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STOCK SPLITS: MOTIVATIONS AND VALUATION EFFECTS IN THE SPANISH MARKET

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This study analyzes the motivations and valuation effects of stock splits in a "medium-sized market" such as the Spanish market. Our findings suggest that splitting firms present a pre-split stock price above the normal trading range, and that, after the split, the number of transactions and the average transaction size increase significantly. Moreover, positive abnormal returns are observed around announcement dates and around the ex-date. For the latter, however, these positive wealth effects are outweighed by the negative abnormal returns observed closely afterwards. Our findings suggest that the liquidity, or optimal trading range hypothesis, prevails over other hypotheses as an explanation for stock splits in the Spanish market.

Keywords: Split, signal, liquidity, event-study.

(*JEL* G14, G35)

1. Introduction

Stock splits have become quite a common feature in the Spanish Stock Market during the second half of the decade of the 1990´s. Whereas, between 1990 and 1995 no pure stock split announcement is to be found, from the second half of 1996 onwards, 94 companies listed on the Madrid Stock Exchange decided to split their stocks; 2 did so in 1996, 17 in 1997, 40 in 1998 and 35 in 1999. This relatively high frequency of splits in our market is similar to that observed in other markets, such as the US market, where between 5-10 % of companies listed on the New York Stock Exchange split their stock every year (Lakonishok and Lev,

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1987). Our paper aims at providing additional insight into the relative explanatory power of the existing theories about the motivations and market valuations of stock splits for a continnous auction medium-sized market, with no differences between round and odd-lots and where transaction costs do not depend on stock prices. For that matter, a database of the splits carried out during the 1990's by firms quoted on the Spanish Stock Exchange is used.

Stock splits represent book entries that do not increase a firm's cash flow. Thus, although their cost is apparent, i.e. administrative, printing and legal costs, as well as transaction costs, their benefits for shareholders are in no way evident. Traditional economic explanations for stock splits include both their use as a signal of the firm's favorable future prospects, referred to as the signalling hypothesis (Brennan and Copeland, 1988), or their use as a means to return share prices to some optimal trading range, thus improving shareholder liquidity, at least for small investors, called the liquidity hypothesis (Baker and Gallagher, 1980). Recently, a third reason has been proposed, namely the use of stock splits by managers to alter the firm's ownership structure by increasing the number of individual investors and reducing institutional shareholders, ownership, which has been labeled the managerial entrenchment hypothesis (Mukherji *et al.,* 1997). Apart from these explanations, we explore the possibility that stock splits in the Spanish market, during the second half of the 1990's, may be explained by the firms' aim to establish a new nominal value close, or multiple, to the equivalent in pesetas of a euro, thus, we consider the consequences of the change of quotes from the denomination in pesetas to that in euros as an alternative explanation for stock splits (which we call the euro explanation).

Previous studies, mainly centred on the US market, have shown how the signalling, liquidity and entrenchment hypotheses may explain the puzzle that stock splits represent for financial economists. These studies have also analyzed the market reaction around stock split announcement and execution dates. For the Spanish market, both Brito (1999) and Gómez-Sala (2000) study liquidity changes around stock splits. The latter also estimates abnormal returns around stock split execution dates. Both authors document an increase in the cost of liquidity due to an increase in the relative spread and a decrease in the absolute spread. Our paper tries to contribute to this literature. In comparison to the previously mentioned papers centred in the Spanish

market, it differs in several ways. Firstly, we take the proposed explanations, not individually, but jointly, as determining factors in the decision to split stocks: the signalling, the liquidity and entrenchment hypothesis, as well as the euro explanation. To this end, we compare different characteristics of firms that split their stock with those of control groups of non-splitting firms, and analyze their influence on a firm's decision to split its stock. Secondly, we estimate the market reaction not only around stock split executions, but also around stock split announcements, analyzing for the latter possible determinants of the observed abnormal returns. Thirdly, we extend the database of these studies by considering all stock splits that have taken place during the 1990's decade in the Spanish market as our initial sample, ending up with a final sample of 55 pure stock splits, 45 of them corresponding to firms that announce stock splits for the first time.

The results suggest that stock splits aim to bring back stock prices to a normal trading range. Splitting firms show higher stock prices than non-splitting firms of the same industry. Post-split, splitting firms' stock prices tend to adjust to their industry peers. Also, after the split significant increases in the number of transactions and a decrease in the average transaction size are observed. Around the split announcement date significant positive abnormal returns are found. These excess returns are mainly explained by the pre- and post-split ratio of the splitting firms' stock price divided by their industry mean.

The rest of the paper is organized as follows: Section 2 discusses the theoretical background and hypotheses to be tested. Section 3 describes the database. Section 4 presents the results regarding the split decision. Section 5 describes the abnormal returns around announcement and ex-dates and analyzes cross-sectional differences in the announcement returns. Finally, Section 6 offers the main conclusions of the study.

2. Theoretical background

Stock splits involve the multiplication of a company's stock without affecting its assets or liabilities. In other words, an entity's stocks are exchanged for others of less nominal value, thereby increasing its number of stocks in accordance with the split ratio. Thus, given that these operations do not offer any apparent benefits, despite incurring administrative, advertising, registration and transaction costs, it is logical to suppose that other possible explanations determine stock splits. Furt-

hermore, previous studies document positive abnormal returns around the stock split announcement (Fama *et al.,* 1969; Asquith *et al.,* 1989) and execution (Grinblatt *et al.,* 1984; Maloney and Mulhering, 1992; Conrad and Conroy, 1994).

Although the economic literature has not yet found a definitive explanation for either the abnormal positive returns observed around the announcement and execution dates, or the reasons why managers decide to split stocks, different explanations, not necessarily mutually exclusive, have been proposed. They include information signalling (the signalling hypothesis), improved liquidity for shares that trade at lower prices (the liquidity hypothesis), and the possibility that stock splits may alter the ownership of firms by reducing institutional investors' ownership (the managerial entrenchment hypothesis).

2.1. The signalling hypothesis

The signalling hypothesis proposes that, in a scenario of asymmetric information between managers and investors, managers may use stock splits to signal positive information to the market about the firm's future expectations. The split situates the company shares at a lower price, thus facilitating the expected future revaluation.

The costs of this financial signal are administrative, advertising, registration and transaction expenses. Moreover, the multi-period setting in which decisions are taken means that these costs are proportionally greater for those companies that genuinely do not have positive expectations, thus discouraging the deceptive use of this signal. The managerial incentives to use splits as a financial signal are related to the increased returns to be expected. Therefore, the announcement of a split fulfils the conditions required to act as a financial signal, as suggested by Spence (1973).

So, the signalling explanation proposes that investors interpret splits as signals sent by managers regarding the firm's positive future expectations and earnings. In accordance with this prediction, splitting firms show larger earning increases before and after the split (Lakonishok and Lev, 1987; Asquith *et al.,* 1989).

Furthermore, different studies analyze the utility of using stock splits as signals and relate their use to the employment of another financial signal: dividends. Fama *et al.* (1969) document that around 70 % of split firms show dividend increases during the year after the split. La-

konishok and Lev (1987) report dividend growth for splitting firms surrounding stock split announcements. Nevertheless, other studies contradict the conclusions of these studies. Grinblatt *et al.* (1984) document positive abnormal returns around split announcements for firms that do not pay cash dividends, and Asquith *et al.* (1989) indicate that the market reaction to split announcements does not reflect anticipation of dividend increases in the short term.

The significant abnormal positive returns observed around the split announcement for the US market, support the informational signal provided by stock splits (Fama *et al.,* 1969; Grinblatt et al., 1984; Asquith *et al.,* 1989; McNichols and Dravid, 1990; Rankine and Stice, 1997)[1]. Likewise, the observed post-split increase in the number of shareholders supports this hypothesis (Mulkerji *et al.,* 1997). Nevertheless, it should be considered that this result does not necessarily imply that investors are attracted by the positive expectations signalled by stock splits.

2.2. The liquidity hypothesis

The liquidity hypothesis assumes that stock splits pursue a lower range of share prices, bringing the firm's prices back within a "normal" price range. In this way, by making stocks more affordable for all investors, managers are able to enhance the liquidity of a firm's shares. As Baker and Gallagher (1980) and Baker and Powell (1993) report, this is one of the main reasons cited by managers for splitting their firms' stock. Maloney and Mulherin (1992), Conrad and Conroy (1994) and Muscarela and Vetsuypens (1996) consistently report increases in liquidity following stock splits[2]. On the contrary, other studies do not support a post-split increase in liquidity and even record a decrease in trading activity (Copeland, 1979; Conroy, Harris and Benet, 1990). For the Spanish market, Brito (1999) and Gómez-Sala (2000) find that splits increase the number of transactions and decrease the average transaction size; a result that could be interpreted in support of an increase in market liquidity[3]. Nevertheless, both authors also document an increase in the relative spread, that is to say, in the cost of liquidity.

[1] Nevertheless, the positive abnormal returns observed around split announcements could also be explained through the liquidity hypothesis.
[2] Lamoureux and Poon (1987) also observe an increase, although not permanent, of the number of transactions and a decrease of transactions average size.
[3] Note that Rubio and Tapia (1996) document a significant positive relationship between depth and transactions.

The positive valuation effects reported in the literature around split announcements could be explained through the liquidity hypothesis (Fama *et al.,* 1969; Asquith *et al.,* 1989; Grinblatt *et al.,* 1984; Maloney and Mulhering, 1992; Conrad and Conroy, 1994). These abnormal returns could be a response to the expected post-split increase in liquidity (although they may also reflect its use as a signal).

2.3. The managerial entrenchment hypothesis

A third hypothesis for stock splits has been proposed recently, namely, the managerial entrenchment hypothesis. It refers to agency costs and managers' opportunistic behaviour. The underlying argument of this hypothesis is that managers may split their firm's stock to reduce institutional ownership. By reducing institutional investors' power and increasing the number and heterogeneity of shareholders, managers may reduce the level of the firm's monitoring (Mukherji *et al.,* 1997) and deter possible takeovers (Lakonishok and Lev, 1987). Accordingly, the number of shareholders should increase after the split, while the number of institutional or large investors should decrease. Nevertheless, one has to keep in mind that managerial entrenchment would become more difficult the higher the firm's overall institutional ownership, as these large shareholders would not approve stock splits that aim to reduce their power[4].

Few studies have tried to test this hypothesis, and to date they do not seem to support it. For example, Murherji *et al.* (1997) find that stock splits result in increases in both the number of institutional or individual investors, however, they do not affect ownership concentration.

2.4. The euro explanation

Additionally to these hypotheses, we consider as an alternative explanation for stock splits, the firm's willingness to establish a close or

[4]Not all blockholders may have the same incentives to monitor. Empirical studies in countries where banks play an important role, both as creditors and shareholders', show that bank ownership can be beneficial for firms. Cable (1985) finds that bank ownership increases shareholder wealth in the German market. Similar results are documented for some time periods by Gorton and Schmidt (1996). In Spain, a country where banks also play an important role as shareholders and creditors, Zoido (1998) documents increases in firms' market values associated to bank shareholdings. García-Marco and Ocaña (1999) show that for firms with a close relationship to banks, investment decisions are more optimal than in those firms where banks do not exercise control over the firm's shareholdings.

multiple nominal value of a euro. This fact could be related to the denomination on January 1st 1999 of all stock quotes on the Spanish Stock Market in euros. We observe that a high percentage of firms that split their stocks in 1998 (40 %) and in 1999 (93 %) establish a new nominal value multiple of the equivalent in pesetas of a euro, at the oficial exchange rate of 166.386 pesetas to 1 euro. This explanation posits a pure cosmetic effect of stock splits.

3. Database and variables description

Our initial sample consists of pure stock splits, that is, splits that do not coincide with increases or decreases in capital. These splits were carried out by companies listed in the Madrid Stock Exchange during the decade of the 1990's[5]. This sample focuses on the second-half of the 1990's. Two splits took place during the second half of 1996, 17 in 1997, 40 in 1998 and 35 in 1999.

We imposed the following filters on this initial sample of pure stock splits in order to calculate the abnormal returns around announcement and ex-dates:

(a) An announcement date had to be identified (14 cases excluded).

(b) Announcements that were accompanied by other contaminating announcements, such as mergers, tender offers, initial public offerings, increases or decreases in capital, were excluded (10 cases).

(c) Stock prices had to be available at least for 200 trading days before the announcement date (3 cases excluded).

(d) Announcements for which the companies traded less than 50 days in the assessment period or less than five in the initial event window of 41 days were also excluded (13 cases)[6].

Once these filters were applied, the sample of splits amounted to 55 announcements. Ten of these announcements correspond to firms that announced a second split during the period under consideration (see Table A1.1 and A1.3 of the Appendix). The repetitive character of these "second split" announcements suggest that they may not con-

[5] Nevertheless, we did not find any case of pure stock splits before 1996. The information concerning the identity of these companies, the number of stocks, before and after the split, the modification of the nominal value, and the date of execution was obtained from the Madrid Stock Exchange.

[6] In these cases we found that abnormal returns were highly extreme even after correcting for infrequent trading.

vey the same information as "first split" announcements and therefore should not be assessed in the same way by investors. Thus, we present the results of the study for the sub-sample of "first split" announcements. Nevertheless, we do comment on the wealth effects associated to "second splits" around the announcement and execution dates.

In addition to the split sample, we construct a control sample of all non-split firms within the same industry in each year, as defined by the Madrid Stock Exchange. In this way we control for the possible influence of industry effects on stock price behavior. We also checked our results by constructing an additional sample of firms within the same industry and with similar size. The results did not vary.

TABLE 1
Characteristics of stock splits

	Mean	Median	Mode	Maximum	Minimum	Standard deviation
Split ratio	4.40	3.00	2.00	50.00	2.00	7.05
Split factor	3.40	2.00	1.00	49.00	1.00	7.05
Pre-split nominal value	639.36	500	500	1,500	100	286.27
Post-split nominal value	199.04	166.67	250	500	10	104.52
Pre-announcement stock price (in pesetas)	10,527	8,635		37,000	1,564	7,686.14
Post-split stock price (in pesetas)	4,397	3,323		18,700	88	3,745.92

The sample is composed of 45 pure first stock splits over the period 1996-1999. Split ratio (SR) denotes the ratio between post-split and pre-split number of shares. Split factor (SFAC) denotes the size of the split distribution, SR=(1+SFAC). Pre-announcement stock price refers to the split firms' price one month before the split is announced, while post-split stock price refers to the splitting firms' market price one month after the split is executed. All values are expressed in pesetas.

Table 1 shows the characteristics of first stock splits, as regards the split ratio and the pre-split and post-split nominal and stock prices of the split sample firms. The split ratio shows a median value of 3. This relatively high split ratio leads to a split factor, in median values, of 2; a value which is significantly higher than the one documented by other studies for the US market (0,62 for example for Grinblatt *et al.,* 1984). The fact that transaction costs in Spain do not depend on stock prices could explain this high ratio. Pre-split prices (in pesetas) show a median value of 8,635, while post-split market prices show a median value of 3,323. Thus, the ratio between pre- and post-prices amounts to 2.6, close to the median split ratio. Note also that the post-split median nominal value is close to the equivalent in pesetas of one euro, which suggests the willingness of some splitting companies to have a post-split nominal value close to one euro.

4. Split motivations

According to the proposed hypothesis, we try to determine what factors influence a firm's decision to split its stock. To this end, we first analyze different characteristics between the sample of split firms and the control group of non-split firms. We use the t-test and the non-parametric Wilcoxon sign-rank test to compare the significance of the mean and median differences of the explanatory variables proposed as proxies of the hypotheses to be tested. Secondly, we run a logit model where the dependent value is given a value of 1 if the firm decides to split its stock and 0 for the control firms' sample. The explanatory variables aim to proxy for the influence of the signalling, liquidity and entrenchment hypotheses, as well as the euro explanation, on the probability of a firm splitting its stock.

The hypotheses to be tested are the following:

The signalling hypothesis: Stock splitting firms show positive future expectations

Hyphotesis 1: *Thus, splitting firms show post-split announcement earnings and dividend increases that are higher than their industry's peers.*

The liquidity hypothesis: Stock splitting firms aim to return stock prices back to a normal trading range

Hyphotesis 2: *Thus, before the announcement of the split, splitting firms show higher pre-split stock prices than their industry counterparts. By doing the split, firms adjust their prices to a normal trading range.*

The managerial entrenchment hypothesis: Managers of stock splitting firms aim to reduce institutional shareholders' power

Hyphotesis 3: *Thus, firms that split their stock reduce institutional ownership after the split. Before the split institutional ownership is lower for splitting firms.*

The euro explanation: Managers of stock splitting firms aim to establish a new nominal value that is a multiple of one euro

Hyphotesis 4: *Thus, splitting firms establish post-split nominal values that are multiples of one euro, while non-splitting firms do not present nominal values that are multiples of one euro.*

In order to test whether or not these hypotheses explain the firm's decision to split its stocks, we propose the following explanatory variables. For the signalling hypothesis, we proxy the firm's positive future expectations by the firm's net earnings and dividend increase in the year of the split announcement[7] (ΔEAR and ΔDIV)[8]. Alternatively we also considered the firm's net earning and dividend increases the year after the split announcement date as proxies of the firm's future expectations. To test the liquidity hypothesis, we define the variable PB as the split firm's stock price, or the stock price of its industry peers', thirty days before the split announcement date. The variable PA is defined as the firm's stock price, thirty days after the split execution date[9]. For the managerial entrenchment hypothesis, we define the institutional ownership held by banks and other institutional investors, such as investment or pension funds, both at the end of the year, before the split is announced, (INSTB) and at the end of the year in which the split is announced (INSTA). For the euro explanation, we define a dummy variable (YEURO) that takes the value of 1 if after the split the firm adopts a nominal value that is a multiple of one euro and 0 otherwise. For control firms, the nominal value is the median value of all firms's nominal value within the industry at the end of 1999. We consider that moment as the reference for control firms, since at the end of 1999 a whole year had passed since the denomination of stocks in euros in the Spanish capital markets and also because it is the end of the study period.

In order to define these variables we use the firms' accounting data supplied by the Madrid Stock Exchange, stock quotes published by the Daily Stock Bulletin of the Madrid Stock Exchange and data on significant shares published by the Spanish Supervisory Agency (CNMV). Stock split announcement dates correspond to the day when the news of the split first appears in one of the nation's leading economic newspapers such as *Expansión, Cinco Días,* and *La Gaceta de los Negocios.*

[7] Note that the announcement dates apply to split firms and the control fimrs. Only in two cases the year of the announcement date did not coincide with the execution year.

[8] As it could be argued that by using the year the splits are announced as a reference period, we are introducing a forward bias, we repeated all estimations and tests, using the year before and two years before the splits are announced as a reference. The results did not vary.

[9] In the logit model these variables are expressed as the logarithm of the split firm's stock price, or its industry peers.

4.1. Characteristics of split and control firms

Table 2 shows the mean and median values of the proposed proxy variables for split firms and their industry counterparts. Earning increases the year the splits are announced (ΔEAR) amount to 17.97 % in median value for stock split firms, while for control firms this value amounts to 86.48 %, the difference being statistically significant. The same behaviour is observed when we consider the difference in earnings increases in the year after the splits are announced (median values of 14.27 % for splitting firms and 30.31 % for control firms). When considering dividend increases the year the splits are announced (ΔDIV) split firms show lower dividend increases than control firms, the difference being statistically significant. Actually, dividend increases, in median values, amount to –41.21 % for split firms and to 1.23 % for control firms. The year after the split is announced, non-splitting firms also show higher dividend increases, although the difference between splitting and non-splitting firms' dividend increases is not statistically significant. Thus, these results do not support the hypothesis that splitting firms outperform their industry counterparts, that splits signal a firm's positive future expectations (H1).

As far as the liquidity hypothesis is concerned, pre-split split firms show higher prices (PB) than their industry peers (8,635 versus 3,562 in median values, in pesetas). This difference is statistically significant at the 1 % level. On the contrary, post-split split firms present lower stock prices than their industry peers. The median stock price, in pesetas, amounts to 3,160 for splitting firms, and to 4,047 for control firms. The difference is statistically significant at the 5 % level. Consequently, significant decreases in the mean and median values of the ratio of the split firms' stock price to the industry's stock price is observed. The ratio amounts in median value to 2.24 one month before the split announcement and to 1.00 one month after the split execution. After the split, the ratio of the split firms's stock price to the median, or mean, industry's stock price is not significantly different from the value of one. This evidence supports H2, which proposed that stock-splitting firms should show higher prices than their industry counterparts, and that they would try to adjust these stock prices to a normal or optimal trading range.

TABLE 2
Characteristics of split and control firms

Panel A: Comparison of characteristics of split and control firms

Characteristic	Split firms				Control firms				Significance tests	
	Mean	Median	Standard deviation	% positive	Mean	Median	Standard deviation	% positive	t-test	W-Wilcoxon-test
Earnings increase the year of the split announcement (ΔEAR) (%)	49.02	17.97	1.24	76	131.28	86.48	3.26	80	(0.121)	(0.006)
Dividends increase the year of the split announcement (ΔDIV) (%)	-28.02	-41.21	0.66	20	11.28	1.23	0.96	51	(0.034)	(0.011)
Earnings increase the year after the split announcement (%) (1)	40.83	14.27	1.29	75	65.00	30.31	1,01	87	(0,237)	(0,088)
Dividends increase the year after the split announcement (%) (1)	39.33	0	2.53	55	8.17	8.12	0,92	53	(0,324)	(0,619)
Pre-announcement stock price in pesetas (PB)	10,527	8,635	7,686		5,543	3,562	2,75		(0.000)	(0.000)
Post-split stock price in pesetas (PA)	3,681	3,160	2,504		4,429	4,047	2,659		(0.032)	(0.027)
Post-split nominal value (in euros) (NOM)	1.20	1.00	0,63		2.16	2.85	1.25		(0.000)	(0.000)
Ownership held by institutional investors before the split (INSTB) (%)	15.98	10.18	0.17		26.30	15.81	0.22		(0.003)	(0.007)
Ownership held by institutional investors after the split (INSTA) (%)	17.76	10.69	0.19		26.00	14.92	0.23		(0.025)	(0.012)

Panel B: Comparison of characteristics of split firms at different moments of time

	Before the split announcement			After the split announcement				
Ownership held by institutional investors before the split (INSTB) (%)	15.98	10.18	0.17	17.76	10.69	0.19	(0.354)	(0.859)
	Before the split announcement (30 days)			After the split execution (30 days)				
Industry adjusted stock price of splitting firms	3.52	2.24	3.26	1.05	1.00	5.11	(0.000)	(0.000)

The sample is composed of 45 split firms and their control pairs. The control group is constructed by matching each split firm with all non-split firms of the same industry, as defined by the Madrid Stock Exchange. The values of the variables are for the year and the year after the split announcement (earnings and dividends' increases), one month before the split announcement and one month after the split (stock prices); one month after the split for splitting firms and the end of 1999 for the control group's firms (nominal values) or at the end of the year before and after the announcement (institutional ownership). The industry adjusted stock price of splitting firms denotes the ratio between split firm's stock prices and the median industry stock price. Significance of paired differences is measured using the t-test for means and the non-parametric Wilcoxon signed rank test for medians. P-values are shown in parenthesis.
(1) The sample of splitting firms is reduced to 40 firms, as 5 firms do not quote one year after the split.

We do not find a significant difference between pre- and post-split institutional ownership. This result contradicts H3, which predicts that stock splitting firms reduce their institutional ownership. In order to check this result further we also compared the split and control firms in terms of pre- and post-split institutional ownership. Both figures are smaller for split firms than for their industry counterparts and the differences are statistically significant. This evidence suggests that stock splits may be carried out by directors of firms with lower institutional ownership, or firms where managers are not so closely monitored. Nevertheless, by doing so, managers are not able to alter the level of the firm's monitoring significantly, given that the level of institutional ownership does not vary significantly after the split has taken place (see also Gómez-Ansón *et al.,* 1998).

Finally, when comparing the post-split nominal values in euros of split firms and the median nominal value of control firms at the end of 1999, the difference turns out to be significant at the 1 % level. The median nominal value for splitting firms is one euro and the median nominal value for control firms is 2.85 euros. Nevertheless, the mode of the nominal value of splitting firms amounts to 1.5 and post-split, as a mean, splitting firms' nominal value does not amount to one euro (the p-value of the test is 0.042). Besides this, out of 45 firms, 23 non-splitting firms show a nominal value multiple (and 5 of them equal to 1 euro) of one euro by the end of 1999, while only 16 splitting firms present a nominal value multiple (and 12 of them equal to 1 euro) of one euro. Thus, non-splitting firms do not present less frequently nominal values that are multiples of one euro, but they do present, to a lesser degree, nominal values close to one euro. This evidence does not support the firms' willingness to establish nominal values which are multiples of one euro, as a motivation for stock splits. Nevertheless, the results support the will to establish nominal values of one euro by split firms to a larger extent than by non-splitting firms.

Summing up, these results seem to suggest that stock splits are announced by firms with higher stock prices than their industry peers, with lower levels of future earnings and dividend increases and with lower levels of institutional ownership. Post-split splitting firms stock prices tend to be situated at the industry or "normal" trading range. Also, post-split splitting firms present nominal values of one euro more frequently.

4.2. Determinants of the decision to split

After this first analysis of the explanatory hypotheses of splits, we now present a logit[10] in which all the motivations are examined together. To do so, the dependent variable is the YSPLIT dummy variable, which takes a value of 1 for splitting firms, and a value of 0 for the control group, that is the mean of the rest of firms in the same industry as the splitting firm. The explanatory variables considered in the analysis are: a) according to the signalling hypothesis, the firm's net earnings increase in the year of the split announcement[11] (ΔEAR), and the firm's dividends increase the same year (ΔDIV); b) according to the liquidity hypothesis, the explanatory variable is the logarithm of the stock price 30 days before the split announcement (LPB); c) according to the managerial entrenchment hypothesis, the explanatory variable is the institutional ownership at the beginning of the exercise in which the split is announced (INSTB); d) according to the euro explanation, the explanatory variable is the dummy variable YEURO that takes the value of 1 if the nominal price is a multiple of one euro post-split or at the end of 1999 for the control group.

The model to be assessed is:

$$\begin{aligned} YSPLIT_i &= a + b_1 * \Delta EAR_i + b_2 * \Delta DIV_i + b_3 * LPB_i \\ &\quad + b_4 * INSTB_i + b_5 * YEURO_i + \epsilon_i \end{aligned} \qquad [1]$$

where $_i$ denotes the splitting firm and its control group.

The results of the logit show a 70 % correct model ranking (Table 3). Contrary to the H1 signalling hypothesis, the managerial expectations of an increase in earnings or dividends are not found to be determining factors of the split. When we include the earnings and dividend increases the year after the split announcement as alternative measures of corporate performance the same behavior is observed, no significant influence of these variables is found. The share price level before the split announcement supports the liquidity hypothesis as it determines the possibility of executing the split positively. Although not included in the results shown in Table 3, when additionally the pre-announcement

[10] When using matched pairs an alternative estimation method is the conditional likelihood analyses based on the linear logistic equation (Breslow, 1982).

[11] Note that the announcement dates apply to split firms and the control firms. Only in two cases the year of the announcement date did not coincide with the execution year.

stock price we include as an explanatory variable the logarithm of the post-split stock price, this variable turns out to be also a significant determinant of the firm's decision to split its stocks. Its sign is negative. This fact reinforces the liquidity motivation as an explanation for stock splits.

The variable representing institutional ownership before the split is both significant and negative in nature, showing that the greater discretion displayed by the management, that is to say, the less institutional ownership there is, more likely is a split to be executed. The variable YEURO is not significant, thus rejecting the euro explanation. When including a dummy variable that takes the value of 1 if, after the split, the nominal value of the firm's stocks equals 1 euro, we found that this alternative variable did influence significantly and positively the probability of splitting. This result suggests that splitting firms establish a nominal value of one euro after the split to a larger extent.

TABLE 3
Determinants of stock splits

Variable	Coefficient	Standard error	Significance
Constant	-11.069	3.906	(0.005)
ΔEAR	-0.062	0.099	(0.530)
ΔDIV	-0.619	0.448	(0.167)
LPB	1.396	0.454	(0.002)
INSTB	-3.806	1.417	(0.007)
YEURO	-0.783	0.559	(0.161)
2 LogLikelihood	96.180		
Goodness of fit	87.788		
Cox & Snell R^2	0.272		
N	90		

The sample is composed of 45 split firms and their control pairs. The control group is constructed by matching each split firm with all non-split firms of the same industry, as defined by the Madrid Stock Exchange. The dependant variable is a dummy variable that assumes the value of 1 for stock splitting firms and 0 for control firms. ΔEAR and ΔDIV denote the earnings and dividends increase the year that the split is announced. LPB is the logarithm of the stock 30 days before the split is announced. INSTB denotes the level of institutional ownership the year before the split is announced. YEURO is a dummy variable that takes the value of one if the nominal price of the firm is a multiple of a euro after the split (for splitting firms) or at the end of 1999 (for control firms).

		Predicted		
		0.00	1.00	Percent Correct
Observed		0	1	
0.00	0	32	13	71.11
1.00	1	14	31	68.89
			Overall	70.00

Summing up, this evidence suggests that stocks splits do not signal earnings nor dividend increases, therefore rejecting the signalling hypothesis. The results do comply with the liquidity hypothesis which suggests that higher price levels more than normal ones motivate splits. The lower the institutional ownership the higher the probability of a firm splitting. Nevertheless, the mean and median difference analysis suggests that institutional ownership is not significantly reduced after the split. Thus, the entrenchment hypothesis is not supported. The willingness to establish a nominal value multiple of one euro as a motivation for stock splits is also not supported by the evidence. Nevertheless, we cannot rule out that apart from reducing the firm's stock price, splits may carry a cosmetic effect with them as splitting firms establish to a larger extent a nominal value of one euro.

4.3. Stock prices trading range and liquidity

To further check if the firms' aim to bring prices back to a normal trading range and to increase liquidity helps explain stock split decisions we analyze both how the firms' aim to return stock prices to a normal trading range may determine the split factor and the changes in the market liquidity of the stocks after the split has taken place.

We first relate the split factor to the split firms' pre-split price and the industry pre-split price. We estimate a cross-sectional regression in log terms, where the dependent variable is the split factor (SFAC) and the explanatory variable is the deviation of the split firm's stock price from the mean of their industry peers (control group) one month before the split is announced (APB=P_{i-1}/P_{cg-1}). Thus, if splits aim to return the firms' stock prices back to a normal trading range, we should expect that the larger the deviation (P_{i-1}/P_{cg-1}) the larger the size of the split, the split factor (SFAC). The result of the cross-sectional regression resulted as follows (t-ratios in parentheses).

$$\ln(1+SFAC) = 1.070 + 0.277^{*} \ln(P_{i-1}/P_{cg-1}) \qquad [2]$$
$$(10.145^{***})\,(2.019^{**})$$
$$F = 4.075^{**} \text{ Adjusted } R^2 = 0.065$$

Note: *Significant at 0.1 level; ** Significant at 0.05 level; *** Significant at 0.01 level.

where, $SFAC$ is the split factor, P_{i-1} is the stock price of the splitting firms one month before the split is announced and P_{cg-1} is the

mean stock price of the control group one month before the split is announced.

Therefore, the industry-wide price appears to be a target for the size of the stock split, i.e. for the split factor. The larger the deviation of a firm's stock prices from its industry peers, the larger the split factor. A one-percent deviation of the split stock price from its comparable pair is associated with a 27.7 percent increase in the size of the split. This fact, which explains about 6.5 % of the cross-sectional variability in the split factor, also supports the liquidity motivation for stock splits. Similar results are reported for the US market by Lakonishok and Lev (1987) or Rozeff (1998).

Secondly, in order, to analyze whether splits increase liquidity for small investors we analyze the split firms' pre- and post–split mean and median differences for different measures of liquidity. Liquidity is understood here as the extent to which a trader is able to effect a transaction at a favorable price (Amihud and Mendelson, 1986). These measures of liquidity include the volume traded each day (VOL), the number of transactions (NT), and the volume per trade (VPT), defined as the total volume or value of stock traded in a day divided by the number of trades. The first three hypotheses that have been formulated as explanations of the decision to split are consistent with increases in the number of transactions and reductions in size per transaction. The signalling hypothesis proposes that the firms' positive future expectations will lead to increases in the firms' share demand, that is, in trading volume. The liquidity and managerial entrenchment hypotheses are consistent with effective aggregate trade sizes that do not significantly change after the split, as the improvements in liquidity for small shareholders do not manage to influence the overall volume significantly.

As can be observed in Table 4, the differences in the mean daily volume (VOL) 30 days before and after the split are not statistically significant. This result supports the liquidity and the managerial entrenchment hypotheses. On the contrary, the signalling hypothesis foresees a larger aggregate volume as a result of the attraction of investors by the positive expectations signalled by splits. Similar results are reported for the US market by Lakonishok and Lev (1987) or Conroy *et al.* (1994). On the other hand, the daily number of transactions (NT) increase in median value amounts to around 100, and it is significant. There is also a significant decrease in daily volume per transaction

(VPT) (from more than 1,000,000 Ptas. in median values). Thus, these results seem to suggest an increase in liquidity after stock splits for smaller-sized transactions, that is to say, for those transactions carried out by small shareholders[12].

TABLE 4
Changes in trading activity after stock split executions

Variable	Pre-split period: Mean (Median)	Post-split period: Mean (Median)	Paired differences: Mean (Median)	p-values: t-test (Wilcoxon-test)
Volume (VOL)	2,509,642,786 (217,687,755)	2,687,188,362 (286,042,198)	177,545,576 (68,354,443)	0.758 (0.371)
Number of transactions (NT)	400.48 (101.62)	599.94 (200.39)	199.46 (98.77)	0.022 (0.000)
Volume per transaction (VPT)	3,908,526.24 (3,101,441.58)	2,801,353.68 (1,973,495.78)	-1,107,172.57 (-1,127,915.8)	0.001 (0.000)

Alternative measures of trading activity for the sample of 45 first pure stock splits over the period 1996-1999. Volume denotes the number of shares traded multiplied by the price of the trade, number of transactions refers to the number of orders and volume per transaction is obtained by dividing the volume traded each day by the number of transaction. Pre-split liquidity measures are averaged over one month before the split is executed, while post-split liquidity is calculated one month after. Significance of paired differences is measured using the t-test and the non-parametric Wilcoxon signed ranks test.

To sum up, the mean difference and the logit analysis support mainly the liquidity hypothesis as an explanation for splits. This hypothesis suggests that a firm's share price above its industry average motivates stock splits. Moreover, the greater the share price deviation with respect to the industry's median or mean price, the greater the split division ratio. In addition, significant increases in the number of transactions and reductions in the volume per transaction are observed. The latter is also consistent with the managerial entrenchment hypothesis.

Regarding the signalling hypothesis we do not find evidence suggesting that splitting firms' post-announcement corporate performance is above non-splitting firms. Also, the managerial entrenchment hypothesis is not confirmed. No significant reductions in institutional ownership are

[12] Nevertheless, we must point out that Gomez-Sala's (2000) and Brito's (1999) results suggest an increase in the cost of liquidity due to an increase in the relative spread. Once again the high average equity performance of splitting firms may explain this behaviour. The high performance of split firms could derive in a pre-split run–up that may induce a decline in relative spreads and thus, influence the value of the relative spread prior to the split significantly. Thus, as Maloney and Mulherin (1992) argue, due to this problem with relative spreads, when studying splits, it may be preferable to use absolute spreads. These authors also document a decrease in absolute spreads after splits. Similar results are also reported by Brito (1999) for the Spanish market.

observed after the split, although the smaller the institutional ownership, the more likely it is that the split will take place.

5. Valuation effects and cross-sectional analysis

Once we have studied how the three proposed hypotheses may help explain the firm's decision to split its stock, we analyze the market reaction to this decision. To this end, we calculate abnormal returns around stock split announcements and analyze how the proxy variables defined for the signalling, liquidity and managerial entrenchment hypotheses and the euro motivation explain the observed abnormal returns.

On the other hand, we also calculate abnormal returns around the execution date. Although no new information is revealed to the market on this date, different studies document significant positive abnormal returns around the ex- date. Thus, we try to check if this anomaly is also present for our sample of Spanish stock splits (see section 3 for details concerning sample screening).

In order to estimate the valuation effects associated with stock split announcements and executions, we calculate daily abnormal returns around these two dates. To this end, market model parameters are estimated for a period from 200 to 20 days before the announcement and the ex-date. The market return is defined as the return of the Madrid Stock Exchange Index, a composite index. Stock prices are split, equity issues and dividend adjusted. We use the parametric test described by Dodd and Warner (1983) to test the statistical significance of our results. Furthermore, we repeated the estimations using the non-parametric test proposed by Corrado (1989) to check our results.

We identify two event days: the day of the announcement, that is the day the news of the split first appears in one of the nation's leading economic newspapers, and the execution date, the day when the split takes place, identified by means of the information supplied by the Madrid Stock Exchange. On average, the ex-date falls about 106 days after the announcement date (the median value is 85 days).

In order to control for the possible influence of the Monday or the January effects we analyzed the distribution of announcement and execution dates. Announcement dates are uniformly distributed throughout the whole week, while ex-dates are mainly Tuesdays (75.56 % of the

sample). Neither did we find a concentration of announcement and ex-dates in December or January (see Appendix, Table A1.2).

5.1. Valuation effects around stock split announcements

Table 5 shows the valuation effects around the announcement dates for the first splits. Daily abnormal returns amount to 1.29 % on day 0 (see Figure 1), being statistically significant at the 1 % level (Z=5.39).

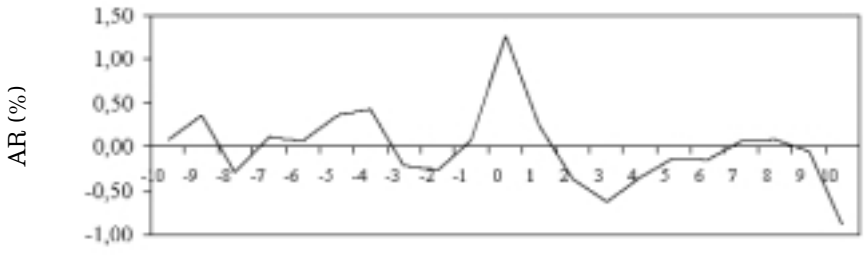
TABLE 5
Daily abnormal returns around split announcement dates (first split)

Days	Abnormal returns (%)	Percentage of positive (%)	Z-Test	Cumulative abnormal returns (%)
-10	-0.19	44.44	-0.16	-0.19
-9	0.44	51.11	0.95	0.25
-8	-0.39	31.11	-1.61	-0.14
-7	0.25	51.11	0.25	0.11
-6	0.40	51.11	1.62	0.51
-5	0.55	55.56	2.47**	1.06
-4	0.66	48.89	4.00***	1.72
-3	-0.47	33.33	-2.31**	1.24
-2	-0.26	42.22	-1.19	0.98
-1	0.05	51.11	0.61	1.03
0	1.29	73.33	5.39***	2.33
1	0.28	57.78	0.66	2.61
2	-0.36	33.33	-1.74*	2.25
3	-0.37	37.78	-2.20**	1.88
4	-0.29	40.00	-1.12	1.59
5	-0.04	46.67	0.12	1.54
6	0.11	51.11	0.56	1.65
7	0.08	46.67	1.00	1.73
8	0.07	44.44	0.57	1.81
9	0.10	42.22	-0.15	1.90
10	-1.08	37.78	-2.08**	0.83

Note: *Significant at 0.1 level. ** Significant at 0.05 level. *** Significant at 0.01 level.

The sample consists of 45 first pure stock splits over the period 1996-1999. Announcement date is the day the news first appear in one of the nation's leading economic newspapers such as *Expansión, Cinco Días,* and *La Gaceta de los Negocios.*

FIGURE 1
Daily abnormal returns around first split announcements



On that date abnormal returns are positive for more than 73 % of the sample split firms. Abnormal returns are also statistically significant on days –5, –4, -3, +2 and +3. These returns are not due to extreme values. Over the event window (-5,+3) cumulative abnormal returns amount to 1.37 % and are statistically significant at the 10 % level[13]. Thus, as has been reported by previous studies in other markets (Fama *et al.,* 1969; Grinblatt *et al,* 1984; Asquith *et al.,* 1989; McNichols and Dravid, 1990), there is a positive abnormal reaction to split announcements[14]. No abnormal returns are observed for second splits on the day of announcement, as shown in Table 4A in the Appendix (due to the small number of cases a non-parametric Corrado test is applied). This difference in behaviour between the first and second splits supports the decision to refer our entire analysis to the first stock splits.

This evidence indicates a significant market reaction around stock split announcements. We next try to analyze how the proposed hypotheses help explain these gains by relating the observed abnormal returns to the explanatory proxy variables of these hypotheses. The abnormal return observed on the announcement day is the dependent variable, even though the results do not change if the cumulative abnormal returns over the event window (-5,+3) are considered as the dependent variable. The variables that relate to the signalling hypothesis are the firm's net earnings and dividends increase in the year of the split announcement (ΔEAR, ΔDIV)[15]. For the liquidity hypothesis, we proxy the deviation of pre- and post-split splitting firms' stock prices to their industry peers by the variable LAPB, defined as the logarithm of the relationship between the share price of the splitting company and the mean sector share price one month prior to the announcement and the variable LAPA, defined as the logarithm of the relationship between the share price of the splitting firm and the mean sector share price one month after the split has taken place. The institutional ownership before the stock split announcement (INSTB) and the dummy variable YEURO are also included in the analysis, as proxy variables for the

[13] In other windows like (-10,+10) or (-5,+10) the accumulated abnormal returns are not statistically significant.
[14] Results are similar using the non-parametric test proposed by Corrado (1989).
[15] When using as alternative variables the earnings and dividend increase the year after the split announcement, the results did not vary.

managerial entrenchment hypothesis and the euro explanation. Thus, the regression model can be represented as follows:

$$AR_i = a + b1 * \Delta EAR_i + b2 * \Delta DIV_i + b3 * LAPB_i + b4 * LAPA_i + b5 * INSTB_i + b6 * YEURO_i + \epsilon_i \quad [3]$$

When we run the regression, we find that the coefficientes of the variables that relate to the signalling hypothesis (ΔEAR, ΔDIV) do not turn out to be significant (Reg. 1, Table 6). This fact suggests that investors do not interpret splits as a signal of the future positive expectations. As regards the institutional ownership variable (INSTB), we also fail to find any significant influence of this variable on the observed abnormal returns, neither is the dummy YEURO significant[16].

TABLE 6
Determinants of the abnormal returns around stock split announcement date

Variable	Reg. 1	Reg. 2
Constant	5.268E-03	2.888E-03
	(0.609)	(0.455)
ΔEAR	-3.808E-03	
	(-1.237)	
ΔDIV	4.140E-03	
	(0.745)	
LAPB	1.322E-02	1.303E-02
	(1.636)	(1.690)*
LAPA	-1.780E-02	-1.766E-02
	(-2.643)***	(-2.762)***
INSTB	4.2431E-03	
	(0.200)	
YEURO	-4.714E-04	
	(-0.058)	
Adjusted R^2	0.072	0.113
F	1.568	3.816**
N	45	45

The sample consists of 45 first pure stock splits over the period 1996-1999. The dependant variable is the abnormal return observed on announcement date. ΔEAR and ΔDIV denote the earnings and dividends increase the year that the split is announced. LAPB and LAPA denote the split firms' industry adjusted stock price 30 days before the split is announced and 30 days after the split is executed (stock prices are expressed as logarithms). INSTB denotes the level of institutional ownership the year before the split is announced. YEURO is a dummy variable that takes the value of one if the firm has a nominal value multiple of a euro after the split and zero otherwise.

[16] When using as an alternative variable a dummy variable that takes the value of 1 if the firm's post-split nominal value is a euro, again no significant relation was found.

The two variables that represent the relation between the splitting firms' stock prices and their industry peers, both before the split announcement and after the split execution, do help explain the observed abnormal returns (Reg. 2, Table 6). The coefficient of variable LAPB is positive and statistically significant at a 10 % level, while the coefficient of variable LAPA is negative and statistically significant at a 1 % level. This result suggests that the higher the pre-deviation of the splitting firm to its industry mean and the lower the post-deviation of the splitting firm to its industry mean, the higher the valuation effects associated with the split announcement.

Thus, this evidence seems to suggest that it is mainly the liquidity motivation, that is, the firm's aim to return stock prices back to a normal trading range, that helps explain the excess returns observed around split announcement dates. This result is reinforced by the evidence documented in Section 4 that showed that the firms' aim to return prices to a normal trading range may determine stock splits.

5.2. Valuation effects around split executions

On the day the split is executed, we should not expect any significant market reaction, as no new information is revealed to the market. Previous studies in the US market have documented an anomaly of significant abnormal returns around split execution dates. Thus, we try to check if this behaviour is also present for our sample of Spanish stock splits (Table 7).

In our sample, abnormal returns are positive on announcement date. They amount to 0.6 % and are statistically significant at the 1 % level (Z=2.58). Nevertheless, as in the study of Lamoureaux and Poon (1987), the negative abnormal returns observed closely afterwards eliminate these positive excess returns (see Figure 2). No significant reaction has been observed for the second split sample, in or around the day of the stock split (see Table A1.5 of the Appendix).

This evidence agrees with the results of previous studies in the U.S. market, where different authors, i.e. Grinblatt *et al.* (1984) or Malhoney and Mulherin (1992), document significant abnormal returns around stock split executions, although they differ from those found by Wulff (1999) for the German market, where no significant returns were observed around the day of the stock split. These results also agree to some extent with the evidence reported for the Spanish mar-

ket by Gomez-Sala (2000) who, using a sample of 20 splits, documents significant positive abnormal returns on ex-date amounting to 0.93 %, even though he does not find that these gains are lost afterwards over event window (+1,+5). The reasons for these different results could be associated with the differences in the samples used in both studies[17].

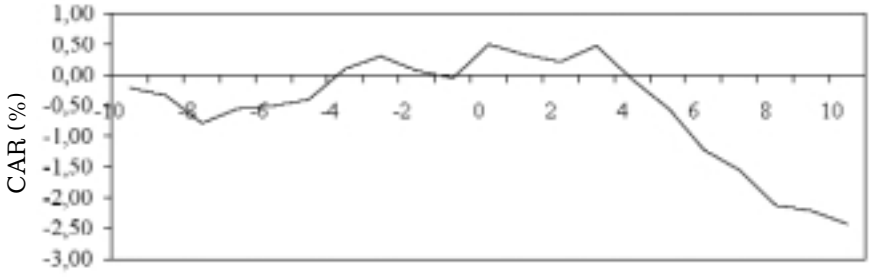
TABLE 7
Daily abnormal returns around split execution dates (first split)

Days	Abnormal returns (%)	Percentage of positive (%)	Z-Test	Cumulative abnormal abnormal returns (%)
-10	-0.19	44.44	-0.28	-0.19
-9	-0.31	51.11	-1.09	-0.50
-8	-0.43	31.11	-1.47	-0.93
-7	0.19	51.11	0.39	-0.74
-6	-0.01	51.11	-0.28	-0.75
-5	0.13	55.56	-0.08	-0.62
-4	0.44	48.89	1.27	-0.18
-3	0.07	33.33	0.66	-0.11
-2	-0.25	42.22	-0.90	-0.36
-1	-0.08	51.11	-0.45	-0.44
0	0.60	73.33	2.58**	0.16
1	-0.04	57.78	-0.56	0.12
2	-0.14	33.33	-1.98	-0.02
3	0.33	37.78	-0.24	0.31
4	-0.52	40.00	-2.27**	-0.21
5	-0.69	46.67	-2.86**	-0.90
6	-0.61	51.11	-1.80*	-1.51
7	-0.29	46.67	-0.82	-1.80
8	-0.49	44.44	-2.16**	-2.29
9	-0.05	42.22	-0.78	-2.34
10	-0.16	37.78	-1.57	-2.50

Note: *Significant at 0.1 level. ** Significant at 0.05 level. *** Significant at 0.01 level.

The sample consists of 45 first pure stock splits over the period 1996-1999. Execution date is the day the split takes place, identified through the information supplied by the Madrid Stock Exchange.

FIGURE 2
Cumulative abnormal returns around execution date



[17] In this paper the sample also includes announcements made in 1999. Moreover, stock splits undertaken by firms that have announced or are subject to mergers, tender offers as well as non-pure stock splits, that is those that are simultaneously accompanied by an increase or decrease in the firms' capital are excluded from the study.

6. Conclusions

This paper studies the motivations for stock splits, as well as the valuation effects around stock split announcement and execution dates in a continous auction medium-sized market such as the Spanish stock market, with no differences between round and odd-lots and where transaction costs do not depend on stock prices.

The results of the study seem to support the liquidity hypothesis as the main determinant for stock splits. Pre-split, splitting firms' stock prices are significantly higher than their industry peers, while the post-split ratio between split firms' stock price to their industry mean stock price, is not significantly different from 1. Moreover, the greater the share price deviation with respect to the normal or industry share price, the greater is the split ratio. Furthermore, significant increases in the number of transactions and reductions in the trading volume per transaction after the split are observed, without there being any significant variation in the effective aggregate volume. The positive gains around stock splits announcements are also mainly explained through the pre- and post-split splitting firms' deviation of the normal trading range share price. Thus, our results are in line with other previous studies that support the liquidity motivation for stock splits (Lamoureaux and Poon, 1987).

Contrary to the signalling hypothesis, stock splitting firms do not seem to have better expectations than non-splitting firms and post-announcement's corporate performance does not help explain the observed abnormal returns around stock splits announcements. In this sense our results are similar to those reported for the U.S. market by Asquith *et al.* (1989). These authors document that splitting firms dividend or earning increases do not explain the market reaction to split announcements. Furthermore, the managerial entrenchment hypothesis is not confirmed in our study. After the split, no significant reductions in institutional ownership levels are observed. As Mukherji *et al.* (1997), we do not find that the managerial entrenchment hypothesis for a different environment explains stock splits. Apart from these hypotheses, we consider the willingness to establish a new nominal value multiple of one euro as an alternative explanation for stock splits. This fact does not seem to influence the firm's decision to split its stock, nor is it positively valued by investors. Nevertheless, we do find that splitting firms show nominal values of one euro more frequen-

tly, although this fact does not influence the wealth effects associated to stock split announcements.

To sum up, our findings suggest that the main reason behind a stock split and for the positive market reaction around stock split announcements is a higher share price than the normal trading range. The reduction of this higher price seems to attract small investors and thus significant increases in the number of transactions and reductions in the trading volume per transaction after the split are observed, without there being any significant variation in the volume of shares traded. This adjustment of the firm's stock price to a normal trading range is valued positively by investors.

Appendix A1

TABLE A1.1
Sample description

Firm	Ex-year	Pre-split nominal value	Post-split nominal value	Split ratio
Prosegur	1996	500	100	5
Vidrala	1997	500	250	2
Banco Santander	1997	750	250	3
Banco Bilbao Vizcaya	1997	780	260	3
Bankinter	1997	1,500	500	3
Gas Natural SDG	1997	600	150	4
Endesa	1997	800	200	4
Campofrío Alimentación	1997	1,000	500	2
Banco Popular Español	1997	500	125	4
Banco Central Hispano Americano	1997	500	250	2
Fomento de Contrucciones y Contratas	1997	1,000	250	4
Inmobiliaria Zabalburu	1997	1,000	250	4
Cortefiel	1997	100	50	2
Corp. Mapfre, Cia. Int. de Reaseguros	1997	500	250	2
Mapfre Vida, S.A. de Seguros y Reaseguros	1997	500	250	2
Zardoya Otis	1998	900	180	5
Tabacalera	1998	500	100	5
Banco Pastor	1998	1,000	500	2
Cementos Portland	1998	500	250	2
Corporacion Bancaria de España	1998	500	125	4
Nicolás Correa	1998	1,000	200	5
Acerinox	1998	800	160	5
Vallehermoso	1998	500	165	3
Abengoa	1998	500	167	3
Bodegas y Bebidas	1998	1,000	250	4
Portland Valderrivas	1998	500	160	3
Unipapel	1998	500	250	2
Ibérica de Autopistas	1998	250	84	3
Azkoyen	1998	1,000	200	5
Acciona	1998	1,000	167	6
Puleva	1998	500	10	50
Banco Guipuzcoano	1999	666	166	4
Repsol	1999	499	166	3
Grupo Dragados	1999	499	166	3
Banco Santander Central Hispano	1999	166	83	2
Hidroelectrica del Cantábrico	1999	998	333	3
Banco Zaragozano	1999	499	166	3
Compañía Vinicola del Norte de España	1999	200	40	5
Cia. Española de Petróleos	1999	499	166	3
Sociedad de Aguas de Barcelona	1999	500	167	3
Corporacion Financiera Alba	1999	998	166	6
Telefónica	1999	500	167	3
Inmobiliaria Urbis	1999	466	233	2
Tavex Algodonera	1999	500	166	3
Amper	1999	300	166	2

The sample is composed of 45 pure first stock splits over the period 1996-1999. Pre and post-split nominal values are in pesetas. Split ratio denotes the ratio between post-split and pre-split number of shares.

TABLE A1.2
Day and month distribution of announcement and execution dates

Panel A: Day distribution

Week day	*Announcement date (% of firms)*	*Execution date (% of firms)*
Monday	22.22	4.44
Tuesday	8.89	75.56
Wednesday	22.22	2.22
Thursday	22.22	6.67
Friday	24.44	11.11

Panel B: Month distribution

Month	*Announcement date (% of firms)*	*Execution date (% of firms)*
January	4.44	0.00
February	8.89	2.22
March	20.00	2.22
April	13.33	4.44
May	24.44	6.67
June	11.11	13.33
July	4.44	33.33
August	0.00	4.44
September	2.22	8.89
October	11.11	8.89
November	0.00	6.67
December	0.00	8.89

The sample is composed of 45 pure stock splits over the period 1996-1999. Announcement date is the day the news first appears in one of the nation's leading economic newspapers such as *Expansión, Cinco Días, and La Gaceta de los Negocios,* and the execution date, the day the split takes place, identified through the information supplied by the Madrid Stock Exchange. When one of these dates corresponded to Saturday or Sunday, it was attached to Monday.

TABLE A1.3
Second split sample

Firm	Ex-year	Pre-split nominal value	Post-split nominal value	Split ratio
Banco Santander	1998	250	115	2
Banco Bilbao Vizcaya	1998	260	90	3
Campofrio Alimentacion	1998	500	167	3
Banco Central Hispano Americano	1998	250	84	3
Vidrala	1998	500	170	3
Nicolas Correa	1999	333	166	2
Zardoya Otis	1999	140	70	2
Gas Natural SDG	1999	500	166	3
Fomento de Contrucciones y Contratas	1999	250	166	2
Azkoyen, S.A.	1999	200	100	2

The sample is composed of 10 firms that make a second split over the period 1996-1999. Pre and post-split nominal values are in pesetas. Split ratio denotes the ratio between post-split and pre-split number of shares.

TABLE A1.4
Daily abnormal returns around split announcement dates (second split)

Days	Abnormal returns (%)	Percentage of positive (%)	Corrado Test	Cumulative abnormal returns (%)
-10	1.31	80.00	1.56	1.31
-9	0.00	60.00	-0.81	1.31
-8	0.13	40.00	-1.92	1.44
-7	-0.45	20.00	-0.96	1.00
-6	-1.37	20.00	-1.20	-0.38
-5	-0.47	30.00	-1.85	-0.85
-4	-0.58	20.00	-0.48	-1.43
-3	1.01	60.00	0.77	-0.42
-2	-0.27	30.00	-0.01	-0.69
-1	0.20	60.00	0.24	-0.49
0	1.18	70.00	0.87	0.68
1	0.06	40.00	-0.04	0.75
2	-0.33	40.00	-2.29*	0.41
3	-1.78	10.00	-3.30**	-1.37
4	-0.61	30.00	0.02	-1.97
5	-0.52	40.00	-1.16	-2.49
6	-1.25	30.00	-0.96	-3.74
7	0.03	50.00	0.46	-3.71
8	0.18	60.00	-1.64	-3.53
9	-0.70	20.00	-1.07	-4.23
10	-0.01	20.00	-2.13**	-4.25

Note: *Significant at 0.1 level. ** Significant at 0.05 level. *** Significant at 0.01 level.

The sample consists of 10 firms that make a second stock split over the period 1996-1999. Announcement date is the day the news first appear in one of the nation's leading economic newspapers such as *Expansión, Cinco Días,* and *La Gaceta de los Negocios.*

TABLE A1.5
Daily abnormal returns around split ex-dates (second split)

Days	Abnormal returns (%)	Percentage of positive (%)	Corrado Test	Cumulative abnormal returns (%)
-10	-0.32	40.00	-0.59	-0.32
-9	0.68	70.00	1.19	0.36
-8	-0.52	20.00	-0.88	-0.15
-7	0.43	70.00	1.05	0.27
-6	0.29	60.00	0.76	0.56
-5	-0.03	40.00	-0.17	0.53
-4	0.76	70.00	1.37	1.29
-3	0.85	60.00	0.85	2.14
-2	-0.17	40.00	-0.01	1.97
-1	-0.29	40.00	-0.48	1.68
0	0.34	60.00	0.61	2.02
1	-0.72	40.00	-1.15	1.30
2	0.00	70.00	0.23	1.30
3	-0.13	40.00	0.06	1.17
4	-0.59	30.00	-0.76	0.59
5	0.50	70.00	0.71	1.09
6	-0.98	10.00	-1.74	0.10
7	-0.52	30.00	-0.80	-0.42
8	-0.95	30.00	-1.32	-1.37
9	-0.25	50.00	-0.19	-1.63
10	-0.55	40.00	-1.04	-2.18

Note: *Significant at 0.1 level. ** Significant at 0.05 level. *** Significant at 0.01 level.

The sample consists of 10 firms that make a second stock split during 1996-1999. Execution date is the day the split takes place, identified through the information supplied by the Madrid Stock Exchange.

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Resumen

Este trabajo analiza los determinantes que llevan a una empresa a realizar un desdoblamiento accionarial, así como los efectos riqueza asociados a su anuncio y realización. Los resultados sugieren que las empresas que realizan desdoblamientos tienen antes de la operación una cotización superior a la normal, consiguiéndose aumentos significativos tras el desdoblamiento en el número de transacciones y en el volumen por transacción. Además, se observan rentabilidades anormales positivas alrededor del día del anuncio y del día de realización del desdoblamiento, aunque en este último caso se anulan en las sesiones siguientes. Los resultados de este estudio sobre los determinantes de la decisión de realizar un desdoblamiento y la reacción del mercado de valores sugieren que, frente a otras explicaciones, resulta más determinante la hipótesis de liquidez en el mercado de capitales español.

Palabras clave: Desdoblamiento accionarial, señal, liquidez, estudio de acontecimientos.

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