

Tender offers in Spain: testing the wave

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ABSTRACT

One of the most common empirical observations made in the literature on mergers and acquisitions (M&A) is that these operations occur in waves, what it means that there are certain periods in which there is an extraordinary number of such transactions. The aim of this paper is to analyse whether there have been waves in the series of M&A in Spain. For this purpose, we use two econometric methodologies in order to analyse the robustness of the results. Firstly, the procedure proposed by Bai and Perron (1998, 2003) to test for multiple structural changes in the mean of the series and, secondly, a unit root test allowing for two structural breaks in level, which extends the work of Perron and Vogelsang (1992) for non-trending data. Then we attempt to relate the time breaks obtained to relevant economic events so as to explain the phenomenon. The main conclusions indicate the existence of a wave of tender offers in Spanish economy from the end of the eighties to the mid-nineties. It appears that this wave was triggered by a regulatory shock set off by the integration of Spain in the European economic area.

Keywords: Merger and Acquisitions, Takeover Waves, Multiple Structural Change, Unit Roots, European Integration

JEL Classification: G34, C22, K2

I. Introduction

One of the most common empirical observations made in the literature on mergers and acquisitions (M&A) is that there are certain periods in which there is an extraordinary number of such transactions, above and beyond what would be considered “normal” activity on the market for corporate control. This phenomenon is known as a wave.

Nelson (1959) was one of the first to identify the existence of waves in the United States economy, and it was subsequently underlined in studies such as Scherer and Ross (1990) or Weston *et al.* (1990), among others. In other economies, we find it mentioned in Hughes and Singh (1989) and Sudarsanam (2003), in relation to the United Kingdom, and in Martynova and Renneboog (2005, 2006) and Sudarsanam (2003) for an aggregate series of European countries. All these studies show how, during these periods, there is a higher level of transformation of the business structure of these economies; so much so that, in the U.S., where five waves have been observed, each one is characterised by a form of restructuring. According to Stigler (1950), the wave at the end of the 19th century encouraged the formation of monopolies, and the wave detected in the 1920s favoured oligopolistic concentrations. The wave of the sixties was defined by diversification, with the number of conglomerate groups growing, whereas the distinguishing feature of the wave of the eighties was the number of hostile takeover bids which partly dismantled the conglomerates created in the previous wave; finally, in the nineties, there were more operations between companies with related economic activities (horizontal and vertical).

In the case of European Union, waves cannot be defined or characterised prior to the sixties because of a shortage of information and empirical studies on the subject. Indeed, they started to be studied with the appearance of databases referring to these operations from 1984 on, such as the Thomson Financial Database, which reveals two waves, one in the eighties and one from 1993 to 2001 (Sudarsanam, 2003; Martynova and Renneboog, 2005). According to Martynova and Renneboog (2005), however, this does not mean that there were no previous waves, although we can assume that there would be much less M&A in this economic area compared to the U.S., as is the case for the waves identified above.

Having observed this phenomenon, and before exploring the causes which can cause a wave, some authors confirmed the observation by econometric testing. This work took place much later than the discovery made by Nelson in 1959. The methods used initially are based on the fact that, if a series of M&A is not stationary, it is not consistent with wave behaviour.

Shughart and Tollison (1984) are unable to reject the hypothesis that mergers in the U.S. (in the 1895-1979 period) are generated either by a random walk process or by a stable AR(1) process. These authors therefore conclude that their results raise doubts about the wave hypothesis. Chowdhury (1993) reached a similar conclusion, finding that the aggregate series of mergers in the United States in 1973:I-1987:IV presents a unit root. On the other hand, Golbe and White (1993) obtain that the series of M&A (during 1895-1989 for the number of operations and in 1895-1920 and 1948-1989 for their monetary value) suitably fit a sinusoidal function, leading them to confirm the presence of waves.

Linn and Zhu (1997) find strong evidence in favour of US mergers following two stationary AR(1) processes with different means (the process with the highest mean corresponds to waves), leading them to conclude that the series of mergers is not a random walk. Their approach enables the compatibility of the apparently contradictory results obtained by Shughart and Tollison (1984) and Golbe and White (1993), as when Linn and Zhu (1997) consider a single AR(1) process for the entire series, they obtain an autoregressive coefficient close to 1 and, moreover, the unit root ADF tests applied do not enable them to reject the null unit root hypothesis, which is consistent with the results obtained by Shughart and Tollison (1984). They reject, however, that the data are generated by a single AR(1) process and consider that two stationary AR(1) processes with different means provide a good fit for a sinusoidal model such as that of Golbe and White (1993). In sum, they believe that the M&A data are compatible with a two-state regime change model supporting the presence of waves, as initially contemplated by Nelson (1959). Town (1992) and Higson *et al.* (2002) also find that merger activity, both in the United States and United Kingdom, can be characterised by a two-state Markov- Switching model.

In the case of Spain, and as far as we know, the existence of this economic phenomenon has not yet been studied. The goal of this paper is therefore to analyse whether there have been waves in the series of M&A in our country. We will be testing whether there have been structural changes in the level of the series and attempt to relate the times when there have been regime changes, characterised by a larger number of tender offers, to relevant economic events which could explain the phenomenon.

The paper is organised as follows: in section 2 we discuss which series of M&A data is the most suitable for econometric testing in Spain. We then define the sample and analyse its relevant characteristics. The third section describes and applies the methods to be used to test whether the selected series presents wave behaviour. We use the methodology proposed by Bai and Perron (1998, 2003), as it enables us to identify the possible existence of different

regimes in the series characterised by different means. In addition to this methodology, we use a unit root test which allows for the existence of two structural changes, in order to analyse whether the break points are consistent with those obtained with the previous method. This test extends earlier work by Perron and Vogelsang (1992) who considered tests for one-time structural change and non-trending data. With both the Bai and Perron methodology and the aforementioned unit root test, the points of structural change are determined endogenously from the data, and therefore not known beforehand. In section 4, we attempt an economic interpretation of the break points obtained, investigating whether they can be associated to an economic or regulatory event, as proposed in part of the economic literature concerned with the subject.

Finally, we present our principal conclusions, indicating the existence of a wave of tender offers in Spanish economy from the end of the eighties to the mid-nineties. It appears that the wave was triggered by a regulatory shock set off by the integration of Spain in the European economic area (especially the de-regulation of capital movements after the second half of 1988) although national legislation might also have influenced the phenomenon (the 1988 Stock Market Act came into force in 1989). Unlike other economies, the progressive “dissolution” of the wave in Spain cannot be associated to a depression in the economic cycle or on the stock markets. This leads us to believe that this deceleration could be related both to the transient nature of the shock created by the integration process and to a more local economic occurrence, also connected to our European integration, which would have acted as an obstacle to the number of tender offers. We are referring to the increase in the privatisation process affecting state companies in Spain via initial public offerings (IPO), from 1996 on, in order to indirectly meet some of the convergence criteria established by the Maastricht Treatise. This phenomenon could have increased the opportunity cost of some tender offers, with the appearance of an attractive alternative form of investment in major concerns in dominant market positions.

II. The evolution of M&A in Spain: data series and sample

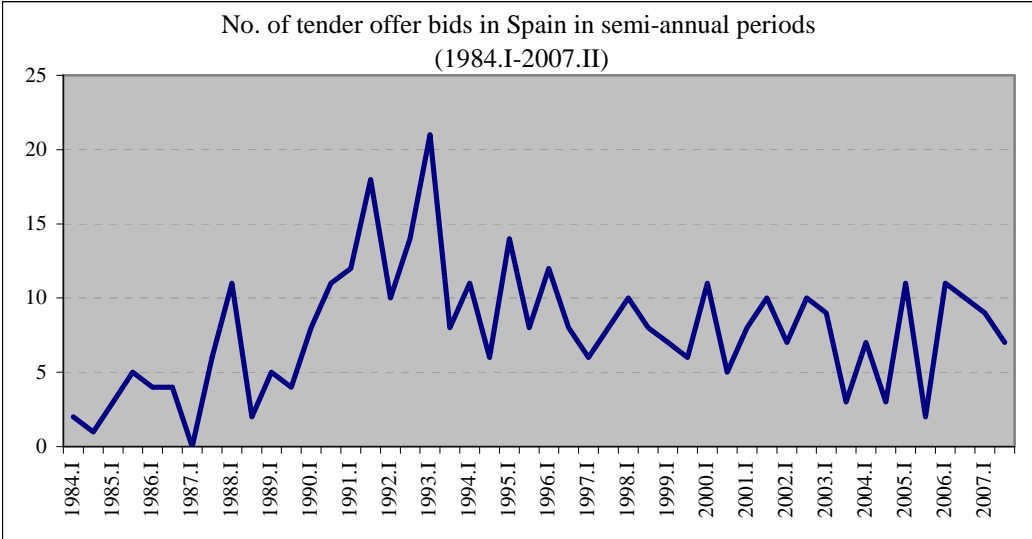
As our aim is to discover whether the existence of a wave can be confirmed in Spain, it is essential to do so with a complete and reliable data series. Unfortunately, in Spain there are no official M&A registers and the information obtained should be based only on those appearing in the business press. The problem with this source of information is that it only identified the M&A with the greatest repercussion on the business media, so not all operations are included and there is no guarantee that all operations of a given magnitude are identified.

This problem can be solved with databases such as the Thomson Financial Database, but it only contains Spanish mergers from 1997 on. This type of source would excessively limit the time series. We therefore focus on the official registers of tender offers for firms trading on the stock exchange, as this type of operation has been regulated in Spain since 1984. Indeed, the choice of public tender offers has the advantage that information about this kind of operation can be obtained for a longer period than if we also include other transactions such as mergers; furthermore, basically due to the information-related legal requirements applicable to tender offers, there are official records available in all cases.

For our econometric testing, then, our M&A sample is based on the series of tender offers comprised by the population of offers made in Spain since 1984, when this type of operation started to be regulated. We thus use the total number of operations, regardless of whether the conditions (basically, the price) were acceptable or not to the shareholders of the firms concerned. The data are provided on a semi-annual basis¹ and refer to the 1984:I-2007:II period².

A mere observation of this series shows that, in the first half of the nineties, there appears to have been an extraordinary number of tender offers (graph 1) in Spain.

Graph 1



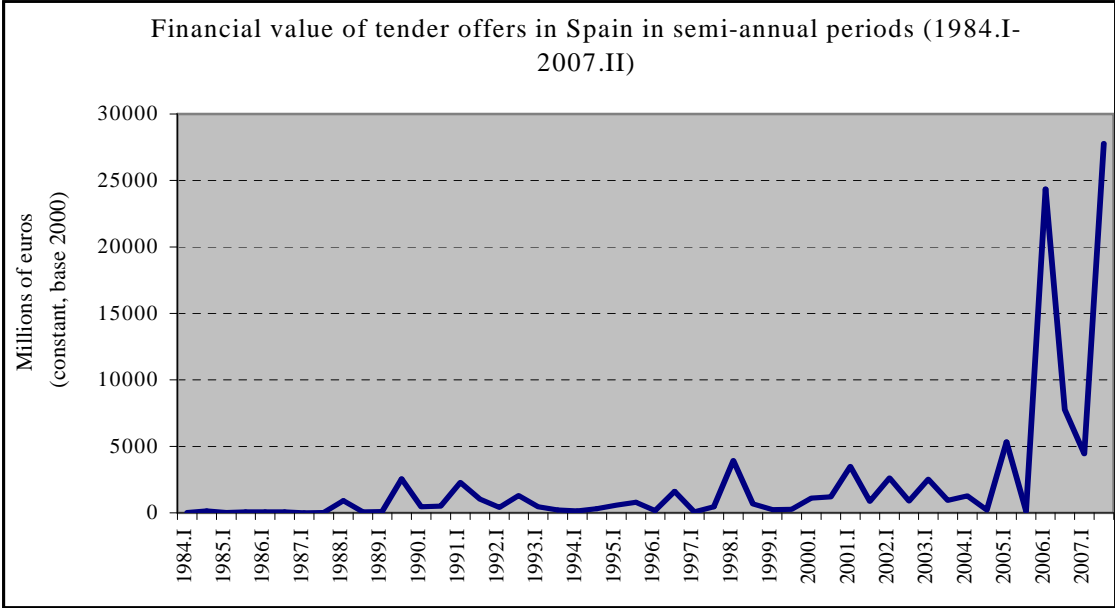
Source: based on the data obtained from the Madrid Stock Market Annual Reports, the National Stock Market Commission and some issues of the BORME (Official Spanish Corporate Register Journal).

¹ We decided to use semi-annual data instead of annual data in order to have more observations with which to work. We decided not to use quarterly data in order to refrain from introducing too much “noise” in the series, as there were no takeover bids in several quarters of the analysed period.

² Our data are not log-transformed, not only because the series has a zero value at 1987:I but also because taking logs tends to dampen the possible wave behaviour and make their identification more difficult, as Golbe and White (1993) and Linn and Zhu (1997) pointed out.

One difference between our work and the studies analysed for other economies is that the wave does not appear to repeat itself when the tender offers are quantified in monetary terms. Unlike in the United States economy, where M&A series follow the same evolution with regards to number and value, this evolution differs in Spain. Indeed, the value of the tender offers does not present a wave profile, but a discontinuously growing evolution (Graph 2).

Graph 2



Source: Annual reports and trading bulletins of the Madrid, Barcelona, Valencia and Bilbao Stock Markets, National Stock Market Commission and BORME.

This difference between the evolution of the number of operations and the volume of money involved is largely due to the large variance in the size of the firms trading on the Stock Exchange in Spain, and therefore the ones which comprise the population of firms susceptible to be acquired by tender offers. This aspect is less significant in the U.S. as the studies conducted are based on M&A series applicable to large corporations (Golbe and White, 1988). Besides, in Spain, the number of operations is also smaller, so that the impact of certain tender offers on the volume of traded resources is enormous in some years. For example, a single tender offer involving two large Spanish banks, the one launched by Banco Santander-Central-Hispano on Banesto, represented 82% of the financial resources spent on tender offers in 1998 (graph 2).

The test is therefore only performed with the number (and not the value) of tender offers affecting companies trading on the stock exchange.

III. Econometric methodology: structural change analysis

As mentioned earlier, there are not many empirical studies using a univariate time series approach to test the existence of waves and they nearly all refer to the United States. In general, they analyse whether the series of mergers and/or acquisitions presents a unit root (what is considered not to be compatible with a wave behaviour) or follows a stationary AR(1) process. In this sense Shughart and Tollison (1984) find that the majority of the merger series that they analyse can be described by a random walk process. Chowdhury (1993) reaches a similar conclusion, obtaining that the aggregate series of mergers have a unit root.

More recently Linn and Zhu (1997) and Higson *et al.* (2002) analyse whether the merger activity can be characterized by a two-state Markov-Switching model (Hamilton, 1989)³. Linn and Zhu (1997) find strong evidence in favour of the series being characterised by two stationary AR(1) regimes, each with a different mean, so the process with the highest mean would correspond to a wave. Higson *et al.* (2002), who use data both from USA and the United Kingdom, extend that work applying different specifications of a Markov-Switching model (MS) and demonstrate that using only one MS specification may be misleading.

Here we test the possible existence of waves in the number of tender offers in Spain in a more extended way. Firstly, whereas in the paper by Linn and Zhu (1997) and Higson *et al.* (2002) the autoregressive parameters are constrained to be fixed across the two regimes, in this paper there is no such constraint. We use the Bai and Perron (1998, 2003) methodology, allowing the structure of the correlation in the errors to differ across regimes. Moreover, applying this methodology permits us to test for multiple structural breaks in the mean of the series, that is, to test for the possibility of there being more than two regimes in Spanish tender offers with different means.

On the other hand, unlike previous papers such as Shughart and Tollison (1984) and Chowdhury (1993), we apply unit root tests allowing the existence of two breaks in the series, as failing to consider the existence of structural changes could lead to not rejecting the unit root hypothesis. We extend the Perron and Vogelsang (1992) test for non-trending data following Papell and Prodan (2006). In this way we can also observe whether the break points obtained coincide with the breaks estimated by the Bai and Perron methodology, making our results more robust.

Bai and Perron (1998, 2003) consider the following multiple linear regression with m breaks ($m + 1$ regimes):

³In that respect, see also Town (1992).

$$y_t = x_t' \beta + z_t' \delta_j + u_t, \quad t = T_{j-1} + 1, \dots, T_j \quad \text{for } j = 1, \dots, m + 1. \quad (1)$$

where y_t is the observed dependent variable at time t , $x_t (p \times 1)$ and $z_t (q \times 1)$ are vectors of covariates, β and δ_j ($j = 1, \dots, m + 1$) are the vectors of coefficients and u_t is the disturbance. T_1, \dots, T_m are the break points, treated as unknown. The purpose of this methodology is to estimate by least-squares the unknown regression coefficients together with the break points. When $p \neq 0$ the parameter vector β is not subject to shifts (this is a partial structural change model) but when $p = 0$ all the coefficients of the model are subject to change, so we have a pure structural change model.

In this paper, to test for structural changes in the mean of Spanish tender offers, we apply this methodology with only a constant as regressor (i.e. $z_t = \{1\}$). We consider the following regression with m breaks ($m + 1$ regimes) and $p = 0$:

$$to_t = \delta_j + u_t, \quad t = T_{j-1} + 1, \dots, T_j \quad (2)$$

for $j = 1, \dots, m + 1$, where to_t is the number of tender offers at time t and δ_j is the mean tender offers in the j th regime.

For each m -partition (T_1, \dots, T_m) , the least-squares estimates of δ_j are obtained by minimizing the sum of squared residuals $S_T(T_1, \dots, T_m) = \sum_{i=1}^{m+1} \sum_{t=T_{i-1}+1}^{T_i} (to_t - \delta_i)^2$.

Let $\hat{\delta}(\{T_j\})$ represent the estimates based on a given m -partition denoted $\{T_j\}$. Substituting $\hat{\delta}(\{T_j\})$ in the objective function, the estimated break points $(\hat{T}_1, \dots, \hat{T}_m)$ are such that $(\hat{T}_1, \dots, \hat{T}_m) = \arg \min_{T_1, \dots, T_m} S_T(T_1, \dots, T_m)$, i.e. they correspond to the global minimisers of the objective function⁴. Consequently, the corresponding least-squares regression parameter estimates are $\hat{\delta} = \hat{\delta}(\{\hat{T}_j\})$.

Bai and Perron (1998, 2003) propose several tests for determining the number of structural breaks m . They first propose a $\sup F_T(k)$ type test of no structural break ($m = 0$) versus a pre-specified number of breaks $m = k$; secondly, two tests (the UDmax and the WDmax) of the null hypothesis of no structural break versus an unknown number of breaks given an upper bound M ; and finally, the $\sup F_T(l + 1 | l)$ test, a test for l against $l + 1$ breaks. The null hypothesis is rejected if the overall minimal value of the sum of squared

⁴ Bai and Perron (2003) develop an algorithm based on the principle of dynamic programming to obtain those global minimizers.

residuals from the $l + 1$ breaks model is sufficiently smaller than the sum of squared residuals from the l breaks model. The break date selected is the one associated with this overall minimum.

The results of applying this methodology for testing the possible existence of multiple structural breaks in the level of tender offers in Spain in the 1983:I-2007:II period are shown on table 1. We allow up to 3 breaks ($M = 3$) and use a trimming $\varepsilon = 0,20$ ⁵. We show the number of selected breaks using both information criteria (the Bayesian Information Criterion (BIC) suggested by Yao (1988) and a modified Schwarz criterion (LWZ) proposed by Liu *et al.* (1997)), and the sequential application of the $\sup F_T(l + 1|l)$ test recommended by Bai and Perron (1998, 2003).

Table 1. Bai and Perron tests of multiple structural breaks in the mean of the Spanish tender offers

Specifications				
$z_t = \{1\}$	$q = 1$	$p = 0$	$h = 9$	$M = 3$
Tests				
$\sup F_T(1)$	$\sup F_T(2)$	$\sup F_T(3)$	$UD\max$	$WD\max$
22.56***	16.14***	13.20***	22.56***	23.95***
$\sup F(2 1)$	$\sup F(3 2)$			
14.59***	2.12			
Number of breaks selected				
Sequential	2			
LWZ	2			
BIC	2			
Parameter estimates				
$\hat{\delta}_1$	$\hat{\delta}_2$	$\hat{\delta}_3$	\hat{T}_1	\hat{T}_2
3.92	11.77	7.65	1989:II	1996:I
(0.81)	(0.98)	(0.37)	(1988:I-1990:II)	(1995:I-2000:II)

Notes:

^a h indicates the minimum number of observations in each segment.

^b*** denotes significance at the 1% level.

^c In parentheses are the standard errors (robust to serial correlation) for $\hat{\delta}_j(j = 1, \dots, 3)$ and the 95% confidence intervals for $\hat{T}_j(j = 1, 2)$.

^d The $\sup F_T(k)$, the standard errors and confidence intervals allow for the possibility of serial correlation in the disturbances. The covariance matrix robust to heteroscedasticity and serial correlation is constructed following Andrews (1991) and Andrews and Monahan (1992) using a quadratic spectral kernel with an AR(1) approximation to select the bandwidth. The residuals are pre-whitened using a VAR(1).

⁵ Bai and Perron (2003) point out that when allowing different variances across segments or serial correlation a high value of ε should be used in order to avoid substantial size distortions. We tried with a trimming $\varepsilon = 0,25$ (consequently $M = 2$ and $h = 12$, since $h = \varepsilon T$) and the estimated break points were the same and the parameters estimates were very similar. These results are available upon request.

The results obtained show that the $\sup F_T(k)$ tests are all significant for k between 1 and 3, so there is at least one structural break. The $\sup F(2|1)$ test is significant at 1%, unlike the $\sup F(3|2)$. Therefore, the sequential procedure using a 1% level of significance shows the existence of 2 structural breaks in the number of tender offers series, as do the procedures based on the BIC and LWZ criteria.

According to the sequential procedure, the two break points obtained are 1989:II y 1996:I. Therefore, we have identified three regimes. In 1989:II there was an increase in the level of the series (which went from 3.92 to 11.77) and in 1996:I there was a decrease relative to the previous situation (going from 11.77 to 7.65) which nonetheless leaves the series of Spanish tender offers at a higher level than before the wave started in the second half of 1989.

To provide additional evidence of the existence of structural breaks, and in order to analyse whether the dates they occurred coincide with those obtained according to the Bai and Perron methodology, we apply a unit root test allowing for two structural breaks. This also brings us closer to the approximation used by other authors to analyse whether the series of acquisitions behaved in wave form. Both Shughart and Tollison (1984) and Chowdhury (1993) conclude that, in the U.S., the behaviour of the series of mergers is not consistent with the wave hypothesis, as a random walk cannot be rejected. However, according to Campbell and Perron (1991), not rejecting the unit root hypothesis could be due to an incorrect specification of the deterministic components included as regressors; particularly, tests which do not consider the existence of structural breaks tend not to reject the unit root hypothesis. Therefore, the use of tests considering the existence of such breaks provides a better approximation to the behaviour of the series. As the series of tender offers does not appear to follow a trend, we use an extension of the Perron and Vogelsang (1992) test for the AO (Additive Outlier) model following Papell and Prodan (2006), to permit two structural breaks in the mean of the series, occurring at initially unknown moments in time.

This model is estimated using a two-step procedure. First, the deterministic component of the series is eliminated using the following regression:

$$to_t = \mu + \gamma_1 DU1_t + \gamma_2 DU2_t + \tilde{z}_t \quad (3)$$

where $DU1_t = 1$ if $t > Tb_1$, 0 otherwise and $DU2_t = 1$ if $t > Tb_2$, 0 otherwise. Tb_1 and Tb_2 are the break points. The unit root test is then performed using the t statistic for $\alpha = 0$ in the regression:

$$\Delta \tilde{z}_t = \sum_{i=0}^k \varpi_{1i} D(Tb_1)_{t-1} + \sum_{i=0}^k \varpi_{2i} D(Tb_2)_{t-1} + \alpha \tilde{z}_{t-1} + \sum_{i=1}^k c_i \Delta \tilde{z}_{t-i} + \varepsilon_t \quad (4)$$

where $D(Tb_i)_t = 1$ if $t = Tb_i + 1$ (for $i = 1, 2$), 0 otherwise. The statistics are calculated for all the possible combinations of break points, not allowing the breaks to occur consecutively. The chosen break points are those which minimise the t statistic on α . The inclusion of $k + 1$ dummy variables is necessary to ensure that the t statistic on α does not vary according to the value of the truncation lag parameter k . Table 2 shows the results obtained using 10% trimming (i.e. $0.10T < Tb_i < 0.90T$ where T is the sample size and $i = 1, 2$).

Table 2. Unit root tests with two endogenous structural breaks.

α	Tb_1	γ_1	Tb_2	γ_2	k	t_α
-0.22	1989:II	7.85 (1.27)	1996:I	-4.12 (1.10)	0	-8.45***

***Denotes significance at the 1% level. The critical values were obtained from Papell and Prodan (2006), table 1. The procedure to select the truncation lag parameter starts with $k_{\max} = 8$ and is repeated until the last lag is significant, using a critical value of 1.645. In parentheses are the standard errors.

These results show that the unit root can be rejected in favour of an alternative hypothesis of regime-wise level stationarity (level stationarity after allowing for two changes in the intercept)⁶. The break points obtained are 1989:2 and 1996:1. They also show that the coefficients of the dummies have opposite signs and are of different magnitudes, so the mean of the series after the second break is greater than the mean before the first. The fact that the breaks are significant and that the dates coincide supports the results obtained using the Bai and Perron methodology⁷.

In the next section, we analyse the economic interpretation of the structural breaks obtained, which were determined endogenously by the data.

IV. Discussion of empirical results

The results obtained above show (i) the existence of an extraordinary number of tender offers in Spain between the second half of 1989 and the first half of 1996 and (ii) an increase

⁶ The critical values of Papell and Prodan (2006) are for $T=129$. Although our sample is smaller, we believe that the unit root hypothesis can be rejected, as the t_α value obtained is far from the critical values tabulated by these authors (-5.24 at the 10%, -5.51 at the 5% and -6.06 at the 1%).

⁷ The observation of the series of Spanish tender offers suggests that it has no trend. For this reason we have used an extended version of the Perron and Vogelsang (1992) tests for non-trending data. In order to analyse whether the results would be different when trending data were considered, we have applied the Lee and Strazicich (2003) unit root tests allowing for two structural changes both in level and trend (the model C). We have obtained very similar results: the unit root hypothesis was rejected at the 1% level (min $LM_\tau = -8.94$) and the breaks points were 1990:1 and 1997:1.

in their mean level after the wave related to the previous situation. Can an economic interpretation be given to the dates of changes endogenously determined by data? One of the hypotheses with most empirical support when explaining waves in the United States (the country contemplated in nearly all the empirical studies) is the existence of an economic, technological or regulatory shock leading to tender offers, based on microeconomic factors (such as economies of scale, market power, etc.), being particularly viable in the new situation whereas previously, without the circumstances caused by the shock, this was not the case. A pioneer breakthrough is the economic disturbances model defined by Gort (1969), where an accumulation of M&A is forecast in response to significant economic changes, a conclusion reached by testing the series in the U.S. in the 1951-1959 period. The effect of technological change is one specific significant factor in this study. Subsequently, there is a number of papers relating the dates of the last two M&A waves in the U.S. with energy shocks (Mitchell and Mulherin, 1996), financial innovations (Mitchell and Mulherin, 1996) and, especially, with the deregulation process or elimination of protectionism in certain sectors of the U.S. economy (Mitchell and Mulherin, 1996; Mullerin and Boone, 2000; Andrade *et al.*, 2001; Harford, 2005).

In the Spanish case, except for the different de-regulation laws applied in the economy in relation to the process of joining the EEC (the progressive elimination of customs duties from 1986, the Defence of Competition Act in 1989 or the de-regulation of capital movements and industry in 1992) we are unable to find a set of specific industry regulations in 1989-1996 in the industries with a higher tender offer rate⁸. It would appear, then, that the possible sources of the shock are national or supra-national regulatory factors which, with a greater scope, could have triggered an extraordinary number of tender offers. Specifically, the intense tender offer activity found in Spain from 1989 to 1996 could mainly respond to:

(i) The country's integration in the European Union's economic area, which alters the limits of the Spanish market, market shares and the number of relevant competitors for firms on the one hand, and gradually limits the effect of the exchange rate between our currency and those of the other member States on the other. During the lengthy configuration process undergone by the EU, there were certain milestones which appear to have led to a larger number of tender offers. Of particular importance was the achievement of the single European market in 1992 and how it was approached by Spanish firms, completing tender

⁸ In just over 50% of the industries involved, there were more takeover operations in 1989-1996. This was the case for the stock market sectors of Farming and Fisheries, Food and Beverages, Banks, Electricity and Gas, Manufacture and Assembly of Capital Goods, Investment Companies, Building Materials, Paper, Oil and Chemicals.

offers in order to consolidate or increase their market shares. Given the fragmented nature of the European business structure, this gives more weight to the operations performed in each economy (Campa, 2004). However, since the progressive de-regulation of capital movements with Directive 88/361 and the peseta's entry in the European Monetary System in 1989 (reducing exchange rate risk and the bias shown by investors for tender offers inside their own countries), the entry of direct foreign investment in the form of tender offers could explain the point of structural change detected in our econometric analysis.

(ii) The factors related to the legal framework, such as the regulation of the Stock Market, could also help to explain the change in the number of tender offers in the series. One of the basic goals of stock market legislation, specifically the Stock Market Act passed on July 28, 1988, which came into force on July 29, 1989, was to promote the Spanish stock market in view of the European capital market expected for 1992. The Act presents the basic lines of the regulations applicable to tender offers, which are developed in detail in the Royal Decree of July 26, 1991. This legislation fills the gaps in the previous 1984 law so that control of a company cannot be taken over without complying with the new standards. To a certain extent, it could be classified as a stock market regulation shock in view of the stricter conditions applicable to taking over firms trading on the market.

The duration of the impact that these shocks (the integration process and stock market regulation) may have had on the corporate control market is different. We believe that the integration process generates transient effects, as once market shares are reassigned after the opening of the Spanish economy, a reduction in the number of tender offers could reasonably be expected. The reasoning is the following: an increase in market size (in this case due to joining the European economic area) can leave the market structure unaltered and lead to an increase in the absolute size of firms, without increasing the number of competitors on the market. In this case, greater rivalry between large corporations can help to maintain highly concentrated market structures, where profits fail to attract new companies⁹. In other words, the opening of our market may have led to an initial "accelerated" corporate takeover process which, once the new market structure was in place, not necessarily involving a larger number of competing firms, led to a drop in the number of tender offers¹⁰.

Relating to stock market regulation, it would appear that its effect should be permanent. Indeed, as long as the legislation is in place, its impact on tender offer activity should

⁹ This reasoning is assuming the existence of relevant sunk costs in the industries involved.

¹⁰ In fact, at least in half of the industries in which it is observed an increase in tender offers in the wave period, the level of market concentration has been kept or risen (Buesa and Molero, 1998).

necessarily be long-lasting, at least until 2007, as the legal requirements established by this regulatory change represent a filter for control operations in firms, and it is difficult to complete a significant tender offer without it being registered as a tender offer¹¹. In other words, it would not only be expected to lead to an increase in the number of operations, but also to cause a change in the “normal” level of tender offers in the economy relative to the previous period.

As to the end of the wave, this could be related both to the fall in both domestic acquisitions and foreign direct investment in Spain resulting from the new market’s consolidation after the EU integration process (which is why we classify the economic integration shock as transient), and to the boom in the privatisation process after 1996. With regards to European integration, it is important to note that after 1996, direct Spanish investment abroad, largely in EU countries, exceeded net direct investment in Spain (including tender offers) (Gómez *et al.*, 2006), showing how the integration process opened the Spanish economy in both directions. On the other hand, another factor should be considered: the qualitative change in the government’s privatisation policy, also starting in 1996. As a result of it, it is observed a trade off between IPOs for state and private firms, from 1996 to 1998, which could be extrapolated to tender offers in as much as the acquisition of share packages of trading firms via tender offers is displaced to the acquisition of share packages of privatised firms via IPOs.

In sum, we can conclude that the wave of tender offers in Spain could have been triggered by shocks caused by Spanish integration in the European market and by national regulatory changes, as they coincide in time with the break points detected in our structural change analysis. This would explain not only the start of the wave but also why, in the case of the stock market regulation with its permanent effect, a change was caused in the mean level of tender offers in the Spanish economy in relation to the period before the new legislation was passed.

V. Conclusions

The aim of this paper was to test whether the series of tender offers in Spain presents wave behaviour, as occurred in the United States and United Kingdom. With the Bai and Perron methodology (1998, 2003) and the application of unit root tests allowing for two structural breaks in the level of the series, we conclude that it cannot be rejected that, from

¹¹ In 2007 there was a regulatory change which could be expected to reduce the number of takeovers, as the new legislation broadens the margin for control operations which are not necessarily takeovers.

1989 to 1996, there was an extraordinary number of aggregate tender offers constituting a wave. This phenomenon is revealed by the existence of two significant structural breaks in the series, the dates of which (1989.I and 1996.II) we attempted to connect to relevant economic events. The wave could have been triggered by both the shock caused by the process of Spanish economic integration with the EU and the regulatory shock represented by the Stock Market Act, to a large extent also a result of the integration process undergone by the Spanish financial markets. Therefore, a macroeconomic policy goal of a given country such as an integration into an economic area, what it could be considered a deregulation shock, may lead that economy to a wave in its M&A activity, which could accelerate, by this way, its industry restructuring, as it has happened in US waves. In the case of Spain this restructuring has taken place between companies with related economic activities.

Certainly, in addition to the shocks, other macro-financial factors could be associated to the wave, but this analysis exceeds the aim of this paper. This will be the natural extension to this study in a multivariate framework.

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