SELL SIDE RECOMMENDATIONS DURING BOOMS AND BUSTS

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Abstract

Our study documents that the information content and the information processing of stock recommendations differ fundamentally between expansions and recessions. The initial market reaction to all recommendations is stronger in recessions, but "Buy" recommendations do not have long-term investment value. We find that in recessions sell side analysts are too optimistic about the stocks they recommend to buy, while investors initially overreact to these recommended stocks. In expansions, no such contradicting pattern exists. We also document that analysts favor "glamour" over "value" stocks irrespective of the state of the economy.

Keywords: Security Analysts, Stock Recommendations, Business Cycle
JEL classification: E32, G01, G11, G14, G2

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1 Introduction

The importance of the business cycle for information processing on capital markets has been pointed out by several studies: For example, Veronesi (1999) shows that the reaction of prices to news tends to be stronger in good economic times than in bad economic times. Boyd, Hu and Jagannathan (2005) and Beber and Brandt (2010) find that investors process the same information differently depending on the business cycle. One of the main information sources for equity investors are sell side analysts who provide recommendations for the covered stocks. Changes in stock recommendations are on average associated with significant stock price reactions. In this paper, we analyze the relationship between analysts' stock recommendations and general macroeconomic conditions. To the best of our knowledge we are the first to study this link.

Related research has studied the performance of stock recommendations during the Dot-com bubble in 2000 and 2001 (Barber et al. (2003)). However, economic fluctuations are not necessarily convergent to movements on equity markets. For example, there is a negative correlation between per capita GDP growth and real equity returns in the 1900-2002 time period (Ritter, 2005). Furthermore, bull and bear markets are to some extent arbitrary demarcations whereas expansions and recessions are marked "officially" by economic dating committees (e.g., the National Bureau of Economic Research (NBER)) or economic activity indices (e.g., the Chicago Fed National Activity Index (CFNAI)).

It appears reasonable to assume that the work of stock analysts is affected by economic conditions. In their role as market intermediaries financial analysts gather, analyze, and disseminate information which investors regard as a valuable allocation advice. Such advice comprises a comparison of the current and the expected market valuation of a firm and culminates in a stock recommendation that informs investors about potential mispricings. Today's forecast of tomorrow's price depends, among other factors, on the expected earnings (respectively cash flows) and the cost of capital. As capital markets and the real economy are closely interlinked, both, corporate earnings and interest rates are affected by aggregate economic fluctuations. An economic slowdown usually impairs the company's value, e.g., when expected growth rates are lowered. Changed company outlooks demand adjustments in valuation which must also lead to revised recommendations.

We analyze stock recommendations against the backdrop of general economic activity. We address two main research questions: First, we analyze the performance of sell side recommendations over the business cycle, i.e., whether there is a difference in stock recommendation profitability between recessions and expansions? Stock returns and the business cycle are linked, for example, Chordia and Shivakumar (2002) find that momentum strategies earn positive returns in expansions, but negative

returns in recessions. Second, we analyze the characteristics of the stocks that are recommended by analysts: For example, do analysts recommend stocks with similar characteristics over the business cycle? Or do they have preferences for, e.g., "value" stocks in recessions and "glamour" stocks in expansions?

First, we show that recommendations affect stock prices differently contingent on the business cycle. The initial price impact is significantly stronger in recessions.[1] For example, an upgraded stock yields excess returns of 2.41% in the first three trading days after recommendation issuance during an expansion, but 3.45% in a recession. The difference of 1.05% is both statistically and economically significant. Also, downgraded stocks yield excess returns of -2.34% in the first three trading days after recommendations issuance during an expansion, but -4.42% in a recession. This difference of -1.26% is statistically and economically significant as well.

Interestingly, analyzing the price reaction of recommended stocks over a longer time horizon reveals a different picture: In recession, "Buy"[2] recommendations generate negative excess returns during the 6-month window[3] after recommendation issuance. Hence, these "Buy" recommendations have no long-term investment value in recessions, i.e., investors would be better off to sell the recommended stocks after the recommendation announcement day. In expansions, we find that "Buy" recommendations have positive long-term investment value. After the initial positive price reaction, the recommended stocks generate positive excess returns. We also find that the market reaction is in line with the recommendation in both expansions and recessions for "Sell" recommendations, i.e., the stocks underperform their peer-group.

Second, we analyze the characteristics of the recommended stocks. We show that analysts' preferences towards the recommended firms are consistent over the business cycle, since analysts favor "glamour" over "value" stocks in both expansions and recessions. The documented bias in analysts' recommendations for "glamour" stocks (Jegadeesh et al. (2004)) is sustained in recessions. However, the underlying economic rationale for this bias is questionable, since e.g., Lakonishok, Shleifer, and Vishny (1994) show that returns of growth stocks are lower in comparison to those of value stocks in recessions.

[1] We calculate excess returns according to Daniel, Grinblatt, Titman, and Wermers (1997). Stocks are matched in terms of size, market-to-book ratios, and one-year momentum and are divided in 125 portfolios. Therefore, excess returns indicate an outperformance over the peer-group of stocks with similar characteristics.

[2] We follow Cohen, Frazzini, and Malloy (2010) in the classification of recommendations. The "Buy" portfolio consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates her coverage with a "Strong Buy or "Buy" recommendation.

[3] The post-recommendation drift lasts up to six months (Womack (1996)).

Our results are robust in the post Regulation Fair Disclosure (Reg FD) time period, to the business cycle classification according to both NBER and CFNAI, and to mean and median returns. Also, our results are not driven by analyst herding.

Prior research on the relation between business cycle on analysts is limited. Welch (2000) documents increased recommendation herding for bullish markets but not for contracting markets. Richards, Benjamin and Strawser (1977) and Richardson, Teoh and Wysocki (1999) show that EPS forecasts issued during booms tend to be overly optimistic while forecasts issued during busts are less optimistic. Lee, O'Brien and Sivaramakrishnan (2008) observe a similar pattern in five-year earnings growth forecasts, Dhole, Mishra and Sivaramakrishnan (2010) in managers' outlooks and Spiwoks, Gubaydullina and Hein (2011) in interest rate forecasts. As a counterexample, Dreman and Berry (1995) study EPS forecasts but do not find any differences in optimism between expansions and recessions. As far as firm characteristics are concerned, research has so far solely focused on stock market trends and the extent to which they influence analysts' recommendations. Barber et al. (2003) find that analysts keep favoring growth stocks despite their poor performance during stock market busts.

Overall, our study documents that controlling for business cycle effects is important when analyzing financial analysts. Our results indicate that the information content and the information processing of stock recommendations differ fundamentally between expansions and recessions. Investors react significantly stronger to all recommendations in recessions, i.e., the price impact of stock recommendations is significantly higher in recessions. However, while "Sell" recommendations issued in recessions generate negative excess returns over a longer time window, "Buy" recommendations do not have long-term investment value in recessions. These results point out that in recessions analysts are generally too optimistic with regard to the stocks they recommend as a "Buy". Analysts favor "glamour" stocks during recessions and expansions. But these recommended "glamour" stocks are worth following only in expansions. At the same time investors strongly overreact to the positively recommended stocks in recessions, indicating that investors overestimate the investment value of "Buy" recommendations in economic downturns.

The remainder of this paper is structured as follows: Section 2 describes the data, section 3 describes the research approach and the results, section 4 presents various robustness checks and finally, section 5 concludes.

2 Data

Analyst recommendations are obtained from the Institutional Brokers' Estimate System (I/B/E/S)

database. Our sample includes observations from January 1994 to December 2010. Stock data are obtained from the Center for Research in Security Prices (CRSP) database. Company financial data are retrieved from the Compustat database. The total data sample captures two recessions of unequal duration and severity and three expansions. Recessions account for a smaller fraction of the sample time. The total duration of expansions is 173 months compared to only 26 months of recession. Resulting from that, the combined expansion panel contains approximately 390,000 observations compared to 60,000 in recessions.

Table 1. Distribution of Recommendations

This table presents the combined distribution of initial recommendations and revisions thereof as obtained from the I/B/E/S database from January 1994 until December 2010. Relative frequencies refer to the distribution of recommendations within the respective time frame. The consensus is calculated as the arithmetic mean of all recommendations under the standard classification in which a strong buy recommendation is coded as "1", buy as "2" etc.

Start/End	Exp. 01/1994 02/2001	Rec. 03/2001 11/2001	Exp. 12/2001 11/2007	Rec. 12/2007 06/2009	Exp. 07/2009 12/2010	Total Exp.	Total Rec.	Total Sample
Duration (months)	85	8	71	18	15	171	26	197
N (observations)	189,609	16,927	164,221	43,287	36,772	390,602	60,214	450,816
Rel. Frequency (%)								
(1) Strong Buy	29.67	25.41	20.02	19.00	22.12	24.86	20.95	24.36
(2) Buy	36.00	37.56	26.54	23.13	26.13	31.11	27.02	30.59
(3) Hold	30.89	34.23	44.06	46.25	43.48	37.64	42.84	38.31
(4) Sell	1.83	1.77	6.51	7.25	5.55	4.15	5.73	4.36
(5) Strong Sell	1.61	1.04	2.87	4.38	2.55	2.23	3.46	2.39
Consensus	2.10	2.15	2.46	2.55	2.40	2.28	2.44	2.30

(The distinction of recessions and expansions is based on the NBER statistics.)

The two most prominent business cycle classification schemes are the demarcations of expansions and recessions by the National Bureau of Economic Research (NBER)[4] and the Chicago Fed National Activity Index (CFNAI).[5] Both classifications are used in this study.[6] Unlike other classification schemes, the NBER does not employ simplistic rules such as two quarters of declining GDP in a row to mark recessions. Instead they follow their less formal definition of a recession as a "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales" (National Bureau of Economic Research (2011)). It is important to note that the NBER is not available in real time, i.e., the business cycle classification is determined with a (substantial) time lag. Additionally, the three months moving average of the CFNAI is employed for robustness checks. Published with a smaller time lag and based on formal quantitative rules about coincident economic activity, it is available as more recent information for decision making. It comprises 85 monthly indicators of national economic activity from the fields of production and income; employment, unemployment, and hours; personal consumption and housing; and sales, orders, and inventories. The index is constructed in such a way that it has a mean value of zero with a standard deviation equal to one. This construction is straightforward in the way that a positive value corresponds to growth above trend and vice versa.

The divergent approach of both indices becomes apparent in figure 1 which displays the official NBER dated recessions and the course of the three months

[4] The NBER classification is retrieved from the NBER site http://www.nber.org/cycles.html.

[5] The CFNAI is retrieved from the Federal Reserve of Chicago. http://www.chicagofed.org/webpages/research/data/cfnai/current_data.cfm.

[6] The NBER classification is used as the default classification. The results for the CFNAI classification are discussed in section 4 (Table 8).

moving average CFNAI. The CFNAI has two important thresholds for the determination of recessions: First, the likelihood that a recession has begun increases if the index falls below -0.7 after a period of economic expansion. Second, the likelihood that a recession has ended increases if the index outperforms +0.2 after a period of economic contraction.

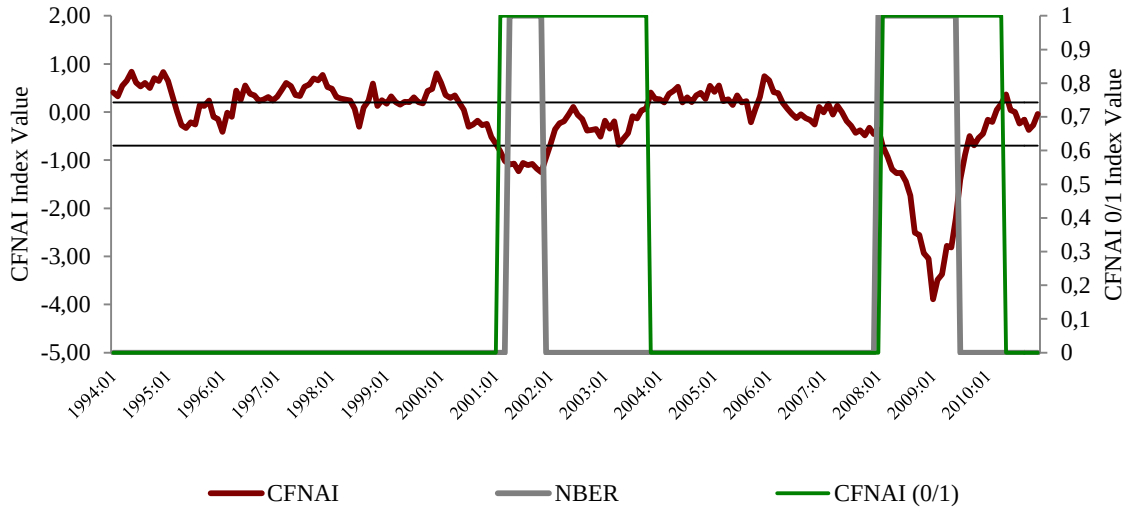

Figure 1 displays the three months moving average CFNAI in its continuous classification as well as in the binary (0/1) version, whereby 0 stands for expansion and 1 for recession. The latter one can be directly compared to the NBER classification. The horizontal bars pertain to the left vertical axis and display the +0.2 and -0.7 point thresholds.

Figure 1. Comparison of NBER and CFNAI Dated Recessions

As can be seen in Figure 1, the CFNAI was able to detect both recessions which have occurred in the time between 1994 and 2010. Coming from an expansion, this is indicated by the index falling below the -0.7 threshold which in turn sets the binary CFNAI to the value of 1. This fact needs to be considered in the context of the release time. Although the actual dates of the beginnings and endings of recessions are published with a substantial delay by the NBER committee, the CFNAI provides a good early warning system. However, the CFNAI has a broader definition of recessions in comparison to the NBER which leads to marked recessions that are larger. Both CFNAI dated recessions, starting in 2001 and in late 2008, account for more than twice the time span indicated by the NBER recessions.

3 Research Design & Results

Event Returns and the Price Formation Process

We conduct an event-study to analyze the profitability of recommendations depending on the business cycle. We calculate daily excess returns for firm i on trading day t according to Daniel et al. (1997) ("DGTW") as shown in equation 1. From each stock's raw return we subtract the return on a value-weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-to-book ratio, and one-year momentum quintile. We use the Fama and French 48-industry classification and update the 125 characteristic portfolios at the end of July of each year. A positive DGTW excess return implies an outperformance over stocks in the peer-group with similar size, market-to-book, and one-year momentum characteristics. We analyze the DGTW excess returns on the recommendation announcement day ("0"), in the first four trading days ("0-3"), in the first month, in the first three months, and up to six months. If a recommendation is revised, we drop the stock from our portfolio after holding it one additional trading day. The cumulative adjusted returns (CAR) are calculated for the event windows specified below:

$$\text{Excess\_Return}_{it} = \text{Raw\_Return}_{it} - \text{DGTW\_Benchmark\_Return}_{it} \quad (1)$$

$$CAR_{itT} = \sum_{t=t}^{T} \text{Excess\_Return}_{it} \quad (2)$$

There is evidence that stocks already move before the recommendation is officially announced (Stickel (1995)). However, the general idea of correctly using stock recommendations implies that one's observation period starts with the official publication date, hence we use t = 0. Moreover, the fraction of price change that occurs before the recommendation publication is rather small. We use t up to 6 months / 126 trading days as Womack (1996) finds related market reactions for up to that period.

We focus on recommendation changes rather than recommendation levels, since changes have higher predictive power for subsequent price changes than levels (e.g., Jegadeesh et al. (2004)). Recommendations are assigned to either a "Buy" portfolio or "Sell" portfolio as outlined by Cohen, Frazzini, and Malloy (2010). The "Buy" portfolio consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Strong Buy" or "Buy" recommendation. The "Sell" portfolio consists of all downgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Hold", "Sell" or "Strong Sell" recommendation. Furthermore, in accordance with Cohen, Frazzini, and Malloy (2010) we analyze the performance of upgraded and downgraded stocks separately.

The recommendations are defined according to recessions and expansions by the business cycle stage at which they are announced, i.e., a recommendation which is issued during the last month of a recession is considered to belong to the recession. After calculating excess returns for recommendations issued in expansions and recommendations issued in recessions we compare the two to assess differences.

Figure 2 and Figure 3 display differences in the initial market reaction to the recommendations announcement and in the subsequent price formation pattern between expansions and recessions. The numeric results are shown in Table 2. Figure 2 shows that stocks in the "Buy" portfolio have a significant stronger market impact in recessions than in expansions. The difference is 0.67% in the first four trading days ("0-3") including the recommendation announcement day. Figure 3 shows that for the subsample of upgraded stocks the difference is with 1.05% even larger. Also, the stock market reaction to recommendations in the "Sell" portfolio respectively downgraded stocks is significantly stronger in recession: Stocks in the "Sell" portfolio underperform their DGTW peer group by -0.9% in the first four trading days, while downgraded stocks underperform by -1.26%. Overall, the initial stock market reaction to analysts' recommendations is significantly stronger in recessions in all analyzed recommendation categories. This difference is both statistically and economically significant.

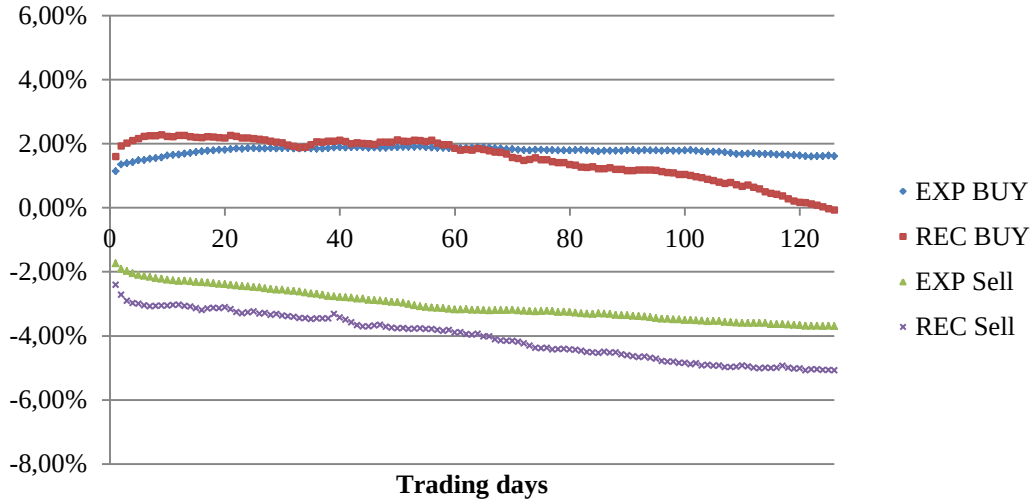

Figure 2. Event Study: Buy and Sell Portfolio in Expansion and Recession (NBER)

This figure shows the cumulated excess returns from the recommendation announcement day up to 126 trading days, i.e., 6 calendar months, later. The ordinate indicates the DGTW (1997) excess return. The abscissa indicates days elapsed since the recommendation was announced with written trading day values. The sample period is from January 1994 to December 2010 using revisions announced during NBER-designated expansions (EXP) and recessions (REC). The individual curves stand for the performance of the Buy and the Short portfolio in expansions and recessions.

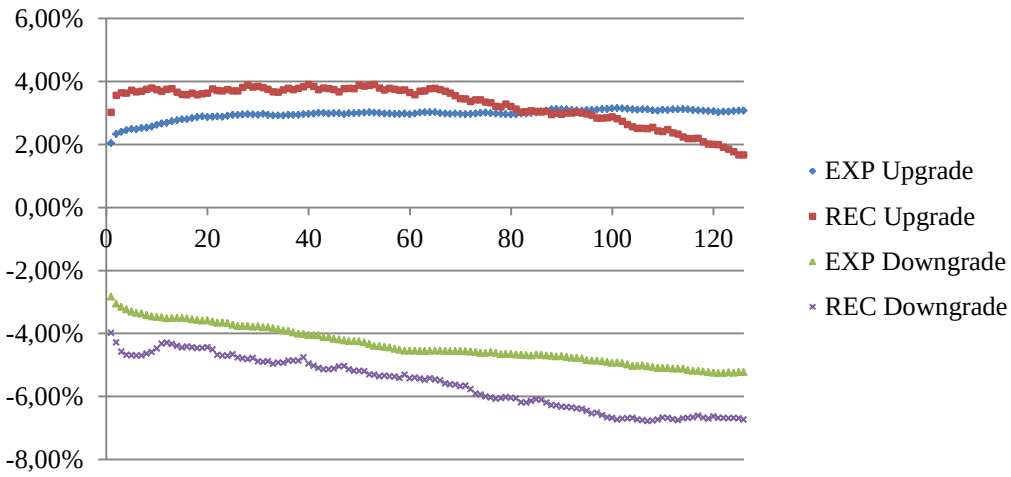

Figure 3. Event Study: Upgrades and Downgrades Portfolio in Expansion and Recession (NBER)

This figure shows the cumulated excess returns from the recommendation announcement day up to 126 trading days, i.e., 6 calendar months, later. The ordinate indicates the DGTW (1997) excess return. The abscissa indicates days elapsed since the recommendation was announced with written trading day values. The sample period is from January 1994 to December 2010 using revisions announced during NBER-designated expansions (EXP) and recessions (REC). The individual curves stand for the performance of the Upgrade and the Downgrade portfolio in expansions and recessions.

However, the reaction over a longer horizon, i.e., the price formation pattern, is different for the "Buy" portfolio and the "Sell" portfolio respectively for the subsample of upgraded and downgraded stocks: In a recession stocks in the "Sell" portfolio follow the initial market reaction, i.e., stocks generate negative excess returns. In line with the initial market reaction, the market reaction over the following 6 months is stronger in recessions. For example, stocks in the "Sell" portfolio generate an additional negative excess return of -2.83% in a recession in comparison to -2.02% in expansions after the recommendation announcement day. This indicates that "Sell" recommendations have higher investment value in recessions in comparison to expansions.

In contrast, stocks in the "Buy" portfolio generate positive excess returns of 0.38% over six month after recommendation issuance excluding the recommendation announcement day in an expansion, but negative excess returns of -1.60% in recessions. This return difference of 1.98% is similar for upgraded stocks. Our results indicate that recommended stocks have a positive long-term investment value over six months in expansions, but a negative one in recessions. Investors would be better off to sell the recommended stocks in recessions after the announcement day, indicating that investors overreact in their initial market reaction.

Table 2. Event Study: Excess returns according to DGTW (1997) NBER

This table presents the results of the event-study for the total sample period 01/1994-12/2010. The event-returns are shown for expansions and recessions according to the NBER classification. The excess returns are calculated according to DGTW (1997). The portfolio classifications follow Cohen, Frazzini, and Malloy (2010). The "Buy portfolio" consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Strong Buy or "Buy" recommendation. The "Sell portfolio" consists of all downgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Hold", "Sell" or "Strong Sell" recommendation. The upgraded and downgraded stocks are shown separately. The excess returns are shown for the announcement day (Day "0"), the first 3 trading days, 1 month, 3 months, 6 months and 6 months excluding the announcement day. If recommendations are revised during the holding period, the stocks remain in the portfolio till the revision plus one trading day. A t-test is performed to evaluate whether the excess returns are significantly different from zero. *, ** and *** indicate significance at the 10, 5 and 1%-level, respectively.

	Sample	Recommendation Classification (Mean Returns)			
Trading days	NBER	Buy-PF	Sell-PF	Upgrade	Downgrade
0					
	Exp	1.24%***	-1.51%***	2.13%***	-2.34%***
	Rec	1.83%***	-1.93%***	3.11%***	-2.89%***
	Rec-Exp	0.60%***	-0.42%***	0.98%***	-0.55%***
0 - 3					
	Exp	1.41%***	-2.12%***	2.41%***	-3.16%***
	Rec	2.08%***	-3.03%***	3.45%***	-4.42%***
	Rec-Exp	0.67%***	-0.90%***	1.05%***	-1.26%***
1 month					
	Exp	1.28%***	-2.37%***	2.53%***	-3.65%***
	Rec	1.59%***	-3.03%***	3.38%***	-4.58%***
	Rec-Exp	0.31%**	-0.65%***	0.85%***	-0.93%***
3 months					
	Exp	1.53%***	-3.07%***	2.82%***	-4.43%***
	Rec	1.48%***	-3.86%***	3.48%***	-5.47%***
	Rec-Exp	-0.05%	-0.79%***	0.66%**	-1.04%***
6 months					
	Exp	1.62%***	-3.74%***	3.05%***	-5.26%***
	Rec	0.20%	-5.03%***	2.02%***	-6.75%***
	Rec-Exp	-1.42%***	-1.29%***	-1.03%***	-1.49%***
6 months (ex Day 0)					
	Exp	0.38%***	-2.02%***	0.92%***	-2.63%***
	Rec	-1.60%***	-2.83%***	-1.00%**	-3.38%***
	Rec-Exp	-1.98%***	-0.81%***	-1.92%***	-0.75%**

(The distinction of recessions and expansions is based on the NBER statistics.)

Overall, our results point out that the information content and the stock market reaction to the recommendations is very different in respect to the business cycle. In recessions, the initial market reaction is significantly stronger for both the "Buy" and the "Sell" portfolio. However, the stronger reaction is only in line with the long-term investment value of the recommendations for the "Sell" portfolio. Stocks in the "Buy" portfolio generate negative excess returns after the recommendation announcement day over six months. This finding indicates that investors overreact to positive recommendations in recessions, since in fact analysts overestimate the long-term performance of the stocks. Stocks that are recommended to buy during recessions perform very poorly in the long run, i.e.,

they do not generate excess returns. These finding points out those analysts are positively biased in terms of the expected performance of "Buy" recommendations during recessions.

Analyst Preferences Towards Firms

Next, we analyze whether analysts change their preferences toward firm characteristics dependent on the business cycle. For example, do analysts favor growth stocks in expansions and value stocks in recessions or are they consistent in their preferences? Economic fluctuations impact corporate earnings, cash flows and therefore valuations. Hence, we expect rational analysts to alter their recommendations according to the business cycle not only in such a way that they issue less optimistic recommendations, but that they also align to preferable stock and company characteristics. We expect revisions to reflect the adaptive ability of analysts the most, because revisions are richer in new data and have shown to add more value to investment decisions (Jegadeesh et al. (2004)).

Economic fluctuations affect the expectations of market participants about firms' earnings and the business climate in general. As firms differ on various dimensions, we also suspect expectations of investors and financial analysts to be subject to changing conditions. Important distinguishing factors among others are: the size and industry affiliation of a firm, the current market valuation in comparison to book earnings or valuation, and the past success and growth of a company.

The methodology of our analysis is based on the following research questions to gain insight into the sources of the predictive power of financial analysts and about potential biases and their consequences for investors.

(I) What preferences for company characteristics are revealed through stock recommendations?

(II) Do analysts change their preferences contingent on the business cycle?

(III) Are the preference structure and its alteration in line with empirical research about the relation between firm characteristics and future excess returns?

A straight-forward way to detect what stock characteristics analysts favor consists in the calculation of means (or medians) of particular financial figures e.g., the market capitalization (as a proxy for the size) and a subsequent comparison across business cycles. However, this approach does not enable precise comparisons of absolute figures. Both recessions occur in the second half of the sample. Between 1994 and 2010 stock prices (and thereby market capitalizations) have increased substantially. Hence, despite the sharp decline in prices during recessions, average values are still higher than during the relatively big time-span of expansion before.

Table 3. Company Financials across Business Cycles

	N		Price ($)		Market Cap. ($)		MB		PE	
	Exp.	Rec.	Exp.	Rec.	Exp.	Rec.	Exp.	Rec.	Exp.	Rec.
(1) Strong Buy	97,667	12,134	35.41	52.71	4,260,457	5,371,954	3.49	3.01	17.59	13.69
(2) Buy	122,244	15,652	36.38	39.44	4,643,797	5,674,206	3.42	3.07	17.23	13.97
(3) Hold	147,899	24,815	40.25	41.55	4,717,733	4,884,081	2.96	2.52	16.24	12.65
(4) Sell	16,322	3,318	36.90	22.93	4,467,955	4,389,518	2.54	2.11	13.74	10.64
(5) Strong Sell	8,758	2,007	40.36	23.23	4,303,041	5,123,125	2.76	2.24	13.88	10.96
Mean/Total	392,890	57,926	37.71	41.61	4,561,436	5,179,729	3.21	2.74	16.73	13.05

(The distinction of recessions and expansions is based on the NBER statistics.)

This table displays financial data of firms across expansions and recessions according to the recommendation category. Values are calculated on the basis of data which was winsorized at the top and bottom quintiles. Prices are obtained from the CRSP database on a daily basis. The market capitalization of firms is calculated as the number of shares outstanding multiplied by the share price (in thousand USD). The definitions of ratios are given in the body of this chapter.However, relative metrics can be compared. As expected, we find the market-to-book and price-earnings ratio to be higher in times of economic expansion. On average, the market-to-book ratio (price-earnings ratio) is 3.21 (16.73) during expansions and 2.74 (13.05) in recessions. These results could be expected from times of declining stock prices. Though, firms which receive the most favorable recommendations according to the I/B/E/S classification score substantially higher on these valuation multiples than those with negative recommendations. In expansions a "Strong Buy" recommendation averages 17.59 compared to 13.88 for a "Strong Sell" on the price-earnings ratio. The same pattern is found for recessions. It indicates a tilt towards stocks which have higher growth opportunities respectively stocks with a higher market valuation. Arguably, this preference is in conflict with capital market research which documents higher returns for stocks that score low on these ratios (Fama/French (1998)).

In order to control for the general effect of the business cycle on financial metrics two complementary approaches are used in the following to enable a reliable line-up of firm characteristics across cycles: First, a comparison of decile ranks of firm fundamentals is employed. Table 3 displays the deciles of average momentum statistics to which recommendations and revisions pertain in order to determine the extent to which analysts discriminate their recommendations based on the past performance of stocks. In addition, it is accounted for size, value, and growth specific preferences across business cycles. The second approach for the investigation of analysts' preferences, displayed in Table 4, deals with quantitative investment signals which have been subject to extensive research in the past indicating a nexus with future returns (see Jegadeesh et al. (2004)). The correlation between recommendation/revision categories and the criteria described below is investigated. Subsequently, if a correlation above .10 is found the actual is compared to the normative direction (of sign) of the correlation with future returns that was found in prior studies. The decile rank comparison and the correlation analysis are somewhat similar as to their contribution to the question about the analysts' preference structure. Though, the latter method gives insight to whether analysts consider and align their recommendations to commonly accepted investment signals in general and in changing economies or if they simply ignore them.

The stock characteristics ratios used for this study are defined in the following. For all definitions listed subsequently *q, m, d* are defined as the quarter, month, or day of a recommendation/revision announcement for the firm *i*. Company financial data pertains to the end of the respective quarter, whereas prices pertain to the day on which a recommendation is published.

Sales growth is calculated as the rolling sum of sales for the preceding two and four quarters:

$$SG2 = \frac{\sigma \sum_{i=0}^{1} Sales_{q-1}}{\sigma \sum_{i=0}^{1} Sales_{q-2-i}} \tag{3}$$

The market-to-book ratio is calculated as the market value of a stock over the book value of common equity:

$$MB = \frac{Price_d \times Shares\ outstanding_d}{Book\ value\ of\ common\ equity_q} \tag{4}$$

The price-earnings ratio is computed as the price of the stock divided by the rolling sum of the EPS for the preceding four quarters ($\mathrm{EPS_q}$ = Earnings per share before extraordinary items):

$$PE = \frac{Price_d}{\sigma \sum_{i=0}^{3} EPS_{q-i}} \tag{5}$$

The price momentum for the periods of 3, 6, 12, and 18 months is calculated as the product of monthly stock returns less the product of the monthly returns on the CRSP Value Weighted Index.

$$\begin{aligned} PM18_m = {} & \left\{\left[\pi_{m-18}^{m-1}\left(1 + monthly\ return_i\right)\right] - 1\right\} \\ & - \left\{\left[\pi_{m-18}^{m-1}(1 + monthly\ return^{CRSP-VW})\right] - 1\right\} \end{aligned} \tag{6}$$

The size of a firm is calculated as the natural logarithm of the market capitalization.

$$SIZE = \ln(Price_d \times Shares\ outstanding_d) \tag{7}$$

In short, our empirical results reveal that analysts show a persistent preference for relatively expensive large cap growth stocks which have performed well in the past. This preference is significantly stronger in recessions. We discover a monotonic decrease in decile ranks on the 3 and 18 months price momentum in recessions and expansions. Both, recommendations and revisions display such a pattern. In line with prior studies, this indicates that analysts favor stocks that have performed well in the past. However, the degree of discrimination, which is measured by the spread between strong buy and strong sell, is lower for the 3 months momentum (0.41 and 0.55) compared to the 18 months momentum (1.37 and 1.38) in both economic states. Analysts seem to consider rather the longer term performance of stocks than the short term performance. Surprisingly, the spread statistics are slightly lower for revisions. One could have expected analysts to discriminate across stocks even more rigorously when changing their expectations which seem not to be the case.

Table 4. Test for Analyst Preferences

This table displays past returns, value, growth, and size characteristics of firms for recommendations (panel A and C) and revisions (panel B and D). Average decile ranks are calculated for each recommendation or revision category according to the business cycle. The bottoms 10% of all observations within a specific characteristic group are assigned the rank "1". Whereas the top 10% group receives the rank "10". Accordingly, ranks above "5" can be interpreted as exceeding the median. The bottom row of each panel table presents the spread between the most favorable and the most unfavorable recommendation level. It reveals the degree to which analysts discriminate their assessments. Panel A and B report ranks for returns during the 3 and 18 months before the recommendation announcement ("PM"). Panel C and D report ranks for the sales growth during the previous 4 quarters before the announcement ("SG4"), the size of a firm ("SIZE"), and its market-to-book ratio at the time the recommendation was published ("MB"). All t-statistics pertain to the null-hypothesis that the mean respective rank is equal in expansion and recession.

Panel A: Price Momentum (Recommendations)

	N		PM3			PM18		
	Exp.	Rec.	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat
(1) Strong Buy	91,261	11,929	5.68	5.73	-1.91	6.23	6.53	-10.94
(2) Buy	114,023	15,403	5.66	5.60	2.29	6.03	6.38	-14.27
(3) Hold	142,070	24,658	5.39	5.36	1.14	5.46	5.71	-12.86
(4) Sell	16,007	3,307	5.21	5.27	-1.01	4.88	5.14	-4.79
(5) Strong Sell	8,415	2,002	5.27	5.18	1.17	4.85	5.16	-4.16
Spread (1) - (5)			0.41	0.55		1.37	1.38	

Panel B: Price Momentum (Revisions)

	N		PM3			PM18		
To ...	Exp.	Rec.	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat
(1) Strong Buy	38,946	5,843	5.60	5.79	-4.72	6.02	6.49	-11.86
(2) Buy	47,977	6,504	5.57	5.54	0.68	5.82	6.25	-11.80
(3) Hold	68,945	12,502	5.42	5.37	1.66	5.47	5.68	-7.67
(4) Sell	9,537	1,978	5.24	5.31	-0.92	4.87	5.18	-4.50
(5) Strong Sell	5,552	1,508	5.33	5.24	1.04	4.82	5.18	-4.26
Spread (1) - (5)			0.28	0.55		1.21	1.31	
Upgrade	77,545	12,439	5.52	5.62	-3.54	5.73	6.16	-15.62
Downgrade	93,412	15,896	5.46	5.38	3.30	5.56	5.73	-6.97

Panel C: Value, Growth, and Size (Recommendations)

	N		SG4			SIZE			MB		
	Exp.	Rec.	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat
(1) Strong Buy	75,201	10,564	6.19	6.39	-7.06	6.74	6.99	-10.68	6.23	6.51	-10.60
(2) Buy	94,069	13,864	6.09	6.33	-9.40	6.90	7.20	-14.60	6.15	6.47	-14.06
(3) Hold	119,050	21,981	5.74	5.95	-10.26	7.01	6.92	5.39	5.79	5.92	-7.03
(4) Sell	13,610	2,901	5.36	5.49	-2.29	6.89	6.86	0.54	5.31	5.36	-0.93
(5) Strong Sell	6,978	1,793	5.28	5.77	-6.37	6.75	6.81	-0.97	5.42	5.48	-0.84
Spread (1) - (5)			0.91	0.62		-0.01	0.18		0.81	1.02	

Panel D: Value, Growth, and Size (Revisions)

	N		SG4			SIZE			MB		
To ...	Exp.	Rec.	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat	Exp.	Rec.	t-stat
(1) Strong Buy	33,553	5,286	5.91	6.25	-8.29	7.12	7.22	-3.07	6.19	6.49	-8.19
(2) Buy	41,174	5,970	5.85	6.15	-7.55	7.17	7.31	-4.60	6.02	6.34	-9.07
(3) Hold	59,251	11,286	5.73	5.97	-8.23	6.92	6.84	3.11	5.79	5.87	-3.00
(4) Sell	8,126	1,724	5.37	5.58	-2.77	6.81	6.73	1.35	5.28	5.30	-0.36
(5) Strong Sell	4,712	1,380	5.20	5.72	-5.97	6.72	6.76	-0.55	5.36	5.43	-0.78
Spread (1) - (5)			0.71	0.53		0.40	0.46		0.83	1.07	
Upgrade	66,520	11,266	5.66	5.95	-10.14	7.17	7.20	-1.44	5.96	6.18	-8.26
Downgrade	80,296	14,380	5.86	6.09	-9.07	6.90	6.87	1.38	5.86	5.94	-3.38

(The distinction of recessions and expansions is based on the NBER statistics.)

The overall finding for the 18 months momentum measure is that for all types of recommendations decile ranks are significantly higher in recessions. Stocks which are revised to "Strong Buy" are on average in the 6.49 decile during recessions and in the 6.02 decile in expansions. Analogously, "Strong Sell" revisions pertain to stocks of the 5.18 decile in recessions and to the 4.82 decile in expansions. Thus, the preference for high momentum stocks is even more pronounced during recessions.

As far as the size of firms is concerned, we discover a general preference for larger companies in expansions and recessions (exceeding the 6.9 decile on average). Furthermore, analysts appear to take sales growth into consideration when issuing recommendations. They discriminate substantially across categories (e.g., 6.19 for "Strong Buy" vs. 5.28 for "Strong Sell" during expansions) and weigh growth stronger during recessions (6.25 vs. 5.91 for revisions to strong buy). Besides that, analysts favor stocks with rather high market-to-book valuation metrics. Commonly, such stocks are popular investment choices whose prices are driven by the magnitude of investors. Again, this is revealed even more explicitly during recessions where a "Strong Buy" recommendation is located at the 6.51 decile in contrast to a "Sell" one at the 5.36 decile. Noticeably, there is no consistent monotonic pattern anymore as to the order from positive to negative recommendations and revisions. Combined with their favor for past winners, the analysts' preference does not seem to be vastly different from so called naïve trading strategies.

In sum, analysts reveal a preference for growth and momentum stocks and even exaggerate that during recessions. However, the benefit of such liking is questionable. Analysts do not only favor stocks that have performed well in the past but they also exaggerate that favor during economically dull times. One could argue that analysts rely more heavily on quantitative characteristics instead of their qualitative idiosyncratic knowledge when markets are not in good shape. Since decile ranks are significantly different for expansions and recessions and persistent over time, it appears unlikely that the preference reinforcement is just random.

Quantitative Investment Signals

The preceding section reveals that analysts alter their preferences contingent on the business cycle in such a way that during recessions they amplify their likings for momentum and growth. The following section investigates the appropriateness of such likings. In sum, the preference structure of analysts and its alterations are in line with empirical research about the relation between firm characteristics and future excess returns as to momentum but not in the case of their favor for growth stocks.

The results shown below confirm the findings of the decile comparison: The correlation between the price momentum variables and the absolute recommendation/revision level is negative which means that a high recommendation number (e.g., "Strong Sell" which is coded as 5 in I/B/E/S notation) by tendency is associated with a relatively low momentum and vice versa. On average, the 18 months price momentum reveals the strongest correlation with analyst recommendations. Further, the correlation is stronger in recessions (-29.03%) than during expansions (-16.36%). As indicated by the consistence of the normative direction and the actual direction, analysts' preference for past high performers is in line with empirical findings that prove this to coincide with future abnormal returns (the algebraic sign of the normative direction equals the actual direction).

Table 5. Analyst Preferences and Investment Signals

This table presents Spearman rank correlation coefficients between the continuous explanatory variable and consensus analyst recommendations. In the first column five investment signals are listed (price momentum comprises four temporal variations, sales growth has two temporal variations). The correlation between these variables and the recommendations level (1) to (5) is reported in columns three and four. The normative direction refers to the expected algebraic sign among both as to future returns. The actual direction is derived from the time weighted correlation coefficient (not tabulated) across recession and expansions and reported if it exceeds 10%. Otherwise it is displayed as "?". *, **, and *** indicate statistical significance at the 10, 5, and 1%-level respectively. The statistics pertain to the null-hypothesis that the mean correlation coefficient in expansion and recession is equal (i.e., that their difference is equal to zero). T-values are obtained via the Fisher r-to-z transformation.

Explanatory Variable	Normative Direction	Correlation		Actual Direction
		Exp.	Rec.	
Price Momentum Variables				
PM18	-	-16.36%***	-29.03%***	-
PM12	-	-16.48%***	-25.40%***	-
PM6	-	-12.76%***	-18.08%***	-
PM3	-	-8.31%***	-11.54%***	?
Value vs. Growth Variables				
SG4	+	-15.63%	-14.91%	-
SG2	+	-13.45%	-13.25%	-
MB	+	-14.76%***	-20.23%***	-
PE	+	-7.45%***	-10.08%***	?
Size	+	4.46%***	-5.87%***	?

(The distinction of recessions and expansions is based on the NBER statistics.)

In contrast to that, we document a discrepancy between what sign of correlation (positive/negative) was expected and what was actually found to exist in the following cases: Companies whose revenues face rather strong growth rates and whose stocks account for relatively high market-to-book and price-earnings ratios are considered as growth stocks (Fama/French (1998)). Empirical analyses have uncovered a negative relation of these aspects with future returns which should translate into a positive relationship with the magnitude of recommendations (i.e., higher rating scores). However, our results reveal a negative correlation for four quarters sales growth of -15.63 % and -14.91% respectively in expansion and recession which signifies that more positive recommendations (with smaller absolute values) are issued for firms which grow at relatively high levels.

The same discrepancy is found for the market-to-book and price-earnings ratios. However, the correlation found under the latter metric is of a small magnitude (only -7.45%) and needs to be interpreted with some caution. The same applies for the size metric. In general, all correlation coefficients are found to be significantly different at the 1% level during expansions and recessions except the sales growth metrics. According to Jegadeesh et al. (2004) analysts prefer firms high in operating performance. High market-to-book firms are generally higher in RoE and expected to grow at faster rates in the future. One could infer that analysts recognize and actively consider investment signals (which appears just logical in light of today's extensive quantitative components of stock research) and in doubt weigh operating performance higher if the respective indicator is in a normative vs. actual conflict (Jegadeesh et al. (2004)). Generally speaking, analysts' preferences are not fully in line with empirical indications. Thus, their contribution to investors might be questioned. However, analysts' preference structure varies systematically across the business cycle.

Robustness Checks

Regulation FD, Median Returns, and CFNAI Business Cycle Classification

Regulation Fair Disclosure (Reg FD) became effective on October, 23rd, 2000. Its goal was to prevent selective disclosure of material nonpublic information to investors and financial intermediaries such as stock analysts. As stated by the U.S. Securities and Exchange Commission (2000) "the practice of selective disclosure leads to a loss of investor confidence in the integrity of our capital markets. Investors who see a security's price change dramatically and only later are given access to the information responsible for that move rightly question whether they are on a level playing field with market insiders." Recent findings indicate that Reg FD was successful in generating a more equal information environment for security analysts. For example, Cohen, Frazzini, and Malloy (2010) find that analysts generate more profitable stocks

recommendations when they have an educational link to the company. However, the higher profitability almost diminished after Reg FD.

Since Reg FD had a significant impact on the information content of analysts' stock recommendations we conduct a robustness check by using only recommendations issued from 11/2000 to 12/2010. The results are shown in Table 6.

Table 6. Event Study: Excess returns according to DGTW (1997) after Reg FD (Oct. 2000)

This table presents the results of the event-study for the period 11/2000-12/2010 after Regulation Fair Disclose (Reg FD). The event-returns are shown for expansions and recessions according to the NBER classification. The excess returns are calculated according to DGTW (1997). The portfolio classifications follow Cohen, Frazzini, and Malloy (2010). The "Buy portfolio" consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Strong Buy or "Buy" recommendation. The "Sell portfolio" consists of all downgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Hold", "Sell" or "Strong Sell" recommendation. The upgraded and downgraded stocks are shown separately. The excess returns are shown for the announcement day (Day "0"), the first 3 trading days, 1 month, 3 months, 6 months and 6 months excluding the announcement day. If recommendations are revised during the holding period, the stocks remain in the portfolio till the revision plus one trading day. A t-test is performed to evaluate whether the excess returns are significantly different from zero. *, ** and *** indicate significance at the 10, 5 and 1%-level, respectively.

	Sample	Recommendation Classification (Mean Returns)			
Trading days	NBER	Buy-PF	Sell-PF	Upgrade	Downgrade
0					
	Exp	1.54%***	-1.48%***	2.55%***	-2.48%***
	Rec	1.83%***	-1.93%***	3.11%***	-2.89%***
	Rec-Exp	0.29%***	-0.45%***	0.56%***	-0.40%***
0 - 3					
	Exp	1.75%***	-2.09%***	2.81%***	-3.34%***
	Rec	2.08%***	-3.03%***	3.45%***	-4.42%***
	Rec-Exp	0.32%***	-0.94%***	0.65%***	-1.08%***
1 month					
	Exp	1.81%***	-2.17%***	3.23%***	-3.56%***
	Rec	1.59%***	-3.03%***	3.38%***	-4.58%***
	Rec-Exp	0.32%**	-1.27%***	0.96%***	-1.41%***
3 months					
	Exp	1.83%***	-2.67%***	3.22%***	-4.18%***
	Rec	1.48%***	-3.86%***	3.48%***	-5.47%***
	Rec-Exp	-0.49%**	-1.34%***	-0.23%	-1.52%***
6 months					
	Exp	1.76%***	-3.04%***	3.20%***	-4.61%***
	Rec	0.20%	-5.03%***	2.02%***	-6.75%***
	Rec-Exp	-1.47%***	-1.99%***	-1.11%***	-2.14%***
6 months (ex Day 0)					
	Exp	0.19%*	-1.28%***	0.62%***	-1.71%***
	Rec	-1.60%***	-2.83%***	-1.00%**	-3.38%***
	Rec-Exp	1.79%***	1.55%***	1.63%***	1.67%***

(The distinction of recessions and expansions is based on the NBER statistics.)

The results in Table 6 show that the difference in returns between expansions and recessions is not driven by Reg FD. The results are similar to those of the full sample.

Next, to check the robustness against outliers we calculate median returns. Table 7 shows the results when using median returns.

Table 7. Event Study: Excess returns according to DGTW (1997) Medians

This table presents the results of the event-study for the total sample period 01/1994-12/2010. The median event-returns are shown for expansions and recessions according to the NBER classification. The median excess returns are calculated according to DGTW (1997). The portfolio classifications follow Cohen, Frazzini, and Malloy (2010). The "Buy portfolio" consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Strong Buy or "Buy" recommendation. The "Sell portfolio" consists of all downgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Hold", "Sell" or "Strong Sell" recommendation. The upgraded and downgraded stocks are shown separately. The excess returns are shown for the announcement day (Day "0"), the first 3 trading days, 1 month, 3 months, 6 months and 6 months excluding the announcement day. If recommendations are revised during the holding period, the stocks remain in the portfolio till the revision plus one trading day.

	Sample	Recommendation Classification (Median Returns)			
Trading days	NBER	Buy-PF	Sell-PF	Upgrade	Downgrade
0					
	Exp	0.53%	-0.61%	0.99%	-1.05%
	Rec	0.88%	-1.10%	1.70%	-1.82%
	Rec-Exp	0.35%	-0.49%	0.71%	-0.77%
0 - 3					
	Exp	0.81%	-1.11%	1.39%	-1.73%
	Rec	1.28%	-1.97%	2.30%	-2.92%
	Rec-Exp	0.47%	-0.86%	0.91%	-1.19%
1 month					
	Exp	0.79%	-1.90%	1.54%	-2.84%
	Rec	0.79%	-2.98%	1.85%	-4.01%
	Rec-Exp	0.00%	-1.08%	0.31%	-1.17%
3 months					
	Exp	0.19%	-2.95%	1.13%	-3.97%
	Rec	-0.15%	-4.66%	1.14%	-5.76%
	Rec-Exp	-0.33%	-1.71%	0.01%	-1.79%
6 months					
	Exp	-0.54%	-3.87%	0.60%	-4.98%
	Rec	-1.48%	-5.57%	0.12%	-6.26%
	Rec-Exp	-0.94%	-1.70%	-0.48%	-1.28%
6 months (ex Day 0)					
	Exp	-1.07%	-3.26%	-0.39%	-3.93%
	Rec	-2.36%	-4.47%	-1.58%	-4.44%
	Rec-Exp	-1.29%	-1.21%	-1.19%	-0.51%

(The distinction of recessions and expansions is based on the NBER statistics.)

For all portfolio classifications and holding periods the general direction is in line with the mean results. Using median returns does change the picture, i.e., our main results are not driven by outliers.

Furthermore, we use the CFNAI business cycle definition instead of the NBER business cycle definition. According to the Federal Reserve of Chicago a value of the CFNAI moving average over 3 months below -0.7 indicates "an increasing likelihood that a recession has begun". A value is above +0.2 indicates a "significant likelihood that a recession has ended".

Table 8. Event Study: Excess returns according to DGTW (1997) CFNAI

The table 8 presents the results of the event-study for the total sample period 01/1994-12/2010. The event-returns are shown for expansions and recessions according to the CFNAI classification. The excess returns are calculated according to DGTW (1997). The portfolio classifications follow Cohen, Frazzini, and Malloy (2010). The "Buy portfolio" consists of all upgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Strong Buy or "Buy" recommendation. The "Sell portfolio" consists of all downgraded stocks and stocks for which the analyst initiates, resumes or reiterates the coverage with a "Hold", "Sell" or "Strong Sell" recommendation. The upgraded and downgraded stocks are shown separately. The excess returns are shown for the announcement day (Day "0"), the first 3 trading days, 1 month, 3 months, 6 months and 6 months excluding the announcement day. If recommendations are revised during the holding period, the stocks remain in the portfolio till the revision plus one trading day. A t-test is performed to evaluate whether the excess returns are significantly different from zero. *, ** and *** indicate significance at the 10, 5 and 1%-level, respectively. Table 8 shows the results of the event-study when using the CFNAI business cycle classification.[7]

	Sample	Recommendation Classification (Mean Returns)			
Trading days	CFNAI	Buy-PF	Sell-PF	Upgrade	Downgrade
0					
	Exp	1.21%***	-1.49%***	2.04%***	-2.26%***
	Rec	1.53%***	-1.72%***	2.74%***	-2.69%***
	Rec-Exp	0.31%***	-0.22%***	0.70%***	-0.43%***
0 - 3					
	Exp	1.39%***	-2.09%***	2.28%***	-3.05%***
	Rec	1.74%***	-2.56%***	3.10%***	-3.86%***
	Rec-Exp	0.35%***	-0.47%***	0.81%***	-0.80%***
1 month					
	Exp	1.23%***	-2.47%***	2.23%***	-3.71%***
	Rec	1.53%***	-2.47%***	3.50%***	-3.92%***
	Rec-Exp	0.29%***	0.00%	1.27%***	-0.21%
3 months					
	Exp	1.54%***	-3.27%***	2.61%***	-4.57%***
	Rec	1.49%***	-3.02%***	3.53%***	-4.58%***
	Rec-Exp	-0.05%	0.25%*	0.93%***	-0.01%
6 months					
	Exp	1.71%***	-4.14%***	2.89%***	-5.65%***
	Rec	0.84%***	-3.58%***	2.93%***	-5.18%***
	Rec-Exp	-0.88%***	0.56%***	0.04%	0.47%*
6 months (ex Day 0)					
	Exp	0.49%***	-2.40%***	0.84%***	-3.03%***
	Rec	-0.67%***	-1.69%***	0.26%	-2.22%***
	Rec-Exp	1.16%***	-0.70%***	0.58%**	-0.82%**

(The distinction of recessions and expansions is based on the CFNAI statistics.)

[7] As a remainder, the recessions and expansions according to NBER and the CFNAI are shown in Figure 1.

Herding Behavior[8]

The arguably most prominent bias in analyst recommendations is herding. Observed herding behavior might be caused by independent similar information processing or mutual imitation. In so far that recessions are marked by a more volatile economic situation and thus more divergent information, it would be plausible that there is less herding due to the first explanation. With regard to the second case, the situation does not seem to be intuitively clear: As in general, analysts might either herd to be on the safe side or anti-herd to stand out from the crowd. A recession might only strengthen this pattern. In recessions and their more volatile market environment an analyst might have the desire not to be entirely wrong, or if so, at least not to be the only one. Thus an analyst would herd more. On the other hand it might be that under these circumstances the employer is more forgiving and she could therefore try a risky approach. Summarizing this reasoning, a different intensity of herding could be expected during recessions compared to expansions.

As a foundation for our herding study we use the Jegadeesh/Kim (2010) approach. Their model assumes that investors recognize herding and, ceteris paribus, react less to herders. They construct a model which controls for sensible other influences and assume that the remaining differences of event excess returns can at least partially be attributed to investors' different behavior towards herders versus non-herders. Our approach employs the basic regression (8):

$$ER^{i}(t,T) = a_{T-t} + b_{T-t} * I_{multi} + c_{T-t} * I_{single} + d_{T-t} * (New\_rec_{i,j,t} - Con\_rec_{i,t-1}) + e_{i,j,t,T}$$

Where

I_{multi} = +1 if the revision increases the numerical I/B/E/S recommendation level[9] (i.e., a downgrade) by at least two labels

= -1 if the revision decreases the numerical I/B/E/S recommendation level (i.e., an upgrade) by at least two labels

I_{single} = +1 if the revision increases the numerical I/B/E/S recommendation level by exactly one label

= -1 if the revision decreases the numerical I/B/E/S recommendation level by exactly one label

$New\_rec_{i,j,t}$ is the new recommendation level of analyst *j* for stock *i* on day *t*, after revision. $Con\_rec_{i,t-1}$ is the consensus recommendation of all active recommendations (except of analyst *j*) about stock *i* one day before the revision. It is calculated as an arithmetic mean without weights using the I/B/E/S recommendation level codes.

The excess returns are expected to be influenced by the recommendation revisions' direction and intensity. If in addition there is a significant non-zero coefficient for the deviation from consensus ($New\_rec_{i,j,t} - Con\_rec_{i,j,t-1}$) then this means that the market participants assume one kind of herding behavior. The mere fact that one strays from the consensus would then lead to a more intense market reaction. Using the I/B/E/S recommendation codes a negative *d* stands for assumed regular herding behavior, while a positive *d* signifies an underlying anti-herding assumption. That would be the case when the market reaction rewards a move to consensus because supposedly the analysts' information force him/her to do so, while his/her natural tendency would be rather to issue a divergent recommendation.

The data is prepared according to Jegadeesh/Kim (2010). However, we employ linear regressions instead of Fama-MacBeth regressions.

[8] Departing from other analyses in this paper, we include observations starting from October 1993 until December 2010.

[9] Recommendation level codes are such, that the lower the better. We keep these values while Jegadeesh/Kim (2010) redefine the level codes and thus obtain opposing signs.

Table 9. Herding: Expansions versus Recessions (NBER)

This table presents the regression estimates for

$$ER^i(t,T) = a_{T-t} + b_{T-t} * I_{multi} + c_{T-t} * I_{single} + d_{T-t} * (New\_rec_{i,j,t} - Con\_rec_{i,j,t-1}) + \varepsilon_{i,j,t,T}$$

where I_{multi} is 1 (-1) for a multi-step revision upwards (downwards) in I/B/E/S recommendations codes with lower values indicating better recommendations. I_{single} is correspondingly defined for single-step revisions. $New\_rec_{i,j,t}$ - $Con\_rec_{i,j,t-1}$ is the new revision's deviation from the consensus level of active recommendations for the same company. Each *T*-*t*-period excess return is estimated for the complete sample and then individually for the sub-samples of expansive and recessive business cycle phases, as defined by NBER (Panel A) and CFNAI (Panel B, see next page). A Wald test is performed to compare the coefficients for *deviation from consensus* of expansions and recessions for equality, i.e., the null hypothesis is that the coefficients are the same. *, ** and *** indicate significance at the 10, 5 and 1%-level, respectively. Significance is only indicated for *deviation from consensus* for the sake of clarity. All other coefficients are significant at the 1%-level. The sample period is from October 1993 to December 2010. "*t*-stat" abbreviates *t*-statistic.

Days since revision	(Sub-) Sample	*N*	*I_multi* (= 1 or -1, multi level)		*I_single* (= 1 or -1, single level)		*Deviation from consensus*	
			Coef. (%)	*t*-stat	Coef. (%)	*t*-stat	Coef. (%)	*t*-stat
Panel A: NBER								
0	Complete	107,068	-2.26	-40.86	-2.27	-62.77	-0.64***	-19.85
	Exp	92,160	-2.10	-35.80	-2.15	-56.73	-0.66***	-19.24
	Rec	14,908	-3.15	-19.61	-3.07	-27.21	-0.54***	-5.74
	Exp-Rec (P > χ^2)						(0.25)	
1	Complete	107,060	-2.63	-42.58	-2.59	-64.38	-0.71***	-19.83
	Exp	92,154	-2.44	-37.43	-2.44	-57.97	-0.72***	-18.83
	Rec	14,906	-3.64	-20.23	-3.60	-28.50	-0.68***	-6.50
	Exp-Rec (P > χ^2)						(0.77)	
2	Complete	107,042	-2.76	-42.28	-2.69	-63.12	-0.72***	-18.87
	Exp	92,141	-2.56	-37.27	-2.54	-57.23	-0.73***	-18.14
	Rec	14,901	-3.88	-19.77	-3.73	-27.08	-0.67***	-5.83
	Exp-Rec (P > χ^2)						(0.63)	
21	Complete	106,478	-3.09	-27.88	-3.22	-44.44	-0.80***	-12.40
	Exp	91,624	-2.97	-25.70	-3.10	-41.52	-0.83***	-12.24
	Rec	14,854	-3.73	-10.87	-3.96	-16.44	-0.68***	-3.42
	Exp-Rec (P > χ^2)						(0.51)	
42	Complete	105,378	-3.21	-21.04	-3.45	-34.64	-0.91***	-10.15
	Exp	90,618	-3.11	-19.53	-3.31	-32.29	-0.98***	-10.52
	Rec	14,760	-3.78	-7.95	-4.29	-12.89	-0.54*	-1.95
	Exp-Rec (P > χ^2)						(0.14)	
126	Complete	101,003	-3.55	-13.21	-3.83	-21.91	-1.17***	-7.49
	Exp	86,605	-3.41	-12.00	-3.60	-19.71	-1.39***	-8.40
	Rec	14,398	-4.27	-5.47	-5.09	-9.32	-0.12	-0.26
	Exp-Rec (P > χ^2)						(0.02)**	

Days since revision	(Sub-) Sample	*N*	*I_multi* (= 1 or -1, multi level) Coef. (%)	*t*-stat	*I_single* (= 1 or -1, single level) Coef. (%)	*t*-stat	*Deviation from consensus* Coef. (%)	*t*-stat
			Panel B: CFNAI					
0	Complete	107,068	-2.26	-40.86	-2.27	-62.77	-0.64***	-19.85
	Exp	71,169	-1.88	-30.10	-2.06	-50.79	-0.59***	-16.20
	Rec	35,899	-3.02	-27.74	-2.70	-37.55	-0.74***	-11.67
	Exp-Rec (P > ?²)						(0.06)*	
1	Complete	107,060	-2.63	-42.58	-2.59	-64.38	-0.71***	-19.83
	Exp	71,164	-2.20	-31.62	-2.32	-51.46	-0.65***	-15.96
	Rec	35,896	-3.47	-28.65	-3.14	-39.27	-0.84***	-11.89
	Exp-Rec (P > ?²)						(0.03)**	
2	Complete	107,042	-2.76	-42.28	-2.69	-63.12	-0.72***	-18.87
	Exp	71,151	-2.30	-31.40	-2.40	-50.38	-0.66***	-15.43
	Rec	35,891	-3.67	-28.43	-3.29	-38.63	-0.83***	-11.06
	Exp-Rec (P > ?²)						(0.06)*	
21	Complete	106,478	-3.09	-27.88	-3.22	-44.44	-0.80***	-12.40
	Exp	70,656	-2.68	-21.08	-2.96	-35.88	-0.78***	-10.57
	Rec	35,822	-3.92	-18.36	-3.78	-26.79	-0.84***	-6.74
	Exp-Rec (P > ?²)						(0.70)	
42	Complete	105,378	-3.21	-21.04	-3.45	-34.64	-0.91***	-10.15
	Exp	69,725	-2.82	-15.97	-3.22	-28.04	-0.94***	-9.07
	Rec	35,653	-4.01	-13.89	-4.01	-21.05	-0.84***	-5.01
	Exp-Rec (P > ?²)						(0.64)	
126	Complete	101,003	-3.55	-13.21	-3.83	-21.91	-1.17***	-7.49
	Exp	66,093	-3.07	-9.45	-3.59	-17.12	-1.49***	-7.85
	Rec	34,910	-4.62	-9.78	-4.58	-14.70	-0.59**	-2.15
	Exp-Rec (P > ?²)						(0.01)**	

(The distinction of recessions and expansions is based on the NBER and CFNAI statistics.)

In order to test the impact of herding we analyze the coefficients for deviation from consensus. Within the NBER classification (Panel A), the difference between expansions and recessions is only significant for 126 trading days. The coefficient for recessions alone, however, is not significant anymore for that time period. This is most probably due to noise which is successively introduced in all coefficients in longer time periods and which should be even higher in volatile recessions. Moreover, as the shorter durations do not show any significant differences, this result for that duration can be considered meaningless. All other differences are insignificant at the 10%-level.

The CFNAI classifications (Panel B of table 9) show a surprisingly different picture. While the difference is insignificant, the NBER differentiation still indicates that the magnitude of herding might be less in recessions. In the CFNAI results the coefficient is just the opposite: bigger for recessions, not smaller. This difference is even significant in the short and long run (albeit not in the medium term). The CFNAI is released monthly and therefore corresponds better to what analysts and other market participants actually know at the time of their decision making. Therefore, there might be some kind of herding effect, after all. CFNAI more easily proclaims a recession than NBER. Essentially the CFNAI recessions consist of the NBER recessions plus some fringe months at the beginning and end of NBER-recessions. It might be that market participants subdivide the business cycle into at least four stages instead of two. And just during the transition phases form expansion to recession and from recession to expansion (covered by CFNAI), there might be more herding taking place. But there might also be a problem of the model. Maybe the consensus recommendation is just too old and as the market is volatile describes a situation which is not valid anymore, so that a new recommendation which takes into account the current situation can easily beat the odds.

Summarizing, there is no difference in herding behavior between recessions and expansions. This finding is in line with Lin/Chen/Chen (2011) but contrary to Welch (2000).

Conclusion

We show that it is crucial to control for the effects of macroeconomic fluctuations when assessing analysts'

stock recommendations. Dependent on the business cycle we find significantly different price formation patterns after recommendations have been issued. In addition to analyst characteristics (e.g., Hess, Kreutzmann, and Pucker (2012)), economic activity is an important determinant of the profitability of stock recommendations.

Our study shows that in recessions analysts are too optimistic with regard to the stocks they suggest as a "Buy". Such recommendations do not have long-term investment value. Interestingly, our results indicate that investors are not aware of this severe bias. In recessions, the initial market reaction to "Buy" recommendations is even stronger than in expansions. This finding points out that the information content and the information processing of stock recommendations differ dependent on the business cycle. The unique information set of analysts (Grossman/Stiglitz (1980)) is assumed to be more valuable in recessions by market participants. However, analysts only issue profitable "Sell" recommendations in recessions, while "Buy" recommendations do not generate excess returns.

A plausible explanation for the difference in profitability is attributable to the nature of the stocks that are recommended: We show that analysts favor "glamour" over "value" stocks in recessions and expansions. However, the bias for glamour stocks does not pay off in terms of long-term investment value: The glamour stocks that are recommended to buy only generate excess returns in expansions. In recessions, analysts overestimate their investment value

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