

**The Invisible Enforcer: Price Behavior of Mexican Firms Cross-listed on the NYSE
around Corporate Announcements. ***

Hermann P. Tribukait-Vasconcelos **

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Abstract

This paper analyzes the impact on stock price behavior of increased disclosure, stricter financial regulation and more efficient formal (legal) and informal (market-based) enforcement mechanisms. To address this issue, I study the stock price behavior of Mexican firms cross-listed on the NYSE through *exchange-listed* ADRs (US-listed firms), relative to non-US-listed Mexican firms, around earnings announcements. I find that stock prices of the non-US-listed firms incorporate over 90% of the earnings news about 31 trading days *before* its public release. In contrast, share prices of the US-listed firms react to the news only on or around its public announcement. Consistent with the view that increasing the expected penalties can change owners/managers behavior, the results hold within a sub-sample of firms that share the *same* owners and/or insiders. I conclude that the observed asymmetries in price behavior are due to the increased disclosure requirements and enforcement mechanisms in the U.S., together with the reputation concerns of foreign firms and their insiders. The results support the view that the fact that the market can immediately punish firms that are linked to financial frauds provides a strong incentive for owners/managers to reduce -or refrain from- illegal practices, even if they are in practice beyond the reach of U.S. law enforcers, as it is the case in US-listed foreign firms.

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** Ph.D. Candidate, Harvard University. Department of Economics, Littauer Center, 1875 Cambridge Street, MA 02138, USA. email: hvasconc@fas.harvard.edu

QUOTE: “Although we may not be able to change the character of corporate officers, we can change behavior through incentives and penalties. That, in my judgment, could dramatically improve the state of corporate governance.” Federal Reserve Chairman Alan Greenspan, in his testimony before the U.S. Senate, July 16th, 2002.

I. Introduction

The institutional and information environment, as well as the formal (legal) and informal mechanisms (market-based) of law enforcement, play a major role in financial markets. The fundamental characteristic of cross-listing shares on a U.S. exchange through *exchange-listed* American Depositary Receipts (ADRs)¹, is that these strategy forces firms to adhere to U.S. securities laws and comply with the strict disclosure and listing standards set by the Securities and Exchange Commission (SEC). Securities laws define the powers of the securities regulators, as well as the disclosure requirements for security issuers and intermediaries and as such they are a key element of investor protection. There is increasing evidence in the literature on ADRs that foreign firms that follow this strategy gain significant benefits, including a reduction in the cost of capital, increased liquidity and higher market valuations, among others.² Coffee (1999) and Stulz (1999) conclude that firms that issue exchange-listed ADRs effectively opt into more protective and transparent regulatory regimes and commit to good conduct. An exchange-listed ADR represents a legal and financial migration or “bonding” to U.S. standards. Coffee (2002) summarizes the corporate governance or bonding hypothesis: “[...] issuers migrate to U.S. exchanges in particular because by voluntarily subjecting themselves to the U.S.'s higher disclosure standards and greater threat of enforcement, they partially compensate for weak protection of minority investors under their own jurisdiction's law and also credibly signal their intention to make fuller disclosure thereby achieving a higher market valuation and a lower cost of capital.”

However, cross-listing shares in the U.S. may affect not only the level, but also the behavior of stock prices. The objective of this study is to analyze the impact on stock price behavior of

¹ ADRs are U.S. securities that settle, clear and transfer according to standard U.S. practices. Each ADR represents a specific number of the underlying shares that remain on deposit in the issuers' home market. Exchange-listed ADRs (Level II and Level III) are listed on one of the three U.S. national stock exchanges (NYSE, AMEX or Nasdaq), as opposed to ADRs Level I that trade over the counter (OTC). Section III of this paper contains a brief description of the characteristics and differences of the securities in the sample. For a more detailed description of ADR programs see Miller (1999).

² See Karolyi (1998) for an comprehensive review of the early literature and findings on ADRs. Miller (1999) finds that foreign firms that issued an exchange-listed ADR experienced positive abnormal returns. Doidge, Karolyi and Stulz (2001) find higher valuations and Tobin's q ratios for foreign firms listed on U.S. exchanges. Lang, Lins and Miller (2002) find that cross-listings on U.S. exchanges improve a firm's information environment, and the increased disclosure is associated with the higher market valuations.

increased disclosure, stricter financial regulation and more efficient enforcement mechanisms. Following the bonding hypothesis, I analyze if an ADR listing on the NYSE also affects stock price behavior. The hypothesis to test is that stock prices of Mexican firms cross-listed in the NYSE, in the form of ADRs, follow a different behavior around earnings announcements than stock prices of non-US-listed Mexican firms, possibly because of a reduction in illegal activities such as insider trading. The idea is that once a firm cross-lists in the NYSE the owners and managers of those firms will be more cautious or less willing to incur in financial frauds. For example, firm insiders will be less willing to share private information with their friends and relatives – and to profit from it- due to the higher potential penalties, both formal (legal) and informal (market-based).

This paper shows that stock prices of firms cross-listed on U.S. exchanges follow a different pattern than their domestic non-US-listed peers, around relevant corporate announcements. Moreover, I find evidence that supports the view that exchange listed ADRs increase investor protection and reduce illegal activities.

The main focus of the paper is a comparison of the stock price behavior of Mexican firms that issued ADRs on the NYSE (US-listed), relative to their domestic peers that are not cross-listed on U.S. exchanges (non-US-listed). Specifically, I compare the reaction of the stock prices - as quoted in the Mexican Stock Exchange in pesos- of US-listed and non-US-listed Mexican firms around quarterly earnings announcements, with particular attention to the pre-announcement drift. For this purpose, I use standard event study methodology and exploit the institutional and informational differences that exist between the United States and Mexico. If insider trading is in fact a widespread problem in the Mexican Stock Market, *Bolsa Mexicana de Valores* (BMV), as concluded by Bhattacharya et al. (2000), and if the threat and costs of being prosecuted in the U.S., derived from an ADR listed on U.S. exchanges, effectively deters this kind of illegal practices, then we should observe the following patterns in prices of Mexican stocks:

- 1) Non-US-listed share prices incorporate private information in advance of important corporate news announcements. Specifically, cumulative abnormal returns would be positive (negative) and significant prior to positive (negative) earnings announcements and the subsequent reaction on or around the date of the public news release should be weak.
- 2) In contrast, in the case of US-listed stock prices we should *not* observe a significant reaction in prices well ahead of the earnings announcements, but only on the announcement date or close to it. In other words, stock prices of foreign US-listed firms

should follow a pattern more similar to the one documented by MacKinlay (1997) for U.S. firms.

- 3) If the institutional and informational differences drive these results, then controlling for firm and industry characteristics should not change the conclusions. Moreover, we should find evidence of a change in behavior of corporate executives, consistent with the bonding hypothesis. That is, the results should hold even after controlling for ownership and insiders.

The BMV has many attractive characteristics for the current study. First, the BMV can be characterized among non-transparent exchanges with highly concentrated ownership structures and poor investor protection. Mexico consistently ranked among the countries with weakest investor protection and rule of law according to the measures presented by LLSV (1998). Second, a previous study by Bhattacharya et al. (2000) indicates that the use of privileged information to profit in advance of corporate announcements is a widespread practice in the BMV. The authors analyze a sample of 75 diverse corporate announcements of Mexican companies between 1994 and 1997, including earnings and dividend announcements, as well as bankruptcy and mergers, among others. Based on non-parametric tests, the authors find that stock prices of Mexican companies apparently do not react to important firm-specific news releases. According to the authors, the results suggest “[...] that unrestricted insider trading causes prices to fully incorporate the information before its public release”. Anecdotal evidence also supports this conclusion. Third, in Mexico, just as in the U.S., it is illegal to trade and profit from security transactions based on inside information, defined as private or privileged information held by officers, directors or major shareholders that has not been publicly released. However, there is a very poor record of enforcement of insider trading regulation in the BMV. Up to 1997, there had not been a single indictment, trial, or conviction for insider trading in Mexico.³ Moreover, according to the Mexican newspaper *Reforma*, from 1997 to June 2002 the regulatory body in charge equivalent to the SEC, the *Comisión Nacional Bancaria y de Valores* (CNBV), has investigated only 26 individuals for allegations of illegal use of privileged information. The results of these investigations show that out of the 26 persons investigated only 6 were found responsible. As a result, these individuals were banned from participating in the stock market for a period of three to twenty four months.⁴ With so little and obscure information available, it is no

³ In contrast, between 1980 and 1989, in the U.S. the SEC filed 464 civil cases with at least one defendant charged with insider trading and there were 189 episodes where at least one or more of the defendants traded stocks based on inside information. See Meulbroek (1992) for an analysis of these insider-trading cases in the United States.

⁴ *Periódico Reforma*, June 11th 2002.

surprise that market-based enforcement mechanisms, not to mention formal mechanisms of law enforcement, can hardly operate. Finally, Mexico is among the five countries with more firms cross-listed on U.S. exchanges⁵ and has the highest proportion of firms with ADRs issued in the U.S. relative to the number of publicly traded firms.⁶

Based on size adjusted abnormal returns, I find evidence that stock prices of non-US-listed Mexican firms incorporate earnings information well in advance of the public quarterly earnings announcements. In contrast, prices of US-listed Mexican firms only react shortly before and shortly after the earnings release. The data indicate that in the pre-announcement period of -60 to -31 trading days, relative to the event day, the size adjusted cumulative abnormal returns (CARs) of Mexican non-US-listed firms are more than 2 percentage points higher than the CARs of Mexican US-listed firms. Regression analysis shows that this difference is significant at the 10% level or better. The results are robust to alternative model specifications that relax the independence and homoskedasticity assumptions and control for firm and industry-specific effects and outliers.

Consistent with the price behavior observed in the pre-announcement window, stock prices of US-listed firms react stronger than the stock prices of non-US-listed firms, in the event window $[-1,1]$. The aggregated CAR $[-1,1]$ of US-listed firms is 0.7% and statistically significant compared to only 0.4% of non-US-listed firms. However, the difference of 0.3 percentage points is not statistically significant. A breakdown of the event window in ten-day windows shows that stock prices of non-US-listed firms incorporate most of the earnings news well before the public announcement, between day -50 and day -41 relative to the announcement date, i.e. during the pre-announcement window $[-50,-41]$. In contrast, stock prices US-listed firms incorporate a significant portion of the earnings news later than non-US-listed firms but still before the announcement date, in the pre-announcement window $[-10,-1]$. Given that most Mexican firms report within 40 trading days after the end of each quarter, the window $[-50,-41]$ covers the last weeks of each quarter. That means that prices of non-US-listed Mexican firms incorporate the earnings news during the last few weeks the each quarter. In the case of the Mexican US-listed firms, prices start incorporating the news about 10 trading days prior to the report date.⁷

⁵ Mexican and Brazilian firms accounted each for 5% of the total number of ADRs, only behind the U.K. (14%), Japan (10%), Australia (9%) and Hong Kong (7%), see www.bofny.com/adr.

⁶ About 38 percent of all Mexican firms listed on the BMV have a cross-listing in U.S. markets (López-de-Silanes, 2000).

⁷ This pattern is consistent with the fact that financial analysts and market participants in the U.S. hold conference calls with the firms' managers and provide earnings guidance and updates to their clients in the weeks prior to the public earnings release. However, there are alternative interpretations such as insiders of US-listed firms delaying their trades closer to the announcement date and stealth trading thanks to the higher liquidity. I further analyze these ideas in Section VI.

Next, I analyze if the observed asymmetries in the stock price behavior are determined by firm characteristics such as size (market value), liquidity (volume), information asymmetry (number of analysts following the stock and bid-ask spread) and leverage (total assets over total liabilities) or rather by the institutional and informational differences, i.e. financial regulation and its enforcement. Additional factors include market practices and market-based informal mechanisms of enforcement that provide a strong set of incentives to comply with the rules and financial regulation in the United States.

Here it is important to address two potential endogeneity problems. First, the exchange-listed ADR may not have an impact on insiders activities and hence on price behavior if, for example, companies keep their promises not because the higher threat of punishment in the U.S., but because they want to build a good reputation to be able to gain access the international capital markets and external financing to exploit high growth opportunities. Gomes (2000) presents a model that shows how firms can commit not to expropriate minority shareholders without any explicit corporate governance mechanism that provides shareholder protection. In Section V we include variables to try to mitigate this endogeneity problem. The results hold after we control for firm and industry characteristics that account for growth opportunities and capital needs.

A second potential problem may be self-selection if not only the firms but also the owners and insiders of US-listed firms are different than those of non-US-listed firms and this differences affects the decision to cross-list or not. It could be possible that the intrinsic differences between management of US-listed and non-US-listed firms account for the asymmetries documented in the transmission of information into prices. Ideally, we would like to analyze the price behavior of the *same* firms before and after the US-listing. However, this test is not possible given the small number of observations of Mexican US-listed firms in the period before the ADR listing.⁸ As an alternative test, I analyze if management and firms self-select. In other words, I analyze if the results hold within a sample of firms that have the same owners and or insiders. If the asymmetries hold within this “same owners/insiders sample”, then the results would support the idea that insiders change their behavior once they face stricter rules and higher expected penalties for wrongdoing. Within this “same insiders sample” I find stronger evidence that non-US-listed firms, in contrast to US-listed firms, incorporate earnings news well in advance of the public earnings announcement. Controlling for insiders, the average cumulative abnormal returns in the period of -60 to -31 trading days, $CAR[-60,-31]$, of non-US-listed firms are 2.85 percentage points higher than the $CAR[-60;-31]$ of US-listed firms. This difference is significant at the 5%

⁸ Most US-listed Mexican firms issued the exchange-listed ADR simultaneously with the initial public offering (IPO) as shown in table 1.

level. Finally, I include an additional analysis of the volume behavior of US-listed and non-US-listed firms, as well as of the volatility of the abnormal returns and robustness tests.

Overall, the findings support the hypothesis that institutional differences and market practices affect stock price behavior around relevant corporate announcements, through its effect on insiders' behavior. One potential explanation of the observed asymmetries is that the increased disclosure and the higher expected penalties faced by firms that cross-list in the U.S. effectively reduce self-dealing activities. Therefore, less information leaks to the market and prices do not react well ahead of its public release, as in the case of the non-US-listed firms.

LLSV (2002b) analyze the effects of public enforcement (through regulatory agencies such as the SEC) and private enforcement (through private litigation) on financial market development. They find a positive effect of public enforcement only in countries with well-developed bureaucracies and a positive effect of the private enforcement in all countries, especially through increased mandatory disclosure and liability rules that facilitate of private contracting and litigation.⁹ The results presented in this paper are consistent with LLSV (2002b). However, the authors do not distinguish between formal private enforcement mechanisms and informal market-based mechanisms and imply that they work together. I will argue that this distinction is key, because it is possible that the main benefits from increased disclosure come through the penalties and incentives provided by the market. This enforcement mechanism may explain the results presented in this paper, given that we observe very limited formal enforcement capabilities, both of public agencies and of private plaintiffs, against US-listed foreign firms.¹⁰ These findings are consistent with the idea that effective and credible increases in expected penalties can change the behavior and practices of insiders and executives. Nevertheless, we need further research and increased disclosure in the BMV, in order to find conclusive evidence and rule out alternative explanations.

The remainder of the paper is organized as follows. Section II reviews the theories that explain the benefits of cross-listings and presents previous empirical evidence. Section III describes the characteristics of the firms and the data set examined in the paper. Section IV reviews the methodology. Section V presents the results and regression analysis and section VI includes the robustness tests. Finally, section VII concludes by summarizing the results and future research.

⁹ Investor protection and property rights facilitate financial market development by reducing risks of asset diversion, earnings manipulation and other forms of shareholders expropriation or “tunneling”, thereby reducing the firms' costs of external financing (LLSV 1997, 1998, 2000 and 2002a; and Johnson, La Porta, López-de-Silanes and Shleifer 2000).

II. Theory and Evidence of the Benefits of Exchange-listed ADRs

The literature on international cross-listings documents that foreign firms and their shareholders gain many benefits from listing shares on U.S. exchanges. These benefits include increased access to financing sources, higher abnormal returns and valuations, increased liquidity and lower costs of capital. Additionally, ADRs offer the convenience of dollar denominated trading and shares listed on U.S. exchanges can be used as currency in the acquisition of other firms.¹¹ Finally, firms gain reputation, exposure and investor recognition in the international capital markets.

Given the benefits for foreign firms, and their shareholders, derived from cross-listing shares on U.S. exchanges it may seem puzzling that only about 10% of all foreign firms that qualify to issue an exchange-listed ADR in the U.S. actually do so (Doidge, Karolyi and Stulz 2001). What prevents foreign firms from issuing these instruments?

Firms listed on U.S. exchanges have to increase disclosure and face high potential penalties, which should help to reduce agency costs and improve investor protection. If owners-managers are or can be held more accountable and be punished for any wrongdoing by the courts and or by the market, we would expect to observe a reduction in asset diversion and other forms of minority shareholders expropriation.

Owners/managers weight the direct and indirect costs, including the reduced ability to expropriate wealth, against the benefits from increased firm value. Direct costs include those of registering with the Securities and Exchange Commission (SEC) and of complying with U.S. financial regulations and laws.¹² The direct costs of cross-listings may be relatively low, but indirect costs can be high for controlling shareholders, because they may have to reduce the consumption of private benefits of control as they face higher risks of potential litigation and

¹⁰ Siegel (2002) documents that there are very few cases of legal action against US-listed foreign firms that expropriate minority shareholders.

¹¹ Tolmunen and Torsilla (2002) analyze 196 European firms cross-listed in the U.S. and find that after cross-listing companies increase the use of shares to finance large acquisitions. For example, Daimler Benz and British Petroleum used their shares listed in the U.S. to finance the acquisitions of Chrysler (US\$50 billion) and Amoco (US\$48 billion), respectively.

¹² Go to <http://www.nyse.com/international/international.html> for a description of the listing standards and fees of the NYSE.

reputation damage.¹³ The costs related to mandatory increased disclosure may therefore be one of the most important factors that deter firms from cross-listing their shares on U.S. exchanges.¹⁴

The expected benefits from cross-listing shares on US-exchanges would have to compensate for the higher costs, as well as for any reduction in the private benefits of control that owners-managers would have to sacrifice due to the higher expected penalties and costs. One reflection of private benefits of control is the use of privileged information. Insider trading is part of the private benefits of control, given that controlling shareholders do not bear the full potential costs derived from insider trading, but they rather impose it on outside investors (Bebchuk and Jolls, 1999). Only controlling shareholders of those firms that have higher growth prospects and that would benefit the most from new investments available through the better access to external financing at a lower cost of capital would be willing to cross-list on U.S. exchanges and give up their private benefits, or at least part of them.¹⁵

An example of this situation is when highly leveraged firms with high growth potential need to raise equity because they cannot issue more debt at competitive costs. Firms with higher growth opportunities incorporated in countries with poor investor protection would benefit the most from an upgrade in investor protection (Doidge, Karolyi and Stulz 2001). Leuz et. al (2001) suggest that there is a strong negative correlation between the extent of earnings management and the level of legal protection, because investor protection reduces asset diversion and rent seeking activities by insiders. Pagano, Roell and Zechner (2000) document that European companies that decide to cross-list in the United States pursue a strategy of rapid expansion fuelled by high leverage before the listing and large equity issues after the listing. These firms rely increasingly on export markets both before and after the listing, and tend to belong to high-tech industries. Finally, Miller (1999) finds that those firms that announce an exchange-listed ADR along with an equity offering (ADR Level III) experience the greatest increase in stock price.

Bailey, Karolyi and Salva (2002) examine the impact of increased disclosure faced by foreign firms that cross-list their shares in the United States. They document significant increases in return and volume reactions to annual earnings announcements, once firms cross-list on U.S.

¹³ Cheung and Lee (1995) claim that the risk of facing litigation and lawsuits can be an important factor in a firm's selection of a foreign exchange to list its shares. For example class action suit is normally not available in other countries -or jurisdictions- than the United States.

¹⁴ According to a survey conducted by Mittoo (1992), managers overwhelmingly cite the additional disclosure and listing requirements, which include reconciliation of financial reports with U.S. accounting standards (U.S.GAAP) and compliance with U.S. financial regulation, as the greatest barriers to cross-list their companies' shares in U.S. exchanges. Also see Biddle and Saudagaran (1992, 1995).

¹⁵ Lins, Strickland and Zenner (2001) find that foreign firms explicitly mention the need of external financing to exploit growth opportunities in their filings and reports around the time of the ADR listing.

markets. However, their results appear to be driven by firms incorporated in *developed* countries issuing *non-exchange-listed* ADRs, i.e. private placements (144A) and OTC listings, which do not require increased disclosure. Thus, their results are not consistent with the view that foreign firms gain economically and statistically significant benefits from committing to increased disclosure by issuing ADRs. The authors emphasize the need for further empirical studies to resolve this issue.

Finally, Glaeser, Johnson and Shleifer (2001) present a theoretical model that shows how a reduction in the costs of information gathering by law enforcers, for example by increasing disclosure and transparency, can improve enforcement efficiency. The authors conclude that financial regulation can substitute for judicial enforcement of private contracts and laws, in countries with weak investor protection and law enforcement. Other studies indicate that increased disclosure can also lead to lower cost of capital if it reduces information asymmetries and thereby it reduces the premium that investors demand to compensate for bearing higher information risks.¹⁶

Overall, the quality and reliability of information available to investors and market participants in general is interrelated with corruption, the rule of law and investor protection, because in less transparent environments it is easier and more attractive to profit from illegal activities, like for example insider trading. The more vague and obscure the available information the more attractive becomes to commit frauds, such as earning manipulation and minority shareholders expropriation. Poor information availability limits the effectiveness of regulators, law enforcement agencies and courts. Moreover, the lack of information is also an obstacle for the market to find out about the firms' and managers' activities. Hence, the probability of being discovered and punished decreases, which implies higher expected profits from frauds and illegal activities in general. Finally, investors that do not perceive the market as a fair system will be less willing to participate, liquidity is going to be lower and firms will face a higher cost of capital or will struggle to find financing sources.

II.1. Law Enforcement, Insider Trading and ADRs

Lack of enforcement of insider trading laws also has a direct impact on firms. Bhattacharya and Daouk (2002) find that, at a country level, the cost of equity decreases significantly only after

Their results suggest that this factor is more important for firms incorporated in emerging markets than in developed countries.

¹⁶ See Barry and Brown (1984 and 1985), Myers and Majluf (1984), Merton (1987) and Healy and Palepu (1993 and 2001).

the first prosecution of insider trading violations, but initially it does not change after the formal introduction of the written laws.

In the U.S., Rule 10b-5 of the Securities Exchange Act of 1934 sets limits on trading by corporate officers, directors and major shareholders and requires them to report their trades to the SEC. These insiders, their relatives and any associates who trade on private information supplied by insiders are considered in violation of the law. Nevertheless, prosecuting foreigners and enforcing the rules in the case of financial frauds involving foreign citizens is not straightforward. Siegel (2002) analyzes the SEC record against foreign firms involved in illegal activities to test the corporate governance or “bonding” theory. He finds very few cases of actual enforcement measures or punishment by the SEC. The author then analyzes a very small group of US-listed Mexican firms, whose owners-managers were confirmed to have stolen assets from their companies and fled the country afterwards, and claims that U.S. law enforcement was not able to deter or to punish them. However, it is worth mentioning that all individuals involved in these cases were afterwards arrested and sent to jail. The author considers that this punishment was due to the Mexican legal institutions and was not related to the effectiveness of U.S. authorities and institutions. But it is difficult to argue that the increased disclosure due to the U.S. listing, as well as the cooperation between U.S. and Mexican authorities, did not play an important role in finding out these frauds and in facilitating the punishment. Finally, the author suggests that the need of building a good reputation to avoid market punishment may be the reason why some, but not all, foreign firms that access the U.S. markets voluntarily follow the rules.

One factor to argue against the effectiveness of U.S. law enforcement against foreigners is the fact that in most cases the assets and the individuals themselves are outside the jurisdiction of U.S. authorities. Nevertheless, the SEC has cooperation agreements with its foreign counterparts and there are a few cases of insider trading, where the foreign individuals involved were sent to jail by U.S. authorities.¹⁷

But, even if SEC enforcement efforts may not be fully effective to deter or punish illegal activities by foreign firms and their insiders, the combination of formal and informal enforcement mechanisms and increased information, both quality and quantity, can provide powerful incentives that effectively reduce financial frauds. This effect may be especially strong in those frauds that are easier to detect –if not to prosecute- through market prices, like insider trading.

Jaffe (1974) is one of the earliest studies to document that stock prices increase after insiders actively bought the stocks of their firms and experience sharp decreases following intensive

¹⁷ The SEC reported two cases of Mexican citizens that were sent to prison for charges of illegal insider trading. However, these cases are related to firms domiciled in the U.S., not ADRs. See www.sec.gov

insider sales. Gosnell, Keown and Pinkerton (1992) analyze a sample of 129 bankruptcy announcements in the United States. They find that prior to bankruptcy announcements, insider trading is significantly greater for over the counter (OTC) bankrupt firms, but not for firms listed on the NYSE or in AMEX. They conclude that in small OTC firms, better-informed corporate insiders are found to use their superior information concerning the financial situation of the firm in trading with a less-informed market. Coffee (2001) asserts that: “[...] insider trading on the NYSE is far more likely to be detected and prosecuted than similar conduct on the LSE [London Stock Exchange], and even less prospect exists of actual legal liability for insider trading on less liquid exchanges”.

Finally, differences in the markets’ microstructure, as well as in the degree and effectiveness of regulatory scrutiny may allow insiders to obscure or hide their trading. For example, Lin and Howe (1990), mention that the multiplicity of market makers in the OTC market may facilitate illegal insider trading.

In general, insider-trading cases are very difficult to prove. Among the main problems to prosecute or prevent insider trading are the definition of insiders and the difficulty to prove “who knew what and when”. The latter is especially difficult in cases related to earnings announcements, because –unlike takeover transactions- there is no clear record of when the insiders learned about the “material” information. Other difficulties include the definition of inside information and in which cases that information is “material”. Meulbroek (1992) analyzes SEC investigations related to actual cases of illegal insider trading, conducted between 1980 and 1989. The author finds that almost half of the pre-announcement drift observed before takeovers occurs on insider trading days.¹⁸ Consistent with the difficulty of defining and prosecuting insider trading violations related to earnings announcements, about 80% of her sample involved takeover transactions and only 8% of the cases were related to earnings announcements.¹⁹

¹⁸ Not all studies find evidence of profitable insider trading. For example, Eckbo and Smith (1998) analyze the performance of insiders in the Oslo Stock Exchange and find no evidence of positive abnormal returns. Seyhun (1986) found positive returns from imitating insider trades reported in the Official Summary of Insider Trading published by the SEC, but the abnormal returns net of transaction costs were non-positive.

¹⁹ Insider trading investigations related to earnings announcements may be less frequent, because they are even harder to prosecute than cases of takeover transactions, where the dates of information sharing are easier to determine, as well as the people that directly participated in the transactions or meetings prior to the event. Another reason is that the actual profits from insider trading related to earnings news are lower than those related to takeover transactions.

III. Sample and data description

The sample is restricted to Mexican companies listed in the *Bolsa Mexicana de Valores* (BMV), which is the only stock exchange in Mexico. I focus on the quarterly earnings announcements over the period starting in March 1995 to March 2001. For each firm and quarter in the sample, I collected the following information: daily closing stock prices, daily volume and year end market capitalization, actual and forecasted quarterly earnings per share (EPS) and earnings announcement dates. The source for the earnings data is I/B/E/S. I use I/B/E/S/ analysts' consensus mean forecast as a measure of the expected earnings.

Stock price data for each stock, as well as the corresponding market value and volume were compiled from the DataStream International database. In order to mitigate effects from differences in microstructure across exchanges, all prices and volume information are in pesos and correspond to the shares traded in Mexico, in the BMV.²⁰ The exact dates of quarterly earnings announcements were collected from the BMV.

In order to be included in the sample, a company must have an identifiable quarterly announcement date, actual EPS and at least one EPS analyst forecast. Price data on the underlying stock is required starting 250 days before the announcement date and ending at least 60 days after the earnings release date.

There are three types of sponsored public American Depositary Receipt, and one private listing. ADRs are classified in three levels: Level I or OTC, Level II (listing only) listed in NYSE, AMEX or NASDAQ and Level III (listing and offering) offered and listed on NYSE, AMEX or NASDAQ.²¹

I divide my sample in non-US-listed firms and US-listed-firms. The first category includes not only firms that exclusively list in Mexico, but also those Mexican firms that trade in the over-the-counter market (OTC) in the U.S., as ADRs Level I, as well as through private placements under Rule 144A. On the other hand, the category of US-listed firms includes those Mexican firms that are cross-listed on the New York Stock Exchange (NYSE), i.e. ADRs Levels II and III.²² It is important to note that the observed behavior of the different securities in the sample

²⁰ Kato, Linn and Shallheim (1991), Miller and Morey (1996) and Park and Tavakkol (1994) find no evidence of arbitrage opportunities between ADRs and the underlying shares.

²¹ Sponsored Depositary Receipts are issued by one depositary appointed by the company under a Deposit Agreement or service contract. Prior to 1983, DRs could be created without a firm's sponsorship and by multiple depositaries for a given issue, in response to market demand. Today, un-sponsored Depositary Receipts are considered obsolete and are no longer established.

²² In 2001, 26 (87%) of the 30 Mexican companies that had shares cross-listed in one of the three national exchanges in the U.S. (NYSE, AMEX and NASDAQ) were cross-listed on the NYSE. The sample also

validates this grouping. Firms included in the non-US-listed category show very similar patterns and distinct from the US-listed category (see graph 1).²³

[INSERT Graph 1 HERE]

Figure 1 summarizes the characteristics of the DR programs by exchange, accounting standards and SEC registration requirements. Figure 1 also indicates the distribution of firms and observations in the sample by security type and as a percentage of the total number of observations, described below.

[INSERT FIGURE 1 HERE]

One of the most important differences between these securities is that exchange-listed ADRs (Level II and III) require a full registration with the SEC.²⁴ This implies that they have to disclose more detailed and transparent information to the market and comply with U.S. standards of information distribution processes, making it easier for regulators and market participants to monitor trading and important corporate activities. They become subject to SEC oversight and to private enforcement in the U.S. courts through class and derivative actions.

In sharp contrast, issuing a shares under Rule 144A or an ADR Level I (OTC) does not make a significant difference for foreign firms in terms of disclosure, accounting standards, legal liabilities and market oversight. Level I ADRs trade over-the-counter as OTC Bulletin Board or “Pink Sheet”. These are issues with limited liquidity and minimal SEC disclosure and accounting requirements. Information on OTC ADRs is more limited as trading data is not well publicized, company financials do not conform to U.S. standards and the SEC does not require companies to communicate with shareholders on a regular basis. Foreign firms can also choose a private placement of DRs under Rule 144A, also known as RADRs.²⁵ RADRs do not require a full SEC registration or compliance with US-GAAP and are traded on PORTAL.²⁶ Firms that choose to list

includes Tamsa, which is a Mexican firm listed on the American Stock Exchange (AMEX). Complete information for the rest of the companies was not available.

²³ I included separate dummy variables for each security type in the regressions presented in Section V. Consistent with the categories, stock prices of BMV, OTC (ADR Level I) and Rule 144A firms follow similar patterns and the differences between them are not statistically significant. Previous empirical evidence also supports the idea that the market perceives exchange-listed ADRs more attractive and as a better signal than OTC and RADRs. For example Miller (1999) finds that the market reacts most favorable to the issue of exchange-listed ADRs. Abnormal returns following an OTC-listing announcement are less than half those of listed-ADRs and there is even a negative reaction to private placements (RADRs). In addition, Doidge, Karolyi and Stulz (2001) show that listed-ADRs enjoy the largest premiums in terms of value.

²⁴ See Section III for a detailed explanation of the three existing types or “Levels” of ADRs, as well as of Rule 144A also known as RADRs.

²⁵ Rule 144A was established by the SEC in April, 1990.

²⁶ PORTAL is a private electronic secondary market operated by the National Association of Securities Dealers (“NASD”) in which only Qualified Institutional Buyers (QIBs) may trade. The SEC defines QIBs

their shares as RADRs are exempt from SEC filing under Rule 12g3-2(b), which allows them to keep their home country accounting rules translated to English. RADRs trade with very limited liquidity.

On the other hand, companies that want to list their securities on the NASDAQ, AMEX, or NYSE, use Level II ADRs, while firms that want to list *and* raise capital in the U.S. use Level III ADRs. Level II and Level III ADRs require full registration and reporting under the Exchange Act of 1934 and must file Form 20-F annually, which basically contain the same information as the 10-K reports, on an annual basis.

The total sample consists of 73 different companies, 25 ADRs and 49 non-ADRs²⁷, out of the 178 Mexican firms listed in the BMV as of September 2000 (see Figure 1 and Table 1). The companies in the sample together represent over 85% of the total market capitalization and volume of BMV. As of December 2001, there were 26 Mexican companies listed in the NYSE. My sample includes 24 of them. The two NYSE-listed companies not included in my sample, due to data availability, are Grupo Dina and Savia. My sample also includes Tamsa, which is one of the two Mexican companies listed in the American Stock Exchange (AMEX), as of December 2001.²⁸

The earnings announcements of the 73 firms provide a total sample of 637 announcements, during the period of study. I/B/E/S provides information of 87 Mexican firms, for which it has 726 quarterly observations with quarterly actual and estimated EPS information, over the same period. In other words, my sample includes 84% and 88% of the Mexican firms and observations covered by I/B/E/S, respectively.²⁹ The difference comes from data availability ones we collect the additional information needed from the other sources and matched the samples.

Of the 637 earnings announcements or events, 221 (35%) correspond to US-listed firms and 416 (65%) to non-US-listed firms. The US-listed events include 48 ADR Level II observations (8% of total) and 173 ADR Level III observations (27% of total). The non-US-listed category includes 174 BMV observations (27% of total), 84 RADRs (13% of total) and 158 over the counter firm-observations (OTC) (25% of total).

as institutions that manage a minimum of \$100 million in securities or registered brokers with investments of at least \$10 million in shares of non-affiliates.

²⁷ Cemex listed its shares in the NYSE on September 15th, 1999, before that it had an OTC listing during the period of study. Hence, it belongs to the non-ADR category between 1995 and September 1999 and switched to the ADR category afterwards. It is the only company in the sample for which all data are available before and after the ADR listing.

²⁸ The other Mexican company listed in the AMEX is Simec. This company is not included in the sample, due to data availability.

²⁹ I/B/E/S begins large-scale coverage of international companies in the mid-1990s.

Although the sample period starts in 1995, most observations correspond to the years 1998 to 2000 as shown in graph 2.

[INSERT GRAPH 2 HERE]

Table 2 presents sample summary statistics for the year 2000. US-listed firms are larger and more liquid relative to non-US-listed firms. The sample average market value (MV) in 2000 was US\$1.5 billion. The US-listed firm average MV was \$2.3 billion dollars, almost double the average MV of non-US-listed firms (US\$1.2 billion), however the difference in medians is only about 15 percent. The sample represents over 85% of the total market capitalization of the Mexican stock market (BMV). The daily average volume of the U.S.-listed firms was more than two times the volume of non-US-listed firms during the period of study and the bid-ask spread was lower for US-listed firms.

[INSERT TABLE 2 HERE]

Finally, Table 3 shows the sample industry composition, following IBES industry classification, which broadly corresponds to 2-digit SIC codes. The firms in the sample belong to 18 different industries. The industries with most firms are Construction and House Building; Retailing; Food Agribusiness and Tobacco; and Conglomerates (Multi-Industry). These categories include US-listed, as well as non-US-listed firms. Each of the eighteen industry categories has at least one non-US-listed firm. However, US-listed firms in the sample are present in only ten of the eighteen industry categories.

[INSERT Table 3. HERE]

IV. Methodology

I follow the traditional event study methodology first introduced by Ball and Brown (1968) and Fama et. al (1969).³⁰ The standard analysis to detect insider trading is based on event studies of the stock price behavior around important corporate news announcements. Mitchell and Netter (1994) review the application of event studies employed by the SEC to detect insider trading.

The variable to analyze is the average cumulative abnormal returns (CAR) in a 121-day event window, starting sixty days before the event day and ending sixty days after the event day. The null hypothesis is that the CARs in the pre-announcement period are equal to zero.

The information content of earnings announcements can be evaluated by analyzing the stock price reaction to the news and comparing the value of the actual earnings to its expectation of the

³⁰ See Mackinlay (1997) and Campbell, Lo and Mackinlay (1997) for a review and discussion of the event study methodology.

market, the difference is the “earnings surprise”. The stock price behavior around corporate announcements reveals the time pattern of the resolution of uncertainty about its impact on firm value, as well as the importance of the news. Events that are expected to provide cash-flow-relevant information to the market, like earnings surprises, are usually *followed* by abnormal returns after the public announcement.³¹ Thus, if the earnings reports provide new information to the market, higher than expected earnings should be correlated with increases in stock prices and lower than expected earnings should be correlated with decreases in firm value.

To capture this relation, each announcement is classified according to the surprise deviation of the actual earnings per share (EPS) from the expected EPS, measured by the analysts’ consensus mean forecast.³² The earnings surprise variable is defined as difference between the actual EPS and the mean analyst forecast, scaled by one plus the absolute value of the mean analyst forecast:³³

$$Mean_ Surprise_i = \frac{(eps_i - forecast_i)}{1 + abs(forecast_i)}$$

The reason to use this metric instead of a naïve model based on the deviation with respect to earnings reported the previous year is twofold. First, empirical studies show that analysts’ forecast is a more accurate measure, because analysts are able to update their estimations based on new firm and economy wide information.³⁴ Second, using the naïve measure of earnings expectation would reduce the sample, because the complete time series are not available for all firms in the sample. In addition, using zero as the threshold for the surprise classification (positive or negative news) has the advantage that the sorting of events does not depend on the surprise measure that we use, but only on the sign of the deviation.³⁵ Nevertheless, given potential problems and differences between non-US-listed and US-listed I/B/E/S forecasts, I run alternative

³¹ See Daniel, Hirshleifer and Subrahmanyam (1998) for a summary of empirical papers on post-announcement drifts.

³² I use the most recent forecasts available from I/B/E/S, posted the month prior to the earnings announcements, but results hold if we estimate the surprise deviation based on the earliest forecasts available instead.

³³ Alternatively, I also estimated a “deflated surprise” measure, defined as the EPS minus the mean forecast divided by the most recent stock price outside the event window, i.e. sixty trading days prior to the earnings announcement. Additional surprise measures include the “Standardized Unanticipated Earnings” (SUE) defined as the actual EPS minus the forecasted EPS divided by the standard deviation of the analysts’ forecasts. Results hold independent of the surprise measure used.

³⁴ See Brown and Rozeff (1978), Givoly (1982) and Brown et al. (1987).

³⁵ Other surprise deviation measures used in the literature are the standardized unanticipated earnings (SUE) and the percentage deviation relative to the mean forecast. The results hold using either measure.

tests than do not depend on the I/B/E/S forecasts.³⁶ These tests show that the results are not driven by the differences in the characteristics of the I/B/E/S variables (see graph X in the appendix).

The announcement is classified as good news if the surprise is positive. If, on the other hand, the earnings reported were below the analysts' mean forecast, i.e. negative surprise, then I classify the announcement as bad news. Table 4 shows the distribution of surprises. There are 342 (54%) events classified as negative news, 134 belong to US-listed firms and 208 to non-US listed firms. Of the 295 events (46%) classified as positive news, 87 correspond to US-listed firms and 208 to non-US-listed firms.³⁷ The US-listed firms in the sample reported bad news more often than good news and the average and median surprises are negative. In contrast, the events corresponding to non-US-listed firms in the sample are evenly divided among good and bad news, and the average and median surprises are closer to zero.

[INSERT TABLE 4. HERE]

The evaluation of the event's impact requires a measure for the abnormal return. The abnormal return is the actual ex post return over the event window minus the normal return over the event window. To estimate the abnormal returns, I use the size adjusted abnormal returns model proposed by Dimson and Marsh (1986) and used by Lin and Howe (1990).³⁸ The abnormal returns are given by:

$$AR_{i,t} = R_{i,t} - R_{si,t}$$

where $R_{i,t}$ is the one day return of stock i on day t and $R_{si,t}$ is the one day return on day t of an equally weighted portfolio of stocks in the same size quintile as stock i .

All prices correspond to the stocks listed on the BMV expressed in Mexican pesos. This model measures the abnormal returns of a stock relative to firms of similar size without the need to estimate any parameters.³⁹ We construct size quintile control portfolios for each year from

³⁶ For example, the results may be affected by differences in the forecast' quality of US-listed relative non-US-listed firms or the analysts may release more timely forecasts for the US-listed firms. To see if these factors affect the results, I run non-parametric tests, such as the Corrado rank test, for the absolute abnormal returns, but the results do not change.

³⁷ This numbers include seven observations for which there was no surprise, i.e. actual EPS were equal to the consensus mean forecast. The seven observations are included in the positive news category and they all correspond to non-US-listed firms. Results hold with and without these observations.

³⁸ Results are robust to the use of alternative models to estimate the normal returns, such as the market model and a two-factor market model.

³⁹ Dimson and Marsh (1986) suggest that ones we adjust for size there is no need to explicitly control for risk.

1995 to 2001, based on end of year market value of the previous year, using all firms in the sample with available information.

As I mentioned before, the timeline for the event study is a 121-day event window, which consists of 60 pre-event days, the event day when the company releases the earnings report to the public, and 60 post-event days.⁴⁰ This period does only include one financial report per company, i.e. the event window does not include the earnings announcement of a same company corresponding to either the quarter prior to or the quarter after the current report.

In order to analyze the multiple period event windows and to draw overall inferences for the earnings announcements, we need to estimate the cumulative abnormal returns (CARs). To compute the CARs, the abnormal return observations must be aggregated across events and across time during the event window, for each earnings news category (positive news and negative news) and for each firm category (US-listed and non-US-listed). This aggregation assumes that the abnormal returns and the cumulative abnormal returns are independent across securities. However, I relax this assumption in the regression analysis by constructing clusters by report quarter, and alternatively by report date, to account for the overlaps in the event windows across securities and the resulting covariance.⁴¹

The average abnormal return in day t is computed by averaging across the quarterly firm observations in the sample. The sample average cumulative abnormal return $CAR(t_1, t_2)$ is the sum of the average abnormal returns, from t_1 to t_2 , where $T_1 < t_1 \leq t_2 \leq T_2$.

The null hypothesis to be tested is that the average $CAR(t_1, t_2)$ is equal to zero, in good and bad news events. The market response given by the abnormal return reflects the amount of additional information provided by the earnings reports. If the financial situation of the firms is revealed *before* the earnings announcements, then the stock prices will incorporate a significant portion of this information prior to the announcement and will show a weak reaction around the announcement date. In other words, we would observe a significant run-up in prices *before* the announcement date and little or no reaction on the event day, when firms released their earnings results.

⁴⁰ For the alternative estimation models, I will use as estimation window the 250 days prior to the event window.

⁴¹ In addition, I estimate heteroskedasticity consistent (White) standard errors.

V. Results

Before turning to the formal regression analysis, I present some graphs and tables that illustrate the behavior of stock prices during the event window. In the next section, the regression analysis will confirm that the patterns observed are statistically significant and hold even after we control for firm characteristics such as size, liquidity and information asymmetries. Moreover, the results are robust to a number of alternative models and methodologies that account for the presence of outliers and potential estimation problems.

In the case of totally *unanticipated* news that affects the value of a firm we would expect to observe the following pattern in stock prices. In the period prior to news, the average CARs should be relatively stable and close to zero, because on average any interim positive news that affects single companies should compensate for negative news affecting the value of other companies. But once the companies report their earnings –on Event Day 0– and once we partition the sample in good news and bad news events, stock prices of US-listed and non-US-listed firms should react strongly. That is, prices should not incorporate news before its public release.

MacKinlay (1997) analyzes the stock price reaction to quarterly earnings announcements of the 30 companies included in the Dow Jones Industrial Index. The author confirms that stock prices of U.S. firms react strongly once the news is publicly released.

Graph 3 shows the average cumulative abnormal return for the full sample of Mexican firms and the two earnings news categories, positive and negative surprises, in the event window around quarterly earnings announcements. The correlation between the sign of the earnings surprise and the abnormal returns is as predicted, the abnormal returns are positive for good news and negative for bad news. But, in sharp contrast to MacKinlay (1997), stock prices of Mexican firms seem to incorporate part of the earnings news well *before* the announcement date. In the period of –60 to –31 trading days relative to the announcement date, the cumulative abnormal returns CARs of good-news-firms increase significantly, while the bad-news-firms fall sharply. Apparently, prices incorporate the earnings news thirty-one trading days *before* the earnings release.

[INSERT GRAPH 3 HERE]

Finally, the abnormal returns apparently show a weak post-announcement drift. However, additional analysis shows that this drift is not statistically significant. Given the strong run-up observed *before* the announcement, the focus of this study is the pre-announcement period [-60;-31] and the period [-1;1], from day –1 to day + 1 relative to the announcement day.

In order to analyze all observations together I will aggregate the data by multiplying by -1 all abnormal returns in the case of bad news events. Table 5 shows that the aggregated CAR from day -60 to day -31 , $CAR[-60,-31]$, is 2.26% (t-statistic= 3.99) and the aggregated $CAR[-1,1]$ is 0.54% (t-statistic=2.83). In the case of positive and negative news, the $CAR[-60;-31]$ for the full sample is 2.13% (t-statistic=2.61) and $-2.36%$ (t-statistic= -3.01), respectively. It is important to note that prices seem to incorporate most of the earnings news in the pre-announcement period $[-60;-31]$. The CARs in the period from day -30 to day -1 are close to zero and are not statistically significant.

We also observe a weak reaction in prices around the event day. It appears that prices react stronger to negative news than to positive news, both in the pre-announcement period and on the days of the public news release. The $CAR[-1;1]$ for the full sample is 0.39% (t-statistic=1.83) and $-0.65%$ (t-statistic= -2.37) in the case of positive and negative news, respectively. I will further analyze these asymmetries in the next section.

[INSERT TABLE 5 HERE]

Next, I partition the sample by firm type, i.e. non-US-listed and US-listed firms. Graphs 4a and 4b present price patterns that are consistent with the hypothesis presented in the previous sections. These graphs suggest that most of the anticipation of earnings news takes place in the non-US-listed firms. In other words, the prices of non-US-listed firms are the ones that incorporate the earnings information well in advance to its public release and we do not observe this pattern in the US-listed Mexican firms.

[INSERT GRAPH 4a AND 4b HERE]

The stock prices of Non-US-listed firms incorporate almost all earnings news thirty-one trading days *before* the public announcement. The size adjusted cumulative abnormal returns (CARs) show a strong run-up in the period of -60 to -31 trading days, relative to the event day ($t=0$). After day -31 , the CARs of non-US-listed firms are basically flat, which indicates that prices already incorporated the impact of any relevant news revealed during the period (see graph 4a). In addition, the stock prices only experience a weak reaction on the day of the earnings announcement. In sharp contrast, we do observe a strong reaction on stock prices of US-listed firms on the event day ($t=0$). However, graph 4b indicates that US-listed firms experience a significant run-up a few days before the public announcement. Additional tests in the next section show that this reaction takes place during the ten trading days prior to the public announcement. The next section presents the formal econometric analysis and shows that the asymmetries documented above are statistically significant and hold after controlling for firm characteristics, including firm ownership and insiders.

V.1. Regression Analysis (I still have to revise this section to include the latest results from the graphs in the appendix)

The previous section illustrates an asymmetric stock price reaction, around earnings announcements, of Mexican non-US-listed firms compared to Mexican US-listed firms. In this section, I analyze the extent to which firm characteristics and estimation methods can account for the observed patterns. The focus will be on the days around the earnings report [-1,1] and on the pre-announcement period [-60,-31], when prices seem to incorporate or anticipate most of the earnings news.

The regressions include variables that are likely to be important determinants of price reaction to news and several controls. The ultimate goal is to isolate the impact of institutional and informational factors. For this purpose I include the dummy variable non-US-listed and its interaction with the control variables, to identify the effects of weak disclosure and investor protection on price behavior. Non-US-listed is a variable equal to 1 if the firm is not cross-listed on any of the three national U.S. exchanges (NYSE, AMEX and Nasdaq), i.e. it has not an exchange-listed ADR, and zero otherwise.

The control variables include firm size (market value), liquidity (volume), the number of analysts following each firm and the bid-ask spread. Firm size is given by market value at the end of the year prior to the earnings reports; volume and bid-ask spreads are given by the daily averages in the days used to compute the CARs. The number of analysts is the number of analyst forecasts used to compute the mean forecast for each firm-event.

Informed traders may be better able to anticipate earnings news of bigger, more liquid and less risky firms. The control variables also take into account information asymmetries and transaction costs. In principle, prices should react stronger to bigger surprises. Therefore, I also add to the regressions the absolute value of the measure of surprise deviation.⁴² The absolute surprise can also be interpreted as a measure of forecast precision. However, this may not be the case in obscure environments with higher risks of earnings management. In addition, I construct 23 clusters by report quarter, to control for correlation between observations in the same quarter. I group in the same cluster the observations that are in the same year and quarter.⁴³ Hence, I assume that the observations are independent across quarters (clusters), but not necessarily independent within the same quarter. I estimate all regression using clusters by quarter and

⁴² Results are robust to the alternative definitions of surprise deviation described in section IV.

estimate robust (White) standard errors. In addition, I include industry dummies, to control for industry effects. The regression results indicate that none of these variables accounts for the asymmetries in the CARs and they are not statistically significant.

Gomes (2000): This model highlights the relationship between a firms' growth opportunities and their ability to develop a good reputation and suggests that the reputation effect would be stronger for a growth company with large financing needs, because of a higher dependence on equity financing. However, as long as the firm has access to credit to finance its growth, the reputation effect and growth opportunities will be unrelated. "No reputation can be credibly developed for treating equity holders well based on the firm's future needs for additional funds as long as forms of financing other than equity are available." Therefore, I include the firms' leverage given by the ratio of total assets to total liabilities, as a control for capital needs. The industry dummy variables should at least partially control for growth opportunities.

In table 5 and table 6, I report the cross-sectional regressions of the average CAR[-60,-31] and CAR[-1,1], respectively, for the aggregated sample and all control variables and interaction terms. The cross-sectional regressions confirm the asymmetries described in the previous section. Regression model I in table 5 shows that the average abnormal returns, accumulated in the pre-announcement period [-60,-31], of non-US-listed firms are 2.14 percentage points higher than the cumulative abnormal returns of US-listed firms in the same period. This difference is significant at the 7 percent level and it increases in magnitude and statistical significance once we include all the control variables. Regression model VI, which includes all control variables, indicates that the CAR[-60,-31] of non-US-listed firms are 6.07 percentage points higher than the abnormal returns of US-listed firms in the same period. This difference is statistically significant at the 1 percent level.⁴⁴ The number of observations in the last two specifications falls due to missing observations of the additional control variables.

[Insert table 5 here]

⁴³ There is one cluster for each quarter with observations in the sample. Given that in 1995 there are two quarters without observations, I have 23 clusters in the sample.

⁴⁴ Other news besides the earnings announcements within the event window are not controlled for and may have an effect on the results. Nevertheless, given that we are averaging the abnormal returns across companies and across time, this effect should be negligible or wash out. That is, the effects of interim positive corporate announcements should be compensated by the impacts of the interim negative corporate announcements.

**Table 5. Cross-sectional Regressions of CARs
(Event: Quarterly Earnings Announcements)
- Full Sample -
Pre-announcement Period [-60,-31]**

Dependent variable is the average cumulative size-adjusted abnormal return CAR, for the period (t1,t2). To aggregate the abnormal returns the negative news events were multiplied by -1. Non-US-listed is a dummy variable equal to one if the firm is not cross-listed in a U.S. exchange (i.e. NYSE, AMEX or Nasdaq) and zero otherwise. SURPRISE is the absolute percentage deviation of actual earnings per share with respect to the consensus mean estimate; ANALYSTS is the number of analysts following the firm; LEVERAGE is total assets divided by total liabilities in March 1997, VOLUME is the average volume in thousands of shares traded in the period (t1,t2); MARKET VALUE is the market value at the end of the previous quarter in million pesos; the interaction terms between the Non-US-listed dummy and the independent variables are also included. Clusters by quarter were generated to control for contemporaneous cross-correlations between observations in the same quarter. t-statistics are shown in brackets, based on White (robust) standard errors. The shaded areas are significant at 10% (*), at 5% (**) and at 1% (***), respectively.

Dependent variable: Aggregated CAR[-60,-31]						
	I	II	III	IV	V	VI
Constant	0.009 [0.87]	0.001 [0.15]	-0.010 [0.71]	-0.037 [1.48]	-0.049 [0.77]	-0.157 [2.55]**
Non-US-listed	0.021 [1.89]*	0.030 [2.70]**	0.021 [2.04]*	0.058 [2.19]**	0.069 [2.51]**	0.179 [6.02]**
Absolute Surprise		0.003 [1.42]				0.003 [1.336]
Analysts						0.007 [1.103]
Leverage (1Q-97)			0.049 [1.32]	0.107 [1.97]*	0.164 [2.79]**	0.303 [5.85]**
Volume (-60,-31)						-2.00E-06 [2.28]**
Market Value						3.0E-06 [1.50]
Bid-Ask Spread (-60,-31)						1.919 [6.40]**
Non-US-listed * surprise		-0.004 [1.67]				-0.004 [1.58]
Non-US-listed * analysts						0.001 [0.09]
Non-US-listed * volume (-60,-31)						1.0E-07 [0.05]
Non-US-listed * leverage (1Q-97)				-0.089 [1.83]*	-0.104 [1.90]*	-0.197 [3.05]**
Non-US-listed * bid-ask (-60,-31)						-1.780 [5.94]**
Non-US-listed * market value						-1.0E-06 [2.19]**
Industry effects	No	No	No	No	Yes	Yes
Observations	637	637	603	603	603	522
Adj. R-squared	0.01	0.02	0.01	0.01	0.02	0.05

On average, bigger firms, firms that report higher surprises and firms that are followed by more analysts, experience higher abnormal returns in the pre-announcement period [-60,-31]. However, these effects are not statistically significant. In the same period, firms with higher volume have lower abnormal returns, but this effect is not statistically significant.⁴⁵ In contrast, firms with higher bid-ask spreads show significantly higher abnormal returns. Finally, it is important to mention that in this type of cross-sectional regressions of cumulative abnormal

⁴⁵ One explanation of why volume may not have a significant effect on the CARs is the "stealth trading" hypothesis by Barclay and Warner's (1993), which states that informed traders hide their trades in low volume transactions. In other words, stealth (medium sized) trades are more likely based on private information. Also consistent with my results, the authors conclude that the NYSE specialist system is more transparent on insider trades relative to the NASDAQ dealer system. Friederich et al. (2002) show that medium-sized trades are more informative for short-term returns than large ones.

returns the R-squared is normally very low. Bailey et al. (2002) perform similar regressions and obtain R-squared of similar magnitudes.

Overall, the regressions confirm that those Mexican firms that are not subject to US financial regulation and market practices anticipate earnings news about thirty-one trading days before the earnings announcement. Given that companies report their financial results within thirty trading days after the end of each quarter, these findings suggests that prices incorporate most of the earnings news during the final weeks of each quarter.

Table 6 shows that on and around the announcement date, the price reaction of non-US-listed firms is weaker than the reaction of US-listed firms. In the aggregated sample, in the period [-1,1], stock prices of US-listed firms (related to the constant term) experience on average a 0.71 percentage point higher cumulative abnormal returns than non-US-listed firms. This difference is significant at the 5 percent level.

[INSERT TABLE 6 HERE]

**Table 6. Cross-sectional Regressions of CARs
(Event: Quarterly Earnings Announcements)
- Full Sample -
Announcement Period [-1,1]**

Dependent variable is the average cumulative size-adjusted abnormal return CAR, for the period (t1,t2). To aggregate the abnormal returns the negative news events were multiplied by -1. Non-US-listed is a dummy variable equal to one if the firm is not cross-listed in a U.S. exchange (i.e. NYSE, AMEX or Nasdaq) and zero otherwise. SURPRISE is the absolute percentage deviation of actual earnings per share with respect to the consensus mean estimate; ANALYSTS is the number of analysts following the firm; LEVERAGE is total assets divided by total liabilities in March 1997, VOLUME is the average volume in thousands of shares traded in the period (t1,t2); MARKET VALUE is the market value at the end of the previous quarter in million pesos; the interaction terms between the Non-US-listed dummy and the independent variables are also included. Clusters by quarter were generated to control for contemporaneous cross-correlations between observations in the same quarter. t-statistics are shown in brackets, based on White (robust) standard errors. The shaded areas are significant at 10% (*), at 5% (**) and at 1% (***), respectively.

Dependent variable: Aggregated CAR[-1,1]						
	I	II	III	IV	V	VI
Constant	0.007	0.008	0.008	0.017	0.004	0.007
	[2.22]**	[2.41]**	[1.44]	[1.09]	[0.221]	[0.28]
Non-US-listed	-0.003	-0.003	-0.003	-0.016	-0.017	-0.014
	[0.50]	[0.65]	[0.66]	[0.89]	[0.92]	[0.48]
Absolute Surprise		-0.001				-0.001
		[1.76]*				[1.69]
Analysts						0.002
						[1.40]
Volume (-1,1)						0.00
						[1.01]
Leverage (1Q-97)			-0.003	-0.022	-0.013	-0.010
			[0.26]	[0.66]	[0.35]	[0.24]
Market Value						1.0E-07
						[0.41]
Bid-Ask Spread (-1,1)						0.084
						[0.53]
Non-US-listed * surprise		3.7E-04				0.0004
		[1.32]				[1.28]
Non-US-listed * analysts						-0.002
						[0.67]
Non-US-listed * volume (-1,1)						2.00E-06
						[0.78]
Non-US-listed * leverage (1Q-97)				0.029	0.03	3.7E-02
				[0.72]	[0.77]	[0.68]
Non-US-listed * bid-ask (-1,1)						0.012
						[0.06]
Non-US-listed * market value						-2.0E-07
						[0.463]
Industry effects	No	No	No	No	Yes	Yes
Observations	637	637	603	603	603	537
R-squared	0.01	0.01	0.01	0.01	0.01	0.01

Regression model IV of table 6 indicates that, once we include all controls, US-listed firms continue to respond stronger to earnings news on or around the release of the firms' financial reports. This difference increases and becomes statistically stronger once we include all controls.

So far the findings presented are robust to several tests and controlling for clustering effects (non-independent events), firm size (market value), liquidity (volume) and information asymmetries captured by the number of analysts following a stock, as well as by the bid-ask spread. The latter variable is also a measure of transaction costs.

In the previous section, I indicated the possibility of an asymmetric response to earnings surprises depending on the sign of the surprise. In particular, it seemed that prices are more sensitive to negative news than to positive news. In order to test if the asymmetries are statistically significant, I include in the regression models presented in tables 5 and 6 a dummy

variable equal to 1 in the case of negative news and zero otherwise, as well as its interaction with the non-US-listed dummy variable (results not reported). The interaction term (non-US-listed*negative-surprise) is positive in the period [-61;-31] and negative in the period [-1,1] in all regression models. However, none of these additional variables is statistically significant. Non-US-listed firms incorporate earnings news well in advance of its public release and this effect may be stronger in the case of bad news. But the available evidence so far is inconclusive with respect to the latter effect.

V.2. Board Structures, Insiders and Selection effect (to be revised)

Two potential endogeneity problems: First, the exchange-listed ADR may not have an impact on insiders activities and hence on price behavior if, for example, companies keep their promises not because the higher threat of punishment in the U.S., but because they want to build a good reputation to be able to gain access the international capital markets and external financing to exploit high growth opportunities. Gomes (2000) presents a model that shows how firms can commit not to expropriate minority shareholders without any explicit corporate governance mechanism that provides shareholder protection. The underlying idea is that managers depend on equity markets to diversify idiosyncratic risks and want to develop a good reputation for treating minority shareholders well by extracting low levels of private benefits in order to sell at a higher price in the future. In the previous section we include variables to try to mitigate this endogeneity problem. The results hold after we include controls for growth opportunities and capital needs.

Finally, it is important to address the question of self-selection, in the sense that not only the firms but also owners and insiders of Mexican US-listed firms may be different than those of Mexican non-US-listed firms. Ideally, to control for firm characteristics we would like to analyze the price behavior of the same firms *before and after* the US-listing. However, this test is not possible given the small number of observations of Mexican US-listed firms in the period before the ADR listing.⁴⁶

In this section I analyze the ownership and board structure of all firms in the sample in order to group them based on common ownership and insiders. I construct a sub-sample of firms that share the same owners and/or insiders (“same-insiders sample”). This will allow us to analyze if price behavior of firms sharing the same insiders still varies depending on where the firms are listed.

⁴⁶ Most Mexican firms in the sample firms either cross-listed before 1994 or issued the ADR at the same time of the IPO in Mexico.

A second potential problem may be self-selection if not only the firms but also the owners and insiders of US-listed firms are different than those of non-US-listed firms and this differences affects the decision to cross-list or not. It could be possible that the intrinsic differences between management of US-listed and non-US-listed firms account for the asymmetries documented in the transmission of information into prices. In this case the asymmetries would not be due to the effects derived from cross-listing shares on U.S. exchanges and they would also be present in the period before the U.S. listing. Ideally, we would like to analyze the price behavior of the *same* firms before and after the US-listing. However, this test is not possible given the small number of observations of Mexican US-listed firms in the period before the ADR listing.⁴⁷ As an alternative test, I analyze if management and firms self-select. In other words, I analyze if the results hold within a sample of firms that have the same owners and or insiders. If the asymmetries hold within this “same owners/insiders sample”, then the results would support the idea that insiders change their behavior once they face stricter rules and higher expected penalties for wrongdoing.

To analyze the latter effects, I construct a sub-sample of US-listed and non-US-listed firms that have the *same* controlling owners and/or insiders. For each US-listed firm in this sub-sample, I include at least one non-US-listed firm that is either owned by the same family or has the same insiders. Two firms share the same insiders if they have the same owner or if the CEO of one of the firms is a board member of the other firm. Within this “same insiders sample” I find stronger evidence that non-US-listed firms, in contrast to US-listed firms, incorporate earnings news well in advance of the public earnings announcement. Controlling for insiders, the average cumulative abnormal returns in the period of -60 to -31 trading days, $CAR[-60,-31]$, of non-US-listed firms are 2.85 percentage points higher than the $CAR[-60;-31]$ of US-listed firms. This difference is significant at the 5% level.

Investors need comprehensive disclosure of relevant financial information in order to properly monitor compliance with contractual agreements and evaluate whether owners, executives and managers are maximizing shareholders’ value. Corporate boards represent *in theory* an additional mechanism to monitor and discipline management on behalf of the external shareholders.⁴⁸ However, in practice, in the U.S. and probably elsewhere, given that Chief Executive Officers (CEOs) directly or indirectly pick or nominate the board members and

⁴⁷ Most US-listed Mexican firms issued the exchange-listed ADR simultaneously with the initial public offering (IPO) as shown in table 1.

⁴⁸ Other mechanisms include the role of financial intermediaries, financial analyst, investment banks and rating agencies) and the market for corporate control.

determine their perks or compensation packages, effective monitoring and control by the board aimed to maximize shareholders wealth is highly in doubt.⁴⁹

Table 7 presents the composition of the board of directors of the firms in the sample. Boards of US-listed firms are on average bigger than non-US listed firms. An interesting fact is that in 29% of the non-US-listed firms the CEO and the Chairman of the Board is the same person, compared to only 17% of US-listed firms.

[Insert Table 7.]

Table 7. Board Composition as of December 2001

Type of Listing	Number of Firms	Board Size	Board Directors	Substitute Directors		CEO=Chairman	
				Yes	Number	Firms	%
No Exchange Listing in U.S.	49	21	9	73%	7	14	29%
BMV	25	22	10	64%	7	7	28%
144A	8	20	9	75%	6	3	38%
OTC	16	21	9	88%	8	4	25%
NYSE listed	24	24	11	71%	8	4	17%
Level II	7	24	10	86%	8	1	14%
Level III	17	23	11	65%	8	3	18%

Source: Bolsa Mexicana de Valores

To analyze if the asymmetries may be due to *different type* of owner-managers making different decisions or rather due to a *change in behavior* of the same individuals and firms, I construct a sub-sample of US-listed and non-US-listed firms that have the same controlling owners and/or insiders. For each US-listed firm in this sub-sample, I include at least one non-US-listed firm that is either owned by the same family and/or has the same insiders. Two firms share the same insiders if they have the same owner or if the CEO of one of the firms is a board member of the other firm. For example, I include Firm A and Firm B in the “same insiders sample” if the same family owns them. If, in addition, the CEO of either of these firms is a board member of Firm C, or if the CEO of Firm C sits in the board of either Firm A or Firm B, then I assume that the three companies have the same insiders and include Firm C in the sample.⁵⁰

Table 8 shows that the sub-sample of “same insiders” includes 42 of the 73 firms (58%). 25 of these firms are non-US-listed and 17 are US-listed firms. In terms of observations, the same-insiders sample contains 63% of the total number of observations in the sample.

[INSERT TABLE 8]

⁴⁹ See Bebchuk, Fried and D. Walker (2001).

⁵⁰ I focus on CEOs only, but many firms have more than one board member in common.

Table 8.

"Same-Insiders" Sample	Total	% of Total Sample	Non-US-listed	% of Total Non-US-listed	US-listed	% of Total US-listed
Firms	42	58%	25	51%	17	71%
Observations	399	63%	228	55%	171	77%
Positive surprises	169	57%	108	52%	61	70%
Negative Surprises	230	67%	120	58%	110	82%

Within the “same-insiders sample” I find stronger evidence that non-US-listed firms incorporate earnings news well in advance of the public earnings announcement. Tables 9 and 10 show that the results presented in the previous section also hold for the “same insiders sample”. Conditional on having the same insiders, the average CAR[-60;-31] of non-US-listed firms are 2.9 percentage points higher than the CAR[-60;-31] of US-listed firms. This difference increases to 8.6 percentage points and is statistically significant at the 1 percent level once we include all control variables (Table 9, model VI).

[INSERT TABLE 9]

**Table 9. Cross-sectional Regressions of CARs
(Event: Quarterly Earnings Announcements)
- Same Insiders Sample -
Pre-announcement Period [-60,-31]**

Dependent variable is the average cumulative size-adjusted abnormal return CAR, for the period (t1,t2). To aggregate the abnormal returns the negative news events were multiplied by -1. Non-US-listed is a dummy variable equal to one if the firm is not cross-listed in a U.S. exchange (i.e. NYSE, AMEX or Nasdaq) and zero otherwise. SURPRISE is the absolute percentage deviation of actual earnings per share with respect to the consensus mean estimate; ANALYSTS is the number of analysts following the firm; LEVERAGE is total assets divided by total liabilities in March 1997, VOLUME is the average volume in thousands of shares traded in the period (t1,t2); MARKET VALUE is the market value at the end of the previous quarter in million pesos; the interaction terms between the Non-US-listed dummy and the independent variables are also included. Clusters by quarter were generated to control for contemporaneous cross-correlations between observations in the same quarter. t-statistics are shown in brackets, based on White (robust) standard errors. The shaded areas are significant at 10% (*), at 5% (**) and at 1% (***), respectively.

Dependent variable: Aggregated CAR[-60,-31]						
	I	II	III	IV	V	VI
Constant	0.012 [1.27]	0.001 [0.08]	0.004 [0.198]	-0.019 [0.55]	-0.095 [1.68]	-0.158 [2.85]**
Non-US-listed	0.029 [2.19]**	0.032 [2.35]**	0.028 [2.16]**	0.060 [1.76]*	0.104 [2.27]**	0.176 [3.51]**
Absolute Surprise		0.006 [1.55]				0.006 [1.49]
Analysts						0.006 [.091]
Leverage (1Q-97)			0.017 [0.47]	0.065 [0.95]	0.165 [1.42]	0.174 [1.40]
Volume (-60,-31)						-2.0E-06 [1.07]
Market Value						1.0E-05 [2.36]*
Bid-Ask Spread (-60,-31)						1.90 [2.08]*
Non-US-listed * surprise		0.002 [0.37]				-0.004 [0.514]
Non-US-listed * analysts						0.005 [0.47]
Non-US-listed * Leverage (1Q-97)				-0.074 [0.89]	-0.177 [1.67]	-0.180 [1.57]
Non-US-listed * volume (-60,-31)						2.0E-05 [0.64]
Non-US-listed * bid-ask (-60,-31)						-1.55 [1.68]
Non-US-listed * market value						-1.0E-06 [1.38]
Industry effects	No	No	No	No	Yes	Yes
Observations	399	399	377	377	377	328
Adj. R-squared	0.001	0.01	0.01	0.01	0.02	0.03

During the announcement period [-1,1], the CARs of US-listed firms are on average 0.70 percentage points higher than the CARs of non-US-listed firms. This difference increases to 3.1 percentage points and is significant at the 1 percent level or better once we include all control variables (Table 10, model VI).

[INSERT TABLE 10]

**Table 10. Cross-sectional Regressions of CARs
(Event: Quarterly Earnings Announcements)
- Same Insiders Sample -
Announcement Period [-1,1]**

Dependent variable is the average cumulative size-adjusted abnormal return CAR, for the period (t1,t2). To aggregate the abnormal returns the negative news events were multiplied by -1. Non-US-listed is a dummy variable equal to one if the firm is not cross-listed in a U.S. exchange (i.e. NYSE, AMEX or Nasdaq) and zero otherwise. SURPRISE is the absolute percentage deviation of actual earnings per share with respect to the consensus mean estimate; ANALYSTS is the number of analysts following the firm; LEVERAGE is total assets divided by total liabilities in March 1997, VOLUME is the average volume in thousands of shares traded in the period (t1,t2); MARKET VALUE is the market value at the end of the previous quarter in million pesos; the interaction terms between the Non-US-listed dummy and the independent variables are also included. Clusters by quarter were generated to control for contemporaneous cross-correlations between observations in the same quarter. t-statistics are shown in brackets, based on White (robust) standard errors. The shaded areas are significant at 10% (*), at 5% (**) and at 1% (***), respectively.

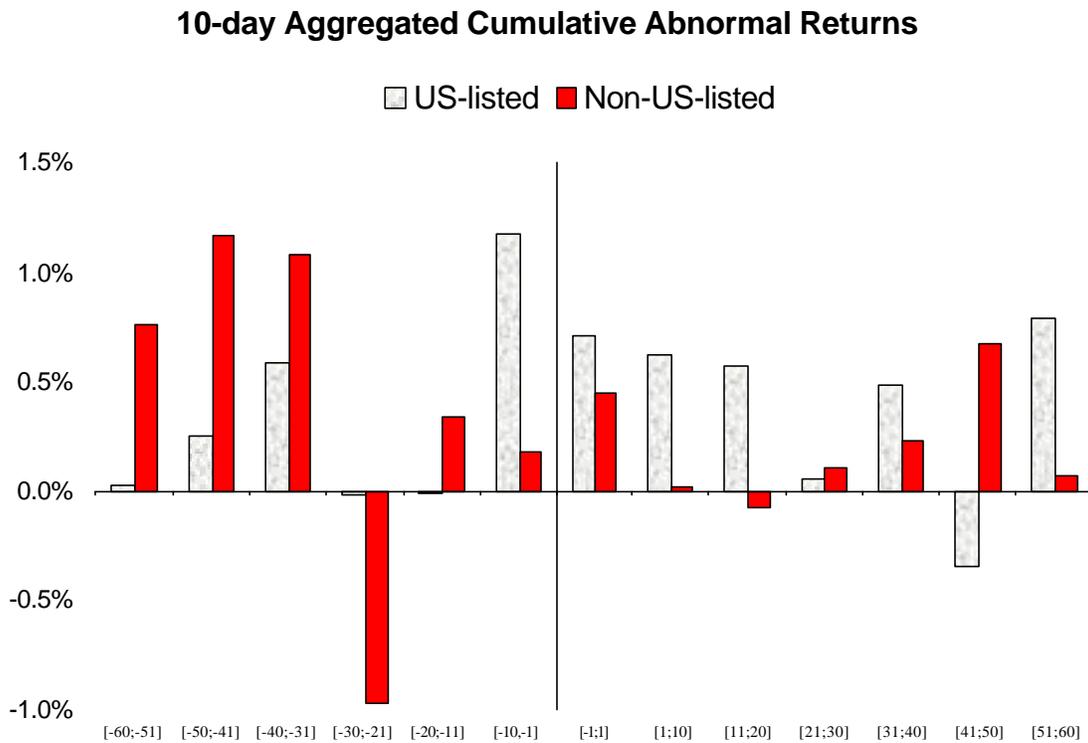
Dependent variable: Aggregated CAR[-1,1]						
	I	II	III	IV	V	VI
Constant	0.007	0.009	0.016	0.029	0.049	0.090
	[2.01]*	[2.19]**	[2.73]**	[1.63]	[1.85]*	[1.36]
Non-US-listed	-0.003	-0.002	-0.006	-0.025	-0.050	-0.047
	[0.60]	[0.50]	[1.27]	[1.14]	[2.11]**	[1.02]
Absolute Surprise		-0.001				-0.001
		[3.07]***				[3.02]***
Analysts						0.0020
						[1.08]
Volume (-1,1)						7.3E-07
						[0.573]
Leverage (1Q-97)			-0.019	-0.046	-0.098	-0.112
			[1.65]	[1.27]	[1.81]*	[1.48]
Market Value						-6.1E-08
						[1.03]
Bid-Ask Spread (-1,1)						0.106
						[0.41]
Non-US-listed * surprise		-0.002				-0.008
		[0.61]				[1.67]
Non-US-listed * analysts						-0.004
						[0.79]
Non-US-listed * volume (-1,1)						-3.0E-06
						[0.87]
Non-US-listed * Leverage (1Q-97)				0.042	0.11	0.143
				[0.89]	[1.91]*	[1.72]*
Non-US-listed * bid-ask (-1,1)						-0.077
						[0.27]
Non-US-listed * market value						-2.9E-07
						[0.26]
Industry effects	No	No	No	No	Yes	Yes
Observations	399	399	377	377	377	340
Adj. R-squared	0.001	0.003	0.001	0.002	0.004	0.014

Overall, these findings support the hypothesis that institutional differences and market practices, especially those related to information disclosure, as well as its enforcement, may explain the observed asymmetries in stock price behavior of Mexican US-listed and non-US-listed firms around earnings announcements. Furthermore, the results indicate that stiffer penalties and enforcement may have a strong effect on stock price behavior through its effect on the behavior and practices of insiders and executives and may help reducing financial frauds, such as insider trading.

Finally, a more detailed breakdown of the pre-announcement window indicates that the strongest reaction of stock prices of non-US-listed firms takes place during the window [-50,-41], i.e. from -50 to -41 trading days relative to the announcement day. In sharp contrast, prices of US-listed firms incorporate most of the earnings news during the ten-day window (from day -10 to day -1) prior to the announcement.

Graph 6 shows a breakup of the pre-announcement period in 10-day windows. It is evident that US-listed firms react most strongly in the period [-10,-1], while non-US-listed firms' prices incorporate most of the earnings news in the pre-announcement window [-50,-41]. The graph also indicates that in each of the three ten-day windows included in the pre-announcement window [-60,-31] the aggregated CARs of non-US-listed firms are higher than the CARs of US-listed firms. This relationship is reversed in the days closer to the public announcement, both shortly before and shortly after the event day.

[INSERT GRAPH 6]



It is interesting that in the ten-day window [-30,-21], the aggregated CARs of non-US-listed firms are negative 1 percent, indicating a reversed behavior relative to the previous three ten-day windows. Graph 7 shows the difference between the aggregated CARs of non-US-listed and US-listed firms, in the ten-day windows. The highlighted periods, [-50,-41] and [-10,-1], are the windows in which the difference is statistically significant at the 10 percent level or better. In the period [-50,-41] the difference between the aggregated CARs of non-US-listed and US-listed firms is positive and significant at the 5 percent level. In contrast, this differences is negative and

significant in the ten-day window [-10,-1] just before the announcement day. One possible explanation of the positive drift in stock prices of US-listed stocks in the period [-10,-1] is that in the period before the public announcement there is extensive communication (conference calls, updates and previews, etc.) between the firms' management and a small group of selected financial intermediaries -such as leading analysts- and institutional investors. Therefore, the privileged investors that had access to these previews of the earnings news were able to trade and profit in advance of the earnings releases. This used to be a common practice also across U.S. firms before Regulation FD and may also explain the positive pre-announcement drift documented in the study by MacKinlay (1997). An alternative explanation is that an exchange-listed ADR does not entirely prevent insiders from trading on their private information and delays the leaking of information by a few weeks. Lack of data availability prevents us to discriminate between these hypotheses.

Finally, in all but one of the ten-day windows in the post-announcement window [1,60], the aggregated CARs of non-US-listed firms are *lower* than the aggregated CARs of US-listed firms, suggesting a stronger post-announcement drift in US-listed firms. However, none of the differences in the post-announcement period are statistically relevant. The next section shows that the results are robust to a number of alternative tests and methodologies to estimate the abnormal returns.

VI. Alternative models and robustness tests

The robustness tests include regressions after dropping the outliers, as well as regressions of medians. Table 11 presents a series of alternative regression models designed to control for outliers. In Panel A, the dependent variable is the aggregated cumulative abnormal returns in the pre-announcement period $CAR[-60;-31]$, and in Panel B the dependent variable is the aggregated CAR on and around the announcement date, $CAR[-1,1]$. Specification I and II are "robust regressions" for the whole sample and the "same-insiders" sample, respectively. The robust regression methodology eliminates outliers and assigns weights to each observation based on the residuals.⁵¹

Model I in Panel A indicates that the aggregated CARs of non-US-listed firms, in the pre-announcement period [-60,-31], are, on average, 1.90 percentage points higher than the CARs[-60,-31] of US-listed firms. Model II shows that this difference increases to 2.50 percentage

⁵¹ Prior to estimating an ordinary regression, a robust regression eliminates any outliers (if Cook's distance >1) and thereafter it performs Huber iterations followed by bi-weight iterations.

points if we analyze the “same-insiders” sample. The coefficient of the dummy variable non-US-listed is significant at the 10 percent level or better in both specifications.

Specification III and IV are median regression models - also known as least-absolute value models (LAV)- for the whole sample and the "same-insiders" sample, respectively.⁵² Specifications V and VI follow the same technique as median regressions, but estimate standard errors using bootstrap re-sampling. These models yield the same coefficients as models III and IV, but provide bootstrapped standard errors. All four models confirm the results of the previous sections. The coefficient of the non-US-listed dummy variable is 2.40 (3.20) percentage points for the whole sample (“same-insiders” sample) and significant at the 5% (10%) confidence level.

Panel B of table 11 shows the regression results of the three estimation methodologies for the whole sample and the “same-insiders” sample, for the announcement period [-1,1]. The results confirm that Mexican firms, both US-listed and non-US-listed, do not experience a strong reaction on the day of the earning announcements. The coefficients of non-US-listed and the constant term are close to zero and are not statistically significant at the 10 percent level.

[Insert Table 11]

⁵² A median regression finds a line through the data that minimizes the sum of the absolute residuals, rather than the sum of the squares of the residuals as in ordinary least squares (OLS).

Table 11. Cross-sectional Regressions of CARs Around Quarterly Earnings Announcement Robustness Tests						
Dependent variable is the average aggregated cumulative size-adjusted abnormal return CAR, for the period (t1,t2). To aggregate the abnormal returns the negative news events where multiplied by -1. Non-US-listed is a dummy variable equal to one if the firm is not cross-listed in a U.S. exchange (i.e. NYSE, AMEX or Nasdaq) and zero otherwise. SURPRISE is the absolute deviation of actual earnings per share with respect to the consensus mean forecast divided by the mean forecast plus one; the interaction terms between the Non-US-listed dummy and the absolute deviation is also included. Specification I and II are robust regressions for the whole sample and the "same-insiders" sample, respectively. The robust regression methodology eliminates outliers and assigns weights to each observation based on the residuals. Specification III and IV are the median regression models - also known as least-absolute value models (LAV)- for the whole sample and the "same-insiders" sample, respectively. Specifications V and VI follow the same technique as median regressions, but estimate standard errors using bootstrap resampling. t-statistics are shown in brackets. The shaded areas are significant at 10% (*), at 5% (**) and at 1% (***), respectively.						
Panel A						
Pre-announcement Period [-60,-31]						
Dependent variable: Aggregated CAR[-60,-31]	I	II	III	IV	V	VI
Constant	0.005 [0.54]	0.010 [0.91]	-0.003 [0.32]	-0.007 [0.56]	-0.003 [0.36]	-0.007 [0.47]
Non-US-listed	0.019 [1.70]*	0.025 [1.80]*	0.024 [2.02]**	0.032 [1.88]*	0.024 [2.18]**	0.032 [1.81]*
Absolute Surprise	0.001 [0.49]	-0.001 [0.43]	0.001 [1.27]	0.003 [1.33]	0.001 [0.45]	0.003 [0.51]
Non-US-listed * Absolute Surprise	-0.001 [0.40]	0.004 [0.69]	-0.002 [1.95]*	-0.001 [0.20]	-0.002 [0.47]	-0.001 [0.13]
Observations	636	399	637	399	637	399
Panel B						
Announcement Period [-1,1]						
Dependent variable: Aggregated CAR[-1,1]	I	II	III	IV	V	VI
Constant	0.003 [1.18]	0.004 [1.48]	0.003 [1.28]	0.004 [1.36]	0.003 [1.55]	0.004 [1.04]
Non-US-listed	-0.001 [0.23]	0.001 [0.18]	-0.001 [0.29]	0.001 [0.21]	-0.001 [0.32]	0.001 [0.18]
Absolute Surprise	-0.0004 [1.20]	-0.001 [1.58]	-0.0004 [1.16]	-0.001 [1.75]*	-0.0004 [0.84]	-0.001 [0.81]
Non-US-listed * Absolute Surprise	0.001 [1.79]*	0.0004 [0.25]	0.0002 [0.69]	-0.001 [0.40]	0.0002 [0.20]	-0.001 [0.20]
Observations	636	399	637	399	637	399

Additional robustness tests include an analysis of Bhattacharya et al. (2000) sample. Graphical evidence indicates that the asymmetries documented in stock price behavior between US-listed and non-us-listed Mexican firms are also present in their sample.

VII. Conclusion and future research (to be revised)

Disclosure and accounting standards, and securities laws in general, as well as the enforcement of these laws differ significantly across countries. Therefore, foreign firms that decide to cross-list their shares on U.S. exchanges become subject to different rules and regulations, as well as more diverse and sophisticated market participants⁵³ and enforcement mechanisms.

On average, Mexican stocks that are not cross-listed on the NYSE (non-US-listed) incorporate most of quarterly earnings news about thirty-trading days before the news is publicly released. The empirical evidence supports the view of unrestricted insider trading taking place in Mexican non-US-listed firms, but not in the Mexican US-listed firms. Furthermore, I provide

⁵³ According to the Bank of New York, about 74% of U.S. institutional investors hold ADRs.

evidence consistent with the view that improving disclosure and enforcement mechanisms affects stock price reaction to earnings news through the effects on insiders' behavior. The asymmetries in stock price behavior hold after controlling for firm characteristics. Moreover, the same conclusions hold within a sub-sample of firms that have the same owners and/or insiders.

Stricter disclosure requirements and enforcement mechanisms are effective in limiting illegal financial practices such as insider trading. One possible interpretation of these results is that the combination of strict regulation and monitoring together with reputation concerns provide powerful incentives to the owners/insiders of firms cross-listed in U.S. markets to reduce the leaking of –and profiting from- inside information. In this sense, there is evidence that supports the idea that cross-listings may allow foreign shareholders to “import” additional benefits of the U.S. financial regulation.⁵⁴ The fact that the market can immediately punish firms that are linked to financial frauds provides a strong incentive for owners/managers to reduce -or refrain from- illegal practices, even if they are in practice beyond the reach of U.S. law enforcers, as it is the case in US-listed foreign firms. However, it is important to emphasize the need for more information and research to be able to prove that insiders of non-US-listed Mexican firms are actually trading and benefiting from their private information, rather than alternative information processes anticipating the firm-specific news prior to its public release.

The BMV can be characterized among non-transparent exchanges with concentrated ownership structures. In Mexico, as well as in many other countries, the obscure information environment and weak regulation along with greater legal immunity allows insiders to maximize their private benefits of control. Future research may find similar results on a cross-country sample. The author is currently working on this analysis.

Finally, the results presented in this paper strongly support those policy recommendations, which emphasize the relevance of having more reliable, transparent and precise disclosure requirements that allow market forces to discipline firms even if the owners/insiders are beyond reach of the formal public and private enforcement mechanisms.

Given the strong empirical evidence in favor of transparency and strict standards, it seems puzzling that many countries, including Mexico, are not decisively moving towards these goals. There seems to be little support and consensus to put in place significant reforms to improve disclosure and markets practices aimed at protecting the market participants and ensuring the

⁵⁴ Rossi and Tribukait (1996) analyze the price behavior of one Mexican firm and find semi-strong-efficient stock price behavior. The authors conclude that this result may be related to the fact that the company under study was cross-listed in the NYSE. Therefore, its stock price may be “importing” the efficiency from the NYSE.

markets' integrity. Powerful participants and shareholders may be effectively blocking or postponing any effective reforms to avoid a reduction in their private benefits of control.⁵⁵

As investors demand for more strict and transparent requirements continues to grow, firms that do not match the standards will continue to lose liquidity as liquidity continues to migrate to global markets at a faster pace, especially towards U.S. exchanges (Coffee 2002). Transparent and honest financial practices are key elements of investor protection. And this is not just a question of a level playing field and fairness in the markets, but it is also about supporting the development of financial markets, which depends heavily on attracting investors. Many investors will not participate and invest, unless they have faith on the integrity of the markets and the available mechanisms to protect their capital. The few investors that dare to participate will almost surely demand higher returns to compensate for the additional risks and uncertainty, increasing the firms' cost of capital. Overall, these effects would have negative impacts on the development of financial markets and this in turn would limit economic growth.⁵⁶

⁵⁵ See Pagano and Volpin (2001)

⁵⁶ The empirical evidence across countries indicates that development of financial markets facilitates an efficient allocation of resources and promotes economic growth and development. For studies on the link between financial development and economic growth refer to Schumpeter (1911); King and Levine (1993); Demirguc-Kunt and Maksimovic (1998); Levine and Zervos (1998); Rajan and Zingales (1998); Levine (1999) and Beck; Levine and Loayza (2000) and Wurgler (2000).

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Figure 1.

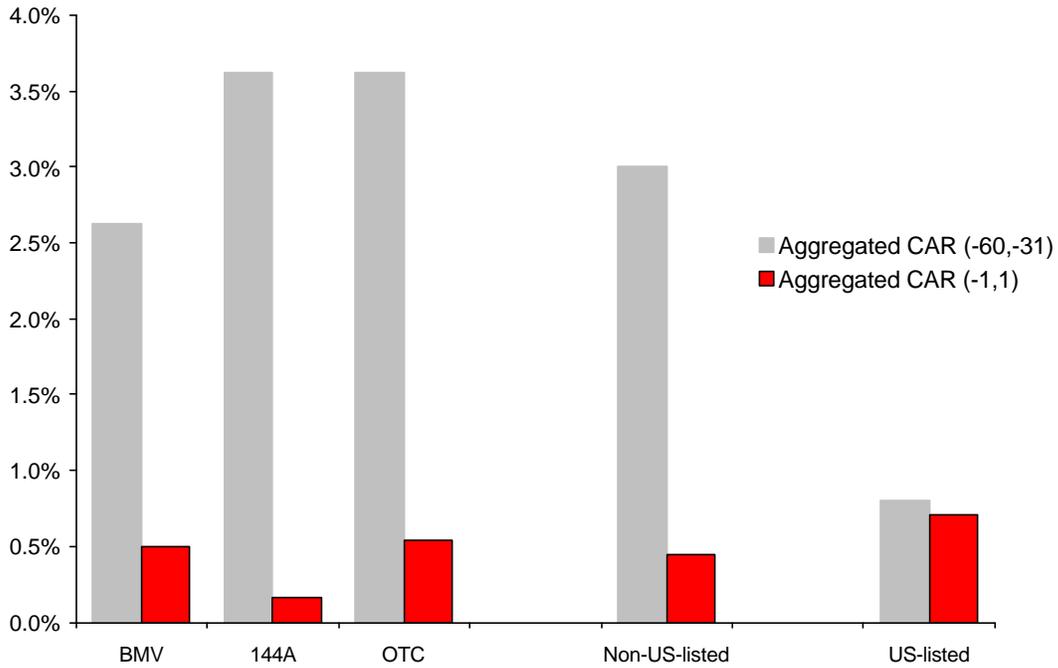


Share Types					
	BMV only	144A*	Level I*	Level II*	Level III*
Primary exchange or trading location	BMV	PORTAL	OTC "pink sheets"	NYSE, AMEX or NASDAQ	NYSE, AMEX or NASDAQ
Accounting standards	MEX GAAP	MEX GAAP	MEX GAAP	U.S. GAAP	U.S. GAAP
S.E.C. registration	Exempt	Exempt	Exempt	Full Registration	Full registration
Share issuance	New equity capital raised	New equity capital raised (private offering)	Existing shares only (public offering)	Existing shares only (public offering)	New equity capital raised (public offering)
Costs (in USD)		[\$250,000 ; \$500,000]	less than \$25,000	[\$200,000 ; \$700,000]	[\$500,000 ; \$2,000,000]

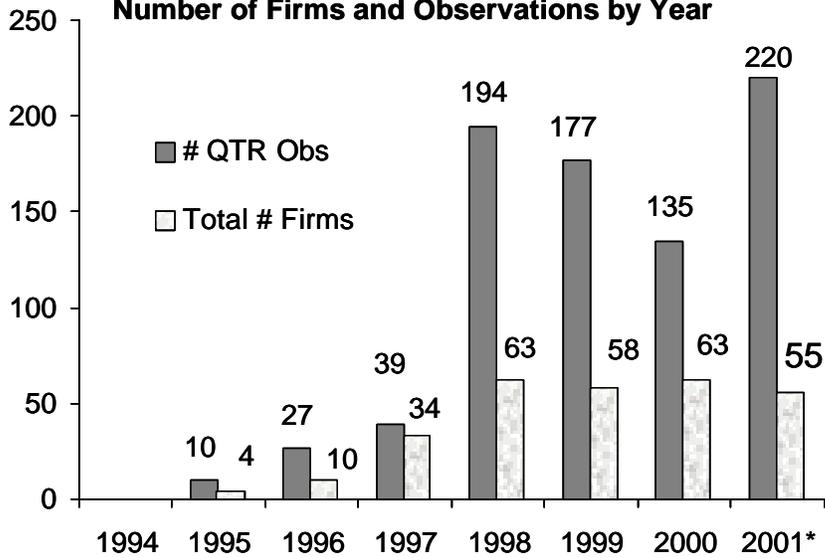
*Source: Miller (1999)

** Number of firms and observations as a percentage of total (in parenthesis) by security type.

**Graph1. Aggregated Cumulative Abnormal Returns by Securities Type
CAR (-60,-31) vs. CAR(-1,1)**

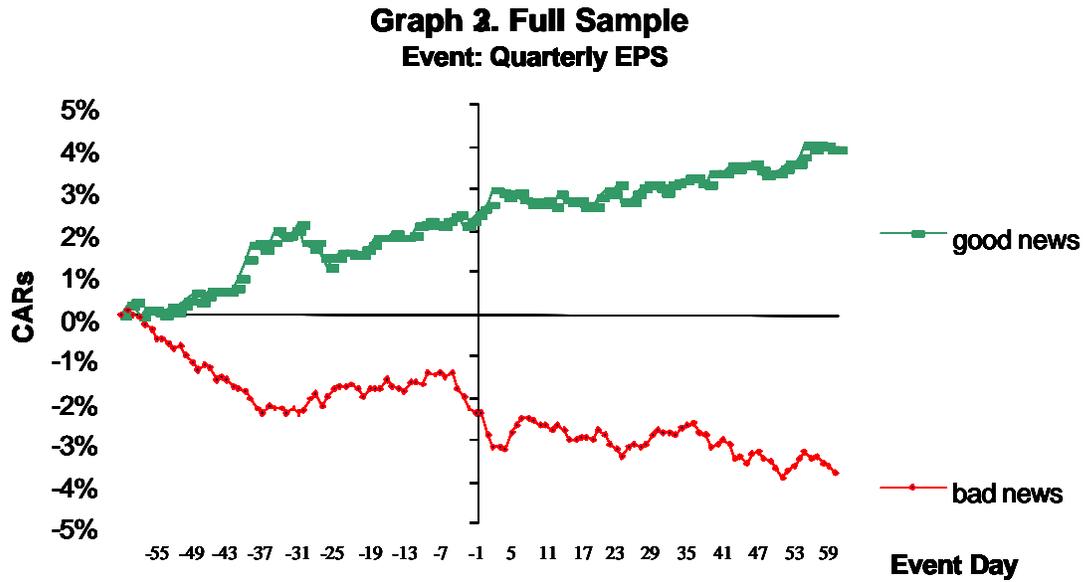


**Graph 2.
Number of Firms and Observations by Year**



* Annualized number of observations, it only includes Q1 of 2001, I.e. 55 observations.

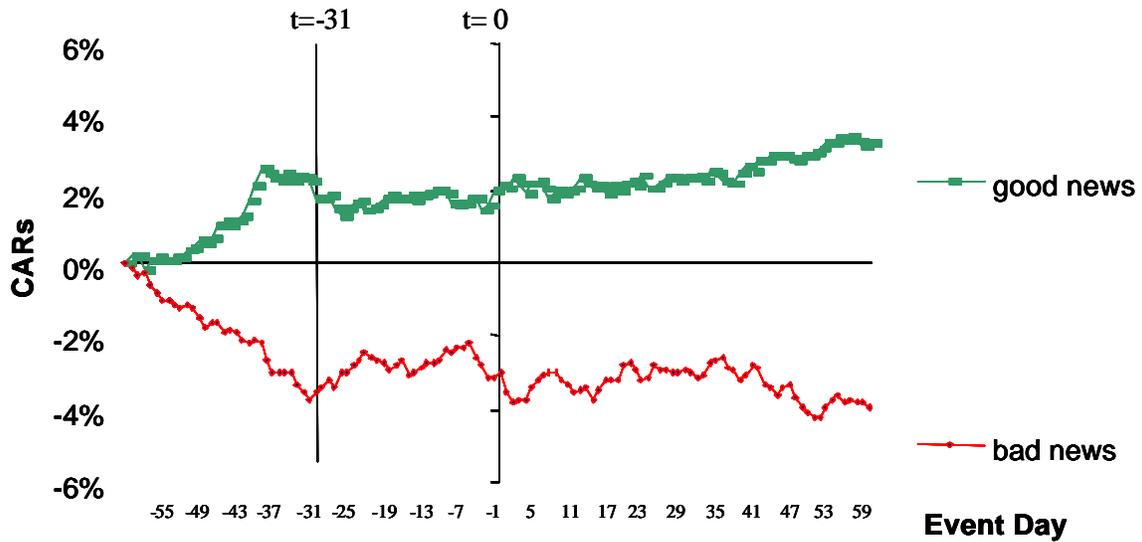
GRAPH 3



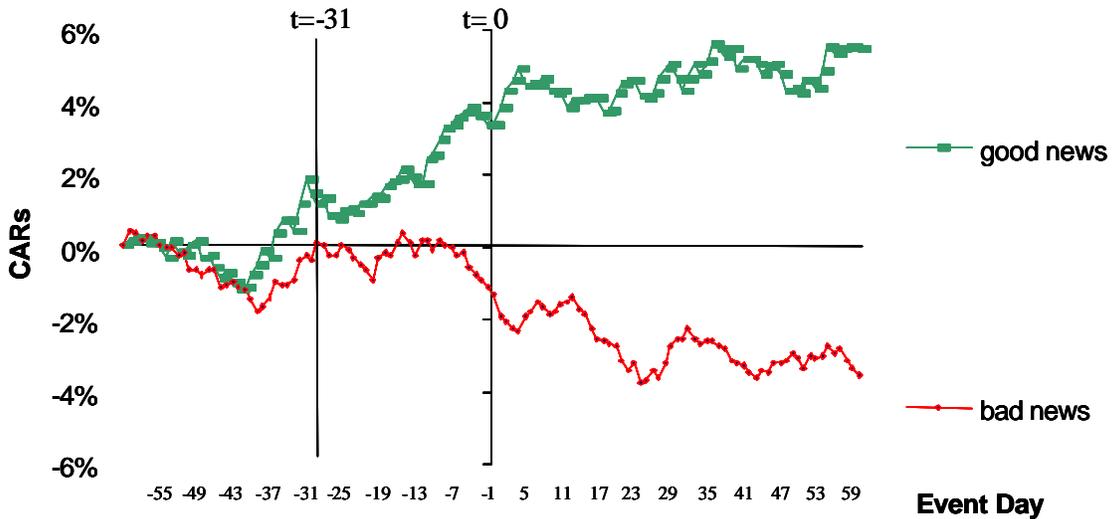
Graph 2. Plot of the cumulative abnormal return for earnings announcements from event day -60 to event day 60. The abnormal return is calculated using the size adjustment model as the normal return measure. The sample consists of a total of 637 quarterly announcements, between March 1995 and March 2001.

GRAPH 4A AND 4B

Graph 4a. Non-US-listed



Graph 4b. US-listed



Graph 4a and 4b. Plot of the cumulative abnormal return for earnings announcements, from event day -60 to event day 60, for Mexican non-US-listed and US-listed firms, respectively. The abnormal return is calculated using the size adjustment model as the normal return measure. The sample consists of a total of 637 quarterly announcements, between March 1995 and March 2001.

TABLE 1 COMES HERE (list of firms)

TABLE 1. LIST OF COMPANIES WITH AVAILABLE INFORMATION BY LISTING TYPE

Company Name	BMV only	144A	OTC	Level II	Level III	ADR listing date
ACCEL S.A.	1	0	0	0	0	-
ALFA	0	1	0	0	0	September-95
APASCO	0	0	1	0	0	August-92
ARGOS	1	0	0	0	0	-
BIMBO	1	0	0	0	0	-
C.I.E.	0	1	0	0	0	September-99
CARSO GLOBAL TELECOM	0	0	1	0	0	August-96
CEMEX	0	0	0	1	0	September-99
CIFRA S A DE C V	0	0	1	0	0	December-97
CINTRA SA DE CV	1	0	0	0	0	-
COCA-COLA FEMSA (KOF)	0	0	0	0	1	September-93
COMERCIAL MEXICANA	0	0	0	0	1	October-96
CONSORCIO ARA	0	1	0	0	0	September-96
CONSORCIO HOGAR	0	0	1	0	0	December-97
CONTAL	1	0	0	0	0	-
CORPORACION GEO	0	1	0	0	0	August-98
CORPORACION MEXICANA DE RESTAURANTES	1	0	0	0	0	-
CORPORACION MOCTEZUMA	1	0	0	0	0	-
CYDSA SA	1	0	0	0	0	-
DESC	0	0	0	0	1	July-94
DUTY FREE	1	0	0	0	0	-
ELEKTRA	0	0	0	1	0	December-94
EMPAQUES PONDEROSA	1	0	0	0	0	-
EMPRESAS ICA	0	0	0	0	1	April-92
FARMACIAS BENAVIDES	0	0	1	0	0	May-94
FOMENTO ECONOMICO MEXICANO S.A. DE C.V.*	0	0	0	1	0	May-98
FRAGUA CORPORATIVO	1	0	0	0	0	-
GEUPEC	1	0	0	0	0	-
GIGANTE	0	1	0	0	0	July-91
GRUMA	0	0	0	1	0	November-98

cont. TABLE 1. LIST OF COMPANIES WITH AVAILABLE INFORMATION BY LISTING TYPE

Company Name	BMV only	144A	OTC	Level II	Level III	ADR listing date
GRUPO ACCION	0	1	0	0	0	December-01
GRUPO AEROPORTUARIO DEL SUR	0	0	0	0	1	September-00
GRUPO BAFAR	1	0	0	0	0	-
GRUPO CARSO, S.A.	0	0	1	0	0	August-96
GRUPO CASA AUTREY / CASA SABA	0	0	0	0	1	December-93
GRUPO CEMENTOS DE CHIHUAHUA	1	0	0	0	0	-
GRUPO COMERCIAL GOMO S.A.	1	0	0	0	0	-
GRUPO CORVI	1	0	0	0	0	-
GRUPO FINANCIERO BANCOMER	0	0	1	0	0	February-96
GRUPO FINANCIERO BANORTE	1	0	0	0	0	-
GRUPO FINANCIERO INBURSA	0	0	1	0	0	March-96
GRUPO FININANCIERO BITAL	0	0	1	0	0	August-97
GRUPO HERDEZ	0	0	1	0	0	January-97
GRUPO IMSA SA	0	0	0	0	1	December-96
GRUPO INDUSTRIAL DURANGO	0	0	0	0	1	July-94
GRUPO INDUSTRIAL MASECA	0	0	0	1	0	April-00
GRUPO INDUSTRIAL SALTILLO	0	0	1	0	0	March-00
GRUPO IUSACEL	0	0	0	1	0	-
GRUPO LA MODERNA SA. DE C.V.	1	0	0	0	0	-
GRUPO MEXICO	1	0	0	0	0	-
GRUPO MINSA	0	0	1	0	0	June-97
GRUPO MODELO	1	0	0	0	0	-
GRUPO POSADAS	0	1	0	0	0	November-96
GRUPO RADIO CENTRO	0	0	0	0	1	July-93
GRUPO SANBORNS	1	0	0	0	0	-
GRUPO TELEVISIA	0	0	0	0	1	December-91
GRUPO TRIBASA	0	0	0	0	1	September-93
GRUPO VITRO SA	0	0	0	0	1	April-91
HILASAL	0	0	1	0	0	January-98
HYLSAMEX	0	0	1	0	0	May-96
ICH	1	0	0	0	0	-
INDUSTRIAS BACHOCO SA	0	0	0	0	1	September-97
INDUSTRIAS PEÑALES	1	0	0	0	0	-
INTERNACIONAL DE CERAMICA SA	0	0	0	0	1	December-94
KIMBERLY CLARK DE MEXICO	0	0	1	0	0	December-93
NADRO	0	0	1	0	0	August-97
PEPSI-GEMEX S.A.	0	0	0	0	1	December-92
SAN LUIS	0	1	0	0	0	February-96
SORIANA	1	0	0	0	0	-
TAMSA	0	0	0	1	0	January-64
TELEFONOS DE MEXICO	0	0	0	0	1	May-91
TRANSPORTACION MARITIMA MEXICANA	0	0	0	1	0	June-92
TV AZTECA	0	0	0	0	1	August-97
Total	24	8	16	8	17	73

TABLE 2.

Table 2.

Summary Statistics 2000	All	US-listed	Non-US-listed
Average MV (in MM USD)	1,548.6	2,294.8	1,198.4
Median MV (in MM USD)	404.2	428.4	380.0
Avg. Daily Volume ('000 shares)	1,297	1,981	939
Avg. Bid-Ask Spread (% of price)	2.82%	2.75%	2.96%

TABLE 3

Table 3
Industry Composition.- Number of Firms

INDUSTRY	BMV	144A	OTC	lev_II	lev_III	Total
Constructn&Housebldg /1	2	2	3	1	4	11
Retailing	6	1	1	2	1	11
Food-Agribus-Tobacco	6	0	2	1	1	10
Multi-Industry	3	1	2	0	2	8
Steel	1	0	1	1	1	4
Beverage	1	0	0	1	2	4
Media-Entertainment	0	1	0	0	3	4
Paper&Forest Prod	1	0	1	0	1	3
Telecom-Data Ntwking	0	0	1	1	1	3
Banking	1	0	2	0	0	3
Mining	2	0	0	0	0	2
Pharma-Healthcare	0	0	2	0	0	2
Transportation Services	1	0	0	1	1	3
Engineer-Machinery	0	1	0	0	0	1
Textiles	0	0	1	0	0	1
Fin Serv-Investment	0	0	1	0	0	1
Real Estate	0	1	0	0	0	1
Hotel & Leisure	0	1	0	0	0	1
Total /1	24	8	17	8	17	73

/1 Cemex listed its shares in the NYSE on September 15th, 1999, before that it had an OTC listing during the period of study. Hence, it belongs to the Construction & House Building OTC category between 1995 and September 1999 and switched to the US-listed Level II category afterwards. It is the only company for which the data are available before and after the ADR listing. Therefore, the number of companies in the Construction & House Building (last (last column) adds up to 11 instead of 12, and total number of companies is 73.

TABLE 4

Table 4.
Distribution of Surprise Measure

	Total	Non-US-listed	US-listed
Observations	637	416	221
Positive surprises	295	208	87
Negative Surprises	342	208	134
Mean surprise /1			
Mean	-0.045	-0.008	-0.116
Median	-0.007	-0.0002	-0.044
Standard dev	0.39	0.265	0.556
Min	-6.33	-1.93	-6.33
Max	2.04	2.04	1.23

/1 Mean surprise = (eps - mean forecast)/ (1+abs(mean forecast))

TABLE 5

Table 5.
Cumulative Abnormal Returns Around Earnings Announcements

The table shows the average cumulative size-adjusted abnormal return CAR, for the period (t1,t2). Column I corresponds to the aggregated CAR, column II and III divide the events in good and bad news, respectively. To aggregate the abnormal returns the negative news events where multiplied by -1. Clusters by quarter were generated to control for contemporaneous cross-correlations between observations in the same quarter. t-statistics are shown in brackets, based on robust standard errors. The shaded areas are significant at 10% (*), at 5% (**), and at 1% (***), respectively.

Period	Aggregated /1	Positive News	Negative News
	CARs	CARs	CARs
(-60,-31)	2.26%	2.13%	-2.36%
	[3.99]***	[2.61]***	[3.01]***
(-30,-1)	0.10%	0.23%	0.01%
	[0.20]	[0.30]	[0.01]
(-1,1)	0.54%	0.39%	-0.65%
	[2.83]***	[1.83]*	[2.37]**

APPENDIX (GRAPHS AND TABLES TO NBE INCLUDED IN THE ANALYSIS)

