EXPLAINING INSIDER TRADING IN THE SPANISH STOCK MARKET.

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Abstract: The profitability of insider trading has been deeply analysed in US markets. Beyond US borders, only countries such as UK, Greece, Norway and Spain have attempted to measure the profitability of insiders transactions, concluding in most cases, that insiders over-perform the market, thus, rejecting the strong-form market efficiency hypothesis. However, outside the Anglo-Saxon literature, there is not much evidence on the factors that help to explain which are the reasons behind that profitability, and how firms and regulators allow that to happen. For this reason, the present paper analyses the profitability of insider trading and the variables which explain this profitability, choosing for that purpose the Spanish stock market. An examination of our findings show that the explanatory factors of insider trading in the Spanish markets mainly agree with those obtained for other markets, although we have incorporated new variables, not previously tested in this context. In brief, there are three main relevant factors: the timing ability of the insider, the transparency of the transaction and the level of free cash flow of the firm. The level of ownership concentration, the spread and the interaction between the transaction size and the transparency of the transaction are other relevant variables, some of them tested for the first time in the insider trading literature.

1.- INTRODUCTION

Despite the outstanding relevance of the research on the effects of information asymmetries and insider trading on capital markets, a unified theory to model insider trading does not yet exist. Somehow, financial theory has gradually incorporated the effects of information asymmetries into its models, highlighting the relevant implications that they have on the economic theory of firms and others, such as the transaction costs theory, the property rights theory or the agency theory. Furthermore, we should also consider the interrelations between asymmetric information and some information-based economic

theories such as the economic theory of uncertainty, the information economics or the asymmetric information paradigm.

Thus, any study attempting to model the causes or consequences of the level of asymmetric information existing in a stock market should ultimately apply to most of these theories, which describe concepts such as the uncertainty in the decision-making process, the potential occurrence of opportunistic behaviours, their effects on price formation and asset valuation, or the everlasting conflict of interest between managers and shareholders.

In addition, the investigation of insider trading comprises a large group of empirical studies which have tried to move further in the formulation of an insider trading theory by analysing its interrelation with the aforementioned theories. The outcome is the selection of a large group of explanatory factors which varies from firm's size or the type of insider to other factors related to agency/control issues or to measures of information asymmetries.

Since the pioneer studies of Jaffe (1974a,b) and Finnerty (1976a), the profitability of insider trading has been deeply analysed in US markets. Beyond US borders, only countries such as UK (Pope and Inyangete, 1992; Friederich, Gregory, Matatko and Tonos, 2002), Norway (Eckbo and Smith, 1998), Spain (Del Brio, Miguel and Perote, 2002), Greece (Georgakopoulos, 2003), Germany (Kling, 2003) and Mexico (Bhattacharya, Daouk, Jorgenson and Kehr, 2000) have attempted to measure the profitability of insiders transactions, concluding in most cases, that insiders over-perform the market, thus, rejecting the strong-form market efficiency hypothesis. More recently, Due and Wei (2004) have revised the relationship between market volatility and insider trading for a large list of countries whose data on insider trading is available at the Morgan Stanley Capital International database (see their technical appendix for further information).

Nevertheless, the number of studies decreases when referring to modelling insider trading. Apart from the New York Stock Exchange (NYSE), we find studies in the Toronto Stock Exchange (Basel and Stein, 1979; Fowler and Rorke, 1984) or the London Stock Exchange (LSE) (Friederich, Gregory, Matatko and Tonos, 2002). The difficulties found to identify the exact type and the quality of information accessible by each trader in the stock markets have also motivated the use of experimental markets (Marsden and Tung, 1999), although this line of research has not advanced much in the financial literature. The present paper joins the second group of papers and analyses the profitability of insider trading and

the variables which explain this profitability, locating the investigation in the Spanish stock market.

The selection of the Spanish market for this study is due to the fact that insider trading has not been much studied for continental-structured markets, such as the Spanish one. Besides, it represents a medium-size market which, despite the huge changes suffered in the 90's, cannot yet be considered as one of the biggest European markets, although has some other peculiarities, as being the door to European markets used by the Latinamerican markets, via the Latibex. The fact that a previous study by Del Brio, Miguel and Perote (2002) stated that it is not strong-form efficient made it clear the need to go further in the study. Other characteristics, such as the different pattern of Spanish firms' equity ownership structure (more concentrated), scarcely developed market for directors and takeovers or less liquid stock markets enhance this research.

In Spain, similarly to many other European countries, the development of the insider trading literature has been very scarce. There are some timely studies such as that of Estrada (1994), which develops a model of insider trading considering different levels of regulation, and the abovementioned paper by Del Brio, Miguel and Perote (2002) testing the strong-form market efficiency hypothesis. As to the rest, we can only mention some studies on the effects of information asymmetries in our stock markets mainly developed under the assumptions of the asymmetric information paradigm rather than in the insider trading context (Rubio and Tapia, 1996; Tapia, 1996). The present paper investigates which factors explain the behaviour of Spanish insiders and their profitability and compares the results for the Spanish case with those obtained in other foreign markets.

As far as we know, this is the first work to analyse the behaviour of insider trading and its explanatory factors in the Spanish stock market. To achieve this goal we first measured the daily returns obtained by insiders in their personal transactions with their own firms' shares –which will be the proxy for the intensiveness of insider trading and also the dependent variable in our model. To calculate these returns, we followed Del Brio, Miguel and Perote (2002) and performed an event study in which the event in analysis is any transaction realised by an insider with their own firms' shares. Once the returns were obtained, the next step consisted of analysing their explanatory factors, which we split into three groups: those related with (i) control/agency issues, (ii) measures of asymmetric

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information, and (iii) managerial issues.

Our results point out that the insider trading profitability is explained by six main factors: the timing ability of the insider, the transaction is performed by a nominee rather than by a primary insider, and the level of free cash flow. The level of ownership concentration, the interaction between the transaction size and the transparency of the transaction and the spread also affect, but less significantly, insider trading profits.

The rest of the paper is distributed as follows: Section 2 outlines the literature on the factors explaining insider trading behaviour; Section 3 identifies those factors affecting insider trading in the Spanish stock market; Section 4 describes both the sample and methodology, and Section 5 displays the results obtained. Finally, Section 6 summarises the main conclusions.

2.- REVIEW OF THE INSIDER TRADING LITERATURE

The level of development of insider trading models in the Anglo-Saxon context has been quite fruitful, mainly owing to the US contributions. The implementation of more robust theories on the effects of private information and the implementation of new asset valuation models has done much to help for the progress of the research on insider trading. The asymmetric information paradigm has been crucial for the study on how the market is affected by the concurrence among investors having different levels of information, and to gauge the level of liquidity and depth of our markets. On the other hand, modified versions of the market model –by incorporation of GARCH effects (Engle, 1982)- and other modifications of the event study methodology (Bhattacharya, Daouk, Jorgenson and Kehr, 2000) have enabled the study of insider trading, even providing market model variations specifically designed for multi-event studies such as those of insider trading (Del Brio, Miguel and Perote, 2002).

In any case, other abovementioned financial theories have played a substantial role in this context. Regarding the agency/control theory, its main interrelation with insider trading literature refers to the problems of over and underinvestment and other opportunistic behaviours derived from excessive manager discretionality, as established in the free cash flow theory by Jensen (1986). Overall, the interest lies in gauging whether the access to private relevant corporate information is related to the insiders' rank within the

firm (that is, the hierarchy) or if it is due to the insider's proximity to strategic decisions, or finally if it may be due to the participation of the insiders in the firm's capital (large shareholders). In fact, within the economics of the firm, different authors have tried to explain the influence of CEOs on the firm's future: their rank in the negotiation process (Cyert and March, 1963), their capacity to make contracts (Alchian and Demsetz, 1972) and their control of price information (Pfeffer and Salancik, 1978). Other studies on the insiders' influence corresponds to Basel and Stein (1979) and Jordan (1999), in their attempt to describe the true behaviour of banking executives. Therefore, the effectiveness of the control mechanisms existing in the firm becomes a determinant factor to refraining insiders from opportunistic behaviour.

Among the external control mechanisms, the effects of takeovers is clear-cut (Holderness and Sheehan, 1985; Seyhun, 1990; Eyssell and Arshadi, 1993), but this mechanism does not apply to the Spanish case where the number of takeovers is certainly minor and certainly less relevant. Therefore, from our perspective, it is more effective to discuss the insider trading relationship with other control mechanisms, such as ownership and capital structures. In this sense, it is noteworthy to recall Demsetz's (1986) paper when he considers that measuring insider trading profitability should produce an incentive to keep the ownership structure within control levels (also stated by Wruck, 1989, and Seyhun, 1990). However, recent findings by Gedajlovic and Shapiro (1998), and Pindado, Miguel and De la Torre (2004) for the Spanish market, indicate that higher levels of ownership concentration do not always allow monitoring directors. On the contrary, at high levels of ownership concentration directors are entrenched and therefore are able to expropriate rents from the firm. Regarding debt, it does not only subject the firm to the stock markets' discipline but it also may be employed to reduce the free cash flow, thus reducing the shareholders/managers conflicts of interest and the asymmetric distribution of information within the firm. Other control mechanisms defined under the agency theory, are the combined effect of debt and dividends (Finnerty, 1976b) and institutional shareholdings (Agrawal and Mandelker, 1990).

Finally, different authors have also consider that firm size and the number of financial analysts collecting data on a particular firm may be considered as good proxies for external control mechanisms. The use of firm size could be justified in two senses: (i) the

smaller the firm, the less the volume of public information collected by financial analysts and investors in general (Banz, 1991) or (ii) due to the complexity of the organization structure, measured as the number of subsidiaries. However, more emphasis should be placed on the number of financial analysts that collect information about the firm, variable that has its own role beyond the consideration of firm size (as in Chakravarty and McConnell, 1999; Muradoglu and Yazici, 2002). Similar measures are the number of times that the firm's name comes up either mass media (Lee, 1992) or the effects of the information published on the WSJ's insider trading spotlight column considered by Chang and Suk (1998).

The signalling theory also has a role to play with regards to the research on insider trading. In fact, insider trading may also help to reduce informational asymmetries when managers use it as an informative signal. Signalling theories have brought to light the need to prevent managers from timing their corporate decisions depending on their own insider trading (Penman, 1982; Gombola, Lee and Liu, 1999; Webb, 1999), but also by focusing on the positive effects of insider trading as in Walsh (1999) and Barclay and Dunbar (1996) where directors dealings signal to the market a firm's growth expectations, highlighting the fact that a mere change in the insider participation in a firm's capital may be considered a signal itself, as also noted by John and Lang (1991) and Niehaus and Roth (1999).

The asymmetric information paradigm also considers the existence of control mechanisms, although in this case they are associated with the stock markets, rather than with the firm itself. Consequently, one of the most commonly used variables is that of shares turnover (Stoll, 1989), the market where the firm is listed (Jain and Mirman, 2000) or the level of regulation and control set by the supervisory stock market commissions in different countries (Arshadi and Eyssell, 1991). Furthermore, there are other market features that may affect the level of information asymmetry and thus the profitability of insider trading, that is, market liquidity and depth (Cornell and Sirri, 1992; Gammill, Sirri and Fleming, 1992), transaction cots (Barclay and Dunbar, 1996; Friederich, Gregory, Matatko and Tonos, 2002), the cost of capital (Amihud and Mendelson, 1986; Aboody, Hughes and Liu, 2003) and market volatility (Due and Wei, 2004) or systematic risk (Eckbo and Smith, 1998). In this sense, the main contributions to the knowledge of the effects of market structures on insider trading come together with studies in market microstructure and the asymmetric

information paradigm. An essential variable is thus the bid-ask spread (Friederich, Gregory, Matatko and Tonos, 2002; Tapia, 1996, and Ibañez and Garcia, 2002, for the Spanish market).

But when modelling insider trading, the characteristics of the transaction itself should also be considered: the transaction size (Jaffe, 1974a), the moment of the day or the transaction costs, the sign of the transaction (that is, an acquisition or a sale), the number of trades realised in the same period (single insider versus multiple insider, as in Madura and Wiant, 1995) or the intensiveness of insider trading as measured by (i) the intensive criterion defined by Lorie and Neiderhoffer (1968) and Pratt and DeVere (1979) and widely spread in the insider trading literature (and measured as the superiority of the number of sales versus purchases, or vice versa) or (ii) the total volume of shares traded by an insider in a particular period (Karpoff and Lee, 1991).

One of the most commonly used variables in the insider investigation is the sign of the insider transaction, that is, whether insiders undertake purchases or sales of their own firms' shares. In the Anglo-Saxon context, the expected relationship with insider trading profitability is traditionally a positive one (Rozeff and Zaman, 1988; Madura and Wiant, 1995), the reason being that insider purchases are mainly motivated by the possession of private information, while sales can be motivated by many other reasons such as liquidity or tax-reduction reasons. However, the only evidence so far obtained for the Spanish market (Del Brio, Miguel and Perote, 2002) points out that sales are more informative than purchases – in line with the results by Eckbo and Smith (1998) for the Norwegian market-but their information content is not immediately released to the market. Consequently, no higher abnormal returns are expected for either sales or purchases on the day of the insider transaction for Spanish market, but only a higher post-event reaction by outsiders mimicking insiders.

Some institutional aspects have also been considered when modelling insider trading, such as the enforcement level of insider trading regulation, the level of prosecution of insider trading either from financial or judicial institutions, as brilliantly set out by Meulbroek (1992), Arshadi (1998), John and Narayanan (1997) and Chakravarty and McConnell (1997, 1999) who cast doubt on the role of regulators when preventing insider trading. Furthermore, for the US markets, Trivoli (1980) and Jain and Mirman (2002) also

distinguish between the market where firms are listed, considering that different market structures also affect insider trading. For instance, there is usually more public information available for firms listed in the NYSE than for those listed in other markets, such as the AMEX; furthermore, there are usually more articles about the former published in newspapers like the *Wall Street Journal.* Similarly, Garfinkel and Nimalendran (2003) distinguish different insider behaviour among NYSE and NASDAQ firms.

Finally, recent papers have incorporated new variables into the research on insider trading. Aboody and Lev (2000) find that firms with high research and development expenditure have higher information asymmetric and higher associated insider gains that firms that do not, thus considering R&D expenditure intensity as an accounting-related measure of insider trading. Similarly, Khang and King (2002) use the average ratio of R&D expense to sales over the previous five years as a proxy for insider trading. Aboody, Hughes and Liu (2003), in turn, use earnings quality as a broader measure of insider trading.

In any case, there is a basic assumption underlying all these theories, the assumption that superior information allows higher stock returns (Veronesi, 2000). This allows us to consider insiders' returns as an appropriate measure of the insider trading existing within a stock market. Iqbal and Shetty (2002) go further and explore the causality between insider trades and present and future stock markets. In this sense, several authors have tried to gauge whether those higher returns are only due to a better predictive capacity on the side of the insiders (Lorie and Neiderhoffer, 1968).

3. MODEL OF INSIDER TRADING BEHAVIOUR

Closely following prior studies on the behaviour of insiders trading on stock markets, our aim is to analyse insider trading in the Spanish markets, its profitability and its explanatory factors. Nevertheless, we should first clarify the definition of insider in the Spanish legislation, which differs from that of the States and some other countries. The directors required by law to report their transactions to the Spanish supervisory commission are a firm's president, vice-president, executive and non-executive directors, corporate officers, managing directors, and any other member of the firm having a post of any responsibility within the firm. It also comprises a group of large shareholders which are likely to affect a firm's decision-making process owing to their high participation in the

capital of the firm. So far, the definition is the same as in other countries, but regarding large shareholders, the Spanish commission required any shareholder in possession of a participation of at least 5% of a firm's capital to report their transactions. In other contexts, a large shareholder required to report his transaction should possess at least 10% of a firm's capital.

To analysing the explanatory factors, we first split them into three groups: those related with (i) control/agency issues, (ii) measures of asymmetric information, and (iii) managerial issues.

(i) Hypotheses related to control/agency issues:

Hypothesis one: the less the ownership concentration in the firm, the greater the expected abnormal return in insider trades.

As stated in Section 3, financial literature traditionally expects an inverse relationship between ownership concentration and abnormal returns obtained by insiders, since shareholders of highly diffuse ownership concentration firms have less incentive to control managers owing to the high supervisory costs, which produces a less effective control over insiders. Therefore, a diffuse ownership concentration encourages bigger information asymmetries. Therefore, we constructed the variable OWN; among the different measurements found in the literature, we selected the percentage of outstanding shares possessed by the five largest shareholders, as in Agrawal and Mandelker (1990). Therefore, a negative relationship is expected among both variables.

Hypothesis two: the higher a firm's free cash flow, the higher the expected profitability of the insider trade.

Although, it has not yet been tested in the literature on insider trading, a firm's free cash flow (hereafter FCF) is a basic measure of the level of discretionality allowed by a firm to its managers. Its explanation lies on the fact that the larger the FCF left to the arbitrary use of managers, the greater the information asymmetry will be, since there will not be sufficient controls to monitor managers and align their interests to those of shareholders. We chose FCF from among other proxies for managers' discretionality such as the debt ratio

or dividend payout in the belief that both of them are subrogates to FCF, considering that their role as control mechanisms depends on how much one or the other reduces the level of free cash flow left to the discretionality of managers. Therefore, a positive relationship is expected between the level of free cash flow allowed by the firm and the inside trades' profitability. Among the various measures of FCF shown in the literature, we chose that of Miguel and Pindado (2001), which –in line with Lang, Stulz and Walking (1991) and McLaughlin, Safieddine and Vasudevan (1996)- measures FCF jointly with the growth opportunities of the firm (as measured by Tobin's q) in a way that guarantees the effective availability of the free cash flows.

(ii) Hypotheses related to measures of asymmetric information:

Hypothesis three: the larger the bid-ask spread in a market, the higher the insiders' expected profitability.

The degree of information asymmetry existing in a market is crucial in analysing insider trading. In fact, the bigger the information asymmetry, the higher the probability of trading with an insider. For this reason, we should control bid-ask spreads, since when the level of private information in a market is high, market makers increase the bid-ask spread so as to be compensated for the risk of trading with an insider (Cornell and Sirri, 1992; Gammill, Sirri and Fleming, 1992). Therefore, a positive relationship is expected between bid-ask spreads and insiders' abnormal returns. To measure bid-ask spreads we constructed the variable SPREAD following Blanco (1997).

Hypothesis four: The less transparent the transaction is, the greater the expected profitability of the insider trade.

As noted by Del Brio, Miguel and Perote (2002), the pattern of insider behaviour may vary when the inside transaction is not directly undertaken by the insider him/herself but through a third person, also called a nominee. In other words, we may distinguish whether the insider reporting the transaction has performed it on his own behalf or on behalf of a third person, who is the true insider. To measure how insiders gains varies from one group to another, we constructed the variable NOMINEE, a dichotomous variable that

takes the value of 1 when the transaction is carried out in insider's own name, and 0 when is carried out by a nominee. According to the aforementioned paper, a negative relationship between the two variables is expected, since insiders expecting high returns may prefer a third person to report the transaction in order to better camouflage the transaction.

Hypothesis five: the bigger the volume traded by the insider on his own behalf, the greater his profitability.

Traditionally, transaction size is taken as a good indicator of the transaction' information content. However, no consensus exits regarding the expected sign of this relationship. Many authors, such as Easley and O'Hara (1987), Larcker and Lys (1987) or Eckbo and Smith (1998), expect a positive relationship since they consider that when an insider possesses high valuable information he will try to maximise his profits in each transaction, and thus he will make a large transaction. However, authors such as Marshall (1974) and even Easley and O'Hara in a later work, 1992, provide evidence on the side of a negative relationship between transaction size and asymmetric information since they believe that it will be easier for an insider to camouflage private-information-based transactions by making small transactions which are not so well detected by the market. More recently, Garfinkel and Nimalendran (2003) conclude that US insiders prefer medium-size transactions when trading on private information.

Therefore, a positive relationship between transaction size and insiders' profitability should be expected for the Spanish market when an insider trades on his own behalf. However, the relationship is not that clear when insiders attempt to camouflage the trading, not only delegating the trading to a third person or nominee, but also by trading smaller quantities. For this reason, we decided to specify a new hypothesis which relates the size of the transaction with its degree of transparency, proxied by the variable NOMINEE, as stated above. To proxy transaction size, we constructed the variable TSIZE, measured as the percentage of capital traded by the insider in a particular transaction. Therefore, we test whether the interaction TSIZE*NOMINEE is positively related to insiders' abnormal performance.

(iii) Hypotheses related to managerial issues:

Hypothesis six: a greater timing capacity by managers is followed by larger abnormal returns in insider trades.

Another outstanding feature regarding insider trading is the capacity of managers to time their trading. Penman (1992) already noticed that insiders may time their transaction around several corporate announcements either to benefit from their trading or just to send proper signals to the market as in Walsh (1999). Since the major corporate events were filtered from the sample, we are not analysing how insiders time their trading around their main corporate decisions. On the contrary, we are more closed to Jaffe's (1974) assertion who stated that insiders tend to time their sales prior to prices decreases and time their purchases prior to increases in prices. Therefore, we constructed a variable measuring the insiders' forecasting ability, called TIMING, which is determined by the insiders' ability to obtain higher than the average returns just before unexpected price changes. To account for it, we construct a binary variable that takes the value of 1 when insiders buy their own firm' shares prior to an abnormal unexpected increase in average prices or sell their own firm' shares prior to an abnormal unexpected decrease in average prices, and 0 otherwise. The expected relationship between TIMING and abnormal returns is positive since any insider who is able to anticipate future prices will obtain larger than average returns.

Hypothesis seven: the greater the access to private information, the greater the profitability of the insider trades.

Within the financial literature many variables have been employed to proxy the insider's access to private corporate information. We consider two different ones in our analysis: (i) the insider's position within a firm's hierarchy and (ii) his/her participation in the capital of the firm prior to the inside transaction. The need to include both variables comes from the fact that is difficult to gauge which variable determines the insider's access to private information: his/her participation in the firm' s capital, his/her belonging to the highest post in the management of the firm or the combination of both variables.

According to Holderness and Sheeham (1985) and Agrawal and Mandelker (1990), a positive relationship is expected between the participation in the capital of the firm and

the access to private information. However, rather than considering only that the mere possession of an important packet of shares is enough to be involved in the decision-making process, we control for the position that the insider occupy within the firm. Therefore, we constructed two variables: TYPE proxies the position of the insider within the firm's hierarchy, and is a binary variable that takes the value of 1 when the investor is a corporate officer, and 0 when the investor is a large shareholder without any position of responsibility within the firm's organizational structure. PARTI is measured as the percentage of outstanding shares possessed by the insider in the period prior to the transaction. We then created the variable TYPE*PARTI which combines both variables and thus measures the participation of insiders in the firm's capital according to their position in the firm. A positive direct relationship is then expected between TYPE*PARTI and insiders gains.

Among all these hypotheses, two are being tested for the first time in the insider trading literature: that of the level of free cash flow and the transparency of the transaction, measured by whether insiders trade on their own names or delegate the trading to a third person. The interactive variables $TSIZE_{it}*NOMINEE_{it}$ and $TYPE_{it*}PARTI_{it}$ also appear for the first time in the insider literature. The selected variables together with the proxies used in the paper are shown in Table 1. The model to be tested is then described by the multiple regression model shown in equation (1).

$$AR_{it} = \beta_0 + \beta_1\ OWN_{it} + \beta_2\ FCF_{it} + \beta_3\ SPREAD_{it} + \beta_4\ NOMINEE_{it} + \beta_5\ TSIZE_{it}*NOMINEE_{it} + \beta_6$$
$$TIMING_{it} + \beta_7\ TYPE_{it*}PARTI_{it} + U_{it} \tag{1}$$

where AR_{it} stands for the average abnormal return obtained by insiders in their transactions on day t, where t stands for the day 0 in an event studies, β_0 is the intercept and β_1-β_7 are the regression coefficients.

4. SAMPLE AND METHODOLOGY

Like the SEC, the CNMV (Comision Nacional del Mercado de Valores, or the Spanish supervisory commission for the stock market, hereafter CNMV) requires officers, directors, and large shareholders of all publicly held firms to report all their transactions in their firms' stocks. Unlike the SEC, the CNMV requires insiders to report their trading

within the fifteen days following the trade. As from that moment, the files remitted by the insider are available to the public. Among other personal and transaction-specific data, insiders are required to report the date of the insider transaction, the sign (purchase or sale) and the amount traded. This information allows us to use daily data for non-illegal insider transactions. Therefore, our sample consists of daily insider trading data collected from the Daily Historical Records of Insiders' Transactions, compiled for this study by the Department of Studies of the CNMV. The Interim Financial Reports for all quoted Spanish firms, published by the CNMV, the historical records of average daily prices, number of transactions and bid-ask spreads were obtained from the Sociedad de Bolsas. Records of daily stock prices for the Spanish continuous market (SIBE) were obtained from the Daily Bulletin of the Madrid Stock Exchange (MSE), and the data to control for confounding events were taken from the Daily Records of Relevant Events as published on its website by the CNMV.

The period of study was from January 1992 to June 1997, and the firms selected were all non-financial firms listed on the Spanish continuous market (SIBE). The presence of incomplete and missing data in the databases provoked a substantial reduction in the sample size. In total, 483 insider trades from 51 firms were analysed; 303 purchases and 180 sales. The breakdown by type of insider was 208 transactions carried out by corporate insiders and 275 by large shareholders. Most of the transactions were undertaken by the insider him/herself (427) and on 56 occasions the transactions were reported by nominees. The main descriptive statistics for the variables employed are shown in Table 2.

Prior to hypothesis testing, it was necessary to construct the dependent variable in the model, that is, the abnormal returns obtained (if that is the case) by insiders in their trading with their own firm's shares. To construct this variable, we applied the methodology of event studies. Hence, we tested whether abnormal returns on an insider trading day (or day 0) and the surrounding period are significantly different from zero.

To properly perform an event study, sample announcements had to satisfy three major screening criteria. Firstly, to ensure that our sample consisted only of insider transactions motivated by the possession of private information, we dropped from the sample any transaction made for non-informational reasons. We thus eliminated transactions made as a consequence of inheritances, gifts, bonuses, acquisitions or disposals

by conversion or exchange and excise of options and rights. Information on the motivation of insider trading was also extracted from the insiders' files remitted to the CNMV, where the insiders themselves report the reasons for their trading. Secondly, in an attempt to adequately isolate the event, we chose estimation periods that were not affected by any other firm-related event, any other insider trade, or any other prediction period. That made it necessary to separate out confounding effects on the one hand, and to exclude from the sample all those transactions that were not separated by a 5-month period, on the other. In order to separate out confounding events, we eliminated all the insider trades concurrent with a relevant firm-related event: mergers and take-overs, outstanding investment and divestment announcements, exclusions from negotiation, equity issues and dividend payoffs on days (-3,+3) as in Markides (1992), along with bankruptcies and firms dissolutions. Finally, in order to reduce the influence of asynchronous trading, we demanded a minimum quoting rate of forty-seven out of the eighty days in the estimation period.

Regarding the measurement of abnormal returns, prediction errors were calculated by subtracting expected or "normal" returns from current returns. Current returns were constructed as the logarithmic conversions of returns adjusted by dividends and subscription rights. To adequately calculate the aggregated returns, and recalling that insiders obtain abnormal returns if stock prices rise abnormally after their purchase or if prices decline abnormally after their sale, we followed Seyhun's (1986) criterion and multiplied excess returns for insiders' sales by -1 for the purpose of aggregation. Since databases on self-reported insider trading do not contain the transaction price, we used closing prices, thus reinforcing the need to adequately estimate the volatility in each period by a conditional autoregressive model. To measure normal or expected returns, defined as the returns that would be expected if the insider had not possessed private information, we used the constrained-ARCH or CARCH market model defined by Del Brio, Miguel and Perote (2002) for event studies testing insider trading. The model modifies the MM by incorporating an accurate measure of volatility through a GARCH model that also accounts for some specific characteristics of our study (i.e., large sample size, unknown transaction prices and relatively short estimation periods). Therefore, abnormal returns (AR_{it}) are defined as in equation (2)

$$AR_{it} = u_{it} = R_{it} - E(R_{it}) \tag{2}$$

where u_{it} stands for a random variable distributed as a $N(0, \sigma_{it}^2)$, where σ_{it}^2 follows the CARCH process described in equation (3)

$$\sigma_{it}^2 = \alpha_{i0} + \alpha_{i1} \sum_{j=1}^{20} u_{it-j}^2 \text{, where } \alpha_{i0} \geq 0 \text{ and } 0 \leq \alpha_{i1} \leq 1 \tag{3}$$

R_{it} stands for the observed return of asset i in period t; $E(R_{it})$ stands for the expected return for event i in period t measured by using the market model $E(R_{it}) = \alpha_i + \beta_i R_{mt}$, where R_{mt} stands for the market portfolio return –proxied by the IBEX35 index; finally, α_i and β_i are the parameters of the model.

For hypothesis testing purposes, the standardised test of Dodd and Warner (1983) was modified. The test was modified to fit the CARCH model following Del Brio, Miguel and Perote (2002). In this study we take an estimation period of eighty days (-90, -10), and an event period equal to (-10, +10). The results obtained in the event study show abnormal returns significant only on day 0 or the event date, at 1% confidence level. Abnormal returns, as well as the corresponding W-statistics are shown in Table 3 for each day on the event period. Therefore, the measure of profitability of insider trades thus obtained is used as the dependent variable of the model shown in equation (1). Since the available data on insider trading is cross-sectional, we used an OLS multiple regression as the testing methodology.

5. RESULTS.

Table 4 displays the results for the estimation of Model (1). As can be seen, six out of the eight variables in the model are found to be significant and therefore help to explain the insiders' behaviour in the Spanish market. TIMING, NOMINEE and FCF are significant at the 1% level, while OWN and TSIZE*NOMINEE are significant at 5% level. Less significant when explaining insider profitability is the variable SPREAD which is scarcely significant at the 10% level. The only non-significant variable is, thus, the variable TYPE*PARTI (although close to 10% significance level). We may then conclude that corporate insiders possessing a bigger participation on the firm's capital are not able to obtain greater profits, reason why we may conclude that insiders gains depend neither on his participation on the firm nor on their position in its hierarchy. Moreover, although no displayed in the paper, we did not

obtain evidence supporting that the bigger their participation, large shareholders without a position of responsibility within the firm may neither obtain bigger returns.

Focusing on the variables that are significant in our model, TIMING (insiders' capacity to timing their sales before prices decreases and their purchases prior to prices increases) is the main explanatory variable, drawing a positive, significant relationship at 1% level, corroborating that large abnormal returns can be obtained when the private information allows the insider to anticipate market movements and time his trading. This relationship could, however, be seen as tautological since large returns can always be obtained if we anticipate future prices -regardless of whether it is due to the possession of private information. However, the high number of cases where the variable TIMING takes the value of 1, makes us think that the insiders' forecasting capacities are due to their potential access to private information. Similar results were obtained by Iqbal and Shetty (2002) for US markets.

The second variable, in order of significance, is the transparency of the transaction (NOMINEE), or in a negative sense, the anonymity or confidentiality of the transaction. Our results make clear that insiders are attempting to camouflage their transactions from either the general public or from the control of the supervisory stock market commission. Regression coefficients indicate a clear negative relationship between transparency and profitability; transactions reported by nominees rather than by the insiders themselves are usually much more profitable (although it is also true that the number of transactions undertaken by nominees is quite small).

Regarding the variable TSIZE*NOMINEE, although the impact of the transaction size has previously been analysed in the literature, its combination with the transparency of the transaction had not been studied yet. Our findings support somehow previous evidence by authors such as Seyhun (1986) and Eckbo and Smith (1998) who find that insiders prefer large size transactions for the sake of maximizing the profit any time they possess private relevant information rather than for the sake of camouflaging their transactions. However, in those occasions where insiders try to camouflage their trading and thus require of a third person to undertake it, the insiders do not necessarily trade large amounts, which could be more easily detected.

Another relevant factor is FCF which is positively related to insiders gains, thus,

corroborating that the larger the level of free cash flow left to mangers' discretionality, the greater the information asymmetry. Consequently, Spanish firms should enhance control mechanisms to monitor managers and align their interests to those of shareholders. However, the negative relationship detected between OWN (ownership concentration) and insider trading indicates that at least the ownership concentration may be working its role efficiently. Therefore, results for the Spanish stock market support the agency theory and its assertions on the convergence of interests and supervisory costs. Our findings thus contradict the managerial entrenchment and expropriation rent phenomena detected by Pindado, Miguel and De la Torre (2004) for the Spanish case.

Regarding SPREAD, which is significant at the 10% level, results corroborate previous studies in the context of the asymmetric information paradigm, and also those of Friederich, Gregory, Matatko and Tonos (2002) in an insider trading context. The variable SPREAD proxies the level of private information existing within a market and the consequent divergence between informed and uninformed investors' expectations. The relationship is positive, as expected, and reflects the surcharge imposed by market makers to compensate for the expected loss when investing against informed investors.

We should not finish without directing our attention to the value of the adjusted-R^2, whose value is extremely low (less than 1%). However, its value is in tune with the results obtained in most of the insider trading literature. As stated by Seyhun (1986, page 207), an explanation of the interpretation of such a small value of the determinant coefficient is insider trading regulation, which prevents insiders from freely trading on their private information, thus spoiling the true effects of the different variables and impeding a more accurate description of the model. The model does not seem to present any evidence of neither heteroskedasticity nor autocorrelation and, what is more important, neither multicollinearity. For that purpose, some statistics (and their corresponding p-values in parentheses), such as the LM for heteroskedasticity, the Durbin- Watson and the condition number (i.e. the square root of the ratio of the largest and the smallest characteristic root of the X'X matrix, X being the normalised matrix of the regressors) are also provided in Table 4. In particular, the condition number (which is 2.91) is by far below than 20, thus indicating absence of multicollinearity among the regressors, as suggested by Belsley, Kuh

and Welsch (1980). The correlation matrix among regressors is displayed in Table 5.

To put an end in our investigation, we performed a second test, focusing on the characteristics of the transactions depending on their transparency. So, we analyse how the main significant variables of Model (1), OWN, FCF and TIMING affect the transaction depending on whether this is undertaken on behalf of the insider or through a nominee. For this reason, we construct two binary variables D_{1it} and D_{2it}, where D_{1it} takes the value of 1 when an inside transaction has been undertaken on behalf of the own insider, and 0 when it has been undertaken through a third person. In turn, D_{2it} is defined as $(1- D_{1it})$ and it is interpreted correspondingly. Therefore, Model (2) is described in equation (2).

$$AR_{it} = \beta_1 D_{1it} + \beta_2 D_{2it} + \beta_3 OWN_{ti} D_{1it} + \beta_4 OWN_{it} D_{2it} + \beta_5 FCF_{it} D_{1it} + \beta_6 FCF_{ti} D_{2it} + \beta_7 TIMING_{it} D_{1it} + \beta_8 TIMING_{it} D_{2it} + u_{it}$$

$$(2)$$

Results are shown in Table 6. All the variables included in the model (FCF, OWN and TIMING) are significant but not for all the groups. TIMING is positively related either to direct transactions or nominees' transactions, detecting that the timing ability does not depend on who carries out the transaction. However, FCF and OWN are only significant for the group of transactions undertaken by nominees. Indeed, a positive significant relationship is detected between and insider trading and FCF for the group of transactions carried out by nominees, and also a negative significant relationship detected between insiders gains and OWN. In both cases, the results seem to indicate that in those firms where control mechanisms work properly, insiders are more inclined to camouflage their transactions by delegating to a nominee. Therefore, our last conclusion regards again to the need for increasing control mechanisms in Spanish markets, and not only regarding direct insider trading, but also when they are carried out by third persons. We understand that is a difficult task, which however should be undertaken sooner or later.

6.- CONCLUSIONS

The study of insider trading has recently been expanded to new markets, apart from the States. New evidence has been obtained for European countries such as Norway, Spain and Greece. However, despite the relevance of the topic, a unique theory of insider trading does not yet exist. We try to shed some more light on the topic by explaining insider

trading in the Spanish stock market. Our study identifies the following factors when explaining insiders' behaviour and their profitability: the insider's capacity to timing their trading, the degree of transparency of the transaction (the less transparent, the higher the return obtained) and the level of free cash flow. Transactions are more profitable for lower levels of ownership concentration and when bid-ask spreads are larger. Also the interaction between the transaction size and the transparency of the transaction, although at a less significant level. It is worth noting that none of these factors are associated with the characteristics of the transaction itself.

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Table 1: Description of individual proxies to the factors representing asymmetric information.

FACTOR	*PROXY*	DESCRIPTION
FIRM'S CONTROL OF INSIDERS	Ownership concentration (OWN).	Percentage of shares owned by the 5 larger shareholders.
INSIDER FORECASTING ABILITY	Insiders buy before prices increase and sell before prices decrease (TIMING).	Dummy variable that takes the value of 1 when insiders buy before prices increase or sell before prices decrease, and 0 otherwise.
EXISTENCE OF INFORMATION ASYMMETRIES WITHIN THE MARKET	Bid-ask spread (SPREAD).	Bid-ask spread adjusted to market's depth
QUALITY OF INFORMATION	Transaction size (TSIZE).	Percentage of shares bought or sold in the transaction
INSIDER'S ACCESS TO PRIVATE CORPORATE INFORMATION (I)	Type of insider according to rank within the organization structure of the firm (TYPE).	Dummy variable that takes the value of 1 when the insider is a corporate director and 0, otherwise.
INSIDER'S ACCESS TO PRIVATE CORPORATE INFORMATION (II)	Participation of the insider in the capital ownership structure (PARTI).	Percentage of shares owned by the insider prior to the transaction related to the number of outstanding shares.
INSIDER'S ACCESS TO PRIVATE CORPORATE INFORMATION (III)	Insiders discretionality in the decision-making process (FCF).	Free cash-flow adjusted to the firm's growth opportunities.
TRANSACTION TRANSPARENCY.	Nominee holding (NOMINEE).	Dummy variable that takes the value of 1 when the insider carries out the transaction by himself, and 0 when a third person or nominee carries it out on his behalf.

Table 2: Descriptive Statistics. Mean, standard deviation and values minimum and maximum for all the variables in Model (1) are displayed.

	AR	OWN	FCF	SPREAD	NOMINEE
MAX	0.092	44.97	0.200	9.966	1
MIN	-0.084	0.01	-0.179	0	0
STD DEV	0.021	2.15	0.054	1.181	0.321
MEAN	0.001	0.64	0.041	1.103	0.117

	TSIZE	TIMING	PARTI	TYPE
MAX	0.028	1	0.429	1
MIN	0.001	0	0.001	0
STD DEV	0.003	0.500	0.020	0.496
MEAN	0.001	0.509	0.003	0.434

Table 3: Abnormal returns. For the event period, going from day -10 to day +10, abnormal returns (ARs) drawn by the CARCH_MM model and t_{GARCH} statistics for each day in the event period are provided.

Date	ARs	W_{CARCH}
-10	9.12E-04	0.56
-9	-3.10E-04	-0.19
-8	3.37E-05	0.02
-7	2.06E-04	0.17
-6	-2.63E-04	-0.21
-5	-1.08E-03	-0.77
-4	1.61E-03	1.15
-3	3.90E-04	0.23
-2	-6.04E-04	-0.37
-1	-5.02E-04	-0.37
0	2.63E-03	2.51
1	1.23E-03	1.00
2	1.47E-03	1.01
3	5.96E-04	0.35
4	7.05E-04	0.43
5	4.31E-04	0.27
6	2.78E-04	0.21
7	4.19E-04	0.40
8	8.84E-04	0.74
9	-1.34E-03	-0.94
10	-6.26E-04	-0.39

Table 4: Estimation results for Model (1).

Coefficients, t-statistics and p-value are shown for Model (1), which regresses abnormal returns obtained by firm i on day 0 on seven selected variables. $AR_{it}= \beta_0 + \beta_1\ OWN_{it} + \beta_2\ FCF_{it} + \beta_3\ SPREAD_{it} + \beta_4\ NOMINEE_{it} + \beta_5\ TSIZE_{it}*NOMINEE_{it} + \beta_6\ TIMING_{it} + \beta_7\ TYPE_{it}*PARTI_{it} + U_{it}$

VARIABLE	COEFFICIENT	T	P-VALUE
CONSTANT	-0.155E-02	-0.72	0.471
OWN	-0.409E-07	-1.85	0.064
FCF	0.349	-1.99	0.047
SPREAD	0.693E-03	1.68	0.093
NOMINEE	-0.929E-02	-2.78	0.006
TSIZE*NOMINEE	0.119E-05	1.72	0.086
TIMING	0.606E-02	3.32	0.001
TYPE*PARTI	0.109E-06	1.47	0.171

R^2: 0.07136; Adjusted-R^2: 0.04158
F = 3.99 (p-value: 0.000)
Durbin-Watson: 1.848 (p-value: 0.105)
LM H Test: 0.2321 (p-value: 0.630)
Multicollinearity Condition Number: 2.91
N: 483

Table 5: Variance-Covariance Matrix for the variables in Model (1). The elements above the main diagonal are the corresponding symmetric correlations.

	TIMING	SPREAD	FCF	TYPE* PARTY	OWN	NOMINEE	TSIZE* NOMINEE
TIMING	1						
SPREAD	-0.033	1					
FCF	0.029	-0.195	1				
TYPE*PARTI	0.048	0.132	-0.161	1			
OWN	0.011	0.051	0.129	-0.061	1		
NOMINEE	0.042	-0.148	0.076	-0.054	0.042	1	
TSIZE* NOMINEE	0.055	-0.039	-0.062	-0.024	0.027	0.491	1

Table 6: Estimation results for Model (2).

Coefficients, t-statistics and p-value are shown for Model (2), which regresses abnormal returns obtained by firm i on day 0 on different characteristic of insider trading according to the values of the variable NOMINEE.

$$AR_{it} = \beta_1 D_{1it} + \beta_2 D_{2it} + \beta_3 OWN_{ti} D_{1it} + \beta_4 OWN_{it} D_{2it} + \beta_5 FCF_{it} D_{1it} + \beta_6 FCF_{ti} D_{2it} +$$
$$\beta_7 TIMING_{it} D_{1it} + \beta_8 TIMING_{it} D_{2it} + u_{it}$$

where D_{1it} is a binary variable constructed to measure whether an inside transaction has been carried out on behalf of the own insider or through a third person, taking the value of 1 for the former and the value of 0 for the latter, and $D_{2it} = 1 - D_{1it}$. The rest of the variables are equal to those of Model (1).

	COEFFICIENT	T	P-VALUE
D1	-0.668E-02	-1.13	0.260
D2	0.152E-04	-0.77E-02	0.994
OWN*D1	-0.385E-08	-0.05	0.959
OWN*D2	-0.443E-07	-1.92	0.056
FCF*D1	-0.057	-1.10	0.271
FCF*D2	0.034	1.92	0.055
TIMING*D1	0.937E-02	1.67	0.094
TIMING*D2	0.592E-02	3.05	0.002

R^2: 0.05030; Adjusted-R^2: 0.0363
F = 3.59 (p-value: 0.001)
Durbin-Watson: 1.87 (p-value: 0.160)
LM Het. test: 0.405 (p-value: 0.525)
N: 483