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DEREGULATION, INSIDER TRADING AND TENDER OFFERS

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Abstract

This paper examines insider trading operations and the transmission of information to markets, during the merger and firm acquisition process, that followed the deregulation and restructuring of the Spanish electrical sector, who began in 1993 and is still under way in many countries of the European Union (Green Paper, 2001). In particular, we will study the events surrounding the 1996 acquisition of FECSA and Sevillana de Electricidad, two of the Spanish biggest electricity suppliers and distributors, by ENDESA, a formerly state owned company and the nation's largest power supplier

We use public trading records around the announcement date of the event to track abnormal returns, market volumes and spreads and to isolate individual transaction records by broker, from the flow of background trading, permitting the analysis of the market's reaction to the onset of informed trading. Because the insider information was not revealed to other market participants until the event, and even rumors of the acquisition were publicly and officially denied, this case presents a unique laboratory for studying the dissemination and incorporation of private inside information into market prices.

Unlike earlier studies that make use of daily transactions and concentrates on how informed trading affects stock prices, this paper also analyzes individual insider purchases within the trading day. We examine excess returns on the days of illegal insider trading and how this trading is conducted in terms of average trade volume, frequency of transactions, average spread and brokerage firm.

The findings reported in the paper shed some light in the process by which the market incorporates and infers information from insider trading in a case of industry restructuring. The relationship between insiders' purchases can be documented on a day-by-day basis, by trade, firm and broker, but we can't go beyond that information (i.e., naming the insiders) except in the few cases where a preliminary penalty file was opened and concluded, by the CNMV. Nevertheless, our results have a number of implications for models of market microstructure, as the reaction of prices to insider operations prior to the announcement day, the way insiders operate on average, with large and frequent limit and market orders and quick sales after the run-ups.

Keywords: Deregulation, Event studies, Industry restructuring, Insider trading, Mergers and Acquisitions, Tender offers.

1. Presentation

This paper examines insider trading operations and the transmission of information to markets, during the merger and firm acquisition process, that followed the deregulation and restructuring of the Spanish electrical sector, who began in 1993 and is still under way in many European Union country members (Green Paper, 2001). In particular, we will study the events surrounding the 1996 acquisition of FECSA and Sevillana de Electricidad, two of the Spanish biggest electricity suppliers and distributors, by ENDESA, a formerly state owned company and the nation's largest power supplier

We use public trading records around the announcement date of the event to track abnormal returns, market volumes and spreads and to isolate individual transaction records by broker, from the flow of background trading, permitting the analysis of the market's reaction to the onset of informed trading. Because the insider information was not revealed to other market participants until the event, and even rumors were publicly and officially denied, this case presents a unique laboratory for studying the dissemination and incorporation of private inside information into market prices in a case of industry restructuring.

The effects of mergers and acquisitions on firms share prices have been well documented and are one of the main test to be conducted on market efficiency. The announcement or the presence of rumors in the news media about an impending bid usually carries an informational effect on strategic changes and the financial and economic perspectives of bidding and target companies. Although unanticipated premiums and stock pre bid run ups will be highly dependent on bid prices related to accounting and estimated market values, it is also clear that changes in management or market power may also alter stock prices.

There is also a large body of literature that focuses on the stock-price effects of insider trading. For instance Jarrel and Poulsen (1989) asked whether the price run-up typically observed before tender offer in-play dates reflects illegal insider trading, or legitimate anticipation created by other sources, such as public news announcements regarding the potential takeover. They report that rumors in the news media concerning as potential bid and the bidders toehold stake are associated with a greater pre-in-play announcement price run-up, but illegal-insider-trading allegations are not correlated with this price run-up. Allegations of illegal insider trading are, however positively correlated with the abnormal return on the in-play date.

Although most the empirical evidence on mergers and acquisitions price run ups have been drawn on U.S. markets, and more recently on British firms, see for instance Higson y Elliott, 1993, there has been also some research in the last few years on Spanish companies (see among other Fernández Blanco and García Martín, 1995 and Ocaña, Peña and Robles, 1995). The eighties and late nineties have seen and acceleration of merger and acquisition process of firms in different sectors to whom the Spanish economy is not alien.

Before the implementation of the Stock Market Act of 1988 (Ley de Reforma del Mercado de Valores) there were very few recorded takeovers due to the lack of a clear regulatory framework. Nevertheless, among the operations which have drawn the public attention in the last few years, as well as the investigation of the Spanish regulatory bodies (CNMV),

we find some recent tender offers and takeover acquisitions, in particular the one of ENDESA on the stock of FECSA and Sevillana de Electricidad.

Unlike earlier studies that make use of daily transactions and concentrates on how informed trading affects stock prices, this paper also analyzes individual insider purchases within the trading day. This paper employs illegal insider trading detected by the CNMV to examine excess returns on the days of illegal insider trading and how this trading is conducted in terms of average trade volume, frequency of transactions, average spread and brokerage firm being used for the transactions.

2. Deregulation and restructuring of the Spanish electrical sector: The acquisition of FECSA and Sevillana de Electricidad by ENDESA.

Although this paper will focus the events surrounding the 1996 acquisition of FECSA and Sevillana de Electricidad, the background of the acquisition lies on the deregulation and restructuring of the European and Spanish electrical sectors.

The consequences of the deregulation process for the Spanish electrical system are mainly reflected in the so called, Reform of the Legal Framework (Reforma del Marco Legal Estable) of December 1993, and in the New Organization of the National Electrical System, which included the foundations of the regulatory and supervisory body the National Electric System Commission, in December 1994, both as part of the National Energy Plan (PEN) for the period 1991-1995, what included other energy sources (coal, oil, natural gas, nuclear power, etc.).

This plan (PEN) is part of the liberalization and restructuring process of the energy sector in the EU, for an harmonized legal framework to provide a suitable public service. The electrical sector has been for too long under the umbrella of the different Union member countries, with the consequence of high prices, inadequate interlink network and a market out of touch in prices, with the aim of reliable supply security. All this resulted in legal and fiscal barriers to access due to the opaque nature of the government aid and fiscal disorder, which is currently under study in the “Green Paper” (European Commission, December 2001).

As part of this process the Spanish authorities tried to consolidate the electrical sector in Spain, around two or three main groups led by ENDESA, Iberdrola and Union Fenosa, which will be able to compete in terms of size and assets with their counterparts in other European country members.

The events and companies involved in the process (i.e., Endesa, Iberdrola, Unión Fenosa, Fecsa, Cia. Sevillana de Electricidad, Hidrocantábrico, Eléctrica de Viesgo and Saltos del Nansa), are all related to the liberalization and deregulation European Energy Chart of December 1991, which established the principles and targets for a common system of production and distribution of energy (including electric supply) in Europe.

[See Figure 1]

The history of FECSA and Sevillana de Electricidad acquisition by ENDESA is drawn from publicly available documents filed by the CNMV (Comisión Nacional del Mercado de Valores), the Spanish equivalent of the Securities and Exchange Commission (SEC), that opened at the end of 1996 a case, that was settled in January 1999, including sanctions against the former President of FECSA and the Treasurer of ENDESA of 2 million pesetas each (€12.000), based on the operating trading profits of some of their sons (also sanctioned with 5 million pesetas -€30.000- each). The case against one of the major investment bankers (BBV), also involved in the operation was also settled, but the terms were undisclosed.

News of the impending acquisition were leaked by "Expansion" a nationwide leading economic journal on October 10, 1996, and by next day, the increase in ENDESA and FECSA stock price and the extraordinary rise in trading volume of some of the companies involved, had caught the attention of the financial community. Although the acquisition was immediately and publicly denied by the acquiring company ENDESA., one week later the operation was fully approved by the Spanish authorities.

On October 24 1996, the president of the board of the CNMV decided to clear the takeover proposal of ENDESA on FECSA and Sevillana de Electricidad. The acquisition bid on FECSA stock was for a maximum of 54,275,308 ordinary shares of a par value of 1,000 pesetas (€6.01) each, which represented a 26.02% of net equity shares, that in conjunction with those shares already in the hands of ENDESA made a 75% stake of ENDESA on FECSA's stock. The bid price was 1,100 pesetas (€6.61) a share.

In the case of Sevillana de Electricidad the offer was for a maximum of 106,085,007 ordinary shares and 40,205 new shares of 500 pesetas (€3) each, that represented a 35,68% of net equity shares. Including those shares already in the hands of ENDESA it represented a 75% stake of all equity of Sevillana de Electricidad. The bid price was of 1,300 pesetas (€7.81) for ordinary shares and 1,280 pesetas (€7.69) for the new shares.

The proposal, disclosed two takeover agreements between ENDESA and FECSA, in one side and ENDESA, Sevillana and SEPI (the State Organization for Industrial Privatisation) on the other, signed on October 16th and 17th. The agreements included the guarantee by the investment banker BBV.

In the following days, the CNMV opened an investigation over the alleged fraud for the use of insider information and violation of the securities' trading laws, which included several top executives of the acquiring company and a Spanish investment banker (BBV). The file, according with a press release on the CNMV President case deposition's in front of the Economic and Industry Commission of the Spanish Congress in February and June 1997, identified an "insiders map" of 450 "suspected" operations conducted between the period of September 23 and October 18, most of them under investigation.

During the last week of this period, the daily trade average volume of Sevillana's shares more than doubles, and the trading volume of FECSA was also multiplied by three. Prices for these shares went up by almost 4.5% and 6%, during this week.

[See Figure 2]

The President of the CNMV revealed in his presentation that this was a case of “asymmetric information” in a market where many traders and the supervisory body itself, trusted ENDESA’s incomplete and misleading information, regarding the impending acquisition of FECSA and Sevillana.

An important aspect of this data collection is that the revelation of the asymmetric information was an endogenous event. The CNMV required information about the acquisition event because of the abnormal increase in the price and volume of ENDESA, FECSA and Sevillana stock. Insiders, actively trading during those few days were able to collect huge returns on the information, while other traders who attempted to trade slowly to protect their information may have failed to obtain their desired quantity of shares because the unexpected announcement of the takeover.

As a result of the preliminary file, the CNMV proposed a sanction against the President and Financial Director of ENDESA which ended with a fine of 300 million pesetas (€1.8million) against the company. In the case of the investment banker BBV, the CNMV investigation concluded “the abusive use of trusted information and a break of the legal obligation to separate the roles of investment banker and broker, the so called *Chinese Walls*”, which allegedly reported 35 million pesetas (€210,355) of extra profits to the banker. The file also mentioned the banker’s CFO behavior and included a company’s preliminary fine of 80 million pesetas (€480,810).

3. The impact of the tender offer on share prices

3.1 Data and methodology

A straightforward way to investigate the relation between illegal insider trading and size of the takeover premia is to compare the average premia and stock price run-ups in the sample with detected illegal insider trading with the corresponding averages in the sample with no illegal detected insider trading. To measure premia, we calculate abnormal returns using standard event-study methodology. A conditional market-model regression (using a separate regression for each company in the takeover bid) provides estimates of the total takeover premium, and the pre-in-play price run up.

We use the event study methodology to examine the valuation effects of the tender offer on the securities involved. For each security i , the market model (1) is used to calculate a prediction error (e), or abnormal return (AR), for day t (2), using OLS estimates of the intercept α and slope β_m of the market model regression for all securities R_{it} .

$$R_{it} = \alpha + \beta_m * R_{mt} \quad (1)$$

$$AR = e_{it} = R_{it} - \bar{R}_i \quad (2)$$

Given the prediction errors from the market model, we assess the statistical significance of unexpected-event holding period returns for each sample. Our 180-day estimation period is from the beginning of the year, to 25 days before the announcement day ($t = 0$). For comparison purposes, we analyze a multiple-day-event holding periods during the thirty-day interval "pre- and post announcement period" from day $t = -25$ to day $t = +5$. The null hypothesis is that the sample average of market model prediction errors is equal to zero for a given event holding period.

To measure market model prediction errors over a specific time interval, we sum the prediction errors during the "window" period of 30 days (-25; +5). This method will allow us to track "insider" operations toehold and the possibility that tender offers announcements might have diffuse rather than immediate effects on shareholder returns. of 2 million pesetas each (12.000 €),

Our results also indicates that the presence of rumors in the news media concerning an impending bid is the strongest variable in explaining unanticipated premiums and pre-bid run-up for tender-offer targets.

We also conduct an statistical test on the average prediction errors on the basis of standardized prediction errors of returns, spread, aggregate volume and the number of transactions. Assuming that the individual prediction errors are cross-sectionally independent, we compound a Z-statistic test, which is asymptotically distributed unit normal under the hypothesis that the average standardized prediction errors equals zero.

The next step is usually to estimate the average abnormal return AAR_t of the different shares involved in the transaction:

$$AAR_t \equiv (1/N) \sum_{j=1}^N AR_{jt} \quad (3)$$

(where N is the number of firms involved in the sample), that is an estimate of the average cross-section error at each moment of the estimated interval. In our case, we do not intent to take averages as we are more interested in the behavior of investors and individual securities, N will, therefore, equal 1.

We calculate specific sub-intervals, (k_1, k_2) , out of the main interval (one month), where k_1 y k_2 are the number of days after the moment "insiders" start buying or selling shares, that is October 10 and 18, respectively.

$$CAR_{k_1 k_2} = \sum_{t=k_1}^{k_2} AR_t \quad (4)$$

Given the excess returns based on the method (2), the statistical significance of the event period excess returns is assessed for each period. We assume that in efficient markets, the CAR reflects the impact of information on share returns. If the estimated value of (4) is positive, this will be an indication of the use of insider information., that is the buying/selling of shares will increase/decrease the stock price and returns. That is, the cumulative absolute residual of the model in equation (4) is an estimator of the of the share price change due to the use of insider information. Nevertheless, we have to check the statistical significance of the period cumulative excess (abnormal) returns (CAR).

The null hypothesis to be tested is that the mean day ‘0’ excess return (e.g., the simple average of market model excess returns) is equal to zero, and thus concerns the average effect of an event on return to shareholders. The test statistic Z is the ratio of the day ‘0’ mean excess return less the mean excess returns (if not 0) to its estimated standard deviation; the mean and the standard deviation is estimated from the time-series of mean excess returns .

The statistical significance of the CAR in small samples, of either five to twenty securities, is not dramatically altered. The goodness of fit tests do not indicate misspecifications. However, the degree of skewness and kurtosis in the test statistics is higher for small samples, than for samples of 50. For example kurtosis is typically in excess of four (average 3) for samples of size five (in our case kurtosis for the sample of companies goes up to 4.7 in the case of FECSA). Thus, stated significance levels should not be taken literally (Brown and Warner, 1985).

To avoid this problem, we might use the statistic developed for small samples by Corrado (1989), which resembles a standard $N(0,1)$

$$S(AR_j) = \sqrt{\frac{1}{T_j} \sum_{t=1}^{T_j} \left[\frac{AR_{jt}}{\sqrt{n_t}} \right]^2} \quad (5)$$

where T_j is the number of AR observed for share “j”.

Be K_{jt} the range of abnormal returns of firm “j” in period “t”:

$$k_{jt} = Range \left[\frac{AR_{jt}}{\sqrt{n_t} S(AR_j)} \right] \quad (6)$$

The average range for company “j” is:

$$\bar{k}_j = \frac{1}{2} (T_j + 1) \quad (7)$$

and the standard deviation of the ranges of company “j” is:

$$\sigma^2(K_j) = \frac{(T_j^2 - 1)}{12} \quad (8)$$

Next we convert the ranges of (7) in following manner:

$$K_{jt}' = \frac{K_{jt} - \bar{K}_j}{\sigma(K_j)} \quad (9)$$

The statistic for moment t is:

$$r_t = \frac{1}{\sqrt{N}} \sum_{j=1}^N K_{jt}' \quad (10)$$

Distributed as a $N(0,1)$, under the null hypothesis.

Then the statistical significance of the $CAR_{k_1 k_2}$ will be :

$$r = \frac{\frac{1}{\sqrt{N}} \sum_{t=k_1}^{k_2} \sum_{j=1}^N K_{jt}'}{\sqrt{k_2 - k_1 + 1}} \quad (11)$$

As we may see in equation (1), before using the “event study” technique, we need a method to estimate “normal” or expected returns for each share, in the case of “no event”. There are, at least, five models that have been tested in different studies: the Market model, the Index model, Average returns model, CAPM model and control portfolio model. However, it is impossible to say which model is performing “better” in this context, since the true extent of abnormal returns is unknown.

In this case, we use the market model of equation (12), which implies a linear relation between the expected return of share “j” in period “t” and the expected return of the market portfolio (Ibex-35):

$$\bar{R}_{jt} = \alpha_j + \beta_j \bar{R}_{Mt} + e_{jt} \quad (12)$$

To get the parameters of the model, we estimate (12) by OLS, According with the specifications. Let \bar{R}_i be the simple average of security i’s daily returns in the (-205, -26) estimation period and R_{mt} is the return on the Ibex-35, Spanish capitalization market index for day t, and the excess return for each day (t) in the event period be:

$$e_{jt} = R_{jt} - E[R_{jt}] \quad (13)$$

where $E[R_{jt}] = \alpha_j + \beta_j R_{Mt}$, and α_j, β_j estimated values of equation (12).

3.2 Empirical evidence.

In our case, we will analyze the market behavior of the biggest electricity suppliers and distributors in Spain (Iberdrola, Unión Fenosa and Hidrocantábrico), compared with those more directly related with the group ENDESA:

Electricity suppliers	Share of ENDESA (1998)
FECSA	75 %
Sevillana de Electricidad	75 %
ENHER	91,4 %
E. Viesgo	87,6 %
Saltos del Nansa	85 %
ERZ	61,2 %
GESA	55,3 %
UNELCO	99,7 %
ENECO	100 %
NULENOR	50 %
ELCOGAS	37,9 %

Although, only the first seven firms are listed in the Madrid Stock Exchange and we will just study the first two (FECSA and Sevillana) that were involved in the ENDESA takeover, almost all of them registered abnormal trading volumes and price returns during the period considered (from the 10th to the 18th October).

To analyze abnormal returns and trading volumes by company and brokerage firm and the impact of "insiders", we will use different ways:

- 1) Calculating the abnormal returns (AR) of the firms involved in the acquisition process and adding them (CAR) to see how the inflow of information was incorporated to the securities' prices.
- 2) Observing stock price returns and volume run-ups and tracking the brokers involved in these operations during the days, abnormalities were detected.

4. The use of insider information.

A significant effort was spent tracking down the flow of insider information. The result of the investigation was a list of trades, identified by the time, firm and brokerage house through which the trade was cleared. **Table ?** tabulates this trading activity in summary form. There was an initial burst of information around September 20, an acceleration following the leak in the newspaper *Expansión* on October, 10 and a final jump about the time of the acquisition approval by the Spanish government on October 18.

The analysis assumes that all trades not made by the insiders were uninformed trades. It is critical to verify the soundness of this assumption to assess the impact of "insiders" on

securities' prices. There are several reasons for believing that there was not direct information leakage to other traders outside this identified group of individuals: First, our sample arose through the costly and extraordinary effort of the 1996 CNMV investigation file, that concluded in 1999, after all insider traders had been identified and fined. Second, we have also checked for evidence of direct leakage of information regarding the transactions. Our search was based in part on the paper by Jarrel and Poulson (1989) who discuss a variety of signs that an insider is in play. We were able to identify all individual transactions by time, frequency, volume and brokerage firm, to assess abnormal trades. Third, although we searched for news stories before that date in the general and economic press, only the newspaper *Expansión* informed on October 10, 1996 about the possibility of the acquisition of FECSA and Sevillana, by ENDESA, and even this news was officially denied by ENDESA in the following days. Fourth, the behavior of investors in ENDESA, FECSA and Sevillana during most of the time, is consistent also with the hypothesis that the tender offer was known only to a few insiders, who operated only in some specific times. This pattern supports the idea that the inside information resided with a small group of traders.

In contrast to the body of research on legal transactions, which support the idea that insider trading promotes quick price discovery which mitigates the incentive for many individuals to collect the same information, the study here concentrates exclusively on detected illegal-insider-trading data. For analysis of this case we will concentrate specifically on illegal insider trading, because the purpose of this paper is to investigate how such illegal insider trading might affect the takeover premiums. Thus, unless otherwise specified "insider trading" in this paper means "illegal insider trading".

Prior research (Meulbroek, 1992) shows that illegal insider trading has an immediate impact on price. The average abnormal return on an insider-trading day is 2.5%, for the takeover sub-sample in that paper. As we shall see, there is also an immediate price impact of insider trading in the sample used in this paper.

To determine whether illegal insider trading potentially induce more bids and bidders, this paper measures the total takeover premia through the last bid date. Also, because we have additional data on the dates of illegal insider trading as well as information about how the insider trading was detected, we can more precisely address the question of whether the positive correlation between illegal insider trading and takeover premia documented in this paper is consistent with the timing of the illegal insider trading.

4.1 Empirical evidence

The tables report two measures of the total premium which differ only in the number of days (T) prior to the in-play day date used in the regressions for the run-up variable. The regressions employ either a 15-day or a 25-day period prior to the in-play day to estimate the premium.

The analysis of returns is centered around three time periods: from the 1st of January to September 12th (180 days) to test the market model, from September 13th to October 18th, as pre-bid period (25 days observation window) and from October 18th to October 25th (5 days) as post-tender period.

The parameters of the equation estimated by OLS are unbiased and quite stable (we have tested several estimation periods for the model with similar results), due to the high liquidity of the shares involved. The values obtained for the firms involved, are as follows:

<i>Firm (j)</i>	α_j	β_j
ENDESA	0,001496	0,999655
Sevillana	0,002641	0,981614
FECSA	-0,00083	1,124584

We find a positive significant relation between insider trading and unanticipated premiums, opposite of the prediction that insider trading causes lower unanticipated premiums and more stock-price run-ups. Tables 3, 4 and 5 presents the results.

The paper also investigates the mechanism by which inside information becomes incorporated into the stock price. In addition to stock return data, we obtained data on daily trading volume from the Madrid Stock Exchange. The changes in the daily volume of shares traded before the announcement of the tender offer is a measure of unusual activity before the public announcement of a takeover. In general, stock volume is positively skewed (see, for example, Harris for a measure of the skewness of volume). To offset overstatement of volume changes caused by this skewness, all volume calculations use the natural logarithm of the daily volume.

Zero trading volume on a given day may indicate decisions by potential traders to not to buy or sell at the bid and ask prices or may reflect trading halts by the company or exchange. From the 180 days until twenty-five days before the bid, we assume that zero trading volume reflects no-trade decisions by potential traders and set log volume equal to zero. However, from twenty-five days before the bid to five days after, we assume zero volume results from a trading halt due to release of information and set zero volume equal to a missing value).

We compare the volume around the takeover bid to a “clean” period (from 180 days to twenty-five days before the announcement) in which no takeover news should have affected trading. The average daily log volume for each firm j over the clean period is:

$$\text{Mean log vol}_t \equiv (1/N) \sum_{j=1}^N \log \text{vol}_{jt} \quad (14)$$

$$\text{Mean log vol}_t \equiv (1/180) \sum_{j=-205}^{-25} \log \text{vol}_{jt} \quad (15)$$

Using the standard deviation of the mean log volume, $S(\text{Meanlogvol})$, we compute a z-statistic for log volume for each day t from twenty-five days before to after five days the bid announcement. The individual firm z-statistic equals:

$$Z - \text{Volume}_t \equiv (\log \text{Volume}_{jt}) - (\text{Meanvol}_t) / S(\text{Meanvol}_t) \quad (16)$$

Table 2 reports the mean z-statistic for the difference between the natural logarithm of daily volume in the event-period compared to the clean period for the companies involved in the offer of our sample. The portfolio z-statistic is significantly different from zero for most of the period reported, as seen in the table.

The insiders, according with our estimations, had a significant impact on the price, volume and liquidity on the acquiring and acquired firm shares, but in a way that is surprising in light of current theoretical models of the consequences of informed trading. Although the insider trading volume appears small relative to the total daily volume, the insider trading could supply the marginal volume necessary to produce abnormal returns. Insider purchases bid up the share prices, frequency and trading volume of ENDESA, FECSA and Sevillana, but they not lead to a widening of the bid-ask spread, as predicted by standard adverse selection models.

We attribute these seeming anomalous results to the presence of "noise traders". Noise traders, as distinct from "insiders" trade on the basis of what they believe, falsely, is special information. Often known as technical analysts these traders follow the trends in price and volume and their trades are consistent with the large rise of trade volume and the number of transactions, net of the insider trades, during the insider trading period. An examination of the insider trading volume by broker, also implies that both the amount traded by the insider trader and trade-specific characteristics, such as average trade size, direction, and frequency, signal the presence of an informed trader into the market.

The **column 2 in table 2** reports the number of days with individual z-statistic where daily volume is significantly greater than its historical mean at the 95 percent confidence level. This measure shows above-normal volume was experienced by a large proportion of these brokers in the days before the formal bids were announced. Ten days before the announcement of the bid, about 22 of the brokers in our data experience trading volume significantly different from the mean volume in the clean period at the 95% confidence level. Five days before the announcement date, the percent of firms with significantly different volume, has increased to about 33 percent. Not surprisingly, about 33 percent of the brokers have volume levels significantly greater than usual on the announcement date and the day after.

5. Summary and concluding remarks

This paper explores the effect of insider trading on takeover premia by analyzing premia in a takeover case with detected illegal insider trading. Takeover premia in this insider-trading case average nearly 22% .

This study presents data on stock prices and trading volume for the companies involved in takeover of FECSA and Sevillana by ENDESA in 1996. We examined how several factors, including insider trading, affect market activity in the presence of media speculation. Our results indicate that the presence of insiders, among rumors in the news media concerning an impending bid, is the strongest variable in explaining the unanticipated premium and bid run-up for the tender offer target companies.

We use the event study methodology to examine the valuation effects of the tender offer on the securities involved. For each security i , the market model (1) is used to calculate a prediction error (e), or abnormal return (AR), for day t (2), using OLS estimates of the intercept α and slope β_m of the market model regression for all securities R_{it} .

The regressions use daily-returns data starting 180 trading days before the in-play day and ending 5 days following the bid. The cumulative abnormal return over the T days prior to the pre-in-play date through the merger-completion date. The total premium is the sum of the run-up cumulative abnormal return from the in-play day through the merger-completion date.

We show that illegal insider trading has a significant immediate price impact. In the pre-play-date period, the average abnormal return on an insider-trading day was **???** versus **???** on a typical day with no insider trading. In the post-in-play-date period, the corresponding average daily returns were **???** versus **???**. Moreover, we report that the average-size of the abnormal returns on days with illegal insider trading is positively associated with the percentage of trading volume by insiders on those days.

The findings reported in the paper indicate that the process by which the market incorporates and infers information from insider trading is rather complicated. The relationship between insiders' purchases can be documented on a day-by-day basis, by trade and broker, but we can't go beyond that information (i.e., naming the insiders) except in the few cases where the CNMV opened a preliminary penalty file. Nevertheless, our results have a number of implications for models of market microstructure, as the reaction of prices to insider operations prior to the announcement day, the way insiders operate on average, with large and frequent limit and market orders and quick sales after the run-ups and the impact of insider trading on the average spread.

Noisy traders are also attracted by the informed trading, playing an important role in the increase of volume and frequency of transactions, but their average transaction is somewhat smaller and there is a time lag in their operations, which affects the returns in their operations. As a result of noise trading, insider information does not necessarily reduce liquidity or cause the bid-ask spread to widen, as predicted by standard adverse selection models. The significant effects of media speculation and of foothold acquisitions on unanticipated premiums and pre-bid run-ups are consistent with a legitimate market for information. They further imply that significant pre-bid market activity is consistent with little or no illegal insider trading. Our results thus indicate that aggregate run-ups statistics must be used cautiously as measures of illegal insider activity.

7. References

- Armitage, S. (1995); "Event study methods and evidence of their performance"; *Journal of Economic Surveys* 8; pp. 25-52
- Asquitz, P. (1983) "Merger Bids, Uncertainty and Stockholder Returns"; *Journal of Financial Economics* 11; pp. 51-83
- Belaire, J.; Contreras, D. and Perís, M. (1998); "Análisis de la desregulación sobre empresas del sector energético"; Congreso de Economía Industrial, Madrid.
- Bernard, V. L. (1987); "Cross-Sectional Dependence and Problems in Inference in Market-Based Accounting Research", *Journal of Accounting Research* 25/1; pp. 1-48
- Brown, S.J. & J. B. Warner (1980): "Measuring Security Price Performance"; *Journal of Financial Economics* 8; pp. 205-257; North-Holland.
- Brown, S.J. & J. B. Warner (1985); "Using Daily Stock Returns: The Case of Event Studies"; *Journal of Financial Economics* 14; pp. 3-31; North-Holland.
- Cornell, B and Sirri, E. R. (1992); "The reaction of investors and Stock Prices to Insider Trading"; *The Journal of Finance* 47/3; pp. 1031-1059
- Corrado, C. J. (1989); "A Non Parametric Test for Abnormal Security-Price Performance in Event Studies"; *Journal of Financial Economics* 23; pp. 385-395
- Dodd, P. and Ruback, R. (1977); "Tender Offers and Stockholder Returns: An empirical analysis", *Journal of Financial Economics* 5; pp. 351-373
- Dyckman, T.; Philbrick, D. and Jens, S. (1984) " A comparison of Event Study Methodologies Using Daily Stock Returns: A Simulation Approach"; *Journal of Accounting Research* 22 (supplement); pp.1-30
- Fernández Blanco; M. and García Martín, C.J. (1995); "El efecto de la publicación de una OPA sobre la rentabilidad de las acciones"; *Revista Española de Economía* 12/2; pp. 219-240
- Harris, L. (1986) "Cross-security Tests of the Mixture of Distributions Hypothesis," *Journal of Financial and Quantitative Analysis* 39.
- Higson, C. and Elliott, J. (1993); "The returns to Takeovers: The UK Evidence"; IFA Working Paper, pp. 173-193 (London Business School).
- Hirschey, M. and Zaina, J. K. (1989); "Insider Trading, Ownership Structure and the Market Assessment of Corporate Sell-Offs"; *The Journal of Finance* 44/4; pp. 971-980

-Jarrel, G.A. and Poulsen, A.B. (1989) "Stock Trading before the announcement of Tender Offers: Insider Trading or Market Anticipation", *Journal of Law Economics and Organization* 5/2, pp. 225-248

-Meulbroker, L.K. (1992); "An Empirical Analysis of Illegal Insider Trading", *The Journal of Finance* 47/5; pp.1655-1699

-Meulbroker, L.K. and Hart, C. (1997); "The Effect of Illegal Insider Trading on Takeover Premia" *European Finance Review* 1, pp. 51-80

-Ocaña, C.; Peña, J. I. and Robles, D. (1997); "Preliminary Evidence on Takeover Target Returns in Spain: A Note"; *Journal of Business Finance and Accounting*, 24(1); pp.145-153.

-Prabhala, N.R. (1997) "Conditional methods in Event Studies and an Equilibrium Justification for Standard Event-Study Procedures"; *The Review of Financial Studies* 10/1; pp. 1-38

-Seyjun, H. N. (1988) "The Information Content of aggregate Insider Trading", *Journal of Business* 61/1, pp. 1-23