Could investors obtain positive returns using security analysts' recommendations?

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Abstract

En este trabajo se analiza el valor de las recomendaciones de inversión de los analistas financieros en el mercado de capitales español en el periodo 1994-2003, con datos procedentes de JCF Quant. Los activos se han clasificado cada mes del periodo muestral en tres carteras en función del nivel de consenso de las recomendaciones y de sus variaciones. La rentabilidad de las carteras de recomendaciones (cambios) se ha estimado utilizando modelizaciones alternativas con una metodología de tiempo de calendario. Los resultados obtenidos muestran que los analistas identifican oportunidades de inversión rentables, dado que con una estrategia de inversión autofinanciada, consistente en comprar la cartera con recomendaciones más favorables y vender la cesta de activos con peores recomendaciones, se pueden obtener rentabilidades significativamente positivas incluso después de ajustar por riesgo. Parte de esta rentabilidad no es atribuible a su propia capacidad sino a la tendencia a recomendar la compra de activos grandes de valor y la venta de activos pequeños con momentum de precios negativo. Finalmente, el valor de las recomendaciones no parece depender del nivel de información existente sobre las empresas aproximado por el tamaño de las empresas o el número de analistas.

Clasificación JEL: G10, G14, G20, G24

Palabras clave: Analistas del lado de la venta; Valor de las recomendaciones, Evaluación resultados de carteras.

Abstract

This paper examines the value of stock recommendations issued by analysts for the Spanish capital market in the period 1994-2003, using data from JCF Quant. In every month of the sample period, stocks are classified into three portfolios, and studied first by consensus recommendation level and then by changes of consensus level. Returns from the recommendation portfolios are estimated using different models in the context of the portfolio calendar-time methodology. The results obtained show that sell-side analysts are able to detect profitable investment opportunities. Investors may obtain significant positive risk-adjusted abnormal returns by buying the best-recommended assets and simultaneously selling the worst consensus stocks. However, a portion of these returns could be attributed to their tendency to recommend the acquisition of big "value" stocks and the sale of small shares with negative price momentum. Finally, the value of an analyst's recommendations is independent of the level of information on the firm, expressed by company size or the number of analysts covering each firm.

JEL Classification: G10, G14, G20, G24

Keywords: Sell-side research; Value of analysts' recommendations, Performance evaluation, calendar time-portfolios.

1 Introduction

The work of an investment analyst basically consists of gathering internal and external information on listed companies, processing it and transforming it into earnings forecasts, target prices and stock recommendations.

Rather than experts, analysts are usually specialised in a particular industry or group of stocks, and may be considered informed investors (Grossman and Stiglitz; 1980). The results of their research are set down in written reports which they first give to their clients, and which are later made available to the public through different channels.

This paper concentrates on the sell-side analysts' stock recommendations. Stock recommendations are the medium normally used by analysts to communicate their expectations regarding the future results of a firm and to advise a certain course of action. Individual and institutional investors use these recommendations to form their own beliefs regarding the value of a stock and to make investment decisions. By influencing the expectations of investors, analysts affect stock prices and contribute to market efficiency.

More specifically, a stock recommendation summarises the opinion of the analyst regarding investment in a certain stock. For example, buy (sell) indicates a belief that a stock is undervalued (overvalued), and gives a professional judgement on its possibilities of appreciation (depreciation) over a certain period of time. An analyst's opinion regarding of an investment is defined, giving the recommendation a level on a scale with a reduced number of discrete values: normally between three (sell, hold, buy) and five (sell, reduce or underweight, hold, increase or overweight and buy).

Moreover, a change to a stock recommendation represents a modification of the analyst's opinion regarding expected future results. A change can be for the better or for the worse. Reiteration simply means that the analyst has not changed his opinion.

Evidence has shown that, on average, these recommendation changes contain information of interest to investors (Stickel, 1995; Womack, 1996). Accordingly, the aim of this paper is to examine whether analysts foresee the direction in which stock prices will move, allowing investors to obtain abnormal returns. We do not study the differences between individual analysts in distinguishing between overvalued and undervalued stocks.

The main contribution of this paper is to analyse the value of analysts' recommendations for investment decisions in the Spanish market, using a calendar-time methodology and information provided directly by the brokerage houses, gathered in the JCF Quant database, rather than from secondary sources (economic press, news agencies, etc.).

On the whole, our results show that, on average, the most highly recommended stocks give better returns than the analysts' least favoured stocks. The difference in returns is positive, even after controlling certain characteristics of companies that explain the cross-section distribution of stock returns. However, it has been shown that the difference in returns between the stocks with buy and sell recommendations derives partly from the tendency of analysts to advise selling the stocks performing badly in recent months and to buy more relatively value-oriented stocks (high book-to-market ratio) than growth oriented stocks (low book-to-market ratio). Likewise, we have seen that average returns on stocks whose recommendation improves are higher than for stocks whose consensus level is downgraded. These differences, however, disappear when controlled for different risk factors. The results obtained are robust to the criterion used to build the recommendation portfolios, the number of portfolios studied and the variable used to proxy the level of information existing about companies.

The rest of the paper is organised as follows: the second section gives a brief summary of available empirical literature on the value of investment analyst recommendations; the third describes the JCF Quant database and the rest of the information used, in addition to calculating the consensus and change of consensus variables; part four explains the procedure followed to build up the recommendation portfolios on the basis of the consensus levels and change of consensus levels, outlines the methodology used to estimate returns that may be attributed to stock recommendations and presents the results; part five uses different procedures to ensure that the results obtained can be attributed to the recommendations rather than to the design of the research, such as the number of portfolios or the variables used to proxy the attributes of the company or its information environment. The paper finishes by summarising the main conclusions reached.

2 Literature

Empirical literature on analysts' stock recommendations follows two main lines of research. The perspective known as *event time* analyses the effects of stock recommendations and stock recommendation changes in relative time. The second, known as *calendar time*, evaluates portfolios, maintaining the real date on which the corresponding recommendation or change was issued.

In the perspective known as *event time* there are several secondary lines of research, using data published in the different media or data made public directly by the brokerage houses themselves. For reasons of accessibility, the first line goes before the second.

There is abundant evidence on published recommendations. The best-known papers refer to the anomaly known as the *Value Line*, which has detected, in general, that when a firm decides to include a stock in the buy (sell) level, positive (negative) returns are generated (Black, 1973; Copeland and Mayers, 1982; Stickel, 1995, etc.). Other papers examine the stock recommendations made public through different media. Lloyd-Davies and Canes (1978) and Beneish (1991) examined the recommendations published in the Wall Street Journal *Heard on the Street* section, detecting positive returns of 2% for buy rated stocks and -3% for sell rated stocks. Likewise, Barber and Loeffler (1993) observed that, with the stocks recommended in the *Dartboard* column of the same newspaper, profits 4% higher than those obtained with a randomly selected portfolio could be obtained. Graham and Harvey (1996) analysed the recommendations of the *Investment Newsletter* with similar results.

On the Spanish market, Gonzalo and Inurrieta (2001), using the recommendations made public by the Bloomberg news agency, showed that it is possible to obtain abnormal returns both from stock recommendations and their changes, and Menéndez (2003) detected how the market reacts to buy and sell stock recommendations published in the economic newspaper Cinco Días.

Stock recommendations and their changes obtained from secondary sources have the disadvantage of being made public some time after having being issued by the analysts, by which time they may already have lost much of their value. In this regard, Belcredi, Bozzi and Rigamonti (2003) studied the impact of recommendations changes on two dates: the date of issue and the date of their subsequent publication in the Italian stock exchange website. They observed excess returns three days around the date of issue, but not on the date of publication, suggesting that the information contained in the stock recommendations loses value very quickly.

To solve this problem, researchers began to use the recommendations (changes) with their corresponding date of issue, gathered and made public by specialised firms such as First Call, Zack Investment and I/B/E/S. Womack (1996), using data from IBES on extreme recommendations changes made by the most important analyst houses in the United States, detected positive returns of 3% in new buys and a drop of 4.7% in new sales, within a period of three days around the recommendation. Finally, in the same line of research, it has been observed that price reactions to stock recommendations may be delayed by several months

before being completely incorporated into prices (Stickel, 1995; Womack, 1996; Brav and Lehavy, 2002).

The *calendar time* methodology was introduced in this area by Barber, Lehavy, McNichols and Trueman (2001, 2003), to analyse the value of trading strategies based on the consensus levels of the stock recommendations issued by analysts in the United States. In their first paper, they observed that the trading strategy consisting of buying the most highly recommended stocks and simultaneously selling the least favoured stocks generates abnormal returns, which disappear when the transaction costs are taken into account. In their second paper, they observed that the same strategy gave negative returns as from the fall in stock prices of 2000, due to the fact that the analysts continued to give favourable recommendations to small, growth-oriented companies, precisely those that performed worse as from that date.

Jegadeesh and Kim (2003) used a similar methodology with data on stock recommendations from G7 countries (USA, UK, Canada, France, Germany, Italy and Japan), reaching the conclusion that trading strategies based on the consensus level are not profitable, as the losses from 2000 onwards eliminated the positive returns of previous years.

Later, Jegadeesh, Kim, Krische and Lee (2004) studied the value of strategies based on consensus changes. Their aim was to study the impact caused by new corporate information on stock recommendations and their effects on the capital market. These authors showed that changes in stock recommendations predict future returns, suggesting that they capture qualitative aspects of corporate activity not picked up by other quantitative variables.

Chen and Cheng (2002) showed that stock recommendations are not just taken into consideration by individual investors, but are also followed by institutional investors, who increase (reduce) their participations in companies with favourable (unfavourable) recommendations.

This paper follows the second methodological perspective, analysing the returns on portfolios built on the basis of the average recommendation level and its changes in calendar time.

3 Sample and Data

Our data consist of stock recommendations from equity analysts contained in the JCF Quant database, the monthly returns of companies quoted on the Spanish Stock Exchange - obtained

from the Spanish Stock Exchange Interconnection System (SIBE) *(Sistema de Interconexión Bursátil Español)* - and accounting data from the Global Compustat database.

In previous empirical research on the activity of equity analysts, the First Call, Zack Investment Research and I/B/E/S databases were used; none of these can be used in Spain. The first two do not have data on stock recommendations for companies quoted on the Spanish market, while I/B/E/S contains earnings forecasts, but not stock recommendations. As far as the authors know, this is the first time that the JCF Quant database has been used to examine the activity of equity analysts.

The ten-year sample period from January 1994 to December 2003 is limited by the availability of stock recommendations in the JCF Quant database, which began its activity in Spain in late 1993.

JCF receives stock recommendations from brokerage houses and converts them to a uniform numeric format, assigning them a score on a standard 5-level scale. The lowest scores correspond to the most favourable recommendation and vice versa: buy = 1, overweight-increase = 1.5, hold = 2, underweight-reduce = 2.5 and sell = 3. This inverse assignation of scores is a common practice in all brokerage houses. The only difference is that the minimum distance between two consecutive levels is 0.5 in JCF, while on other scales, such as Zack Investment and I/B/E/S, for example, it rises in increments of 1 point from the buy level[1]. In order to facilitate the interpretation of the results and their comparison with the evidence already existing on other markets, we have made two changes to the original JCF scale: first, we changed the 0.5 point difference between two consecutive levels to 1 point; and second, like Jegadeesh, Kim, Krische and Lee (2004), and Ljungqvist, Marston and Wilhelm (2003), the indirect relationship between recommendation and score on the original scale was inverted to the following code system: sell = 1, underweight-reduce = 2, hold =3, overweight-increase = 4, and buy = 5. Accordingly, the higher value is associated with the most favourable recommendation and a positive change corresponds to an upgrade of the initial rating[2]. The scoring system does not use any benchmark (market or industry), and recommendations are interpreted in terms of the expected evolution in the returns for a stock.

The sample of stock recommendations is not random, as JCF takes the information from a series of brokerage houses that collaborate voluntarily, sending the stock

[1] The difference arises from the fact that JCF introduced the five-level scale in 1999. Previously they only used three: buy=1, hold=2 and sell =3. Accordingly, the transition to the new scale was made by splitting the buy and sell levels.

recommendations made by their equity analysts. Accordingly, there may be a selection bias. This bias is present in all empirical literature on the subject and is difficult to correct, as a company may appear not to be covered by analysts either because the brokerage houses that follow it do not collaborate with JCF, or because professionals consider that it is not of interest.

It should be underlined that the JCF database is free of survival bias as regards the stocks studied, as it includes all stocks with an investment rating quoted at any moment of the period under consideration. Likewise, it contains all the collaborating brokerage houses that have issued recommendations for these stocks in the same period, even though they may have disappeared later.

Using the stock recommendations issued by the analysts, the consensus level variable for each of the companies quoted on the continuous market was calculated at the end of each month, as was the arithmetic average of the latest recommendations issued by each of the analysts that covered the company over the previous 180 days. An intermediate term of six months between the 90 days used by Chen and Cheng (2002) and the 360 used by Jegadeesh, Kim, Krische and Lee (2004) was chosen for two reasons: first, because evidence has shown that recommendations are valid for up to 6 months (Womack, 1996) and, secondly, to ensure that the consensus contains recent information. In this way, the consensus level of each company constitutes a representative index of the average opinion of the equity analysts regarding a certain stock, and may be considered a proxy for the aggregate ability of the analysts to pick the best stocks.

However, the use of the consensus level as a basis for trading strategies has the problem that stale recommendations, which may have lost part of their value, may be included. One way of palliating this situation consists of using the monthly variation in the consensus recommendation as a proxy for new information made available regarding the company in the period under consideration. The use of this variable is not without difficulties either, such as, for example, the fact that its variability is very low. Jegadeesh, Kim, Krische and Lee (2004) suggested that a change in consensus could capture qualitative aspects of company activities (capacity of the management team, strategic alliances, intangible assets, and growth opportunities), not included in other quantitative signals. Consensus change is calculated as the variation in the consensus level of a certain company in two consecutive

[2] Since the new US regulation on the production and publication of information (Global Settlement) was passed in 2002, brokerage houses have mostly adopted a three-level recommendation scoring system. However, the IBES, Zack and JCF databases maintain the 5-category classification system.

months. The informative content will depend on the direction of the change as regards the previous level.

3.1 Descriptive Statistics

Table 1 describes the database of stock recommendations used. The columns further to the left of panel A describe the sample companies year by year, and the columns further to the right show the sample of brokerage houses and equity analysts. Panel B presents the sample of stock recommendations.

Beginning with Panel A, we can see how the number of listed companies increased from a minimum of 116 in 1994 to a maximum of 143 in 1999 and 2001. At the same time, but in a much more pronounced manner, the number of companies covered by JCF also increased, from 43 in 1994 up to a maximum of 119 in 1999, with an average of 94 over the 10-year period. The proportion of companies covered is very high, approximately 70% of listed companies, on average, and much higher than the 46.1% on the US market (Barber, Lehavy, McNichols and Trueman, 2001). The next column gives a first indication that the companies covered are the largest ones, as their market value represents on average 96.87% of total market value.

The final three columns on the right of panel A show that the number of brokerage houses and equity analysts identified has increased year by year. The number of analysts identified has grown spectacularly, surpassing 400 by 2000. On average each listed company is followed by 2.66 analysts, less than the 4.74 on the US market (Barber, Lehavy, McNichols and Trueman, 2001). The number of brokerage houses that have issued at least one stock recommendation during the period under consideration is 54, while in the US this figure has reached 460 (Madureira, 2004).

Panel B shows the number of stock recommendations, the percentage of revisions per month, the cross-section distribution of the stock recommendations and the average consensus. The JCF database contains 88,814 stock recommendations from 1994 to 2003. This number has increased annually from 2,954 opinions in 1994 up to 12,271 in 1998. Beyond this year, the annual number has remained at about 10,000, except in 2002.

The next column shows that from 1996, the frequency with which stock recommendations are revised is around 20% to 30%, with an average of 24% over the 10 years. This means that only one in four stock recommendations is revised each month, so that

over the 180-day periods used to calculate the consensus level, the incorporation of updated information is assured.

The cross-section distribution of the stock recommendations shows a positive bias with the right tail much wider than normal, which is consistent with the fact that the equity analysts have incentives to issue more favourable rather than unfavourable recommendations. The most frequent category is that of buy/overweight, with 44,311 recommendations, almost half of all issued (49.8%). Hold recommendations account for 32.7%. The least numerous are in the sell/underweight category, with 15,465 recommendations, about 17% on average for the period. This distribution contrasts with the distribution of the US market, where buy recommendations are much more frequent (58.9%), while sell/underweight are practically nonexistent (4.8%) (Jegadeesh, Kim, Krische and Lee, 2004). With this distribution, investors would be always buying if they traded as advised by the recommendations of the equity analysts, unless they adjust downwards by discounting the incentives of the analysts.

The column furthest to the right shows that, due to the positive bias of the distribution of stock recommendations, the average rating is always above 3.5 points, close to the buy level, except as from 2002, when the consensus approximated an average recommendation of hold. This value is lower than the average of 4.07 for stocks on the S&P500 index for the US market, and than the 3.72 for European companies on the Eurostoxx index.

[TABLE 1]

The monthly returns on each stock recommended between January 1994 and December 2003 have been calculated as the logarithm of two consecutive monthly prices (adjusting for dividends, capital increases, splits and reverse splits). The Madrid Stock Exchange General Index (IGBM) has been used as a proxy for market return, and the average interest rate on 30-day repos on Spanish Government bonds, has been taken as a proxy for the return of the risk-free asset.

Accounting information from the Global Compustat database has also been used. In this database the book-to-market ratio is calculated by dividing the book value of the equity per share by the closing stock price. Market value has been obtained by multiplying the closing stock price by the number of shares. Both variables have been computed at the end of each month.

4 Trading Strategies based on analysts' recommendations

This section examines the value of the analysts' recommendations using the consensus level and its changes. Some authors believe that the existing bias in stock recommendations may make the consensus level irrelevant to investors or give a negative relation between the value and bias of the recommendations. If this were so, the lower bias in recommendations in Spain could provide the value that they lack in G7 countries (Jegadeesh and Kim, 2003).

4.1 Building Portfolios

The value of the stock recommendation consensus (changes) issued by equity analysts is analysed by classifying the recommended stocks into mutually exclusive portfolios. There are four main factors of the portfolio-building procedure: the number of portfolios, the criteria to be applied to stratify the assets, the period of time between two consecutive rebalances of the composition of the portfolios and the asset weighting system.

The number of portfolios is arbitrary although, in general, it is conditioned by the number of assets available on each market, by the scoring system used by the brokerage houses and by the objective of the study. In empirical literature on stock recommendations, this number varies from three to five (Jegadeesh, Kim, Krische and Lee, 2004; Barber, Lehavy, McNichols and Trueman, 2001), seeking a balance with the cut-off points of the recommendation scale used.

As regards the second point, two alternative portfolio-building procedures have been used in the literature. The first consists of classifying the stocks using the recommendation distribution percentiles as the cut-off point, building portfolios from the lowest rated to the highest rated stocks (quintiles in the case of Jegadeesh, Kim, Krische and Lee, 2004). Alternatively, portfolios have been built using different consensus level values as cut-off points (Barber, Lehavy, McNichols and Trueman, 2001, 2003). One of the aims of this procedure is to establish a correspondence between the average consensus level of the portfolios and the stock recommendations. However, the bias in the distribution of the stock recommendations, with the subsequent scarcity of sell recommendations, makes it necessary to raise the cut-off point so that, normally, the average level of the portfolio with the least favourable ratings is close to hold.

The third of the factors to be considered in the portfolio-building process refers to how often their composition is rebalanced. The choice of the holding period is very important

when implementing a trading strategy. A very short period considerably increases the transaction costs, making it economically unviable. A very long period, on the other hand, has the disadvantage that it is hard to capture the part of the returns that occurs around the date of issue of the recommendation (Boni and Womack, 2003). Unlike the monthly period normally used in most of the literature on investment strategies, in the former evidence on the value of analysts' recommendations, the readjustment periods used have gone from daily (Barber et al., 2001), up to quarterly (Jegadeesh et al, 2004), with an intermediate period of one month (Boni and Womack, 2003).

The analysts' recommendations do not imply a specific weighting. Accordingly, the portfolio of recommended assets can be equally-weighted or weighted on the basis of market value. In general, value-weighted portfolios are considered to have an economic significance lacking in equally-weighted portfolios, as they take the aggregate importance of the company into account. However, in a context where the aim is to study the aggregate ability of equity analysts to pick the best assets, equal weighting has the advantage of ensuring that the results are not dominated by recommendations for large companies, which makes it difficult to appreciate the contribution of small companies and to evaluate the true contribution of the equity analysts.

In our case, bearing in mind the limited number of stocks listed on the Spanish Stock Exchange and the recent tendency of analysist houses to reduce the number of step in their recommendation scales from five to three, we have built three recommendation portfolios and three recommendation changes portfolios. To do this, on the last day of each month, the stocks were classified from the highest to the lowest consensus level and assigned to one of three portfolios, with an adaptation to the scale used by Buchalet (2004) being taken as the cut-off point. Accordingly, the first portfolio contains stocks with an average rating, equivalent to buy-overweight, in the interval [3.9, 5]. The second, with an average consensus in the [2.9, 3.9] interval, is equal to a neutral (hold) rating, and the third portfolio contains stocks with the lowest average level, equivalent to sell/underweight, in the interval [1, 2.9]. Next, the equally-weighted returns on each portfolio were calculated in the month after their formation (t): $R_{pt} = N_{pt}^{-1} \sum_{i=1}^{N_{pt}} R_{ipt}$, where R_{pt} is the returns on maintaining the portfolio between t-1 and t, and N_{pt} is the number of assets in portfolio p. The assets remain in the portfolio for one month, after which time the composition is rebalanced. Successive rebalancing of the portfolio at the end of each month gives a time series of 120 monthly post-formation returns.

In the same way, three change of consensus level portfolios were formed at the end of each month. The first portfolio contains the stocks with an upgraded consensus level (+), the second, stocks which maintain their consensus level (0), and the third, stocks with a downgraded consensus level (-).

Panel A of table 2 shows a descriptive statistic of some characteristics of the stocks recommended for the three portfolios built on the basis of the consensus level. Panel B presents the same statistic for the three consensus change portfolios. The first part of panel A shows that the average consensus of the portfolios goes from a minimum of 2.22 in the portfolio with the lowest rated stocks (C3), up to 4.29 for the portfolio with the highest rated stocks (C1). Using this procedure, and due to the positive distribution bias, the average rating of 3.42 for the middle-ranked stocks portfolio (C2) exceeds the hold level. Likewise, the consensus for the least favoured stocks (C3) is above the underweight recommendation. The absence of recommendations with a lower consensus means that it is not possible to represent the sell ratings accurately. However, these three portfolios still represent the scale of the stock recommendations better than those built by Chen and Cheng (2002), which go from a range of hold to a range of buy-overweight, those formed by Jegadeesh et al (2004), in which the consensus level for the least favourable portfolio is 2.76, and those of Barber et al. (2001, 2003), with an average rating of 2.48 for the portfolio with the lowest ranked stocks.

The second part shows that there is a direct relationship between the recommendation level and the market value of the companies. Larger companies, with an average value of 4.10 billion euros, get the best ratings. Size decreases steadily as the rating worsens, so that in the least favoured stock portfolio (C3) market value is approximately three times lower than in the first portfolio (C1). In line with previous evidence, which has detected that small companies are covered by fewer analysts than large companies, the last row shows how the companies with the lowest rated stocks (C3) are followed on average by 9 analysts. This number reaches its maximum value of 15.06 in the second portfolio (C2), more than in the portfolio with the most highly recommended stocks (C1). However, no relationship is observed between the rating level and growth opportunities, proxied by book-to-market ratio.

[TABLE 2]

Panel B gives the same characteristics for the consensus change portfolios, ordered from most positive to most negative change. The first portfolio (CC1) contains the stocks with a positive consensus change, the second (CC2) contains those with no change in consensus,

and the third (CC3) contains stocks negative variations. There is certain symmetry, as in the first portfolio the consensus level increases by 0.20, and in the third it falls by 0.21. The greatest changes, both positive and negative, occur in the stocks of greater market value and lower book-to-market ratios (portfolios CC1 and CC3). Similarly, the corresponding column shows that the ratings for the smallest stocks, those which are least covered and have the higher book-to-market ratio, are basically reiterations (CC2).

In short, it seems that equity analysts tend to issue their best recommendations in favour of larger stocks, which are also followed by a greater number of analysts. It would also seem that they tend to raise or reduce the ratings for companies with greater market value and following.

4.2 Evaluation of the recommendation portfolios

The results of the recommendation portfolios are evaluated using a calendar-time methodology, taking the date of formation of the portfolios as the predetermined date. We are going to use different measures of results: average monthly post-formation returns and abnormal returns using alternative models.

4.2.1 Average returns of the recommendation portfolios

Table 3 gives a descriptive statistic of the returns on the three consensus level portfolios and consensus change portfolios. Each panel gives the average monthly return, the standard deviation, the minimum and maximum values and the Sharpe ratio for each of the portfolios. Market-adjusted returns have also been calculated in order to compare the results with those obtained in the previous evidence.

This simple statistic shows how the average monthly returns on the three consensus level portfolios are always positive and that the portfolios with the most highly recommended stocks, given by a higher average consensus, obtain higher monthly average returns. The portfolio equivalent to a buy recommendation (C1) generated average monthly returns of 1.75%, while the last portfolio, associated with sell recommendations (C3), had positive monthly returns of 0.56%, three times lower than the former one. The average returns on the portfolios are always significant at a level of 5% or lower, except the least favoured stocks portfolio (C3). This statistic also shows that the total risk, measured by the standard deviation

of return, increases slightly as the consensus level worsens. Therefore, the results of the portfolio with the highest rated stocks (C1) are also much better after adjusting for total risk, as their Sharpe ratio is 0.32, compared to 0.09 for the stocks with the lowest consensus (C3).

Measuring the excess return over the market portfolio, all the portfolios generated positive market-adjusted returns, except the lowest rated stocks portfolio (C3). However, only the buy recommendation portfolio (C1) is significantly different from zero. The difference between the market-adjusted return of the highest and the lowest rated stocks over a six-month period would be 7.54%, much higher than the 2.3% detected by Jegadeesh, Kim, Krische and Lee (2004).

[TABLE 3]

Panel B computes the average returns and the market-adjusted returns for the consensus change portfolios. The statistic shows that returns are positive in all cases, whether the recommendation is upgraded, maintained or downgraded, measured by the variation in the consensus rating. Moreover, average monthly returns are always significantly different to zero at a confidence level of 5% or below, except in the case of the downgraded consensus portfolio (CC3). The first (CC1), with positive changes, generated the second highest returns (1.2%), while the negative change (CC3) gave the lowest returns (0.81%). However, the relationship between consensus change and returns is not steady. Surprisingly, it is the neutral consensus change portfolio (CC2) which generated the highest average return: 1.5%. Measuring the results using the Sharpe ratio, the best portfolios are the first (CC1) and the second (CC2), the worst being the third (CC3), with the most pronounced change in consensus level. Similar results were obtained for market-adjusted returns.

Figure 1 shows the accumulated average returns on the consensus portfolios (panel A) and the consensus change portfolios (panel B). It can be seen that, from 1995, the accumulated returns on the buy portfolio was always positive and higher than for the hold and sell portfolios, in that order. It can also be seen how returns grew quickly up to 1998, remained stable until 2000 then again followed an upward trend. Panel B shows the dominance throughout the period of the maintained consensus portfolio.

Initially, this evidence suggests that investors can obtain positive returns using the consensus rating of analysts' recommendations, even when this includes recommendations issued months earlier. It is surprising that both the upgraded consensus portfolio, associated with the incorporation of favourable new information, and the downgraded consensus

portfolio, associated with new negative information, generate positive returns. It is also paradoxical that the greatest returns are generated by the unchanged consensus portfolio.

[FIGURE 1]

4.2.2 Risk-Adjusted returns in the context of the CAPM

The difference in the returns generated by the different recommendation portfolios could be due to the risk differences of the stocks themselves. To account for market risk differences in portfolios based on consensus levels and changes, we measured the returns of the portfolios in the context of the CAPM. Specifically, for each portfolio, the following equation is estimated:

$$R_{pt} - r_{ft} = \alpha_p + \beta_p \left(R_{Mt} - r_{ft} \right) + e_{pt} \qquad (1)$$

where R_{pt} is the returns on portfolio p (p = 1, 2, 3) in month t (t = 1, 2,.., 120), r_{ft} is the returns on risk-free assets in month t, R_{Mt} is the returns on the market portfolio proxy in t and e_{pt} is the error term. The parameter β_p is the measure of exposure to market risk of portfolio p and α_p is Jensen's alpha. This coefficient is interpreted as a measure of returns relative to the market proxy used which acts as a *benchmark*. In this context, we assume that the difference between the excess returns on the portfolio and that of the market factor give an estimation of the risk-adjusted returns.

Panel A of Table 4 shows the results obtained for the three recommendation level portfolios and panel B shows those for the consensus change portfolios. Both cases also show the results of a fourth portfolio representative of a self-financed investment strategy (C1-C3 and CC1-CC3), consisting of taking a long position in the highest rated stocks (change) portfolio and simultaneously taking a short position in the lowest rated stocks (change) portfolio. Left to right shows the slope, the intercept and the adjusted determination coefficient.

[TABLE 4]

Panel A shows that the three portfolios present a positive and statistically significant exposure to market risk. The values are lower than one and do not seem to follow a clear pattern, except that the correlation of the sell recommendation portfolio (C3) to the market is slightly higher than for the buy portfolio (C1). The exposure to market risk of the recommendation level portfolios is slightly lower than detected in other countries, where the beta coefficients are always close to one, although also without appreciable differences between portfolios (Barber, Lehavy, McNichols and Trueman, 2001).

The intercept is positive in the first two portfolios and negative in the one containing the least favoured stocks (C3). However, it is only statistically significant in the most highly recommended stocks portfolio. The risk-adjusted returns on the buy portfolio (C1) are slightly higher than 1%, which decreases gradually as the average consensus level drops. The returns on the sell portfolio (C3) are -0.22%, indistinguishable from zero from a statistical point of view (t = - 0.55). Moreover, the risk-adjusted returns for the trading strategy of taking the long position for the highest rated stocks and the short position for the lowest rated stocks (C1-C3) is positive, reaching 0.96% per month, significant at a level of 1% (t = 2.84).

As regards the portfolios built on the basis of consensus level changes, the beta coefficients are also lower than one. The values of this coefficient follow a certain system, as the first and third portfolios, with positive and negative variations in the consensus, take higher values. The lower beta corresponds to the neutral variation portfolio (CC2). The alpha coefficient is positive in all three portfolios, but only statistically significant at a level of 10% or lower in the first two. The differential strategy, consisting of acquiring the stocks with the highest upgrade and simultaneously selling the stocks with the largest downgrade (CC1-CC3), gives positive average risk-adjusted monthly returns of 0.49%, marginally significant at a level of 10% (t = 1.64).

Consequently, investors may obtain positive returns by following trading strategies based on the average level of analysts' recommendations and their variations, while these returns cannot be attributed to the different exposure of the portfolios built on the basis of analysts' recommendations and their changes to market risk.

4.2.3 Abnormal returns in a multi-factor context

This section analyses the returns on the recommendation level (change) portfolios in the context of the Fama and French (1993) and Carhart (1997) multifactor models, as a means of

reducing possible bias which could be attributed to the presence of investment styles characteristic of the recommendation portfolios (e.g., size, value vs. growth, etc.), to which part of the returns on the recommended portfolios could be attributed. The need for a multifactor model derives also from empirical evidence, which has shown that there is a predictable component in the returns on the stocks. Specifically, size and BTM ratio seem to explain part of the cross-section variability of the stock returns (Fama and French, 1993). These results question the suitability of the CAPM model to explain the returns of the assets in cross-section. Accordingly, certain extensions have been proposed to control the most important anomalies. In this line, Fama and French (1993) propose a three-factor model in which they add two size and book-to-market proxies: the SMB factor and the HML factor to the market factor used in the CAPM model. Formally, supposing that the size and BTM ratio factors are important determinants of the stocks returns, the model would be expressed by the following formula:

$$R_{pt} - r_{ft} = \alpha_p + \beta_p \left(R_{Mt} - r_{ft} \right) + s_p SMB_t + h_p HML_t + e_{pt} \qquad (2)$$

where R_{pt}, r_{ft} and R_{Mt} are defined as in (1), the SMB_t factor is the difference in month t between the average returns on the three portfolios containing the smallest cap stocks and the three portfolios containing the highest cap stocks, and the HML_t factor is the difference between the average returns on the two stock portfolios with a high BTM ratio and the average performance of the stock portfolios with a low BTM ratio.

The model (2) may reduce the evaluation errors in the CAPM model. However, it does not explain the cross-section variation of the returns that may be attributed to the medium-term trend of the prices, as documented by Jegadeesh and Titman (1993). Carhart (1997) extends the Fama and French three-factor model (2), introducing price momentum as a fourth factor. The resulting model is consistent with a four-factor market equilibrium model, which may be interpreted as a returns attribution model, where the coefficients, and the premium of the portfolios that replicate the factors, indicate the returns that may be attributed to the four elemental strategies. Formally,

$$R_{pt} - r_{ft} = \alpha_p + \beta_p \left(R_{Mt} - r_{ft} \right) + s_p SMB_t + h_p HML_t + w_p WML_t + e_{pt} \qquad (3)$$

where all the variables are defined as in (2) and WML is the price momentum at one year, calculated as the difference in month t between the returns on the portfolio of winners and losers. The portfolio of winners (losers) is the equally weighted portfolio which contains 30% of the stocks with the highest (lowest) returns in the previous period beginning in month t-12 and ending in t-2[3].

In models (2) and (3) the β_p, s_p, h_p and w_p coefficients admit a double interpretation: first, they are measures of the exposure of portfolio p to the respective risk factors (sensitivity) and, secondly, as mentioned already, the coefficients and premia of the portfolios that replicate the factors indicate the proportion of the average return attributable to each of the four possible elementary strategies: market, size, book-to-market ratio and price momentum, thus informing of the characteristics of the stocks recommended by the analysts and of the composition of the portfolio. In this second interpretation, the coefficients make it possible to verify the possible existence of trends in analysts' recommendations; i.e., the implicit existence of investment styles. If the coefficient associated with the SMB factor is positive, the return on the portfolio will depend more on the performance of small rather than large stocks. A positive coefficient in the HML coefficient will indicate a greater sensitivity to high book-to-market value stocks, instead of a trend towards stocks with a low book-to-market ratio (growth stocks). Controlling the four above factors, it is possible to verify whether the analysts merely issue specific recommendations for categories of stocks, or, on the contrary, they are skilled at picking stocks.

Models (2) and (3) above are estimated in a time series for each of the portfolios, first with the independent (R_M-R_f), SMB and HML variables, and then adding the WML momentum factor. With the three-factor model, an estimation of $\alpha_{p,3FF}$ is obtained which measures the excess performance of portfolio p, and which has the advantage of measuring the average monthly return adjusted for market covariance and the two additional risk factors. The four-factor model gives an estimation of the Jensen alpha $\alpha_{p,4FF}$, which also adjusts for covariance with the price momentum factor. The α_p coefficient is interpreted as the return due on the stock recommendations, as in models (2) and (3); the factors that determine the return on the stocks are understood to be adjusted.

[3] See Fama and French (1993) for details regarding the construction of the SMB and HML factors, and Jegadeesh and Titman (1993) for the construction of the momentum factor.

Table 5 shows the estimated coefficients. The intercept for the three and four-factor models is on the right, while the coefficients associated with the regressors of the four-factor model (3), with adjusted determination coefficient, are on the left.

[TABLE 5]

First of all we can see that the adjusted determination coefficient increases in relation to the CAPM, to give the additional explicative facility of the factor model. The beta market coefficients are all positive and lower than one, with no appreciable differences in magnitude between the portfolios. Once again, we can see that the highest rated stocks portfolio (C1) is also the portfolio with the lowest systematic risk. Also, most of the coefficients associated with the additional market factors (six out of nine) are significantly different to zero. The coefficient of the SMB size factor is positive and statistically significant in the three recommendation portfolios. This coefficient has its highest value (0.54) in the lowest rated stock portfolio (C3), suggesting that analysts have a strong tendency to issue sell recommendations for relatively small stocks. The magnitude of the coefficient for the most highly recommended stocks portfolio (C1) signals a trend towards large companies, rather than smaller ones, relative to the sell portfolio (C3).

Likewise, the coefficient sign associated with the HML factor takes positive values in the three consensus portfolios, although these, unlike the previous ones, are statistically significant only in the first two, but not in the sell recommendation portfolio (C3). The magnitude of the coefficient decreases steadily from the highest to the lowest rated stocks, signalling that the buy and hold portfolios (C1 and C2, respectively) are oriented more towards a value strategy (stocks with high book-to-market values), while the sell portfolio (C3) leans more towards a growth strategy (stock with low book-to-market values).

As regards the price momentum factor, the coefficient is positive for the buy portfolio (C1), but negative for the other two. Its magnitude, however, is only large enough from a statistical point of view in the sell portfolio (C3), where the coefficient has the value -0.19 ($t = 1.91$). Clearly, analysts tend to recommend selling stocks whose price has fallen over the past year. This result is partially consistent with the findings of Loh and Mian (2004), Jegadeesh et al. (2004), and Madureira (2004) on the US market, where optimistic recommendations are preceded by positive returns, and pessimistic recommendations by significant negative economic performances.

Consequently, the recommendations exhibit different investment styles. The most highly recommended stocks portfolio (C1) is formed basically of stocks which have a relatively low beta value, are bigger and exposed more to value than to growth, while the sell portfolio (C3) contains smaller stocks with negative price momentum. These results differ from the findings of Barber, Lehavy, McNichols and Trueman (2001) for the US market. These authors found that the highest rated stocks portfolio consisted of smaller, growth stocks with a high beta value. There is a greater similarity in the lowest rated stock portfolio, containing value stocks with negative price momentum and a low beta value.

The value of the estimated abnormal returns in model (2) is positive in the first two portfolios and negative in the third, after controlling for market, size and book-to-market factors. Abnormal returns increase as the consensus recommendation improves. This value is significant only in the first portfolio, and insignificant in the other two. The risk-adjusted return on the buy portfolio (C1) is 0.81% per month (t = 3.15), falling to 0.25%, in the second portfolio. The results are qualitatively similar in model (3), after controlling the price momentum factor, except that the magnitude of the abnormal returns for the buy portfolio (C1) is lower, due partly to the positive price momentum, and greater in portfolios (C2) and (C3), due to the negative momentum. In consonance with the findings of Lee and Swaminathan (2000), the higher returns for buy recommendations may be due to investors choosing value stocks rather than *glamour* stocks.

The findings for the differential portfolio (C1-C3) show that its exposure to market risk and the SMB and HML factors is minimal. However, it is significantly exposed to price momentum, tending to lean towards stocks whose prices have evolved favourably over the past 12 months. The difference in average monthly return of the two portfolios, risk-adjusted using the four-factor model, is positive: 0.97% (t = 2.87). Before controlling for recent price trends, it is 1.23% in the three-factor model (t = 3.62). Therefore, stocks with a buy consensus give an average abnormal return significantly higher than stocks with a sell recommendation. These results contradict those of Boni and Womack (2003), who found that the same differential portfolio did not generate significant abnormal returns on the US market using the four-factor model between 1996 and 2002.

Comparing with the results offered in table 4 above, we can see that the abnormal returns obtained using the Fama and French (1993) model are always lower than the results calculated using CAPM, which shows that this model is insufficient to evaluate abnormal returns, due to the important role played by other variables in determining expected returns.

Panel B shows the coefficients for models (2) and (3) for the consensus change portfolios. Sensitivities to all factors, except momentum, are positive. However, the only visible pattern is that the unchanged portfolio (CC2) has the least systematic risk and the highest coefficients associated with the size factor and the book-to-market ratio. It also gives the highest risk-adjusted return: 0.73% (t = 2.91) in model (2) and 0.74% (t=2.65) in model (3). This is followed by the upgrade portfolio, with a statistically insignificant return of 0.43% (t = 1.63). A strategy of long position in the upgrade portfolio and short position in the downgrade portfolio (CC1-CC3) would give average abnormal returns of 0.49%, statistically indistinguishable from zero, with no apparent tendency towards any particular class of stocks. Similar results are obtained with the three-factor model (2), the intercept for which is given in the antepenultimate data column.

Figure 2 summarises these results in graphic form. The abnormal returns for each month are measured as the sum of the estimated alpha coefficient and the residual for model (4), so that each point on the figure represents the returns for the corresponding month added to the accumulated total of the returns for all the previous months. Panel A shows how, after adjusting for risk, the returns for the buy portfolio are positive and growing over time, while the abnormal returns for the hold (C2) and sell (C3) portfolios remain practically stable, and even negative for the latter in the second half of the sample period. Panel B shows the dominance of the unchanged consensus portfolio (CC2). The accumulated positive (negative) return of the positive (negative) change consensus portfolios is also worth noting.

[FIGURE 2]

Accordingly, analysts' recommendations are of value and following them on the Spanish market can give significant positive returns. However, part of their value is rooted in analysts' tendency to recommend stocks with characteristics that predict future returns, such as size, book-to-market ratio or price momentum. As the intercepts of the three and four-factor models show, only part of the returns on the recommended stocks comes from the analysts' ability to gather, analyse and process specific information on the companies. Specifically, Spanish market analysts recommend buying big value stocks, rather than growth stocks, as US analysts have done, and which has caused the bad performance of their recommendations, especially after the drop in 2000 (Barber, Lehavy, McNichols and Trueman, 2003). Likewise, they recommend selling small, growth-oriented losing stocks, unlike the US, where unfavourable recommendations are issued for small value stocks

(Barber, Lehavy, McNichols and Trueman, 2003). On the other hand, there are reasonable doubts that abnormal returns can be obtained by exploiting the monthly variations in the consensus level.

4.3 Consensus ratings and information level

The value of analysts' recommendations could be greater if less information were available about a certain company. Empirical literature uses firm size, measured by its market value, as a proxy for the level of information existing about a company. The prediction is that the smaller the size, the less information is publicly available and, therefore, the greater the value of the experts' recommendations. To study this question, the stocks were classified each month in accordance with their consensus level in three categories and, simultaneously, the stocks in each consensus (change) portfolio were ordered independently into two portfolios, taking their median market value as the cut-off point. The first portfolio contained the smallest stocks from each recommendation portfolio, while the second contained those with the greatest market value. This method gave six portfolios with which to calculate the monthly post-formation return over the sample period.

[TABLE 6]

The rows in Table 6 show the average monthly return and intercepts corresponding to the CAPM model (1), the Fama-French three-factor model (2), and the Carhart extended four-factor model (3), for the three consensus portfolios and the three consensus change portfolios. Three columns are given for each model: one for big companies, one for small companies and another showing the average or abnormal return of the trading strategy of holding a long position in large companies and a short position in small ones (L-S) for each consensus (variation) portfolio. The last row of each panel shows the coefficients corresponding to the strategy of buying the highest rated stocks (variations) and selling the lowest rated stocks of every size.

Panel A shows first that average monthly returns are positive in the portfolios for all consensus levels, both for large and small companies. In both cases, the highest rated stocks portfolios give the best returns, and the magnitude of the performance decreases steadily from

the most highly recommended stocks portfolio (C1) to the least favoured stocks portfolio (C3) in both cases. At every recommendation level, the smaller businesses get the highest yields. However, the differences between small and large businesses in each recommendation level (L-S column) are always insignificant. The strategy of buying the highest rated stocks and selling the lowest rated generates average returns of 1.15%, significant at a level of 5% (t = 2.44) for big companies, and better than the significant 0.99% generated by the same strategy for small companies (t =2.20).

Similar results, although with smaller magnitudes are reached for abnormal returns, adjusted for risk using models (1), (2) and (3). Concentrating on the results of this final model, we can see positive abnormal returns in the first two consensus portfolios of large and small firms, but only significant in the first (C1). This indicates that the performance of the recommendations in the neutral and sell portfolios (C2 and C3, respectively) for large and small stocks is insufficient to compensate for their risk. The column representing the long position for large firms and short position for small companies (L-S) shows that returns from large companies are bigger than from small companies for the buy recommendations (C1), but smaller in the rest. Finally, the strategy of using the lowest rated stock portfolio to finance the highest rated stock portfolio (C1L-C3L) gives significant abnormal returns of 0.88% (t =2.15) in model (3) for large companies. A similar strategy applied to companies with a lower market value (C1S-C3S) gives a lower, marginally significant return of 0.79% (t = 1.82).

Panel B shows the results of the analysis with the sample segmented for the change of consensus portfolios. As the patterns followed are the same in the four cases, we refer only to the results of the four-factor model. Average returns are positive for the three portfolios with large stocks, although only those corresponding to positive and neutral changes are significant. In portfolios of low cap stock, however, they are only positive in the neutral consensus change portfolio. The returns for large companies are always higher than those for small companies in the upgrade and downgrade portfolios (CC1 and CC3, respectively). Likewise, they are always lower in the neutral change portfolio (CC2). However, these differences between large and small stocks in each consensus change portfolio are not worthy of note. The strategy of holding a long position in the upgrade portfolio, while simultaneously selling the downgrades portfolio (CC1-CC3), gives significant positive returns for small companies, but not for large companies.

In short, the recommended portfolios of small companies do not perform notably differently to the same level portfolios for the large companies. Accordingly, on the Spanish market, it would not seem that the value of the investment recommendations is related to the

level of information available, proxied by market value. However, the returns generated by the trading strategy consisting of buying the highest rated stocks and selling the lowest rated stocks gives significantly positive returns both for large companies and small companies. These results are again contrary to the findings of Barber, Lehavy, McNichols and Trueman (2001) for the US market, in which profitable strategies were detected for each size category, and higher yields always in the case of smaller stocks. On the Spanish market, however, when the recommendation is similar, it is practically indifferent whether one invests in companies with a higher or lower market value.

5. Robustness of the results

This section will examine whether the results obtained above depend on the criteria used to build the portfolios or on the variable used to proxy the level of information available on the recommended companies.

5.1 Sensitivity to the portfolio formation criteria

We will first verify the robustness of the results, building the three stock portfolios using two criteria other than those based on the cut-off points used by Buchalet (2004). First of all, the first portfolio is assigned the top 30% of the stocks, the second is given the next 40% and the third is given the 30% with the lowest average consensus. Secondly, we will use a three-portfolio adaptation of the cut-off points used by Barber et al. (2001, 2003), assigning the first portfolio stocks with a consensus in the interval [4, 5]; the second, stocks with consensus values in the [3.5, 4] interval; while the third, with the lowest score, gets the stocks with consensus in the [1, 3.5] range. The results of these three recommendation portfolios is analysed using the average return and the three risk-adjustment stock evaluation models: CAPM, the Fama and French three-factor model (1993), and the Carhart four-factor model (1997). Table 7 shows the results. The columns on the left show the results for the percentile portfolios; on the right, the consensus level portfolios following Barber et al. (2001).

First of all, we can see that both procedures have a similar effect, raising the average consensus level of each portfolio above the level obtained with the adapted Buchalet cut-off points (2004), except for the buy portfolio (C1) when the portfolios are formed by percentiles. The least favourable the recommendation, the greater the increase, and the effect is more

pronounced using the Barber et al (2001) procedure. In the buy portfolio, the average level rises slightly, from 4.29 with the Buchalet (2004) procedure, to 4.33 with the Barber et al (2001) procedure. The average rating of the second portfolio increases by 0.29 points, from 3.42 using the former procedure, to 3.71 with the Barber et al. (2001) procedure. Likewise, the average consensus of the third portfolio goes from 2.22 to 2.75, an increase of 0.53.

The result is that the correspondence between average consensus level and recommendation is less appropriate when the portfolios are formed with percentiles and with the Barber et al (2001) procedure. Thus, for example, with the Buchalet criterion used in the above sections, the average level of the lowest rated stock portfolio is 2.22, which may be considered very close to a recommendation to underweight. However, using the three percentiles mentioned, the average level rises to 2.48, and goes to 2.75 using the Barber et al. (2001) cut-off points, closer to a hold recommendation. This also happens with the second portfolio (C2), which, applying the two latter procedures, comes close to an implicit buy recommendation instead of a hold recommendation. However, the implicit recommendation for the first portfolio is to buy, with all three procedures. Moreover, it can be seen that returns increase steadily with the average consensus level.

In spite of the difference in magnitude, the results obtained by building portfolios by percentiles and using the Barber et al. (2001) criterion are qualitatively similar. Accordingly, we will only comment on the latter ones. We can see how all the consensus portfolios give positive returns before adjusting for risk, although these are only statistically significant in the first and second portfolios (C1 and C2, respectively) The returns decrease steadily from the most highly recommended stock portfolio to the least favoured stocks portfolio. After adjusting for market risk, only the returns of the first portfolio (C1) continue to be statistically significant. The sensitivity of the four-factor model indicates that the highest rated stocks tend to be the largest stocks, with a higher book-to-market ratio. The lowest rated stocks are characterised by having negative price momentum and a relatively low book-to-market ratio. After controlling for risk factors ($t = 3.03$), the self-financed strategy of buying the highest and selling the lowest rated stocks (C1-C3) generates important positive returns of 0.68%. It should be pointed out that the returns for this strategy are lower than when the portfolios are built using the Buchalet (2004) procedure.

[TABLE 7]

Accordingly, the results obtained above for the three portfolios built using the Buchalet (2004) cut-off points are maintained when the procedure followed to build the portfolios is changed. Analysts' recommendations are of value, and investors may obtain positive returns by buying the highest rated or upgrade stocks and selling the lowest rated or downgrade stocks. However, the implicit recommendations for portfolios built using the Buchalet (2004) recommendation is closer to the scale of recommendations than the portfolios formed using the Barber et al (2001) procedure, especially for the least favoured stocks portfolios.

5.2 Information available: analyst coverage

In the preceding section we used market value as a proxy for the level of information available about a certain company, with the idea that the larger the company, the more information will be available, and the more media will make it public. Empirical literature also uses analyst coverage, measured by the number of professionals who issue recommendations about a company as a proxy for the amount of information available (Hong and Stein, 1999). These variables are normally positively related (Brennan and Hughes, 1991). However, the predictions made with the two variables vary.

Analysts create specific information regarding listed companies, which is added to the information produced by the companies themselves. Empirical evidence supports the fact that analysts produce information for all market participants, increasing the offer of public information, rather than providing private information (Easley, O'Hara and Paperman, 1998). Alternatively, the number of analysts allows an interpretation in terms of future perspectives (Doukas, Kim and Pantzalis, 2002).

The interpretation of the amount of public information is based on the function of external supervision discharged by analysts. The greater the coverage of the analysts, the greater the scrutiny to which the company is subjected, and the greater the offer of information. The more analysts that follow a company, the more opinions will be available, the more investors feel they know about the company, and the more they will be willing to invest in it. The consequence is that investors have more information and prices are closer to their intrinsic value. In other words, it is less probable that companies with buy recommendations will be undervalued and stocks with sell recommendations will be overvalued. Accordingly, it is more probable that prices will reflect fundamental values when

financial analysts are involved, and the value of any one recommendation will be lower the more analysts there are following a company.

[TABLE 8]

The point of view of future perspectives implies that the economic incentive for obtaining investment banking revenue means that analysts will tend to follow companies with the best future perspectives, as they will carry out more investment and financing operations, which will create business opportunities for the brokerage houses. From this perspective, a greater number of buy (sell) recommendations implies greater agreement regarding the best (worst) future perspectives of a company. Accordingly, the more analysts that follow a company, the higher the value of a given recommendation.

The analyst coverage variable has been measured as the number of analysts who have issued a recommendation in the previous 180 days. Table 8 shows the average returns and intercept for the CAPM, Fama-French three factor and four factor models for portfolios built with the double criteria consensus (changes) and number of analysts. Each consensus or change portfolio is divided into a further two portfolios: low coverage and high coverage, using the median of the number of analysts issuing recommendations.

Panel A shows how, independently of the level of coverage, returns are always higher the better the recommendation, and that the returns for the buy portfolio are significant in all models. However, the average returns for the hold portfolio (C2) are only significant in the first coverage level. Comparing the results of the analyst coverage level portfolios for all recommendation levels, the average returns for the stocks with the highest coverage are lower than the stocks with lowest coverage, although the average returns between both types of stocks in the two recommendation portfolios are not significant. The situation is similar for the three- and four-factor models.

The trading strategy of holding the long position for the highest rated stocks and the short position for the lowest rated stocks (C1-C3) always gives significant abnormal returns in the high coverage portfolios, even after adjusting for the four risk factors. In the least covered portfolios, returns are positive but insignificant in the four-factor model. Specifically, the abnormal returns in the four-factor model are 0.91% when coverage is high and 0.80% when coverage is low, the first value being statistically significant at a level of 1% or below.

The results shown in panel B for the consensus change and coverage portfolios are basically similar to the results given by the consensus change and size portfolios. When

coverage is high, returns are positive and significant in the positive and neutral change portfolios before adjusting for size, BTM and price momentum. Returns after adjusting for market risk are positive (negative) and insignificant in the upgrade (downgrade) portfolios. Likewise, the zero net investment strategy only generates significant returns in the case of high coverage before adjusting for risk. In the low coverage portfolios, however, the returns are always significant when changes are neutral (reiterations) (CC2). In general, when recommendations are equal, returns are greater for low coverage portfolios than for high coverage portfolios, although the difference is never statistically significant. This could mean that investors do not give particular value to the fact that a given recommendation is backed by more analysts.

The findings of this section mirror those obtained using market value as a proxy for the level of information available on the company, as the value of the recommendations (changes) does not seem to be related to the number of analysts researching the company. In other words, when recommendations (changes) are equal, investors do not show a preference for stocks undergoing greater scrutiny by analysts. Neither do our findings support the interpretation based on the future perspectives of the companies, as the high coverage portfolios do not obtain notably better returns than the low coverage portfolios. This is consistent with the idea that analyst coverage does not inform of the possible differences between price and intrinsic value.

6. Conclusions

Analysts are professionals who analyze listed companies and advise investors with their stock recommendations. Their involvement in activities other than stock analysis, such as brokerage and investment banking, has harmed the objectivity of their research. This has led to an optimistic bias due to the lack of sell recommendations and in the value far higher than one in the ratio of buy recommendations to sell recommendations (3.52). In this situation, it would seem *a priori* questionable whether analysts' recommendations could be of any use to investors in making informed investment decisions.

This paper is based on analyst recommendations contained in the JCF Quant database over the period 1994-2003, in order to study whether analysts, as a group, detect over and undervalued stocks, anticipate stock movements and identify investment opportunities for their clients on the Spanish market. Our results show that, on average, buy rated stocks

generate higher returns than sell rated stocks. This difference is positive even after controlling for certain characteristics of companies with proven capacity to explain the cross-section distribution of stock returns.

We have also seen that analysts have a certain ability to select the best securities, even though they issue specific recommendations for certain categories of stocks. Accordingly, part of the difference in returns for buy and sell rated stocks derives from their professional ability, while another part stems from their tendency to advise selling stocks that have performed badly over the last twelve months, and to acquire more value-oriented (high book-to-market ratio) than growth-oriented (low book-to-market ratio) stocks. We have also seen that the average returns on upgraded stocks is higher than for downgraded stocks, although these differences disappear when controlled for risk.

Moreover, our results suggest that there is no relationship between the amount of information available, expressed by market value, and the returns on the recommendations. Finally, our findings are robust to the criteria used to build the recommendation portfolios and the variable used to express the level of specific information existing on the companies.

In short, although the results show that while investment analysts on the Spanish market tend to recommend certain categories of stocks, as a professional group they have proven their ability to select stocks and advise investors.

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Table 1. Descriptive Statistic of Analysts' Recommendations in the JCF Database 1994-2003.

In Panel A, the number of listed companies refers to companies quoted on the Spanish Stock Exchange. The number (percentage) of companies covered is the number (percentage) of companies for which the analysts issue recommendations. "Market Value" is the percentage of total market value of the companies studied. "Brokerage Houses" is the number of firms issuing recommendations on the companies covered. "Identified Analysts" is the number of known analysts issuing recommendations on the companies covered. "Analysts per Company" is the average number of identified analysts issuing recommendations. Panel B shows the total number of recommendations issued each year, the percentage revised each month, the number and percentage as regards the total represented by sell-underweight, hold, and buy-overweight ratings, respectively, and the consensus level. The average rating has been calculated by rating the recommendations on the following scale: sell = 1, underweight = 2, hold = 3, overweight = 4 and buy =5.

Year	# Listed Companies (1)	# Companies Covered (2)	% Companies Covered (3)	% Market Value (4)	# Brokerage Houses (5)	# Identified Analysts (6)	# Analysts per Company (7)
			Panel A: Companies and Equity Analysts				
1994	116	43	36.72	88.43	28	23	0.54
1995	123	59	48.33	92.33	32	79	1.34
1996	124	72	57.99	95.48	36	147	2.04
1997	131	102	78.11	98.51	42	190	1.86
1998	140	113	81.18	98.93	45	188	1.66
1999	143	119	83.45	98.68	67	284	2.39
2000	142	118	83.33	98.01	68	361	3.06
2001	143	115	80.03	97.76	78	449	3.90
2002	141	100	71.47	94.48	72	546	5.46
2003	136	104	76.49	97.89	70	454	4.37
Media	134	94	69.71	96.87	54	272	2.66

Panel B: Stock Recommendations

			Recommendations per Category						
			Sell/ Underweight		Hold		Buy/ Overweight		
	# Recommendations (1)	% Changes (2)	# (3)	% (4)	# (5)	% (6)	# (7)	% (8)	Average Rating (9)
1994	2,954	16.75	366	12.39	1,042	35.27	1,546	52.34	3.78
1995	5,066	19.87	827	16.32	1,823	35.98	2,416	47.69	3.66
1996	8,273	26.32	1,579	19.09	3,415	41.28	3,279	39.63	3.41
1997	9,654	21.81	1,697	17.58	3,821	39.58	4,136	42.84	3.51
1998	12,271	22.69	2,345	19.11	4,284	34.91	5,642	45.98	3.54
1999	10,515	30.62	1,511	14.37	3,128	29.75	5,876	55.88	3.76
2000	10,991	26.38	1,365	12.42	2,908	26.46	6,718	61.12	3.77
2001	10,632	24.40	1,583	14.89	3,059	28.77	5,990	56.34	3.58
2002	8,383	25.61	1,681	20.05	2,541	30.31	4,161	49.64	3.42
2003	10,075	25.93	2,511	24.92	3,017	29.95	4,547	45.13	3.31
Total o Average	88,814	24.04	15,465	17.41	29,038	32.7	44,311	49.89	3.57

Table 2. Characteristics of the Consensus Level and Consensus Change Portfolios

This table shows the characteristics of the three portfolios formed on the basis of consensus level and consensus change. Consensus is the simple arithmetic average of the last recommendation issued by each analyst following the company over a period of 180 days prior to the end of each month. Size is the market value expressed in thousand million dollars. BTM is the book-to-market average of the portfolio stocks. The number of analysts is the average of the recommendations issued for each stock. The standard deviation was calculated using the monthly returns on the rated portfolios from 1994-2003.

Characteristic	Portfolio (1)	Average (2)	Standard Deviation (3)	Min. (4)	1st Quartile (5)	Median (6)	3rd Quartile (7)	Max. (8)
			Panel A: Consensus Portfolios					
Consensus	C1	4.29	0.08	4.10	4.23	4.28	4.34	4.65
	C2	3.42	0.05	3.26	3.38	3.42	3.46	3.53
	C3	2.22	0.16	1.68	2.12	2.22	2.33	2.54
	All	3.31	0.06	3.16	3.27	3.31	3.35	3.43
Size	C1	4.10	1.50	0.70	3.18	4.01	5.20	7.07
	C2	2.75	1.23	0.75	1.86	2.46	3.30	6.55
	C3	1.30	0.73	0.20	0.83	1.20	1.50	4.04
	All	2.72	0.42	1.97	2.46	2.70	2.94	4.94
BTM	C1	0.67	0.14	0.41	0.60	0.65	0.77	1.43
	C2	0.68	0.12	0.40	0.60	0.69	0.76	1.03
	C3	0.70	0.20	0.13	0.55	0.74	0.85	1.16
	All	0.68	0.12	0.40	0.61	0.72	0.76	0.93
#. Analysts	C1	13.45	2.61	3.05	12.12	13.63	14.82	20.38
	C2	15.06	2.75	3.40	13.65	15.16	16.64	19.58
	C3	9.56	2.40	3.00	8.27	9.57	11.47	13.68
	All	12.69	2.02	3.15	11.65	12.70	13.88	17.76
			Panel B: Consensus Change Portfolios					
Consensus	CC1	0.20	0.07	0.07	0.15	0.19	0.24	0.42
	CC2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CC3	-0.21	0.06	-0.46	-0.25	-0.20	-0.17	-0.10
	All	0.00	0.02	-0.04	-0.02	0.00	0.01	0.05
Size	CC1	3.73	1.54	1.48	2.66	3.55	4.66	10.74
	CC2	1.01	0.76	0.11	0.51	0.74	1.26	5.33
	CC3	3.92	1.33	1.35	3.01	3.69	4.76	7.80
	All	2.89	0.55	1.91	2.53	2.85	3.17	4.58
BTM	CC1	0.63	0.12	0.38	0.55	0.63	0.70	0.96
	CC2	0.74	0.17	0.29	0.62	0.77	0.85	1.08
	CC3	0.65	0.13	0.35	0.57	0.65	0.75	1.05
	All	0.68	0.11	0.40	0.62	0.70	0.75	0.88
# Analysts	CC1	16.58	2.69	5.80	15.33	16.54	18.05	23.39
	CC2	7.40	2.46	1.00	5.65	7.29	9.10	12.42
	CC3	16.60	2.58	5.30	15.05	16.85	18.30	22.44
	All	13.53	1.89	4.99	12.75	13.60	14.55	17.40

Table 3. Descriptive Statistic of the Returns on Portfolios based on Recommendations
This table shows the returns and excess over market returns for portfolios formed on the basis of the consensus level (Panel A) and consensus changes (Panel B). The columns show the average monthly returns on each portfolio expressed as a percentage, the statistic for the null hypothesis that the average returns for the portfolio are equal to zero, the standard deviation in returns, the minimum and maximum returns for each portfolio and the corresponding Sharpe ratio. * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Portfolio	Returns (1)	t Stat. (2)	St. Dev. (3)	Min. (4)	Max. (5)	Sharpe R. (6)
		Panel A: Consensus Portfolios				
Returns						
C1(most favourable)	1.75	(3.54)***	5.39	-12.97	18.62	0.32
C2	1.25	(2.44)**	5.62	-13.44	15.46	0.22
C3(least favourable)	0.56	(0.98)	6.26	-12.04	21.84	0.09
Market-adjusted Returns						
C1(most favourable)	0.82	(2.66)***	3.56	-8.50	22.10	
C2	0.33	(1.19)	2.63	-9.73	9.64	
C3(least favourable)	-0.35	(-0.83)	4.29	-12.92	13.01	
		Panel B: Consensus Change Portfolios				
Returns						
CC1(upgrade)	1.20	(1.99)**	5.44	-11.77	15.33	0.19
CC2	1.50	(2.68)***	5.64	-14.23	22.63	0.07
CC3(downgrade)	0.81	1.48	5.77	-13.17	20.46	-0.01
Market-Adjusted Returns						
CC1(upgrade)	0.38	(1.45)	2.83	-7.41	9.38	
CC2	0.68	(1.74)*	4.27	-9.99	26.17	
CC3(downgrade)	-0.01	(-0.03)	2.82	-11.82	9.67	

Table 4. Abnormal Returns on Recommendation Portfolios in the context of CAPM.
This table shows the results of the estimation of equation (1) by ordinary least squares, for January 1994 – December 2003. The alpha coefficients are given as a percentage. The t statistics in brackets are consistent with the presence of heteroscesdasticity. * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Portfolio	βI (t statistic) (1)	α_i (%) (t statistic) (2)	R^2 adj. (3)
	Panel A: Consensus Portfolios		
C1(most favourable)	0.7212	0.98	0.66
	(11.60)***	(3.29)***	
C2	0.8314	0.44	0.81
	(18.58)***	(1.65)	
C3 (least favourable)	0.7815	-0.22	0.58
	(9.83)***	(-0.55)	
C1-C3 (difference)	-0.0065	0.96	0.17
	(-0.11)	(2.84)***	
	Panel B: Consensus Change Portfolios		
CC1(upgrade,+)	0.8031	0.46	0.78
	(15.32)***	(1.73)*	
CC2	0.6863	0.81	0.54
	(8.10)***	(2.24)**	
CC3 (downgrade,-)	0.8545	0.05	0.79
	(20.73)***	(0.18)	
CC1-CC3 (difference)	-0.0564	0.49*	0.00
	(-1.33)	(1.64)	

Table 5. Abnormal Returns on the Recommendation Portfolios in a Multi-Factor Context
This table shows the results of equations (2) and (3) by ordinary least squares from January 1994 – December 2003. The alpha coefficients are given as a percentage. The t statistics in brackets are consistent with the presence of heteroscedasticity. * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Portfolio	Coefficients 4-Factor Models				α_{3FF}	α_{4FF}	R^2
	MKT (t est) (1)	SMB (t est) (2)	HML (t est) (3)	WML (t est) (4)	(t est) (5)	(t est) (6)	adjust. (7)
Panel A: Consensus Portfolios							
C1(most favourable)	0.7515	0.3276	0.3293	0.0732	0.81	0.74	0.71
	(17.13)***	(3.60)***	(3.41)***	(0.98)	(3.15)***	(2.66)***	
C2	0.8405	0.2564	0.2848	-0.0168	0.25	0.27	0.86
	(27.61)***	(4.75)***	(3.37)***	(-0.35)	(1.03)	(1.07)	
C3(least favourable)	0.7569	0.5483	0.2375	-0.1970	-0.41	-0.22	0.72
	(10.48)***	(2.85)***	(1.33)	(-1.91)*	(-1.36)	(-0.75)	
C1-C3(difference)	-0.0054	-0.2207	0.0918	0.2702	1.23	0.97	0.17
	(-0.09)	(-1.52)	(0.60)	(2.21)**	(3.62)***	(2.87)***	
Panel B: Consensus Change Portfolios							
CC1(upgrade,+)	0.8122	0.2453	0.2020	-0.0651	0.37	0.43	0.82
	(18.41)***	(2.64)***	(2.47)**	(-1.68)*	(1.41)	(1.63)	
CC2	0.7386	0.7144	0.3630	-0.0100	0.73	0.74	0.72
	(15.79)***	(6.28)***	(2.69)***	(-0.14)	(2.91)***	(2.65)***	
CC3(downgrade,-)	0.8686	0.2307	0.3026	-0.0566	-0.11	-0.06	0.83
	(27.83)***	(3.61)***	(4.07)***	(-1.14)	(-0.47)	(-0.24)	
CC1-CC3(difference)	-0.0564	0.0146	-0.1006	-0.0085	0.48	0.49	0.00
	(-1.33)	(0.12)	(-1.19)	(-0.15)	(1.63)	(1.64)	

Table 6. Abnormal Returns on Portfolios by Recommendation levels and Size

This table shows the results of the estimation of equations (1), (2) and (3), by ordinary least squares for the portfolios built with the two criteria of consensus level (consensus and change) and market value, from January 1994 – December 2003. The alpha coefficients are given as a percentage. * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Portfolios	Average Return			CAPM			3-Factor Model			4-Factor Model		
	Large (1)	Small (2)	L-S (3)	Large (4)	Small (5)	L-S (6)	Large (7)	Small (8)	L-S (9)	Large (10)	Small (11)	L-S (12)
					Panel A: Consensus Portfolios							
C1	1.58***	1.75***	-0.17	0.75***	0.98**	-0.23	0.72***	0.79**	-0.07	0.72**	0.67*	0.05
C2	1.27**	1.32**	-0.06	0.43*	0.49	-0.06	0.28	0.30	-0.02	0.25	0.36	-0.11
C3	0.42	0.76	-0.33	-0.28	-0.09	-0.19	-0.26	-0.32	0.07	-0.16	-0.12	-0.03
C1-C3	1.15**	0.99**	0.16	1.03**	1.08**	-0.05	0.97**	1.11***	-0.14	0.88**	0.79*	0.09
					Panel B: Consensus Change Portfolios							
CC1	1.50**	1.27*	0.23	0.78**	0.52	0.26	0.75**	0.36	0.39	0.69*	0.49	0.21
CC2	1.33**	1.38**	-0.06	0.60**	0.65*	-0.05	0.52**	0.55**	-0.03	0.52*	0.57**	-0.05
CC3	1.05*	0.23	0.82*	0.28	-0.51	0.79	0.11	-0.63	0.74	0.13	-0.56	0.69
CC1-CC3	0.45	1.04**	-0.59	0.50	1.03**	-0.53	0.64	0.99**	-0.35	0.56	1.04*	-0.48

Table 7. Recommendation Portfolios with Different Cut-Off Points

This table gives the results of the estimation of the average returns and equations (1), (2) and (3), by ordinary least squares, for the three portfolios formed by consensus level, from January 1994 – December 2003. The alpha coefficients are given as a percentage. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

		Consensus Portfolios (Percentiles)							Consensus Portfolios adapted to the Barber et al method (2001)						
Portfolio	Model	Average Level (1)	MKT (2)	SMB (3)	HML (4)	WML (5)	Alfa (6)	R^2 aj. (7)	Average Level (8)	MKT (9)	SMB (10)	HML (11)	WML (12)	Alfa (13)	R^2 aj (14)
C1 (most favourable)	Av. Returns	4.28					1.72***		4.33					1.80***	
	CAPM		0.737***				0.94**	0.66		0.708***				1.03**	0.64
	3F		0.754***	0.302**	0.332***		0.76***	0.71		0.724***	0.304**	0.299***		0.87***	0.70
	4F		0.758***	0.308***	0.341***	0.014	0.74**	0.71		0.738***	0.329***	0.337***	0.061	0.81***	0.70
C2	Av. Returns	3.55					1.32**		3.71					1.08**	
	CAPM		0.806***				0.50*	0.78		0.802***				0.26	0.76
	3F		0.820***	0.202***	0.293***		0.33	0.81		0.816***	0.168*	0.285***		0.09	0.79
	4F		0.821***	0.204***	0.296***	0.004	0.33	0.81		0.832***	0.197**	0.330***	0.073	0.02	0.79
C3(least favourable)	Av. Returns	2.48					0.67		2.75					0.96*	
	CAPM		0.799***				-0.14	0.69		0.814***				0.14	0.76
	3F		0.819***	0.578***	0.289***		-0.27	0.82		0.833***	0.449***	0.297***		-0.01	0.85
	4F		0.783***	0.515***	0.192*	-0.157**	-0.12	0.83		0.801***	0.393***	0.211**	-0.138***	0.13	0.86
C1-C3(difference)	Av. Returns						1.05***							0.84***	
	CAPM		-0.061				1.08***	0.01		-0.106**				0.89**	0.05
	3F		-0.064**	-0.275***	0.043		1.03***	0.12		-0.108**	-0.144**	0.002		0.88***	0.07
	4F		-0.025	-0.206***	0.149*	0.171*	0.86***	0.16		-0.062*	-0.064	0.126	0.200***	0.68***	0.14

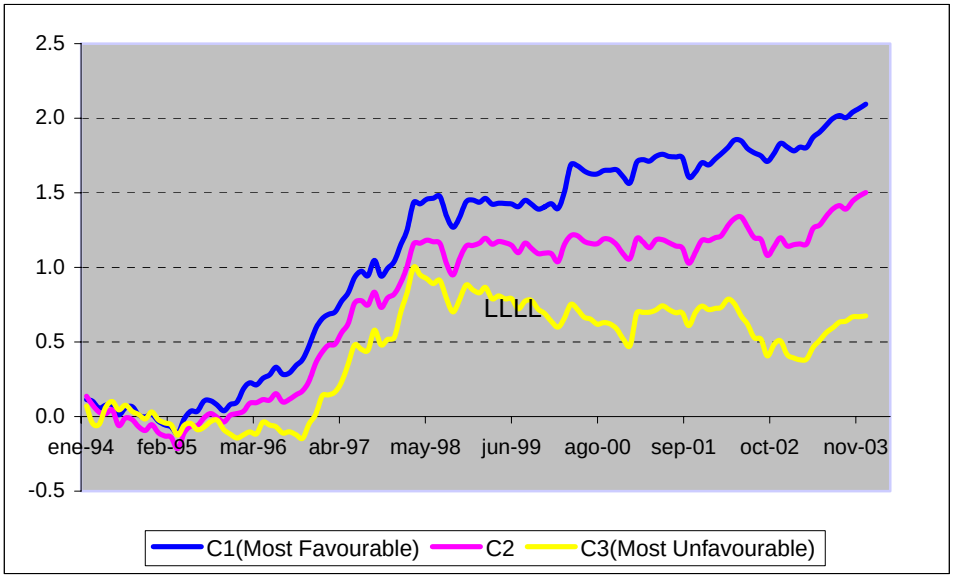
Table 8. Abnormal Returns on Portfolios by Recommendation or Change Levels and Coverage Levels

This table gives the results of the estimation of the average returns and equations (1), (2) and (3), by ordinary least squares, for the portfolios formed using the two criteria of consensus level (change) and analyst coverage, from January 1994 – December 2003. The alpha coefficients are given as a percentage. * Significant at 10%, ** Significant at 5%, *** Significant at 1% .

Portfolio	Average Returns			CAPM			3-Factor Model			4-Factor Model		
	High Coverage (1)	Low Coverage (2)	High – Low (3)	High Coverage (4)	Low Coverage (5)	High – Low (6)	High Coverage (7)	Low Coverage (8)	High – Low (9)	High Coverage (10)	Low Coverage (11)	High –Low (12)
Panel A: Consensus Portfolios												
C1	1.54***	1.82***	-0.28	0.72***	1.07**	-0.35	0.61***	0.88**	-0.27	0.57**	0.79*	-0.22
C2	1.19**	1.30**	-0.11	0.33	0.52	-0.19	0.14	0.39	-0.25	0.18	0.37	-0.20
C3	0.33	0.88	-0.55	-0.51	0.08	-0.60	-0.67	-0.11	-0.55	-0.34	-0.01	-0.33
C1-C3	1.21***	0.93*	0.27	1.23***	0.99*	0.25	1.28***	0.99**	0.28	0.91***	0.80	0.11
Panel B: Consensus Change Portfolios												
CC1	1.33**	1.15	0.18	0.58*	0.44	0.15	0.46	0.40	0.06	0.40	0.50	-0.10
CC2	1.22**	1.45**	-0.23	0.47**	0.76**	-0.29	0.34	0.67***	-0.33	0.43	0.66**	-0.23
CC3	0.58	0.67	-0.10	-0.19	-0.08	-0.11	-0.39	-0.19	-0.19	-0.36	-0.18	-0.17
CC1-CC3	0.75*	0.48	0.28	0.78**	0.52	0.26	0.85	0.59	0.26	0.76	0.69	0.07

Figure 1: Non Risk-Adjusted Returns

Panel A: Consensus Portfolios



Panel B: Consensus Change Portfolios

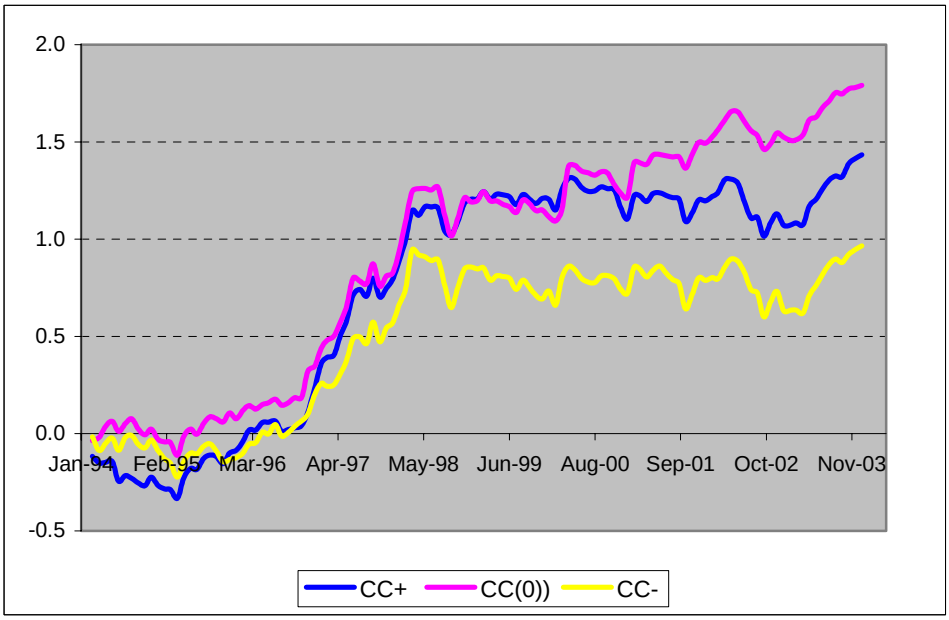
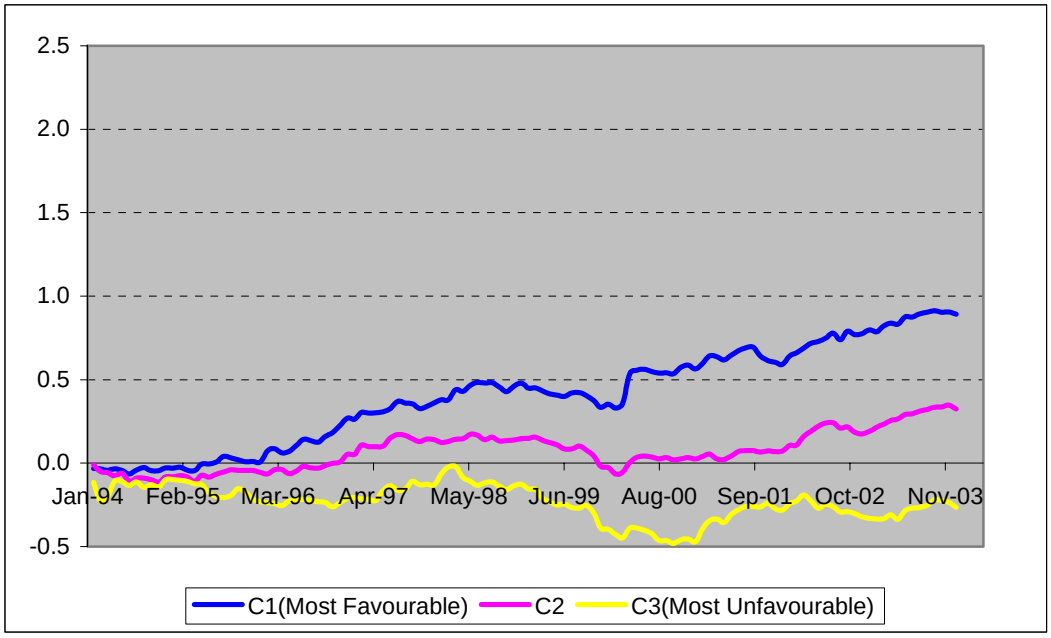


Figure 2: Risk-Adjusted Returns (4-Factor Model)

Panel A: Consensus Portfolios



Panel B: Consensus Change Portfolios