SHORT-TERM EFFECTS OF ANALYSTS RECOMMENDATIONS IN SPANISH BLUE CHIPS RETURNS AND TRADING VOLUMES*

EFECTOS A CORTO PLAZO DE LAS RECOMENDACIONES DE LOS ANALISTAS EN LAS RENTABILIDADES Y VOLÚMENES DE NEGOCIACIÓN DE LAS PRINCIPALES EMPRESAS ESPAÑOLAS

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Abstract

The purpose of this paper is to investigate the effects of stock recommendations in returns and trading volumes. Unlike previous research we have investigated the five most usual types of recommendations: buy, outperform, hold, underperform and sell. The methodology we propose is also different from previous studies. From our results we conclude that positive (negative) abnormal returns are associated to positive (negative and neutral) recommendations, the day of publication of the recommendation and the day before, but not the day after publication. We also document an asymmetry in the effect of recommendation on the stock trading volume, following the sign of the recommendation.

Key words: *Stock recommendations, abnormal returns, trading volumes, price pressure hypothesis, information content hypothesis.*

Resumen

El objetivo de este trabajo es investigar los efectos de las recomendaciones bursátiles en las rentabilidades y los volúmenes de negociación. A diferencia de las investigaciones anteriores, nos hemos centrado en los cinco tipos de recomendaciones más habituales: comprar, sobreponderar, mantener, infraponderar y vender. La metodología que proponemos es también diferente a la utilizada en las investigaciones previas. Los resultados muestran la existencia de rentabilidades anormales positivas (negativas) asociadas a recomendaciones

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favorables (negativas y neutrales), el día de la publicación de la recomendación y el día anterior, pero no el día después. Constatamos también la existencia de una asimetría en los efectos de la recomendación en los volúmenes de negociación, en función del signo de la recomendación.

Palabras clave: *Recomendaciones de stock, rentabilidades anormales, volúmenes de negociación, hipótesis de presión de precios, hipótesis de contenido de la información.*

JEL Classification: *G14.*

1. Introduction

The increasing importance of stock markets around the world, jointly with the growing participation in financial markets by small investors, have provided a dramatically increase in the production and consumption of financial information. This information includes company reports and analysis and, above all, recommendations issued by investment banks, brokerage houses and generally, financial analysts. This fact has brought up numerous questions in the finance academic community. As an example, according to Ramnath *et al.* (2008), since 1992 at least 250 papers related to financial analysts have appeared in nine major research journals[1]. A question that immediately emerges from the important role of financial analyst nowadays is the potential conflict between analyst recommendation performance and the efficient market hypothesis. In a fully efficient market, no price effect should be observed because the information was already available to a certain number of investors. However, Grossman and Stiglitz (1980) state that when there are costs associated to the collection of information, significant returns should be earned by those investors to compensate for bringing information to the market. Therefore, according to the authors, abnormal returns do not contradict the efficient markets hypothesis, since these returns must be earned in order to attract investors to assume the costs involved by information acquisition. Other questions that are becoming increasingly popular among researchers are the potential conflict of interests of financial analysts, that tend to issue many more buy than sell recommendations (the so-called "analyst optimistic bias"), and the determinants of the superior stock picking ability showed by some analysts.

The investigation of analysts' recommendations performance is a well established line of research in Finance. Davies and Canes (1978) investigate buy and sell recommendations published in the Wall Street Journal's "Heard on the Street" column in 1970 and 1971, detecting abnormal price movements the day of publication and the day afterwards. They also observe a much stronger reaction for sell compared with buy recommendations. Later but with the same

[1] The Accounting Review, Contemporary Accounting Research, International Journal of Forecasting, Journal of Accounting and Economics, Journal of Accounting Research, Journal of Finance, Journal of Financial Economics, Review of Accounting Studies, and Review of Financial Studies.

approach, Beneish (1991) for the years 1978 and 1979, and Liu, Smith and Syed (1990) for the period 1982-85, support Davies and Canes findings. Dimson and Marsh (1984) extensively review stock recommendation in Australia, Canada, Hong-Kong, the United Kingdom and the United States, documenting that following recommendations provides only a very modest profitability. Elton, Gruber and Grossman (1986) perform an extensive investigation, with data from 720 analysts for the period: March, 1981- November, 1983, observing abnormal returns the month of change in recommendation and the two subsequent months, concluding that analysts' recommendations provide new information to the market about the stock. Barber and Loeffler (1993) investigate the effects of stock recommendations published in the monthly "Dartboard" column of the Wall Street Journal, on the behavior of security prices and trading volumes from October 1988 to October 1990. The authors find positive abnormal returns of approximately four percent and an average trading volume double than normal, for the two days following the publication, concluding that the positive abnormal return was the result of naive buying pressure (the "price pressure" hypothesis) as well as the information content of analysts' recommendations (the "information content" hypothesis). Womack (1996) reports an asymmetric behavior in stock returns following buy and sell recommendations for the period 1989-1991. The author finds significantly negative returns for the six moths following sell recommendations and no significant abnormal returns after buy recommendations. More recently, Barber *et al.* (2001) investigate the performance of consensus forecasts from Zacks database for the period 1985-1996. The authors document that purchasing (selling short) the stocks with the most (least) favorable consensus recommendation, jointly with daily portfolio rebalancing yields annual abnormal gross returns greater than four percent. However, when transaction costs where considered these strategies leads non-significant abnormal returns. Although most of the research has been performed for US markets, similar investigations have been performed in most developed countries. For example, Pieper, Schiereck and Weber (1993) investigate buy recommendations published in the "Effekten-Spiegel" for the years 1990 and 1991 in the German stock market, concluding that abnormal returns could only be realized by buying the stock prior to the publication of the recommendation. Schmid and Zimmerman (2003) investigate the price and volume behavior of Swiss stocks around buy, sell and hold recommendations, as published in the major financial newspaper in Switzerland. They find a significant price reaction the week of the recommendation publication. They also study the behavior of trading volumes around the publication of the recommendations, observing a systematic (although non significant) increase in trading volume the week before the announcement, as well as a systematic and significant decrease afterwards. With a different focus, Jegadeesh and Kim (2007) evaluate the value of analysts' recommendations in the G7 countries, observing a significant reaction of stock prices to recommendation revisions in all countries except Italy. The authors find the largest price reactions around recommendation revisions and the largest post-revision price drift in the US market.

Focusing on the Spanish market, three papers, to our knowledge, have previously investigated the contents of analyst recommendations. Gonzalo and

Inurrieta (2001) investigate the performance of brokerage houses recommendations. Menendez (2005) analyzes buy and sell recommendations published in one of the most important Spanish business newspaper for the period 1997-99. Both papers report positive and significant risk-adjusted returns the days before the recommendation is made public. More recently, Gómez and López (2006) obtain similar conclusions, analyzing consensus instead of individual recommendations.

Summarizing the major findings, a wide consensus seems to exist among researchers about a strong relationship between recommendations, trading volumes and stock prices. A serious "analyst optimistic bias" seems to exist since in all studies buy recommendations strongly outperforms sell recommendations. However, following analysts' recommendations does not in general provide abnormal risk-adjusted returns, with the possible exception of selling recommendations.

Our paper contributes to the existing literature in various ways. The major contribution relies on the methodology we propose. Previous studies have followed the classical four steps Brown and Warner (1985) event study methodology. First, they estimate the expected daily return of the recommended stock, then calculate the abnormal return as the difference between the expected and the actual return, and compute the average abnormal return. Finally they compare if average abnormal returns are significantly different the days around stock recommendation. This methodology makes restrictive assumptions concerning the statistical properties of the abnormal return measures. In addition, it presents particular problems when applied to high liquid stocks that tend to concentrate many recommendations, often of different sign, for example in dates around the publication of proforma statements. Suppose, for example, that on April 3rd we have a buy recommendation for stock i, and on April 6th we have a sell recommendation for the same stock. When we calculate the average abnormal return for, for example, 50 days around the date of issue of the first recommendation, what we observe is the abnormal return resulting from two contradictory recommendations, because it is not possible to isolate the effects of both recommendations. Therefore, we propose a more straightforward approach, following the same methodology that has been widely used in the investigation of stock calendar anomalies. Our methodology introduces dummy variables (indicating the different kind of recommendations) in the market model to capture the effect of recommendations on stock returns and trading volumes. Other distinctive features of our investigation are the length of the period investigated, and the types of recommendation analyzed. While most studies tend to cover periods of a few years, our paper covers more than nine years. The fact that our period of investigation includes a complete stock market cycle also constitutes a distinguished feature of our research. Finally, the scope of our paper is wider than previous research that focus only on buy and sell (some of them only analyzing one single category) recommendations. Our investigation includes the five most usual types of stock recommendations: buy, outperform, hold, underperform and sell. This distinguish feature makes our conclusions especially robust.

The structure of the paper is as follows. The next section presents the data and methodology used in the investigation. Sections three and four present the results and conclusions of our research, respectively.

2. Data and Methodology

In this section, we first present the dataset used in the investigation and next the methodology proposed.

2.1. Data

Our dataset is formed by the published stock recommendations in the leading Spanish business newspaper "Expansion" (internet edition), issued by financial institutions, during the period: January 2000-April 2008, on the six most liquid stocks of the Spanish stock market. Financial institutions whose recommendations are included in the newspaper are of very different kind, including brokers, dealers, investment and commercial banks as well as domestic and foreign institutions. Analysts tend to issue different kinds of recommendations, the most typical being buy, sell and hold, but also outperform and underperform. Some analysts issue accumulate and reduce recommendations. We have assimilated accumulate to outperform, and reduce to underperform. Therefore we have analyzed five different kinds of recommendations (buy, sell, hold, outperform and underperform) on the main Spanish blue chips, totalizing 1,001 recommendations. The selected stocks are: Telefónica, Santander, BBVA, Endesa, Repsol and Iberdrola. After removing from the dataset what we call, contradictory recommendations, we have finally worked with 944 recommendations. Two recommendations are called contradictory when referring to the same stock, belong to different categories and have been published with less than four days of difference.

Table 1 illustrates the distribution of the 944 recommendations by category. As it can be seen, buy recommendations are nine times the number of sell recommendations, suggesting an "analyst optimistic bias" stronger than in other countries. In this point, we must remember that our research period includes three years of intense decrease in stock prices (2000-2002) due to the "dot com" crisis, five years of continuous increases in stock prices (2003-2007) and another five months of intense decreases in prices following the sub-prime crisis (December, 2007-April, 2008).

When we analyze the recommendations year by year (Table 1 part B), although the number of positive recommendations is higher than the negative for every year of the period investigated, buy recommendations are particularly high the years 2000 and the beginning of 2008, precisely the two periods in which stock prices have dropped more sharply.

Table 2 classifies the 944 recommendations finally used in our investigation by type and security. Thus, as we can see, with the exception of Repsol, that shows a moderate bias toward positive recommendations, a strong analyst optimistic bias is detected in the selected stocks. Buy recommendations range between 50.79% for Telefonica and 27.27% for Repsol, while sell recommendations range between a maximum of 15.51% for the BBVA and a minimum of 0.95% for Iberdrola.

2.2. Methodology

The dominant approach to investigate the effects of recommendations in stock returns, follows the classical Brown and Warner (1985) event study methodology, where abnormal returns are defined as:

(1) $$AR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt})$$

Where, AR_{jt} is the abnormal return for security j on the event day t, R_{jt} is the return on security j on the event day t, R_{mt} is the return of a weighted market index on day t and α_j and β_j are estimated for firm j from the market model.

The market model is estimated over a period before the publication of the recommendation and finally, the statistically significance of the average abnormal return for each day of the selected period is tested, assuming that the abnormal returns are independent and identically distributed with finite variance.

TABLE 1
RECOMMENDATIONS BY CATEGORY AND YEAR

Part A. Recommendations by category

Period	Buy	Outp.	Hold	Underp.	Sell	Total
2000-2008	375	265	171	89	44	944

Part B. Recommendations by category and year (in percentage)

Year	Buy	Outp.	Hold	Underp.	Sell
2000	61.97	16.90	18.31	1.41	1.41
2001	45.03	24.50	24.50	3.97	1.99
2002	37.06	25.88	18.82	11.76	6.47
2003	37.85	27.68	13.56	16.95	3.95
2004	30.88	36.76	17.65	10.29	4.41
2005	34.68	38.71	16.94	5.65	4.03
2006	25.49	27.45	23.53	11.76	11.76
2007	32.97	30.77	17.58	10.99	7.69
2008	63.41	19.51	9.76	4.88	2.44

Source: Expansion (internet edition) and own elaboration.

TABLE 2
NUMBER OF RECOMMENDATIONS BY CATEGORY AND SECURITY
(Figures in percentage)

	Buy	Outp.	Hold	Underp.	Sell
Santander	38.12	32.60	19.34	8.84	1.10
BBVA	35.95	27.45	20.92	11.11	4.58
Endesa	45.67	24.41	22.05	6.30	1.57
Iberdrola	42.86	24.76	26.67	4.76	0.95
Telefónica	50.79	29.84	8.90	8.90	1.57
Repsol	27.27	26.74	16.58	13.90	15.51

Source: Expansion (internet edition) and own elaboration.

In a comprehensive methodological paper, Kothari and Warner (2006, pg. 8) state "Even the most cursory perusal of event studies done over the past 30 years reveals a striking fact: the basic statistical format of event studies has not changed over time (…). The key focus is still on measuring the sample securities' mean and cumulative mean abnormal return around the time of an event." The authors highlight various potential problems associated to this methodology, some of them related to the assumptions concerning the statistical properties of the abnormal return measures. As an example, in page 16 the authors state "a standard t-test for mean abnormal performance assumes, among other things, that the mean abnormal performance for the cross-section of securities is normally distributed. Depending on the specific t-test, there may be additional assumptions that the abnormal return data are independent in time-series or cross-section".

As it has been introduced in the first section of the article, our paper proposes a different methodology to investigate the effects of recommendations on stock returns and trading volumes. We propose the use of the market model with dummy variables accounting for the existence of recommendations on stock *j*. The methodology we proposed is less restrictive since it does not make so many assumptions about the statistically properties of stock returns. Accordingly, we have investigated the effects of analysts' recommendations on stock returns through the following model:

$$R_{jt} = \alpha + \beta R_{mt} + \gamma B_{jt} + \eta OP_{it} + \theta H_{it} + \xi UP_{it} + \varsigma S_{it} + \varepsilon_{jt} \tag{2}$$

Where, R_{jt} is the return on security *j* adjusted for dividend payments on day *t*, calculated as $\ln(P_{it}/P_{it-1})$, where P_{it} is the closing price of stock *i* (adjusted for dividends) on day *t*, R_{mt} is the return of the IBEX-35 market index on day *t*, ε_{jt} is the error term, and five dummy variables have been included: *B*, *OP*, *H*, *UP* and S (one for each type of recommendation) that respectively accounts for the existence of Buy, Outperform, Hold, Underperform and Sell recommendations. These variables take the score one on those days when a recommendation of the corresponding type has been issued and zero otherwise.

In order to have a better knowledge of the drivers through which recommendations influence stock returns, we have also investigated the effects of recommendations on trading volumes. When the publication of a recommendation on a given stock influences stock return through the increase in its trading volume, we are faced to the "price pressure" hypothesis. This hypothesis poses that positive (negative) recommendations create temporary buying (selling) pressure by naive investors in the recommended securities. Therefore, in a similar way as expression (2), we have proposed a model to explain stock trading volume through the stock market trading volume and the five dummy variables introduced in expression (2).

$$V_{it} = \delta + \zeta V_{mt} + \varphi B_{jt} + \psi OP_{it} + \omega H_{it} + \text{з} UP_{it} + \text{л} S_{it} + \lambda_{jt} \tag{3}$$

Where, V_{it} is the trading volume in euros of security *i* on day *t*, V_{mt} is the trading volume in euros of the stock market m, measured through the trading volume of stocks belonging to the IBEX-35 index on day *t*, *B*, *OP*, *H*, *UP* and *S* the dummy variables used in expression (2), and λ_{jt} is the error term. As suggested by Ajinkya and Jain (1989), a log transformation of the euro volumes has been performed to more closely approximate the variable to a normal distribution.

Models (2) and (3) have been estimated for the six selected stocks for the period January, 2000 - April, 2008.

We have investigated the effects of analysts' recommendations on prices and trading volumes of the recommended stock, the day when the recommendation is published. In addition, we have also investigated the effects of analysts' recommendations on prices and trading volumes the day before and after the publication of the recommendation. The reason to investigate the effects of recommendation on returns and trading volumes the day after the publication is to know whether the effects of recommendations last beyond the day of publication. In addition, since financial institutions can offer stock recommendations to their clients before they are published in the media, we have investigated the effects of stock recommendations on returns and trading volumes the day before publication of the recommendation. If this were the case, we should observe abnormal returns and trading volumes the day before publication of the recommendation. The results by Menendez (2005) support the existence of abnormal returns and trading volumes the day before the recommendation is published.

3. Results

In this section we discuss the effects of recommendations on returns and trading volumes following the estimation of equations (2) and (3).

3.1. Effects on stock returns

Our dataset includes two kinds of information: cross-sectional information, reflected in differences between individuals (stocks) in the sample, and time-series information, reflected in changes on the individuals over the time. Unlike ordinary regression, panel data estimation allows to take advantage of these two types of information. The first step in the application of panel data methods involves the election between fixed and random effects models. The critical issue relies on the heterogeneity of units in the sample. According to Greene (2007), fixed effects models assume that differences across units can be captured through differences in the constant term. They are especially suitable when the omitted and unobserved variables are correlated with the regressors, and constant over time. On the contrary, if the unobserved individual heterogeneity can be assumed to be uncorrelated with the included variables the random effects approach is more suitable. Applying this discussion to our case, since our model includes a unique beta coefficient for the six stocks in the sample, there will exist individual effects given that the level of systematic risk of the six stocks is not the same[2]. However, we neither expect the systematic risk level of the stocks to be correlated with the regressors in our model, nor to be constant during the period of estimation. Therefore, the random effects model seems to be more suitable for our investigation. The application of the Hausman test supports our decision to use a random effects model. Nevertheless, fixed as well as random

2 Nevertheless, since the six selected stocks are the most important Spanish blue chips, we do not expect important differences in the level of systemic risk between them.

effect models made strong assumptions about the error term. When the error term exhibits heteroscedasticity and autocorrelation, fixed and random effect models cease to be effective and unbiased. When this is the case, Beck and Katz (1995) suggest estimating the model through the Prais-Winstein method, calculating panel corrected standard errors. Thus, after estimating equation (2) by a random effects model, the validity of these assumptions has been checked. Unsurprisingly, since daily stocks returns tend to be, both autocorrelated and heterocedastic, the performed tests reveal that the residuals exhibit autocorrelacion, heterocedasticity and correlation across panels. Therefore, we have finally performed the Prais-Winstein estimation with panel corrected standard errors.

The Grubbs test to detect outliers was performed, detecting 39 outliers in our sample. Table 3 shows the estimates of equation (2) with z-values in parentheses, after removing outliers from the dataset.

The first column of Table 3 accounts for the effects of recommendations on returns the day of publication. The second (third) column accounts for the effects of recommendations on returns the day after (before) publication of the recommendation. Table 3 reveals that the publication of a recommendation has a significant effect on the return of the recommended stock the day of publication, as well as the day before publication, but not the day after. If we focus on the first column of the table, we observe positive effects on returns for buy and outperform recommendations, statistically significant at 1% and 5% level respectively, and negative effects on returns for underperform and sell recommendations, significant at a 1% and 5% level respectively. This apparently surprising result could be explained in terms of the analysts' optimistic bias, discussed in section 2.1. Accordingly, if participants in the financial market have internalized that analysts tend to show an optimistic bias, when these analysts issue a hold recommendation, market participants assume that it is a negative recommendation, based on the internalized bias. As expected, the associated coefficient to buy recommendations is higher than the corresponding to outperform recommendations. The same occurs for sell and underperform recommendations in absolute values. It is interesting to note that the coefficients associated to negative recommendations are much higher (in absolute values) than the ones corresponding to positive recommendations, indicating comparatively stronger effects on stock returns of negative compared to positive recommendations. As we have just commented to explain the negative coefficient associated to hold recommendations, this result could be explained in the same terms, due to the optimistic bias showed by financial analysts that would justify a relatively stronger effect of negative compared with positive recommendations. The second column of the table indicates that the publication of a recommendation has not effects on stock returns the day after publication, no matter the sign of the recommendation. This result would indicate a fast adjustment of prices to the new information associated to the publication of recommendations. The third column of the table indicates that recommendations affect stock returns the day before publication. This price behaviour occurs for buy and underperform recommendations at a 5% significance level and for hold recommendations at a 1% level, but surprisingly not for outperform and sell recommendations. The signs of the coefficients associated to buy, hold and underperform recommendations are the same as in the first column: positive for buy, and negative for hold and underperform recommendations. Surprisingly, the associated coefficient to sell recommendations, although negative, is not statistically significant at the usual levels.

Since we have followed a different methodology, our results are not fully comparable with previous research. However, our investigation support major findings in the existing literature, as the effects of stock recommendations in stock returns the day of publication and the day before, but not after publication, and the comparatively stronger effect on stock returns of negative recommendations compared with positive recommendations. Regarding the Spanish case, as in Menendez (2005) and Gonzalo and Inurrieta (2001), we find positive (negative) abnormal returns the day before publication of buy (sell) recommendations, but not after the publication of the recommendation. However, unlike them, we also find positive (negative) abnormal return for the day of publication of the positive (neutral and negative) recommendations.

TABLE 3
EFFECTS OF RECOMMENDATIONS ON STOCKS RETURNS

Variables	d0	d+1	d–1
Constant	0.0000536	0.0000757	0.0001005
	(0.65)	(0.91)	(1.21)
R	0.9557911 **	0.9561548 **	0.9560935 **
	(169.17)	(169.28)	(169.14)
B	0.0021662 **	0.0000831	0.0013821 *
	(3.83)	(0.15)	(2.46)
OP	0.0014639 *	0.0004854	0.0003332
	(2.21)	(0.74)	(0.50)
H	−0.0019241 *	0.0010054	−0.0021887 **
	(−2.27)	(1.19)	(−2.58)
UP	−0.0033992 **	−0.0013401	−.0028985 *
	(−2.91)	(−1.15)	(−2.47)
S	−0.0039826 *	−0.0023338	−0.0022062
	(−2.29)	(−1.35)	(−1.28)
R-square	0.5568	0.5558	0.5568
Chi-square	28693.00	28712.51	28693.20
Sig. Level	0.0000	0.0000	0.0000

*Significant at a 5% level. **Significant at a 1% level.

Finally, any paper empirically investigating stock return should be aware about the possibility of data mining problems. This situation was clearly stated by Lakonishok and Smidt (1988, pg. 405): "A hundred researchers using the same data test a hundred different hypotheses. The 101st derives a theory after studying the previous results and tests and theory using more or less the same data." This problem has been considered especially grave in the investigation of calendar anomalies (eg. Sullivan, Timmermann and White, 2001) and technical analysis (eg. Sullivan, Timmermann and White, 1999). The crucial point in both cases is that if enough economic models are studied, by pure chance some of them are likely to be statistically significant. There are several ways to minimize data mining problems. One of them, suggested by Sullivan, Timmermann and White (1999 and 2001) is not to focus on a sub-sample of models but on a wide universe. For instant, if we investigate technical analysis, we should not consider a small subset but the whole set of technical rules. Another approach, proposed by Lucey and Whelan (2001) is to find a new and relatively independent dataset, not previously used in similar investigations, and to test the proposed model through this new dataset. We argue that our results are not contaminated by data mining problems, since we have investigated not a subset but all the categories of stock recommendations. In addition, our dataset has not been previously used in similar investigations. Nevertheless, to reinforce our view, we have performed a bootstrap estimation with 1000 simulations for the models explaining stock returns. The results of this estimation, not reported, remain basically unchanged.

3.2. Effects on trading volumes

Table 4 reports the estimates of equation (3). As done with equation (2), we have performed the Prais-Winstein estimation with panel corrected standard errors. After implementing the Grubbs test to detect outliers, 16 observations have been remove from the sample. As in Table 3, the first column of the table shows the effects of recommendations on stock trading volumes the day of publication of the recommendation. The second (third) column shows the effect of recommendations on trading volumes the day after (before) the recommendation is published.

Regarding the first column of the table, our results show that positive recommendations (buy and outperform), positively affect trading volumes of the day of publication. The associated coefficients to variables B and OP are statistically significant at a 5% and 1% level respectively. On the contrary, neither neutral nor negative recommendations (sell and outperform) have any effect on stock trading volumes.

The second and third columns reveal no significant effects of recommendations on trading volumes the day before or after publication. However, the associated coefficient to variable OP, although no-significant at the considered levels is in the limit of significance at a 5% level.

The results showed by Tables 3 and 4 jointly considered reflect that, unlike the effects of recommendations on returns, its effects on trading volumes are limited to the day of publication of the recommendation. In addition, an asymmetric behavior between positive and negative (plus neutral) recommendations has been observed.

Previous research does no generally report different effects on stock trading volumes according with the sign of the recommendation. As an exception, Menendez (2005), although reporting stronger volume effects associated to buy compared with sell recommendations, finds an increase in trading volume before and after the publication of buy recommendations, and an increase in trading volume one day before the publication of sell recommendations. To our knowledge, our paper is the first investigation to report trading volume effects that are only associated to positive stock recommendations.

Examining together the first column of Tables 3 and 4, an interesting result emerges. Positive recommendations induce an increase in trading volume that is associated with significantly positive returns. On the contrary, the publication of negative and neutral recommendations does not have any effect on trading volumes, but have a negative effect on stock returns. Thus, we face an asymmetry about the behaviour of returns and trading volumes, according with the sign of the recommendation, with appealing effects for the interpretation of the relationship between recommendations and stock returns. Barber and Loeffler (1993) poses two potential explanations for the relationship between stock recommendations and abnormal returns: the "price pressure" hypothesis and the "information content" hypothesis. The former argues that positive (negative) recommendations create a temporary buying (selling) pressure by naive investors in the recommended stock, and this buying (selling) pressure causes the abnormal positive (negative) return. On the other hand, the information content hypothesis poses that the analysts' recommendation reveals relevant information about the recommended security, and, thus, the abnormal return observed the day of publication represents a fundamental revaluation of the security. If we examine our results on the light of these hypotheses, we will conclude that while positive recommendations provide abnormal returns by generating a temporary buying pressure on the recommended stock, negative recommendations effects on returns seem to be better explained by the information content hypothesis.

TABLE 4

EFFECTS OF RECOMMENDATIONS ON TRADING VOLUMES

Variables	d0	d+1	d–1
Constant	2.442361 **	2.434571 **	2.441239 **
	(19.43)	(19.38)	(19.38)
V	0.5006696 **	0.5016502 **	0.500809 **
	(37.50)	(37.60)	(37.43)
B	0.0163021 *	−0.0001336	−0.0003743
	(2.32)	(−0.02)	(−0.05)
OP	0.0231595 **	−0.0154355	0.0084842
	(2.91)	(−1.95)	(1.06)
H	0.0163146	−0.0049165	0.0058883
	(1.59)	(−0.43)	(0.57)
UP	0.0086444	−0.0026465	0.0220893
	(0.62)	(−0.19)	(1.58)
S	0.0228922	0.0094172	−0.0222793
	(1.15)	(0.47)	(−1.10)
R-square	0.6476	0.6441	0.6478
Chi-square	1425.30	1419.97	1406.65
Sig. Level	0.0000	0.0000	0.0000

*Significant at a 5% level. **Significant at a 1% level.

4. Conclusions

The effects of analysts' recommendations on stock returns and trading volumes have raised an enormous interest among researches during the last decades. However, despite the numerous investigations carried out on the topic, the basic statistical format of these papers has not changed over time. This paper, supposes a different methodological approach to the topic with less restrictive assumptions compared with the prevailing methodology. Our results reveal that analysts' recommendations have a significant influence on stocks returns the day of publication of the recommendation. Unlike most papers in this area, five types of recommendations have been taken into account: buy, outperform, hold, underperform and sell. As expected, positive (negative) recommendations positively (negatively) affect stocks returns. In addition, the effect is stronger for buy compared with outperform, as well as for sell compared with underperform recommendations. Unexpectedly, the publication of a hold recommendation has a negative effect on stock return the day of publication. We have also investigated the effects of recommendations on stocks trading volumes, concluding that as positive recommendations positively influence trading volumes, negative and neutral recommendations have no influence on trading volumes. This finding is particularly interesting since it reveals that while the "price pressure" and the "information content" hypotheses are both consistent with higher returns associated to positive recommendations, the effects of negative recommendations on returns can not be explained by the "price pressure" hypothesis. In addition, our results show that stock recommendations have no effects on returns or trading volumes the day after publication, but they influence stock returns, although not trading volumes, the day before publication. The situation suggests a private use of recommendations before publication, indicating that when recommendations are used privately, the effects on stock returns are not associated to "price pressure" issues. However, additional research is needed in this area.

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