk-premia. Statistics are given conditional and unconditional of the state of the economy. Recessions and Expansions are defined according to the CFNAI classification scheme. The risk-free rate is the US 3-month T-Bill rate obtained from FED H.15 release. Implied cost-of-capital are calculated following Daske et al. (2006). The expected risk-premia is calculated as the difference between the implied cost-of-capital and the risk free rate.

Table 2: Summary Statistics for the Macroeconomic News Variables

Announcement	Abb	No of Obs.	Start Date	End Date	Announcement Time	Std	Min	Mean	Median	Max
1. Consumer Confidence	CC	222	Jul 91	Dez 09	10:00 AM	1	-3,031	0,023	-0,038	2,552
2. ISM	ISM	239	Jan 90	Nov 09	10:00 AM	1	-3,116	-0,025	-0,049	3,660
3. Nonfarm Payrolls	NFP	299	Jan 85	Nov 09	8:30 AM	1	-2,988	-0,082	-0,091	3,721
4. Unemployment Rate	UN	359	Jan 80	Nov 09	8:30 AM	1	-3,565	-0,224	0,000	3,565
5. Retail Sales	RS	359	Jan 80	Nov 09	8:30 AM	1	-3,301	-0,026	-0,138	6,878
6. Industrial Production	IP	359	Jan 80	Nov 09	9:15 AM	1	-6,032	-0,035	0,000	4,826
7. Capacity Utilization	CU	261	Mrz 88	Nov 09	9:15 AM	1	-4,612	0,034	0,000	3,798

This table contains the descriptive statistics for the macroeconomic news variables. No of Obs. denotes the number of standardized news variables available. Standardized macroeconomic news are calculated according to equation (9). The forecasts are drawn from Money Market Services ("MMS"). The table comprises Start Date and End Date of the data as well as the Announcement Time when the corresponding macroeconomic variable is announced.

Table 3: Impact of Macroeconomic News on Stock Returns, Expected Risk-Premia, Earnings Expectations and the Risk-Free Rate conditional on the State of Economy

$$\Delta VP_{i,k,t,t-\tau} = \alpha_0 + \sum_{m=1}^{7} \beta_m^{rec} D_t^{rec} S_{m,t-1,t-\tau+1} + \sum_{m=1}^{7} \beta_m^{\exp}(1 - D_t^{rec}) S_{m,t-1,t-\tau+1} + \delta_1 ES_{i,k,t,t-\tau+1} + \delta_2 \Delta EPS_k^{-4q} + \delta_3 ret_k^{-3m} + \delta_4 dev_{i,k,t,t-\tau} + \varepsilon_{i,k,t,t-\tau}$$

$$\Delta RF_{t,t-1}[ret_{t,t-1}] = \alpha_0 + \sum_{m=1}^{7} \beta_m^{rec} D_t^{rec} S_{m,t,t-1} + \sum_{m=1}^{7} \beta_m^{\exp}(1 - D_t^{rec}) S_{m,t,t-1} + \varepsilon_{i,t,t-1}$$

SP500 - CFNAI - 4 Weeks		Change in (a) Stock Return	Change in (b) Expected Risk- Premia	Change in (c) Expected Earnings	Change in (d) 1d Risk-Free Rate Return
	CC^{exp}	**-0,239 ****	**0,021**	0,045 *	0,147
	ISM^{exp}	**-0,226 ****	**0,018**	**0,045 ***	0,135
	NFP^{exp}	0,211 **	-0,049 **	0,006	**0,559 *****
Expansion	UN^{exp}	**0,599 *****	**-0,166 *****	**-0,126 *****	-0,134 *
	RS^{exp}	**-0,044**	**0,047 ****	0,112 ***	0,288 ***
	IP^{exp}	-0,062	**-0,028**	0,089 **	0,173
	CU^{exp}	-0,007	**0,030**	-0,154 ***	0,047
	CC^{rec}	**0,750 *****	**-0,074 *****	0,045	0,248
	ISM^{rec}	**0,659 *****	**-0,133 *****	**-0,070 ***	0,477 ***
	NFP^{rec}	0,338 ***	-0,090 ***	0,069 **	**1,228 *****
Recession	UN^{rec}	**0,008**	**0,045 ***	**0,039**	-0,435 **
	RS^{rec}	**0,501 *****	**-0,055 ****	-0,023	0,264 ***
	IP^{rec}	-0,320	**0,248 *****	0,250 ***	0,124
	CU^{rec}	-0,467 ***	**-0,098 *****	-0,195 ***	0,101
Earnings Surprise	ES		5,228 *	85,783 ***	
3-month Stock Return	ret		1,828 ***	3,962 ***	
YoY Earnings Change	ΔEPS		0,140 ***	0,891 ***	
Deviation from Consensus	dev		0,449 ***	1,716 ***	
Intercept	α	0,189 ***	-0,241 ***	-0,746 ***	-0,006
	N	56.837	56.816	56.816	9.529
	adj. R2	0,85%	3,17%	11,10%	1,96%

This table contains the regression results of daily stock returns, changes in expected risk-premia, changes in earnings expectations and changes in the risk-free rate on surprises in the macroeconomic news announcements (m =1, .., 7). We use S&P 500 firms and condition our analysis on the state of economy. The risk-free rate is the US 3-month T-Bill rate obtained from FED H.15 release. Implied cost-of-capital are calculated following Daske et al. (2006). The expected risk-premia is calculated as the difference between the implied cost-of-capital and the risk free rate. The change in the expected risk-premia and earnings expectations is calculated according equation (10) and (11) using a revision window of 4 weeks. We use standardized surprises based on Money Market Services ("MMS") forecasts. Recession and expansion are defined according to the CFNAI classification scheme. The regression covers the time period from 1980-2009. Bold numbers indicate whether the coefficients are significantly different at the 1% level across the two economic states according to the Wald Test. Significance levels based on clustered standard errors are indicated as follows: *** 1%, ** 5% and * 10%.

Table 4: Impact of Macroeconomic News on Expected Risk-Premia
using Alternativ Business Cycle Classification Schemes

$$\Delta RP_{i,k,t,t-\tau} = \alpha_0 + \sum_{m=1}^{7} \beta_m^{rec} D_t^{rec} S_{m,t-1,t-\tau+1} + \sum_{m=1}^{7} \beta_m^{\exp} (1 - D_t^{rec}) S_{m,t-1,t-\tau+1}$$
$$+ \delta_1 ES_{i,k,t,t-\tau+1} + \delta_2 \Delta EPS_k^{-4q} + \delta_3 ret_k^{-3m} + \delta_4 dev_{i,k,t,t-\tau} + \varepsilon_{i,k,t,t-\tau}$$

		Change in expected risk-premia using			
SP500 - 4 Weeks		**(a) CFNAI**		**(b) NBER**	
Expansion	CC^{exp}	**0,021**		-0,031	*
	ISM^{exp}	**0,018**		-0,069	***
	NFP^{exp}	-0,049	**	**-0,110**	***
	UN^{exp}	**-0,166**	***	**-0,099**	***
	RS^{exp}	**0,047**	**	**0,042**	**
	IP^{exp}	**-0,028**		**0,007**	
	CU^{exp}	**0,030**		**0,025**	
Recession	CC^{rec}	**-0,074**	***	-0,191	
	ISM^{rec}	**-0,133**	***	-0,247	*
	NFP^{rec}	-0,090	***	**0,301**	***
	UN^{rec}	**0,045**	*	**0,329**	***
	RS^{rec}	**-0,055**	**	**-0,191**	***
	IP^{rec}	**0,248**	***	**0,712**	***
	CU^{rec}	**-0,098**	***	**-0,518**	***
Earnings Surprise	ES	5,228	*	3,349	
3-month Stock Return	ret	1,828	***	1,784	***
YoY Earnings Change	ΔEPS	0,140	***	0,144	***
Deviation from Consensus	dev	0,449	***	0,455	***
Intercept	α	-0,241	***	-0,229	***
	N	56.816		56.816	
	adj. R2	3,17%		3,12%	

This table contains the regression results of changes in expected risk-premia on surprises in the macroeconomic news announcements (m =1, .., 7). We use S&P 500 firms and condition our analysis on the state of economy. The risk-free rate is the US 3-month T-Bill rate obtained from FED H.15 release. Implied cost-of-capital are calculated following Daske et al. (2006). The expected risk-premia is calculated as the difference between the implied cost-of-capital and the risk free rate. The change in the expected risk-premia is calculated according equation (10) using a revision window of 4 weeks. We use standardized surprises based on Money Market Services ("MMS") forecasts. Recession and expansion are defined according to the CFNAI and NBER classification scheme. The regression covers the time period from 1980-2009. Bold numbers indicate whether the coefficients are significantly different at the 1% level across the two economic states according to the Wald Test. Significance levels based on clustered standard errors are indicated as follows: *** 1%, ** 5% and * 10%.

Table 5: Impact of Macroeconomic News on Expected Risk-Premia using Different Sample Sizes

$$\Delta RP_{i,k,t,t-\tau} = \alpha_0 + \sum_{m=1}^{7} \beta_m^{rec} D_t^{rec} S_{m,t-1,t-\tau+1} + \sum_{m=1}^{7} \beta_m^{\exp} (1 - D_t^{rec}) S_{m,t-1,t-\tau+1}$$
$$+ \delta_1 ES_{i,k,t,t-\tau+1} + \delta_2 \Delta EPS_k^{-4q} + \delta_3 ret_k^{-3m} + \delta_4 dev_{i,k,t,t-\tau} + \varepsilon_{i,k,t,t-\tau}$$

CFNAI - 4 Weeks		Change in expected risk-premia using (a) SP500 Firms		(b) All Firms	
	CC^{exp}	**0,021**		**0,015**	*
	ISM^{exp}	**0,018**		**0,003**	
	NFP^{exp}	-0,049	**	-0,048	***
Expansion	UN^{exp}	**-0,166**	***	**-0,098**	***
	RS^{exp}	**0,047**	**	**0,030**	***
	IP^{exp}	**-0,028**		**-0,007**	
	CU^{exp}	**0,030**		-0,007	
	CC^{rec}	**-0,074**	***	**-0,073**	***
	ISM^{rec}	**-0,133**	***	**-0,109**	***
	NFP^{rec}	-0,090	***	-0,047	***
Recession	UN^{rec}	**0,045**	*	**0,092**	***
	RS^{rec}	**-0,055**	**	**-0,030**	***
	IP^{rec}	**0,248**	***	**0,062**	***
	CU^{rec}	**-0,098**	***	-0,046	***
Earnings Surprise	ES	5,228	*	7,952	**
3-month Stock Return	ret	1,828	***	1,739	***
YoY Earnings Change	ΔEPS	0,140	***	0,119	***
Deviation from Consensus	dev	0,449	***	0,367	***
Intercept	α	-0,241	***	-0,146	***
	N	56.816		172.685	
	adj. R2	3,17%		1,77%	

This table contains the regression results of changes in expected risk-premia on surprises in the macroeconomic news announcements (m =1, .., 7) and condition our analysis on the state of economy. We use a) all available firms and b) restrict our analysis to the S&P 500 firms. The risk-free rate is the US 3-month T-Bill rate obtained from FED H.15 release. Implied cost-of-capital are calculated following Daske et al. (2006). The expected risk-premia is calculated as the difference between the implied cost-of-capital and the risk free rate. The change in the expected risk-premia is calculated according equation (10) using a revision window of 4 weeks. We use standardized surprises based on Money Market Services ("MMS") forecasts. Recession and expansion are defined according to the CFNAI classification scheme. The regression covers the time period from 1980-2009. Bold numbers indicate whether the coefficients are significantly different at the 1% level across the two economic states according to the Wald Test. Significance levels based on clustered standard errors are indicated as follows: *** 1%, ** 5% and * 10%.

Table 6: Impact of Macroeconomic News on Expected Risk-Premia using Different Revision Windows

$$\Delta RP_{i,k,t,t-\tau} = \alpha_0 + \sum_{m=1}^{7} \beta_m^{rec} D_t^{rec} S_{m,t-1,t-\tau+1} + \sum_{m=1}^{7} \beta_m^{\exp}(1-D_t^{rec}) S_{m,t-1,t-\tau+1} + \delta_1 ES_{i,k,t,t-\tau+1} + \delta_2 \Delta EPS_k^{-4q} + \delta_3 ret_k^{-3m} + \delta_4 dev_{i,k,t,t-\tau} + \varepsilon_{i,k,t,t-\tau}$$

CFNAI - SP500		Change in expected risk-premia using a revision window of (a) 2 weeks		(b) 4 weeks		(c) 6 weeks		(d) 8 weeks	
	CC^{exp}	0,022		**0,021**		**0,007**		**-0,007**	
	ISM^{exp}	0,003		**0,018**		**0,009**		**0,001**	
	NFP^{exp}	0,030		-0,049	**	-0,033	**	-0,018	
Expansion	UN^{exp}	-0,047		**-0,166**	*******	**-0,156**	*******	**-0,141**	*******
	RS^{exp}	**0,101**	*******	**0,047**	******	**0,020**		**0,003**	
	IP^{exp}	**-0,043**		**-0,028**		**-0,032**	*****	**-0,037**	******
	CU^{exp}	**0,054**		**0,030**		**0,042**	******	**0,044**	*******
	CC^{rec}	-0,005		**-0,074**	*******	**-0,080**	*******	**-0,082**	*******
	ISM^{rec}	-0,099	*	**-0,133**	*******	**-0,095**	*******	**-0,095**	*******
	NFP^{rec}	-0,078		-0,090	***	-0,081	***	-0,073	***
Recession	UN^{rec}	0,034		**0,045**	*****	**0,097**	*******	**0,102**	*******
	RS^{rec}	**-0,058**		**-0,055**	******	**-0,078**	*******	**-0,073**	*******
	IP^{rec}	**0,302**	*******	**0,248**	*******	**0,253**	*******	**0,253**	*******
	CU^{rec}	**-0,212**	*******	**-0,098**	*******	**-0,075**	******	**-0,074**	*******
Earnings Surprise	ES	0,802		5,228	*	4,158		3,646	
3-month Stock Return	ret	1,891	***	1,828	***	1,868	***	1,875	***
YoY Earnings Change	ΔEPS	0,200	***	0,140	***	0,108	***	0,097	***
Deviation from Consensus	dev	0,454	***	0,449	***	0,430	***	0,429	***
Intercept	α	-0,224	***	-0,241	***	-0,223	***	-0,222	***
	N	24.115		56.816		74.489		81.044	
	adj. R2	3,62%		3,17%		3,09%		3,08%	

This table contains the regression results of changes in expected risk-premia on surprises in the macroeconomic news announcements (m =1, .., 7). We use S&P 500 firms and condition our analysis on the state of economy. The risk-free rate is the US 3-month T-Bill rate obtained from FED H.15 release. Implied cost-of-capital are calculated following Daske et al. (2006). The expected risk-premia is calculated as the difference between the implied cost-of-capital and the risk free rate. The change in the expected risk-premia is calculated according equation (10) using a revision window of 2, 4, 6 and 8 weeks. We use standardized surprises based on Money Market Services ("MMS") forecasts. Recession and expansion are defined according to the CFNAI classification scheme. The regression covers the time period from 1980-2009. Bold numbers indicate whether the coefficients are significantly different at the 1% level across the two economic states according to the Wald Test. Significance levels based on clustered standard errors are indicated as follows: *** 1%, ** 5% and * 10%.