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When an event is not an event: the curious case of an emerging market☆

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Abstract

Shares trading in the Bolsa Mexicana de Valores do not seem to react to company news. Using a sample of Mexican corporate news announcements from the period July 1994 through June 1997, this paper finds that there is nothing unusual about returns, volatility of returns, volume of trade or bid–ask spreads in the event window. We provide

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evidence that suggests that unrestricted insider trading causes prices to fully incorporate the information before its public release. The paper thus points toward a methodology for ranking emerging stock markets in terms of their market integrity, an approach that can be used with the limited data available in such markets.

JEL classification: G14; G15

Keywords: Insider trading; Event studies; Emerging markets

1. Introduction

Event studies are used to measure the impact of an economic event on firm value. Assuming that the event will be reflected in traded asset prices, these studies focus on how asset prices respond to information released during a public announcement of the event.[1] An interesting debate, discussed in Fama (1997), rages on about the speed of stock price reaction to the information released during news announcements, on whether there is systematic over-reaction or under-reaction to information, and on whether the over-reaction or under-reaction is inexplicably large. Though there exist many such disagreements on the reaction of stock prices to information released during a public announcement, these disagreements arise in the first place because stock prices do react.

Is it possible to have a stock market where a firm's stock price does not react to firm-specific news announcements? If so, there may be four scenarios in which this phenomenon may occur. First, the stock market may be informationally inefficient, which implies that stock prices are not linked to firm values. In such a stock market, stock prices will not change when new information about firm value is released through corporate announcements. Second, it is possible that corporations in an economy do not make value-relevant news announcements. Even if stock markets in this fictional economy are informationally efficient, prices are left with no announcement stimuli against which to respond. Third, though a stock market may be efficient, and the news may be value-relevant, the news provided may be completely anticipated. For example, in the period

[1] Ball and Brown (1968), and Fama et al. (1969) pioneered the classic event study methodology and, except for minor modifications (see Salinger, 1992), their methodology continues to be used. Campbell et al. (1997) provide an excellent exposition of the event-study methodology in Chapter 4 of their book. McWilliams and Siegel (1997) discuss the many uses and abuses of this methodology in the social sciences.

1970–1979, Huberman and Schwert (1985) document that 85% the news contained in a consumer price index announcement had been anticipated and was being reflected in the prices of Israeli indexed bonds. In such a market, announcement days bring no surprise. Fourth, insider trading prohibitions may not exist in a stock market or, if they exist, are not enforced. In this stock market, the superior information of insiders may have been incorporated in stock prices through their trades prior to the announcement.[2] In that case, the public announcement would be news to everyone except the traders. If we define an event as a point in time at which a great deal of information is incorporated into stock prices, any of these four reasons could explain why a corporate news announcement may not really be an event.[3]

This paper reviews an apparent example of a stock market where prices do not react to firm-specific news announcements. In this stock market, we find that returns in an event window, defined conventionally as the day before to two days after a firm-specific public news announcement, are not abnormal. Volatility, trading volume, and bid–ask spreads in the event window are similarly typical.

We study the Mexican Stock Exchange, the Bolsa Mexicana de Valores (BMV), in this paper. Several factors inform this choice. First, we wanted to study a stock market where undisclosed insider trading might be taking place, because that would present a market where the superior information of insiders would already have been incorporated in stock prices through their trades. From its inception to the period covered in this study, there has not been a single indictment, trial, or conviction for insider trading in the BMV. Second, since share ownership in Mexico is segmented into various classes, it is possible to test for differential responses to corporate news announcements. Third, data are available for the Mexican stock market. For the purpose of this study, we needed and obtained daily share trading data and records of corporate news announcements of the most liquid stocks. Fourth, and finally, given that Mexico is a representative emerging market, it formed an ideal pilot study in our quest

[2] Meulbroek (1992) documents the uncanny ability of the U.S. stock market to detect the possibility of illegal insider trading. She finds that about half of the pre-announcement price run-up observed before takeovers occurs on insider trading days, implying that the other half comes from public anticipation. On the day of the takeover announcement, prices do jump sharply. We quote from Bodie et al. (1996), "The dramatic increase in the CAR that we see on the announcement date indicates that a good deal of these announcements are indeed news to the market and that stock prices did not already reflect complete knowledge about the takeovers. It would appear, therefore, that SEC enforcement does have a substantial effect on insider trading, even if some amount of it still persists". See Mitchell and Netter (1994) for a review of the applications of event studies employed by the Securities and Exchange Commission (SEC) of the U.S.A.

[3] Brown et al. (1988) have made the same point in a different context. In their study, they defined an event day as a day where the absolute abnormal return exceeded 2.5%. No references were made to any firm-specific news announcements.

for a methodology for ranking emerging stock markets in terms of their 'market integrity', a methodology that could be used by researchers and practitioners who do not have access to intra-day data that is available in more advanced stock markets.[4]

To test for the reaction of stock prices to news announcements, we begin with a broad definition for news announcements, covering a variety of firm-specific episodes, including earnings announcements, dividend announcements, bankruptcy announcements, merger announcements, and other examples of firm-specific news. As firms trading in emerging stock markets typically do not generate a large number of news announcements of any one particular type, analyzing a broad array of news announcements, instead of just one type, allows us to include more data points in our study. However, this choice precludes using the conventional technique of testing for a price run-up or price run-down to show pre-announcement drift. As noted above, one objective of our paper is to progress towards a methodology for ranking emerging stock markets in terms of their market integrity. Non-conventional econometric techniques have to be used to handle the paucity of data. In this study, we test the impact of news announcements using two different types of tests.

The first series of tests document that the return volatility of one series type, whose shares only citizens may hold (A-shares), unambiguously leads return volatility of another series type, whose shares can be held by foreigners (B-shares), before the public news announcement, suggesting that there is an information spillover from one series type to another. If this observation is correct, considering that citizens may hold both type of shares and foreigners have ways to get around the legal restrictions, why is this lead–lag relationship not arbitraged away? This question leads to our second series of tests. We show that, if bid–ask spreads are ignored, economically and statistically significant returns can be made by applying simple technical trading rules that exploit this lead–lag relationship. If transaction costs are taken into account, the maximum return achievable using these trading rules is less than the risk-free return in this market. This is why the observed lead–lag relationship is not arbitraged away.

The observed lead–lag relationship between A-shares and B-shares in the pre-announcement period reveals that information is being gradually incorporated first into the prices of A-shares and then into the prices of B-shares. We should not be able to detect this pattern if markets are inefficient, or the news announcements are value-irrelevant, or the power of our tests are small because of a small sample size. This is because under these three hypotheses, no linkage should be detected between prices and information, before or after the news

[4] Market integrity refers to the disadvantages outsiders face vis-a-vis insiders when trading in the market. We expect that market integrity changes over time. This study aims to measure the average market integrity for the BMV during a specific period of time.

announcement. Another piece of evidence favoring the conclusion that there is pre-announcement information leakage is the observation that, although trading volumes do not show a time trend before the announcement, the bid–ask spreads seem to be secularly declining.

Could stock prices be insensitive to news announcements in our example because the public had fully anticipated them? If so, both A-shares and B-shares should have the same pre-announcement price behavior. The fact that the prices of the A-shares lead the prices of the B-shares hints that insider trading, rather than full anticipation by the public, may be responsible for the insensitivity of stock prices to corporate news announcements. Another piece of evidence favoring the above conclusion is that at the time of the corporate news announcement, though both types of shares show little reaction, the reaction of the A-shares is even less than the reaction of the B-shares. So holders of the A-shares are less surprised by the announcement than holders of the B-shares.

Empirical research on international market segmentation — segmentation by ownership, by trading locations, by voting rights, or by information endowments — is a growing field. A partial list of papers addressing these topics would include Jorion and Schwartz (1986), Alexander et al. (1988), Jayaraman et al. (1993), Foerster and Karolyi (1993), Umlauf (1993), Bailey and Jagtiani (1994), Chan et al. (1995), Bekaert and Harvey (1995), Kleidon and Werner (1996), Stulz and Wasserfallen (1996), Forster and George (1996), Brennan and Cao (1997), Morck et al. (1997), Domowitz et al. (1997,1998) and Chui and Kwok (1998). Though each of the above papers focuses on a different issue, a central theme in this literature is that exogenous or endogenous segmentation leads to the violation of the law of one price. Our paper, which belongs to this literature, attempts to document the different reaction of share prices in segmented markets to corporate news announcements.

The paper is structured as follows. In Section 2 we give a brief background of the BMV, with particular emphasis on the enforcement of insider trading regulations and the types of shares being traded. The data are described in Section 3. Section 4 documents the impact on trading behavior, or the lack thereof, of corporate news announcements. In Section 5, we provide evidence suggesting that insider trading is responsible for the insensitivity of stock prices to corporate news announcements. Section 6 concludes. Here we summarize the findings of this paper, argue that the findings may not be uncommon, and opine that this paper presents an approach for ranking emerging markets in terms of their market integrity.

2. The Bolsa Mexicana de Valores

Brokerage activities began in Mexico around 1850, when European and American businessmen traded mining shares openly on the streets of Mexico

City. On October 31, 1894, the Bolsa Nacional de Mexico (The National Exchange of Mexico) was born. A year later, it merged with another group of organized investors. Together, these two groups of investors created the Bolsa de Mexico (The Mexican Exchange). Under this title, trading on the floor began on October 21, 1895. Between that first market and the present-day Bolsa Mexicana de Valores (BMV), a succession of institutions provided facilities for the continuous evolution of trading in Mexico. Trading was interrupted only for brief periods, such as the internal monetary turbulence during the Revolution, and financial difficulties after the First World War. Today, the BMV stands as Mexico's only stock exchange, a private limited liability institution owned by a few Mexican brokerage houses, each of which owns a single share.

Until 1975, the regulatory framework for the BMV was defined by the Credit Organizations Law (Ley de Organizaciones de Crédito) of 1932, and the Exchange Regulation Law (Ley Reglamentaria de Bolsas) of 1933. Since 1975, the BMV has been governed by the Securities Market Act (Ley del Mercado de Valores). The Mexican laws restricting insider trading are similar to those in the United States. The National Banking and Securities Commission regulates the exchange, and is responsible for the enforcement of insider trading laws.

Article 16 Bis 8 Ley Mercado de Valores (LMV) states: 'Inside information consists of the acts of a corporation, accountants, or administrators of a said corporation, which is not divulged to the public investor, but which can influence the prices and quotations of the stock's price of the said corporation' (author's translation). The LMV gives examples of types of privileged information: 'Changes in a company's board of directors, dividend policies, anticipated amortization of obligations, news of impending strikes, and defaults' (author's translation). The LMV further specifies who can have such privileged information (Art 16 Bis 1, LMV): 'the administrators, directors, managers, secretaries of a corporation, a stockholder holding 10% or more of outstanding equity, the providers of independent services to the corporation, the assessors and the businesses of publicity, stockholders holding 10% or more of equity of a stock brokerage, the Bolsa specialists of the firm, and the administrators of the BMV' (author's translation).

Mexican companies issue many different types of equity, called series. For the purpose of this study, two types of series interest us, the A-shares and the B-shares. Legally, A-shares may only be held by Mexican nationals, and account for at least 51% of a firm's voting rights. B-shares are open to foreigners, and issues of B-shares are limited to 49% of the ownership. By using trusts, it is technically possible for foreigners to hold A-shares. Other than segmentation by ownership, these two series are similar. In particular, owners have equal rights to cash flows and voting privileges. The A-shares and the B-shares, along with L-shares, which carry limited voting rights, are the most popular types of outstanding shares (Domowitz et al., 1997,1998).

3. The data

The daily trading data used for this study were collected from Bloomberg News Service terminals, and copied by hand. Corporate news announcements were also obtained from Bloomberg News. Given the limitations of the data collecting process, we chose to limit the period under study from July 1994 through June 1997.

The data were screened using the following process. The number of different types of securities that had ever traded in the BMV in our period of study was 884. The first screen that we applied was to select only common stocks. Only 369 series survived this screen. The second screen that we applied was to select firms that had either only A-shares, or only B-shares, or both A-shares as well as B-shares. The total number of firms that match this criteria was 159, yielding 240 series. In this set, 24 firms had only A-shares, 54 firms had only B-shares, and 81 firms had both A-shares as well as B-shares. The third filter we applied was to eliminate all stocks that had no 'event-worthy news' in Bloomberg in that time period. Event-worthy news includes, but is not restricted to, all restructuring announcements, which includes news about changes in capital structure, mergers, takeovers, acquisitions, spinoffs, selloffs, joint ventures, privatization announcements and board change announcements. Atypical earnings and dividend announcements are also included. Only 73 series, from 49 firms, survived this screen. In this group, 10 firms had only A-shares, 15 firms had only B-shares, and 24 firms had both A-shares as well as B-shares; yielding 34 A-share series and 39 B-share series. Fortunately for us, a few series had two distinct news events that were at least three months apart, and a few series even had three distinct news events that were at least three months apart. This repetition allowed us to increase our sample size to 119 series-event data points, by using the data for the 38 series affected by one news event once, using the data for the 24 series affected by two news events twice, and using the data for the 11 series affected by three news events three times. The details are given in Table 1.

The 75 events involving 49 firms that we cover are listed in the appendix. We verified the occurrence of these events and the event days by cross-checking with the local Mexican press. The most frequent corporate news from Mexico in 1994–1997, as reported by the Bloomberg News Service, related to company restructurings followed by earnings announcements. A casual observation of the daily wire reports from Bloomberg News Service suggests that this reporting emphasis is similar to U.S. company news in that same period.

The day of the company news announcement also appears in the appendix. It is taken to be the day on which the news was first reported by Bloomberg. Since it is difficult for us to pinpoint the exact time the news was made public, for the purpose of this study we define the event window to be from a day before the news announcement to two days after the news announcement.

Table 1
Mexican Stock Exchange data, July 1994–June 1997

Types of securities issued by firms with newsworthy announcements. A-shares issued by Mexican firms can be held only by Mexican nationals, while B-shares can be held by foreigners. A-shares comprise a majority of a company's equity, while B-shares are limited to minority ownership status. Events are defined as firm announcements, reported in the Bloomberg News Service, regarding company structure, privatization, board changes, and earnings and dividend announcements that are abnormally large. The table displays the number of firms issuing shares arranged by the number of announcements affecting each firm.

Firms issuing shares	Number of events			Total
	1	2	3	
Only A-shares	7	2	1	10
Only B-shares	13	2	0	15
Both				
A-shares	9	10	5	24
B-shares	9	10	5	24
Total number of series	38	24	11	73

We define an event period to be from 80 days before the news announcement to 10 days after the news announcement. In some cases, if data is missing at the beginning or end of the event period, the event period is shorter. For each of these event periods, for both A-shares and B-shares, we obtained the daily closing bid, ask and transaction prices, and the daily trading volumes. Data were missing for a few observations. We also collected the daily closing price of the IPC, the popular Mexican stock index, for the period July 1994 through June 1997.

4. The impact of corporate news announcements

The surprise or news in a corporate news announcement is measured by its impact on trading behavior. Bigger the surprise, more atypical is the trading behavior. In this section, we document the effect of corporate news announcements in Mexico on the daily return of the firm's share price, the volatility of the daily return, the daily trading volume, and the end-of-day bid–ask spread. We are particularly interested in detecting abnormalities in these variables at the time of the corporate news announcement.

4.1. Returns

We test each firm-series in our sample for abnormal returns for every day in the event period, using the methodology proposed by Brown and Warner (1985).

The normal period is defined as 80 days before the announcement day to 10 days before the announcement day. We use a market model to define excess returns for each firm for each day. A t-statistic is estimated for each firm for each day. Our null hypothesis is that excess returns for each day are equal to zero. We use a t-distribution to decide on the rejection of the null hypothesis, relying on a two-tailed t-test at a 5% significance level.

Fig. 1 presents a graph of the percentage of firms with A-shares and the percentage of firms with B-shares that had a rejection of the null hypothesis on each day in the event period. The shaded area in the figure highlights the event window. If we assume that excess returns are normally distributed, given our definition of abnormal returns, we should observe, on average, 5% of our sample to have abnormal returns on any particular day. Our results reflect this

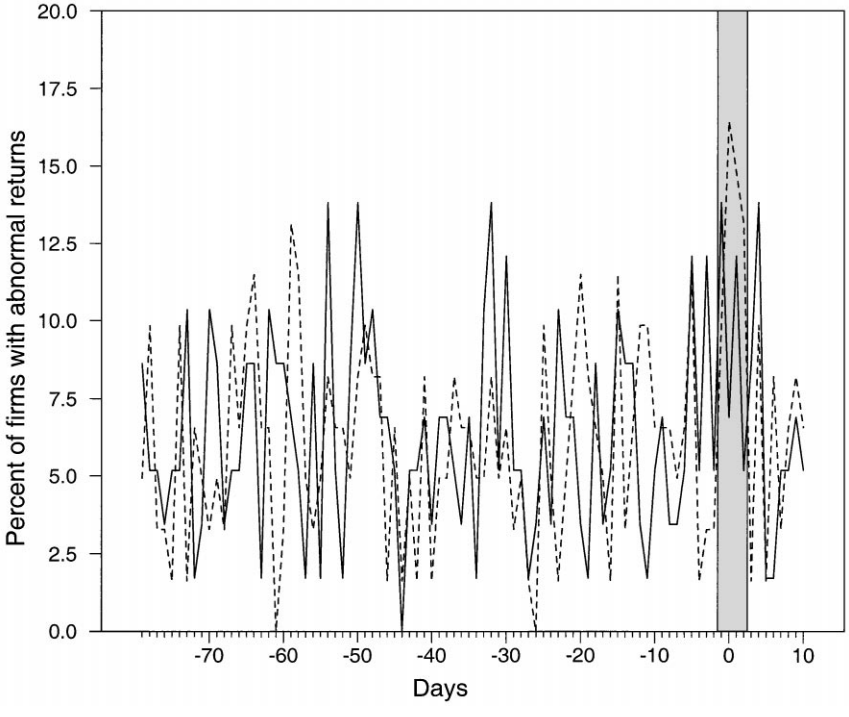

Fig. 1. Percentage of firms with abnormal returns. Data is taken for A-shares and B-shares issued on the Mexican stock exchange between July 1994 and June 1997. Day 0 is the announcement day. The y-axis gives the percentage of firms that had a rejection of the null hypothesis that returns were not abnormal on day t, where t ranges from -80 to $+10$. A firm has an abnormal return on date t if the null hypothesis of no abnormal return is rejected using a two-tailed t-test at a 5% significance level. The shaded area in the figure highlights the announcement event window, from day -1 to day $+2$. The solid line represents A-shares. The dashed line represents B-shares.

expectation. Further, if the corporate announcement has an effect on stock prices, then we would expect to see more rejections in the shaded area, which would appear as a big spike around the event date shown in Fig. 1. The fact that we do not see more rejections in the event window for A-shares, and that we observe variation that can be explained as typical noise over the whole 90-day period (-80 to $+10$), suggests that there is nothing of significance going on around the event date for A-shares. For B-shares, although there is no dramatic spike displayed in the event window, the highest observed level occurs in the event window. From the evidence displayed in Fig. 1, we conclude that corporate announcements in our sample seem to have no impact on returns of A-shares, and have some impact on returns of B-shares. Robustness checks were made by varying the number of days in the event window, and calculating excess returns as returns minus the mean return as well as returns less the Mexican stock market index return. Our conclusions do not change.

The results presented in Fig. 1 relates to individual firms. We are not able to pool abnormal returns and conduct a single test encompassing all of the observations in our sample, because the firms in our sample have announcements about events that are different in nature. Some of the announcements will be taken as good news, others will be taken as bad news. Also, some announcements will not be considered news at all. Announcements cannot be classified in advance, and classifying each announcement after the fact, based on the realized excess returns in the event window, would introduce a severe selection bias. For example, classifying positive realizations of excess returns as good news will make their excess returns positive by construction, even if the true data generating process has expected excess returns of zero. The analysis in the next section gets around this problem, by focusing on the volatility of returns.

4.2. Volatility of returns

A large literature relates stock price volatility with the flow of information in financial markets. This section examines if there is any evidence of unusual volatility for our sample in the event window.

We take the absolute value of excess returns observed in our sample and pool these over all firms. Using absolute values allows us to compare event observations for firms that have announcements that are different in nature. Our null hypothesis is that absolute returns during the event window are not higher than those in the normal period. The testing methodology used in the previous section is no longer appropriate, since it is based on the assumption that sample returns follow a normalized t-distribution. This assumption cannot be made for absolute returns. We therefore use a non-parametric test on mean ranked excess absolute returns, as proposed in Corrado (1989). This test does not make any distributional assumptions, focusing instead on the rank of the observations instead of their values. Corrado (1989) shows that this test statistic is

well-specified, and is expected to be asymptotically normally distributed. For our purposes, a finite sample under the null hypothesis of no abnormal absolute returns, might yield a normal t-distribution. We also try different methods in calculating excess returns, such as raw returns minus their mean, raw returns minus market returns, and residual returns from the market model, using both the conventional beta as well as Dimson (1979) beta to control for infrequent trading.

Table 2 provides statistics using the Corrado (1989) test for both the A-shares as well as the B-shares. Using a one-tailed test at a 5% significance level, the

Table 2
Rank test for volatility

Table displays point estimates, standard deviations, and the test statistic, T, computed by the Corrado (1989) test. The Corrado (1989) test is as follows. For each share i, we sort the 91 days of absolute values of residuals in descending order. We define K_{it} as the rank of the absolute value of the residual in date t. Day 0 indexes the event date. The point estimate $\mu(K)$ for the event window (day -1 to $+2$) is computed as

$$\mu(K) = \frac{1}{N}\sum_{i=1}^{N}\left(\sum_{t=-1}^{2}(K_{it} - 45.5)\right)$$

and the standard deviation $\sigma(K)$ is calculated using the entire 91-day event period (day -80 to $+10$) as

$$\sigma(K) = \sqrt{\frac{4}{91}\sum_{t=-80}^{+10}\left(\frac{1}{N}\sum_{i=1}^{N}(K_{it} - 45.5)\right)^2}.$$

The data is taken for A-shares and B-shares issued on the Mexican stock exchange between July 1994 and June 1997. The null hypothesis is that the absolute values of residuals for the event window are the same as those in the event period. The test statistic, T, is

$$T = \frac{\mu(K)}{\sigma(K)}.$$

Residuals are computed in three ways. 'Raw' refers to return minus mean return. 'Index' refers to return minus the return of the Mexican stock market index. 'Market' refers to return minus the return predicted by the market model. For the market model, we used the conventional beta. The results using Dimson's (1979) beta to correct for infrequent trading are not reported, because they are similar to the above.

	$\mu(K)$	$\sigma(K)$	T
Raw, A-shares	4.595	5.570	0.825
Raw, B-shares	12.738	5.956	2.139[a]
Index, A-shares	− 4.276	6.263	− 0.683
Index, B-shares	13.787	7.021	1.964[a]
Market, A-shares	10.010	6.704	1.493
Market, B-shares	14.689	6.569	2.236[a]

[a]Statistical significance at the 5% level.

table shows that we cannot reject the hypothesis of no abnormal absolute returns in the event window for A-shares, which are held only by citizens, regardless of how we compute excess returns. On the other hand, the results concerning B-shares, which can be held by foreigners, are mixed, allowing the possibility of abnormal volatility in the event window for this type of share.

Fig. 2, which is in the spirit of Fig. 1 of the previous section, presents the results of Table 2. It plots the above rank statistic for each day in the event period, with the shaded area highlighting the event window. If the corporate announcement has an effect on stock volatility, then we would expect to see higher values of the rank statistic in the shaded area. We do not see any large jumps around the event date for the A-shares, but we do see it for the B-shares.

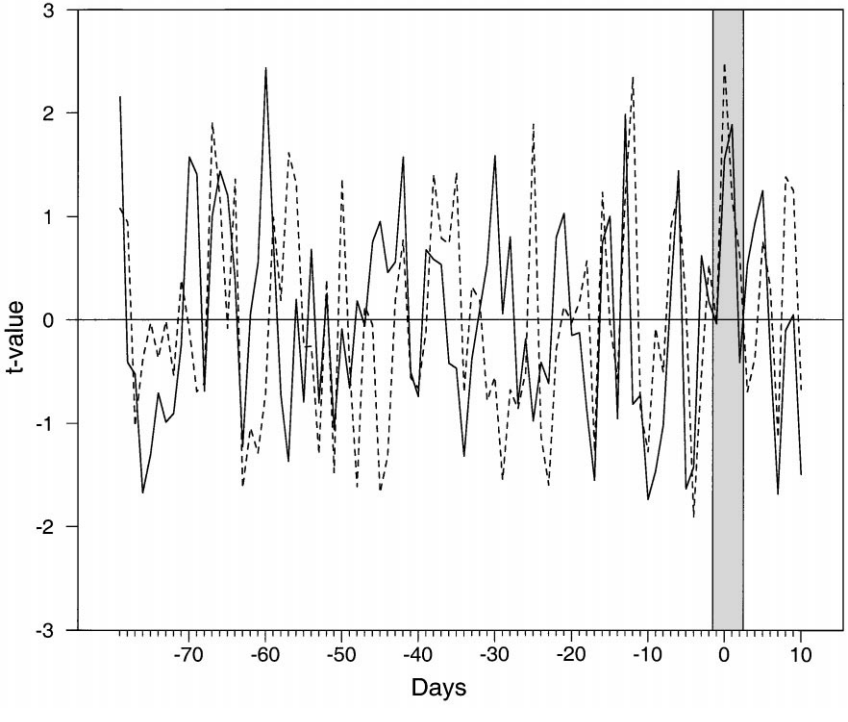

Fig. 2. Rank statistics of abnormal volatility. The t-value is the rank statistic obtained following a methodology proposed by Corrado (1989). Day 0 is the event day. The y-axis gives the t-value of the Corrado (1989) test, where the null hypothesis is that volatility, measured as absolute residual returns, is not abnormal on day t, where t ranges from -80 to $+10$. The shaded area in the figure highlights the announcement event window (-1 to $+2$). The solid line represents A-shares. The dashed line represents B-shares.

This observation is robust, withstanding the variation in the number of days included in the event window, and the usage of alternative methods to calculate excess returns. The conclusion we draw is that corporate announcements in our sample seem to have no impact on the return volatility of A-shares, but they do impact positively the return volatility of B-shares.

4.3. Trading volume

In the market microstructure literature, high trading volumes are associated with information arrivals (see, e.g., Kyle, 1985). This section examines if there is any evidence of unusual trading volume in the event window.

We proceed in two steps. First, an individual share's daily trading volume for a particular day is divided by the average daily trading volume for that share in the event period. This calculation yields a normalized measure that is independent of firm size. An alternate measure displaying similar characteristics is turnover. However, we could not use this metric for lack of data. Second, the normalized volume for each share is averaged across all shares for each day. Given our method of constructing the normalized trading volume, we should observe, on average, a normalized daily trading volume of unity. Our results reflect this expectation.

Fig. 3 plots this normalized daily volume figure in the event period. If corporate news announcements affect the volume of trade, we would expect to see a big spike around the event date in Fig. 3. As seen in Fig. 3, there is no such spike in the event window for either the A-shares or the B-shares. We notice a large spike after the event window for the B-shares. This abnormal volume is driven by an outlier and took place four days after the announcement day. We conclude, therefore, that corporate announcements in our sample seem to have no impact on volume.

4.4. Bid–ask spreads

In the market microstructure literature, unusual bid–ask spreads are related to inventory control problems associated with unusual volatility (see Stoll, 1978; Ho and Stoll, 1981,1983), or a period of severe asymmetric information (see Glosten and Milgrom, 1985; Kyle, 1985). This section examines if there is any evidence of unusual bid–ask spreads in the event window.

We proceed in two steps. First, an individual share's bid–ask spread in a particular day is calculated as its closing ask price less its closing bid price divided by the mid-point between the ask price and the bid price. Second, the bid–ask spreads for each share are averaged across all shares for each day. Fig. 4 plots this daily bid–ask spread in the event period. If corporate news announcements affect bid–ask spreads, we would expect to see a big spike

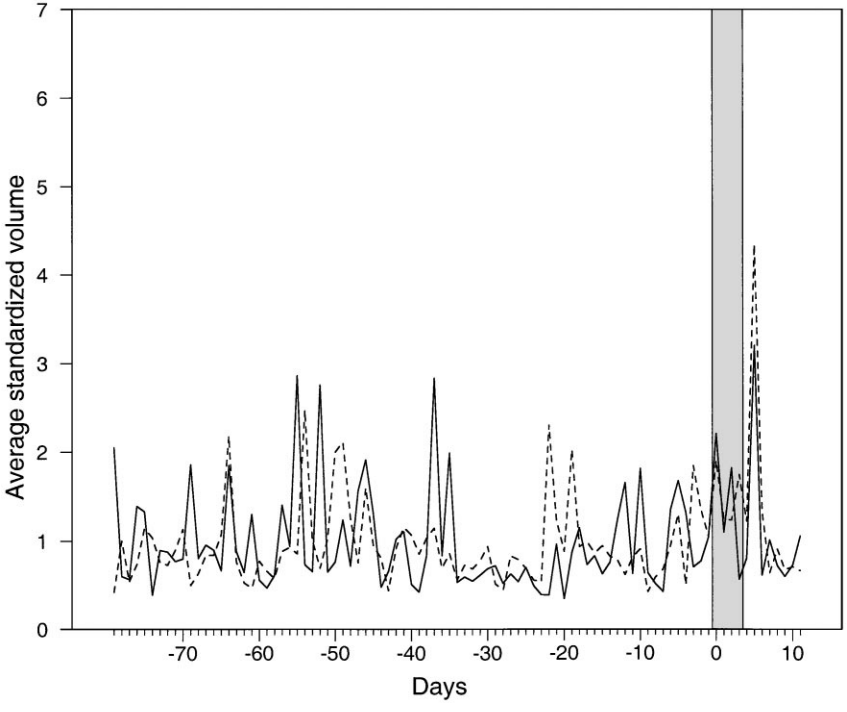

Fig. 3. Average standardized volume. Average standardized volume is calculated in two steps. First, an individual share's daily volume is divided by the average daily volume for that share. Second, the normalized volume for each share is averaged over all shares. The y-axis gives this average standardized volume on day t, where t ranges from -80 to $+10$. By construction, the mean of the time series of average standardized volume is unity. Day 0 is the announcement day. The shaded area in the figure highlights the announcement event period (-1 to $+2$). The solid line represents A-shares. The dashed line represents B-shares.

around the event date in Fig. 4. As Fig. 4 shows, there is no such spike in the event window for either the A-shares or the B-shares. We conclude then that corporate announcements in our sample seem to have no impact on bid–ask spreads.

Two observations are warranted. First, notice from Fig. 4 that the bid–ask spreads are declining as we approach the announcement date. This decline may occur because information asymmetry is decreasing or it may occur because trading volume is increasing. But Fig. 3 reveals that trading volume is not increasing, suggesting that information asymmetry is decreasing. This explanation is consistent with a conclusion drawn in the next section, regarding the presence of pre-announcement information leakage. Second, the average

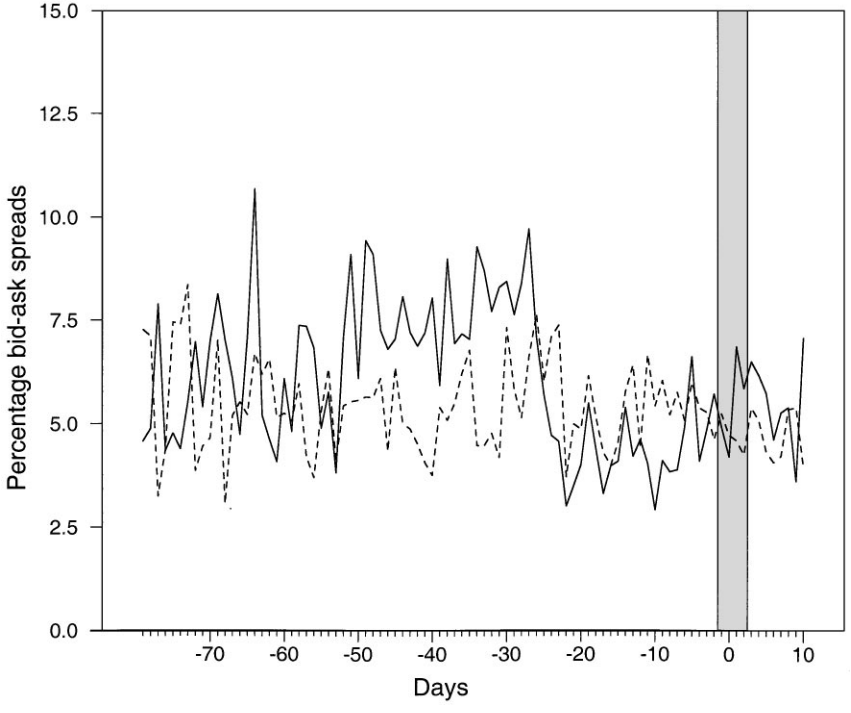

Fig. 4. Percentage bid–ask spreads. Percentage bid–ask spread of each stock was calculated as the ask price less the bid price divided by the midpoint between the ask and the bid. The result was then averaged across all stocks. The y-axis gives the percentage bid–ask spread on day t, where t ranges from -80 to $+10$. Day 0 is the announcement day. The shaded area in the figure highlights the announcement event window (-1 to $+2$). The solid line represents A-shares. The dashed line represents B-shares.

bid–ask spread is around 5.7% in the event period, and this level is much higher than the 1996 average spread calculated for NYSE traded stocks, which is about 0.5%.[5] This result is consistent with another conclusion we draw in the next section: though there is a lead–lag relationship between prices of A-shares and B-shares, significant transaction costs of trading preclude trading strategies from exploiting this fact.

[5] This figure is obtained by dividing the average spread (23 cents) by the average share price ($38.40) documented in the 1996 NYSE Fact Book. Because of Jensen's inequality, this estimate is biased downwards.

4.5. Price surprises and earnings surprises

Of the 75 events in our sample, 19 refer to earnings announcements. This feature of our sample offers us a unique opportunity. The positive association between earnings surprises and stock price surprises in the United States is one of the best-documented empirical regularities in accounting (see Lev, 1989). Earnings, therefore, are believed to have information content. Testing for a similar relationship in our sample of Mexican securities would add to the current literature.

We define an earnings surprise as actual earnings per share (EPS) minus forecasted earnings per share, divided by forecasted earnings per share. Actual EPS is obtained from data provided by the vendor Worldscope. This information is available only for the end of a calendar year in Mexico. Forecasted EPS is the median forecast of analysts, and this figure is obtained from data provided by the vendor I/B/E/S. This data is also available only for the end of a calendar year in Mexico. Of the 19 earnings events, earnings surprises could be computed for only 15, due to missing data.

The earnings are classified as follows. 'Big surprises' are all earnings surprises where the difference between the actual and forecasted EPS exceeds 100% in absolute value. 'Small surprises' are all earnings surprises where the difference between the actual and forecasted EPS is between 20% and 100% in absolute value. 'Insignificant surprises' are all earnings surprises where the difference between the actual and forecasted EPS is less than 20% in absolute value.

If earnings information announcements impacted prices in Mexico, it follows that bigger earnings surprises should lead to bigger price surprises. Table 3 reveals that this link is absent. If we do the Corrado rank test for abnormal volatility as we did in Table 2, we find that not only the t-values for the three categories are statistically insignificant, implying that earnings announcements have no discernible effect on prices, but their ordering is perverse. The biggest earnings surprise category actually has the lowest impact on prices, as measured by effect on volatility.

Some caution needs to be exercised in interpreting the results in Table 3. The data used in this table has a number of problems, one of them being the fact that we do not have many data points. The biggest problem, however, is the following. As all our price surprises are for quarterly or semi-annual announcements, but all our actual EPS as well as forecasted EPS are for end of calendar years, we use the nearest end-of-year records of actual and forecasted EPS to match with our announcement date. This step leads to a severe mismatch between the dating of the price surprise and the dating of the earnings surprise.

To summarize Section 4, the behavior of returns, volatility, trading volume, and bid–ask spreads points to the fact that, in the period July 1994 through June 1997, Mexican corporate news announcements did not have any noticeable

Table 3
Price surprises and earnings surprises

Difference between forecasted earnings per share (EPS) and actual earnings per share, classified by size of earnings surprise, for a data set of Mexican securities, July 1994 through June 1997. Earnings surprises are calculated for firms experiencing an earnings event, defined as a news announcement concerning firm earnings, using the actual value of EPS minus the forecasted value of EPS, divided by the forecasted value of EPS. Actual EPS has been obtained from data provided by the vendor Worldscope. Forecasted EPS has been obtained from data provided by the vendor I/B/E/S. The earnings surprises were classified as follows. 'Big' contains all earnings surprises where the difference between the actual and forecasted EPS exceeded 100% in absolute value. 'Small' contains all earnings surprises where the difference between the actual and forecasted EPS was between 20% and 100% in absolute value. 'Insignificant' contains all earnings surprises where the difference between the actual and forecasted EPS was less than 20% in absolute value. As all our price surprises are for quarterly or semi-annual announcements, but all our actual EPS as well as forecasted EPS are for end of calendar years, we use the nearest end-of-year records of actual and forecasted EPS to match with our announcement date. The T-value displayed is the T-value for the Corrado (1989) rank test for abnormal volatility.

Earnings surprise	Firm event	Event date	Forecasted EPS	Actual EPS	T-value
Big	First half net drops 43% to 22.68 pesos, Argos A/B	July 29, 1994	0.313	1.050	
	Desc profit soars 600%, Desc A/B	July 27, 1995	1.057	3.460	
	42% drop in net income, Gmex1 B	March 4, 1997	2.920	− 8.560	− 0.471
	Ponderosa first half loss doubles to 155 M pesos, Pond A/B	August 1, 1994	− 2.120	0.130	
	First half net income plunges 78%, Sears B	August 1, 1994	1.377	− 0.010	
	Situr sales down 55%, Situr A/B	October 27, 1995	0.706	− 0.970	
Small	Net earnings down 23% from third quarter of 1994, Gfnorte A/B	October 27, 1995	0.939	0.740	
	Kimber first quarter net 96% lower than year ago, Kmc A/B	April 20, 1995	0.643	0.440	
	First quarter net income rose 49%, Masec A/B	April 29, 1996	0.395	0.490	0.193
	Third quarter net income rose 68%, Posad A	November 2, 1994	0.155	0.190	
	Second quarter earnings drop 71%, Sigma B	July 25, 1996	4.970	3.750	
Insignificant	Abnormal earnings report, Argos A/B	July 28, 1995	0.265	0.220	
	Earnings of fourth quarter of 1995 up 35.4%, Gissa A/B	February 16, 1996	0.652	0.680	0.162
	Grupo Inbursa third quarter net doubles to 825 M, Inbur A/B	October 24, 1994	0.920	0.825	
	San Cristobal first half net doubles to 49.2 million pesos, Cris A/B	July 29, 1994	0.855	0.920	

impact on trading on the announcement day.[6] Therefore, in the next section, we explore the reasons why news announcements did not impact trading on a corporate announcement day in Mexico.

5. Is it insider trading?

As we discussed before, we might find stock prices to be insensitive to corporate news announcements because of a variety of reasons. First, our sample size might be too small. Alternatively, it could be the case that markets are inefficient. Or markets might be efficient, but the corporate news announcements are either not value-relevant or they have been fully anticipated. Finally, markets might be efficient, and corporate news announcements are value-relevant, but unrestricted insider trading has caused prices to fully incorporate the information in advance of its official release.

If any of the first three hypotheses are correct, we should not observe pre-announcement price behavior that suggests an information leakage. On the other hand, if any of the last two hypotheses are correct, we should observe pre-announcement price behavior that suggests a one-hundred percent information leakage. Let us explore how this might happen in both of the last two cases.

Suppose Mexican corporate news announcements are badly kept secrets. Information leaks out into the public domain regularly. Market participants, consequently, update their beliefs. They trade accordingly, and the stock price reflects this information leakage. If the news leakage is extreme, the updated belief could contain the information in the announcement. The announcement would be fully anticipated, and it will not affect prices.

On the other hand, suppose insider trading is widespread in Mexico. Insider trading is trading by a person who, by virtue of his position, has information non-insiders do not have. Through trading, their superior information gets incorporated in stock prices (see models by Glosten and Milgrom (1985), and Kyle (1985), for a formal exposition of this point). Prices will move to reflect the information that is leaked through insider trades and, in principle, could incorporate nearly all of the information before the announcement. In this case, the announcement will have no news content.

[6] The period of our study covers the Mexican crisis period of December 1994 through February 1995. It is possible that the macroeconomic volatility during this period swamped the micro-economic volatility of corporate news announcements and, therefore, our tests did not detect any effects. We thank our referee for bringing up this point. To control for this possibility, we subdivided our sample into two sub-periods, July 1994 through December 1995 and January 1996 through June 1997, and repeated all our tests on these two sub-periods. We did not find any difference in test results between these two sub-periods.

Insider trading is illegal in Mexico. However, given the fact there has never been an indictment, trial or conviction for insider trading there till the end of 1997, the possibility of insider trades cannot be ruled out.

In the United States, it is impossible to distinguish between the last two hypotheses stated above.[7] However, Mexico offers us a rare opportunity to explore these hypotheses. The existence of two classes of shares which are segmented by ownership, permits us to analyze the pre-announcement price behavior of the two types of shares. If the full anticipation hypothesis holds, both types of shares would exhibit the same time-series price behavior before the announcement. If the insider trading hypothesis holds, the time-series price behavior may be different before the announcement.

A few points need to be made here. First, if we see different pre-announcement price behavior that reveals a significant information spillover from one type of share to another, this behavior presents evidence not only against the full anticipation hypothesis, but also against the small sample, the market inefficiency and the value-irrelevant corporate announcement hypotheses. Second, if we document such an information spillover, information should be flowing from the type of share where there is more insider trading to the type of share where there is less insider trading. Since we do not know in advance which type of share, A-share or B-share, is subject to more insider trading, we cannot formulate an advance hypothesis regarding the direction of information flow. Third, if we document an information spillover, considering that citizens may hold both type of shares and foreigners have ways to get around the legal restrictions by using trusts, we need to explain why this lead–lag relationship is not arbitraged away. We now present three sets of tests that address these issues.

5.1. Lead–lag relationship between A-shares and B-shares

Lead–lag relationships are best established using the econometric concept of Granger Causality. A variable x is said to Granger cause another variable y if lags of x have an explanatory power in a regression of y on lags of x. If variable x Granger causes variable y, but variable y does not Granger cause variable x, then we can conclude that x is the cause and y is the effect. The Granger Causality test is an F-test of the joint significance of all lags of an explanatory variable. The null hypothesis is that no joint significance exists.

In our case, we want to study the flow of information between the two classes of shares. Volatility presents the best proxy for the incorporation of information

[7] Meulbroek (1992) is a notable exception. Her study was possible because she had access to illegal insider trading data from the SEC. In many emerging stock markets even market regulators do not have this data.

into prices. Therefore, we need to establish the direction of volatility transmission between the two classes of shares. This requirement leads us to restrict our data set to the subset of firms that issue both A-shares and B-shares. For the next two tests, we use this subset of 44 events, affecting 24 firms.

Following Comte and Lieberman (1996), we use the notion of Granger Causality in variance. Granger Causality is best tested in the framework of a vector autoregression (VAR).[8] We set up a simple two-variables VAR, with the variance of returns of A-shares and B-shares as the endogenous variables. We use a standard Likelihood Ratio test to choose the number of lags in our two-equation VAR (see Enders, 1996). The procedure is that of sequential hypothesis testing. Essentially, we start with a one-lag model, and then test if we can reject the hypothesis that adding another lag will not improve the explanatory power of the model. The procedure is repeated until the hypothesis cannot be rejected, resulting in a model with a sufficient number of lags.

Panel A of Table 4 presents results of the Likelihood Ratio test on increasing the number of lags. The model chosen by the test is one with 4 lags. Panel B of Table 4 reports results of the Granger Causality test for our 4-lag model. For robustness, we also conduct the test with a 3-lag model and a 5-lag model. All specifications yield the same unambiguous result: the volatility of returns of A-shares Granger cause the volatility of returns of B-shares, whereas the volatility of returns of B-shares do not Granger cause the volatility of returns of A-shares. This implies that information spills from A-shares to B-shares, and not vice-versa, which hints that insider trading may be the cause of Mexican corporate announcements being non-events.[9]

[8] The reason we choose to do a VAR on volatility rather than a VAR on returns is as follows. Though there are many events in our sample, like an abnormally low earnings announcement, which would be unequivocally accepted as bad news by both holders of A-shares and holders of B-shares, there are also many events in our sample, like stock swaps between Mexican Grupos, that may be regarded as good news by one class of shareholders and bad news by the other class. As a matter of fact, any corporate event that causes value redistribution between A-shares and B-shares will have this feature. So it is important for us to define events in terms of magnitude of price movements without any reference to the direction of price movements. To see this more clearly, suppose that an increase in prices of A-shares is sometimes followed by an increase in prices of B-shares, due to a value increase for the whole firm, and is sometimes followed by a decrease in prices of B-shares, due to a value redistribution from B to A. The VAR test in returns under these conditions will show no average linkage, an incorrect conclusion. A VAR in volatility will show a linkage. That is why a VAR in volatility is superior to a VAR in returns for our particular case.

[9] In a different context, Frankel and Schmukler (1996) documented that during the 'peso crisis' of December 1994, the Net Asset Values of mutual funds, held mostly by Mexican citizens, Granger caused Net Asset Values of mutual funds, held mostly by foreigners. They concluded that the first to flee were not fickle foreign investors, but well-informed Mexican investors.

Table 4
Granger Causality Tests for Mexican A-shares and Mexican B-shares in the period July 1994–June 1997

This table reports results from a two-variable vector autoregression (VAR) system of equations

$$a_t = \beta_{10} + \sum_{i=1}^{n} \beta_{11i} a_{t-i} + \sum_{i=1}^{n} \beta_{12i} b_{t-i},$$

$$b_t = \beta_{20} + \sum_{i=1}^{n} \beta_{21i} a_{t-i} + \sum_{i=1}^{n} \beta_{22i} b_{t-i},$$

where a_t and b_t denote the variance of returns of A-shares and B-shares, respectively, at date t. Panel A gives the results from a Likelihood Ratio test that is constructed to determine the optimal number of lags in the VAR. The Chi-squared statistic used is for the null hypothesis that an additional lag is not adding explanatory power to the model, yielding a particular significance level. Panel B reports the results of Granger causality tests for three different models with 4, 3, and 5 lags respectively. The A-shares F-statistic refers to the hypothesis that lags of A-shares do not Granger cause the dependent variable. The B-shares F-statistic refers to the hypothesis that lags of B-shares do not Granger cause the dependent variable. The significance level of the corresponding F-statistic is given. Low values of significance level indicate Granger causality.

Panel A: Likelihood ratio test

	Log determinant t	Log determinant $t+1$	Chi-squared	Significance level
1 lag vs. 2 lags	− 2.281	− 2.280	16.63	0.0023
2 lags vs. 3 lags	− 2.279	− 2.279	14.44	0.0060
3 lags vs. 4 lags	− 2.279	− 2.278	32.19	0.0000
4 lags vs. 5 lags	− 2.277	− 2.277	6.96	0.1381

Panel B: F-statistics

Dependent variable	Number of lags	A-shares		B-shares	
		F-Statistic	Significance	F-Statistic	Significance
A-shares	4	29.523	0.0000	1.925	0.1035
B-shares	4	92.915	0.0000	68.919	0.0000
A-shares	3	30.863	0.0000	2.297	0.0756
B-shares	3	123.359	0.0000	91.323	0.0000
A-shares	5	23.615	0.0000	1.799	0.1096
B-shares	5	75.900	0.0000	56.874	0.0000

5.2. The lead–lag relationship and arbitrage

We have just documented that A-shares lead B-shares in terms of information revelation. Is it possible for market participants to use this fact to devise

profitable trading strategies? The idea is that market participants would be able to observe the movements in A-shares and infer some of the information that insiders have. Then, knowing this information, they would trade B-shares to exploit the fact that B-shares have not reflected the information as yet. If market participants can apply these strategies profitably, we should not observe any lead–lag relationship between A-shares and B-shares.

To test this possibility, define an (i, t) technical trading strategy such that a position is opened by buying B-shares when the cumulated percentage difference in returns between A-shares and B-shares, cumulated over t days, is greater than a trigger $+i$, or a position is opened by selling B-shares when the cumulated percentage difference in returns between A-shares and B-shares, cumulated over t days, is less than a trigger $-i$. Close the position when the reverse trigger occurs, or when the end of the event window is reached, whichever comes first. For example, the (4, 3) strategy would involve buying B-shares when the 3-day cumulative difference in returns between A-shares and B-shares is greater than $+4\%$, and to close the position when the 3-day cumulative difference in returns between A-shares and B-shares is less than -4%, or the last date of the event window is reached, whichever comes first.

The (i, t) technical trading strategy captures the essence of our intuition. If a divergence between the returns of A-shares and B-shares is due to insider information that is incorporated in A-shares but is not incorporated in B-shares, it is expected that B-shares would soon catch up to A-shares as this information spills over. Given the amount of noise in share prices, it would be profitable to take a position in B-shares when the divergence is more than a threshold value, defined as i. Not knowing in advance the exact amount of time it takes for the information to spill over, it would be wise to check a range of values for t.

We first ignore the transaction costs of trading, and we assume that all buys and sells occur at the mid-point of the bid and ask prices. Fig. 5 presents the gross returns that can be made with various (i, t) technical trading rules. Varying i from 1% to 30%, and t from 1 to 4 days, we notice that substantial 91-day returns can be made for many of the (i, t) technical trading strategies. The highest is the 11.9% obtained from the (12, 2) trading rule. This result supports our earlier findings that A-shares contain information that are not yet revealed by B-shares.

Given this finding, the question is why are market participants not using these strategies and arbitraging away the lead–lag relationship between A-shares and B-shares. The answer is high transaction costs. The cost of transactions in our sample, as measured by percentage bid–ask spreads, is 6.06% for the A-shares and 5.34% for the B-shares. If we do not ignore these high transaction costs, and assume that all buys are executed at the ask price and all sells are executed at the bid price, there are no profits to be made. This situation is shown in Fig. 6. As can be seen, almost all strategies that previously yielded positive gross returns now yield net negative returns. For low values of i, the loss is substantial, because these rules imply a high frequency of trades, and therefore

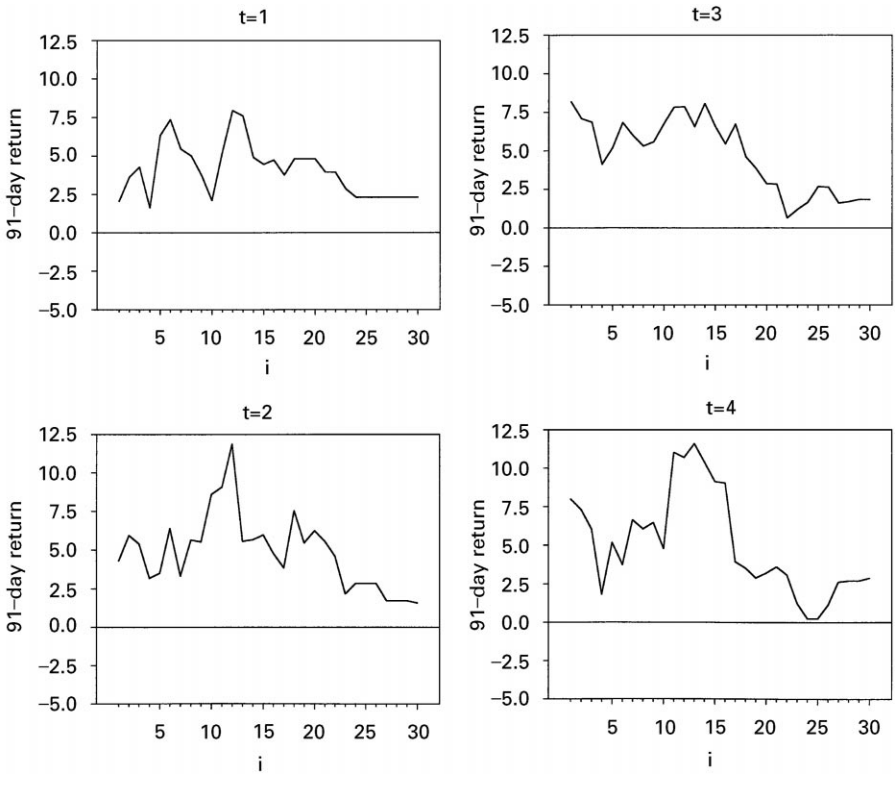

Fig. 5. Gross returns for different trading rules. The graphs plot 91-day returns ignoring transaction costs, obtained from an (i, t) technical trading strategy, where i denotes a triggering level of returns, cumulated over t days. Trading positions are opened by either buying or selling B-shares, depending on the cumulative percentage difference in returns between A-shares and B-shares. Positions are closed when the reverse trigger occurs, or when the end of the event window is reached, whichever occurs first.

high transaction costs. For high values of i, the loss is less pronounced. Moreover, in some rare cases, there is even a net positive return.

However, the net positive returns that we can obtain from some of the technical trading rules do not imply riskless arbitrage opportunities. First and foremost, the highest return from the best strategy is less than the risk-free rate in Mexico during that period. Specifically, the lowest level attained by the 3-month Mexican T-bill (Cetes) is 5% for 91-day in our sample period, whereas the return on the best trading rule, where i equals 12 and t equals 1, produces a net yield of 4.7% for 91 days. Second, notice that we choose our best trading rule in hindsight. In the real world, market participants would not have this information in advance. Third, observe that we assume that market participants

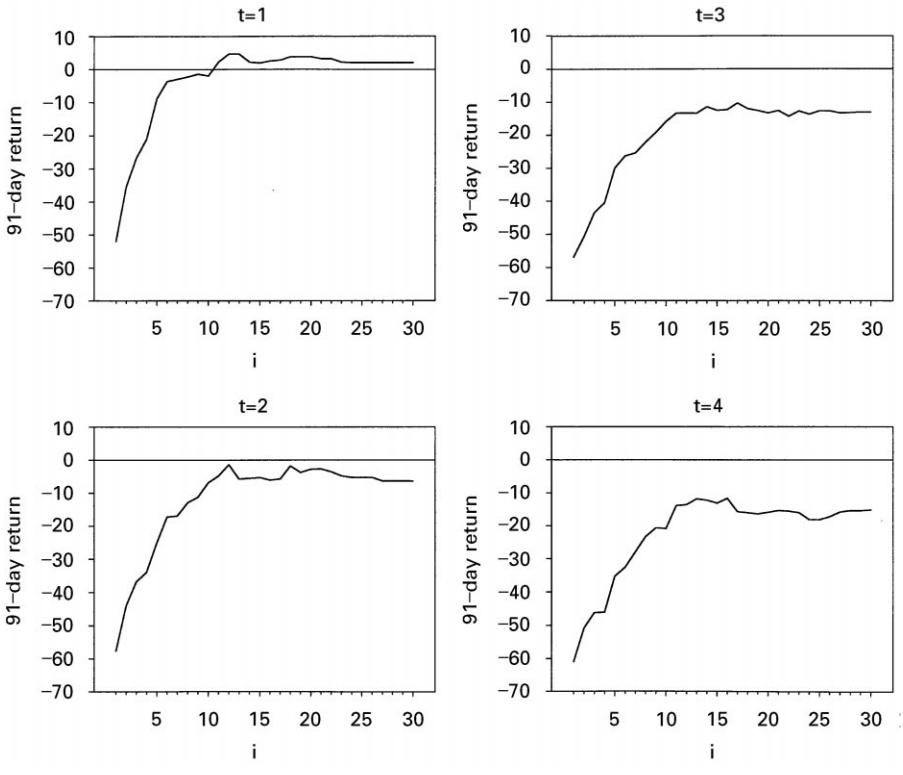

Fig. 6. Net returns for different trading rules. The graphs plot 91-day returns including transaction costs, obtained from an (i, t) technical trading strategy, where i denotes a triggering level of returns, cumulated over t days. Trading positions are opened by either buying or selling B-shares, depending on the cumulative percentage difference in returns between A-shares and B-shares. Positions are closed when the reverse trigger occurs, or when the end of the event window is reached, whichever occurs first.

follow these (i, t) trading rules because they know that the firm is going to make an announcement. In the real world, market participants do not necessarily have this information. These reasons allow us to conclude that even if market participants are aware that A-shares lead B-shares, they cannot use this information to trade profitably, and thus destroy the lead–lag relationship.

5.3. *Differential announcement effects on A-shares and B-shares*

For each firm, for each type of share, for each day in an event period (-80 to $+10$), we calculated the absolute value of residuals from a market model of returns. We then averaged the absolute value of residuals over all share types for

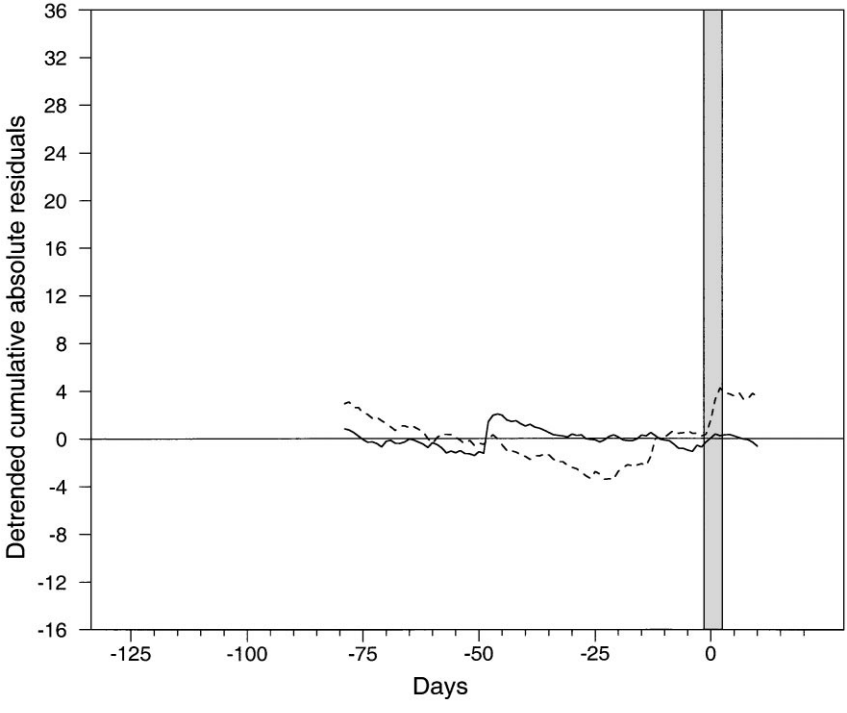

Fig. 7. Abnormal returns around corporate announcement for A-shares and B-shares. The y-axis displays a detrended cumulative absolute residual (CAR) scale for returns from a group of Mexican stocks. The CAR is calculated as follows. For each firm, for each type of share, for each day in an event period (-80 to $+10$), the absolute value of residuals is taken from a market model of returns. The absolute value of residuals is then averaged over all share types for each day in the event period, and these results are cumulated for the event period. Finally, the series is detrended by regressing it on a time trend. The y-axis gives this detrended CAR on day t, where t ranges from -80 to $+10$. The shaded area in the figure highlights the announcement event window (-1 to $+2$). The solid line represents A-shares. The dashed line represents B-shares.

each day in the event period. We used absolute values of abnormal returns here rather than follow the conventional practice of using raw abnormal returns, because we were pooling different types of events, some of which were good news events and some of which were bad news events. We then cumulated the averages through the event period, -80 to $+10$. Finally, since cumulative absolute values will have an upward drift by construction, the series was detrended by regressing it on a time trend. Fig. 7 is a plot of the detrended cumulative absolute abnormal returns around the corporate announcement. A sharp blip in the event window would suggest abnormal returns in that period, indicating a surprise element in the corporate news announcement.

In Fig. 7, we notice that, although both types of shares show little reaction during the announcement, the reaction of the A-shares is even less than the reaction of the B-shares. So holders of the A-shares are less surprised by the announcement than holders of the B-shares. We re-plotted the graph using raw returns minus mean return, and raw returns minus market returns. Our conclusions do not change. These results are consistent with our previous findings of the lead–lag relationship between A-shares and B-shares, seen in Table 4 and Figs. 5 and 6. They are also consistent with the observations we made from Table 2, and from Figs. 1–4, that news announcements seem to have no differential impact on A-shares and B-shares with respect to volume of trade or bid–ask spreads, and that there is a differential impact with respect to returns and volatility.

A possible critique of the above differential response test is that A-shares are held by Mexican institutional investors who trade much less frequently than the foreign holders of the B-shares. If that is the case, the above differential tests are revealing the bias caused by the staleness of prices in the A-shares.

The above criticism contains some truth. We found that in our event period the volume of trade of A-shares was about 63% of the volume of trade of B-shares. The average A-share had 36 days in which a price change occurred, and 49 days with a positive volume, whereas the average B-share had 51 days in which a price change occurred, and 63 days with a positive volume. So B-shares are more liquid than A-shares in this dimension, although their percentage bid–ask spreads are not statistically different.

The previous lead–lag tests, however, are immune to the above criticism as they are based on the premise that if the holders of the A-shares really know more, and are trading on their superior information, volatility of the returns of A-shares would lead the volatility of the returns of B-shares. We detected this pattern. We would not have been able to detect this pattern if the staleness of prices of A-shares was significant.

6. Conclusions

Using a data set of corporate news announcements in Mexico from July 1994 through June 1997, this paper documents that nothing much happens to a firm's stock price on the day of an event. Returns, volatility of returns, trading volume, and bid–ask spreads are not atypical in the event window. Further classification into A-shares, which only citizens may hold, and B-shares, which foreigners can hold, reveals that this lack of reaction is mostly concentrated in the A-shares, suggesting that foreigners are more surprised than the citizens. This finding, and the result that the return volatility of A-shares leads return volatility of B-shares, but not strongly enough for there to exist trading rules to arbitrage it away, insinuates that insider trading is responsible for a Mexican corporate news announcement to be a non-event.

Determining whether this occurrence is common, or a rare phenomenon that is unique to a particular stock market at a particular period, is beyond the scope of this paper. It is our contention that this phenomenon is not restricted to Mexico in the period July 1994 through June 1997. An examination of the data in de Caires (1987) shows that only 26 stock markets of the world require insiders to either abstain from trading, or to disclose their information before doing so. While the de Caires (1987) study is dated, we do not think that insider trading regulations have expanded to cover all stock markets in existence at the end of 1997. It is even more unrealistic to hope that such regulations are enforced in all of them.

If insider trading is the rule rather than the exception in the majority of existing stock markets, many interesting research questions open up. We identify two of them.

The first research area is a quest to develop a metric to rank stock markets in terms of their market integrity. The notion of market integrity is an important facet of emerging stock markets. Foreign and domestic investors want to know whether the market they are about to buy or sell shares represents a level playing field.[10] Investor beliefs about market integrity will determine their level of confidence in the market, and affect the amount of financing that can be raised through the stock market.

How does one develop a metric to measure the abstract concepts of market integrity, level-playing field, and confidence in the market? Liquidity is correlated with these concepts, but liquidity itself measures something else. A good measure for market integrity would be the difference in trading profits between insiders and outsiders, but this measure can only be employed in developed stock markets where we have data on insiders. Another measure would be to find out the number of insider trading cases under investigation, the number of indictments, and the number of convictions, but this data is rarely available even in developed countries.

So, ironically, data is available and measures can be developed to evaluate market integrity only for stock markets that do not need to be evaluated on this dimension. How, then, should we proceed?

This paper provides a small, first step. It says that researchers should find out what happens on the day of a corporate news announcement. If nothing happens, then get suspicious. Check what happens before the pre-announcement. If there is a one-hundred percent leakage, become more suspicious. If,

[10] Foreign institutional investors in particular are beginning to have a significant impact on emerging markets. In Mexico, for example, Domowitz et al. (1997) report that foreigners, mostly U.S. nationals, account for over 27% of holdings and up to 75% of trading in their 1990–1993 sample period.

further, there is a lead–lag relationship between shares segmented by ownership, become even more suspicious. This methodology can be used on a country by country basis, and it will work best in countries where we have segmentation by ownership.[11] A cross-country comparison of market integrity using this methodology is impossible. This assertion does not preclude the goal that one day future researchers may use elements of this idea in designing tests for market integrity that use other variables as well.

The second research question, which was first raised by Huberman and Schwert (1985), is: if prices do not react to news announcements, how does an econometrician date an event in an event study?

Appendix A

Company news announcements in Mexico, July 1994 through June 1997.

News announcements for companies in Mexico were obtained from the Bloomberg News Service. The event day is the day on which the news was reported. We index this day as day 0. The event period is -80 to $+10$, or less, if data at the earliest or latest ends of the period are unavailable. The majority (53) of the announcements are restructuring announcements, concerning changes in capital structure, joint ventures, mergers or takeovers, or acquisitions, spinoffs or selloffs. The second largest category of announcements concerned earnings announcements (19).

Company	Symbol	Event window	Event and event date
Alfa	ALFA A	7/15/94–11/23/94	AT & T and Alfa announce a joint venture (November 11, 1994)
Argos	ARGOS A/B	3/31/95–8/4/95	Abnormal earnings report (July 28, 1995)
Argos	ARGOS A/B	4/8/94–8/12/94	First half net drops 43% to 22.68 pesos (July 29, 1994)
Banacci	BANAC A/B	7/29/94–12/2/94	Banacci and Aegon form insurance company (November 18, 1994)
Banacci	BANAC A/B	6/27/94–10/31/94	Banacci signs with MCI (October 17, 1994)
Banacci	BANAC A/B	9/30/96–2/10/97	Announce a $1.58 billion write-off of mortgage loans (January 24, 1997)
Banorta	GFNORT A/B	3/8/96–7/18/96	Will buy Banpais, SA (July 4, 1996)
B.I.	BIBC B	8/21/96–12/31/96	Declares 0.2717 to 1 rights issue (December 16, 1996)
Bimbo	BIMBO A	10/4/96–2/14/97	Joint venture with Unilever (January 30, 1997)

[11] Shares restricted by ownership, like A-shares and B-shares, exist in a surprisingly large number of emerging stock markets, including China, Finland, Indonesia, Malaysia, Mexico, Philippines, Singapore, and Thailand (Domowitz et al., 1997).

Company	Symbol	Event window	Event and event date
Bital	GFBIT A/B	9/27/96–2/7/97	Announcement of $90 million sale of shares (January 23, 1997)
Carso	CARSOA1	3/3/97–7/11/97	Phillip Morris increases stake to 50% from 29% (June 27, 1997)
Carso	CARSOA1	3/28/96–8/6/96	Stock swap for each of the 3 subdivisions (July 23, 1996)
Carso	CARSOA1	9/13/95–1/24/96	Spin-off of telecommunication assets (January 10, 1996)
Cementos	GCC B	2/13/96–6/24/96	Buying Sux City Predy Mia of Texas (June 10, 1996)
Cemex	CEMEX A/B	4/12/95–8/16/95	Bank of America finally decides to buy $399 million of commercial paper (August 2, 1995)
Cemex	CEMEX A/B	9/18/95–1/22/96	Cemex ends tender offer to buy Tolmex (January 1, 1996)
Cemex	CEMEX A/B	11/25/96–4/9/97	Buy back $200 million (1.6 billion pesos), 2.3% of shares outstanding (March 24, 1997)
C.InterA	CIEB	2/6/97–6/19/97	Selling 250 million pesos of 2-yr convertible bonds to finance investments (June 5, 1997)
Cifra	CIFRA A/B	6/23/94–10/27/94	Wal-Mart, Dillard, and Cifra announce joint venture to open stores (October 14, 1994)
Cifra	CIFRA A/B	10/3/94–2/6/95	Wal-Mart suspends Mexican expansion (January 23, 1995)
C. de P.	COFARB	2/26/97–7/9/97	Won a 270 million peso contract to provide pharmacies with drugs (June 25, 1997)
Cydsa	CYDS A	5/17/96–9/23/96	Purchased its partnership stake of 40% from Britain's Northrumbrian Water Group plc (September 6, 1996)
Cydsa	CYDS A	6/13/95–10/18/95	Forms joint venture with Britain's Northrumbrian Water Group plc (October 4, 1995)
Desc	DESC A/B	4/5/95–8/9/95	Desc profit soars 600% (July 27, 1995)
Desc	DESC A/B	8/30/95–1/3/96	Desc announces limited partnership in Invermexico (December 20,1995)
Desc	DESC A/B	1/15/97–5/29/97	Announces alliance in synthetic Rubber (May 15, 1997)
Empaques	EMPAQ	7/5/94–11/11/94	Selling controlling interest to Empresas La Moderna (October 26, 1994)
Ericsson	TIE A/B	7/18/94–11/21/94	Ericsson offers to buy back its own shares (November 7, 1994)
Fernandez	GFES B	7/29/96–12/4/96	Bankers Trust decides to take 14% stake (November 19, 1996)
GBM Atl	GFA A/B	10/5/94–2/8/95	GBM Atlantico 1994 net drops 55% (January 25, 1995)
GBM At1	GFA A/B	5/15/95–9/18/95	GBM Atlantico agrees to government aid package (September 5, 1995)

Company	Symbol	Event window	Event and event date
Geo	CORPGEO B	5/11/95–9/15/95	Decides to have $57 million worth of private equity sale (August 31, 1995)
GF Norte	GFNORTE A/B	7/7/95–11/10/95	Net earnings down 23% from third quarter of 1994 (October 27, 1995)
GFB	GFB A/B	6/8/94–10/12/94	GTE-GFB (BANCOMER) merger announcement (September 28, 1994)
GFB	GFB B	7/1/96–11/5/96	Declares joint venture with AT and T, Alfa and Visa (October 22, 1996)
GIDuSA	GIDUSA	8/30/94–1/10/95	Buying a packaging plant in Chiapos (December 27, 1994)
Gissa	GISSA A/B	11/16/94–3/22/95	Grupo Saltillo to buy back class A and B shares of Gissa (March 8, 1995)
Gissa	GISSA A/B	10/27/95–3/1/96	Earnings of fourth quarter of 1995 up 35.4% (February 16, 1996)
GMEX	GMEX1 B	11/5/96–3/18/97	42% drop in net income (March 4, 1997)
Herdez	GHAC/GHBC	4/5/95–8/9/95	Hormel explores formation of food venture with Grupo Herdez (July 26, 1995)
Herdez	GHAC/GHBC	11/2/95–3/7/96	Hormel agrees to joint venture with Grupo Herdez (February 22, 1996)
Inbursa	INBUR A/B	7/4/94–11/7/94	Grupo Inbursa third quarter net doubles to 825 million pesos (October 24, 1994)
Inbursa	INBUR A/B	12/7/95–4/11/96	Grupo Inbursa buys 40% stake in Medcom DTH television venture (March 28, 1996)
Inbursa	INBUR A/B	5/17/96–9/23/96	Buying all shares of its insurance unit it does not own (September 6, 1996)
Inverlat	INLAT A/B	8/10/95–12/14/95	Mexico to bail out Inverlat (November 30, 1995)
Kimber	KCM A/B	12/29/94–5/4/95	Kimber de Mexico first quarter net 96% lower than year ago (April 20, 1995)
Kimber	KCM A/B	11/29/95–4/3/96	Kimber to swap 73.5 million shares for Crisoba (March 20, 1996)
Latincaca	LATIN A/B	5/24/94–9/28/94	Sweden's Ericsson sells controlling interest (September 13, 1994)
Macma	MACMA B	8/8/95–12/18/95	Acquires ice cream company Yom-Yom SA of Mexico City (December 1, 1995)
Maseca	MASEC B	1/2/96–5/14/96	First quarter net income rose 49% (April 29, 1996)
Parras	PARRAS A	4/8/94–8/15/94	First half net income drops 58% (August 1, 1994)
Pond	POND A/B	4/11/94–8/15/94	Ponderosa first half loss doubles to 155.2 million pesos (August 1, 1994)
Posadas	POSAD A	7/11/94–11/17/94	Third quarter net income rose 68% (November 2, 1994)
Promex	GFPF A/B	7/2/96–11/6/96	Will buy Banco Union's 159 branches and its 10 billion deposits (October 23, 1996)
San Cris	CRIS A/B	4/5/94–8/9/94	San Cristobal first half net doubles to 49.2 million pesos (July 29, 1994)

Company	Symbol	Event window	Event and event date
San Cris	CRIS A/B	11/29/95–4/3/96	Kimber to swap 73.5 million shares of San Cristobal (March 20, 1996)
Santander	SANMEX B	2/17/97–6/30/97	Debt for equity swap of $400 million (June 16, 1997)
Sears	SEARS B	12/2/96–4/16/97	Groupo Carso to acquire 60% of Sears (April 2, 1997)
Sears	SEARS B	4/8/94–8/15/94	First half net income plunges 78% (August 1, 1994)
Seguros	SEGC A/B	7/8/95–11/8/95	Seguro's net income rises 64% in third quarter (October 25, 1995)
Seguros	SEGC A/B	12/28/95–5/10/96	Will buy 70% stake in Asemex (April 25, 1996)
Seguros	SEGC A/B	3/30/94–8/8/94	First half net income soars by 136% (July 25, 1994)
Serfin	GFS AC/BC	11/21/96–4/7/97	HGBC will buy 20% stake in company (March 19, 1997)
Serfin	GFS AC/BC	6/28/96–11/4/96	Buys USF & G (a U.S. insurance holding company) (October 20, 1996)
Sidek	SIDEK A/B	10/26/94–3/11/95	Sidek defaults on debts (February 15, 1995)
Sidek	SIDEK A/B	12/12/95–4/16/96	Sidek presents plan to restructure and cut debt (April 2, 1996)
Sigma	SIGMA B	4/1/96–8/8/96	Second quarter earnings drop 71% (July 25, 1996)
Simec	SIMEC B	2/6/97–6/19/97	Restructuring debt. Misses an interest payment (June 5, 1997)
Simec	SIMEC B	10/19/94–2/28/95	Defaults on debt (February 14, 1995)
Situr	SITUR A/B	7/7/95–11/10/95	Situr sales down 55% (October 27, 1995)
Situr	SITUR A/B	12/12/95–4/16/96	Situr presents plan to restructure and cut debt (April 2, 1996)
Synkro	SYNKR A	2/17/97–6/30/97	Debt for equity swap of $400 million (June 16, 1997)
Telmex	TELMEX A	9/6/96–1/17/97	SBC Communication reduces stake (January 3, 1997)
Telmex	TELMEX A	8/30/95–1/11/96	Raises basic and long-distance rates 20% (December 27, 1995)
TMM	TMM A	3/15/96–7/25/96	Announces share buy back plan (July 11, 1996)

References

Alexander, G., Eun, C., Janakiraman, S., 1988. International listings and stock returns: some empirical evidence. Journal of Financial and Quantitative Analysis 23, 135–151.

Bailey, W., Jagtiani, J., 1994. Foreign ownership restrictions and stock prices in the Thai capital market. Journal of Financial Economics 36, 57–87.

Ball, R., Brown, P., 1968. An Empirical evaluation of accounting income numbers. Journal of Accounting Research 6, 159–178.

Bekaert, G., Harvey, C., 1995. Time-varying world market integration. Journal of Finance 50, 403–444.

Bodie, Z., Kane, A., Marcus, A., 1996. Investments, 3rd Edition. Irwin Press, Chicago, IL.

Brennan, M., Cao, H., 1997. International portfolio investment flows. Journal of Finance 52, 1851–1880.

Brown, K., Harlow, W., Tinic, S., 1988. Risk aversion, uncertain information, and market efficiency. Journal of Financial Economics 22, 355–385.

Brown, S., Warner, J., 1985. Using daily stock returns: the case of event studies. Journal of Financial Economics 14, 3–31.

Campbell, J., Lo, A., MacKinlay, C., 1997. The Econometrics of Financial Markets. Princeton University Press, Princeton, NJ.

Chan, K.C., Fong, W., Stulz, R., 1995. Information, trading, and stock returns: lessons from dually-listed securities. Journal of Banking and Finance 20, 1161–1187.

Chui, A., Kwok, C., 1998. Cross-autocorrelation between A shares and B shares in the Chinese stock market. Journal of Financial Research 21, 333–354.

Comte, F., Lieberman, O., 1996. On variance, non-causality and cointegration. Unpublished Working Paper, Israel Institute of Technology, Haifa, Israel.

Corrado, C., 1989. A non parametric test for abnormal security-price performance in event studies. Journal of Financial Economics 23, 385–395.

de Caires, B. (Ed.), 1987. The GT Guide to World Equity Markets 1987. Euromoney Publications PLC, London.

Dimson, E., 1979. Risk measurement when shares are subject to infrequent trading. Journal of Financial Economics 7, 197–226.

Domowitz, I., Glen, J., Madhavan, A., 1997. Market segmentation and stock prices: evidence from an emerging market. Journal of Finance 52, 1059–1085.

Domowitz, I., Glen, J., Madhavan, A., 1998. International cross-listing and order flow migration: evidence from an emerging market. Journal of Finance 53, 2001–2027.

Enders, W., 1996. RATS Handbook for Econometric Time Series. Wiley, New York.

Fama, E., 1997. Market efficiency, long-term returns, and behavioral finance. Unpublished Working Paper, University of Chicago, IL.

Fama, E., Fisher, L., Jensen, M., Roll, R., 1969. The Adjustment of stock prices to new information. International Economic Review 10, 1–21.

Foerster, S., Karolyi, G., 1993. International listing of stocks: the case of Canada and the U.S. Journal of International Business Studies 24, 763–784.

Forster, M., George, T., 1996. Pricing errors at the NYSE open and close: evidence from internationally cross-listed stocks. Journal of Financial Intermediation 5, 95–126.

Frankel, J., Schmukler, S., 1996. Country fund discounts and the Mexican crisis of December 1994: did local residents turn pessimistic before international investors? Open Economies Review 7, 511-534.

Glosten, L., Milgrom, P., 1985. Bid, ask and transaction prices in a specialist model with heterogeneously informed traders. Journal of Financial Economics 14, 71–100.

Ho, T., Stoll, H., 1981. Optimal dealer pricing under transactions and return uncertainty. Journal of Financial Economics 9, 47–73.

Ho, T., Stoll, H., 1983. The dynamics of dealer markets under competition. Journal of Finance 38, 1053–1074.

Huberman, G., Schwert, G.W., 1985. Information aggregation, inflation, and the pricing of indexed bonds. Journal of Political Economy 93, 92–114.

Jayaraman, N., Shastri, K., Tandon, K., 1993. The Impact of international cross listings on risk and return : the evidence from American Depository Receipts. Journal of Banking and Finance 17, 91–103.

Jorion, P., Schwartz, E., 1986. Integration versus segmentation in the Canadian stock market. Journal of Finance 41, 603–616.

Kleidon, A., Werner, I., 1996. U.K. and U.S. trading of British cross-listed stocks: an intraday analysis of market integration. The Review of Financial Studies 9, 619–664.

Kyle, A., 1985. Continuous auctions and insider trading. Econometrica 53, 1315–1335.

Lev, B., 1989. On the usefulness of earnings: lessons and directions from two decades of empirical research. Journal of Accounting Research 27 (Suppl.), 153–201.

McWilliams, A., Siegel, D., 1997. Event studies in management research: theoretical and empirical issues. Academy of Management Journal 40, 626–657.

Meulbroek, L., 1992. An Empirical analysis of illegal insider trading. Journal of Finance 47, 1661–1699.

Mitchell, M., Netter, J., 1994. The Role of financial economics in securities fraud cases : applications at the Securities and Exchange Commission. The Business Lawyer 49, 545–590.

Morck, R., Yeung, B., Yu, W., 1997. The Information content of stock markets: why do emerging markets have synchronous stock price movements? Unpublished Working Paper, University of Michigan, Ann Arbor.

Salinger, M., 1992. Standard errors in event studies. Journal of Financial and Quantitative Analysis 27, 39–53.

Stoll, H., 1978. The Supply of dealer services in securities markets. Journal of Finance 33, 1133–1151.

Stulz, R., Wasserfallen, W., 1996. Foreign equity investment restrictions, capital flight, and shareholder wealth maximization: theory and evidence. The Review of Financial Studies 8, 1019–1057.

Umlauf, S., 1993. Transaction taxes and the behavior of the Swedish stock market. Journal of Financial Economics 33, 227–240.