THE ANNOUNCEMENT EFFECT OF BOND AND EQUITY ISSUES: EVIDENCE FROM CHILE

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Abstract

This paper analyzes the impact of security offering announcements on stock prices for a sample of 172 issues of securities in the Chilean financial market, during the 1993-2002 period. We found that the authorization of bond issues given by the SVS (Superintendencia de Valores y Seguros) produced no significant abnormal returns, and that the authorization of equity issues given by the SVS produced a significant and negative abnormal return. We also found that the magnitude of the negative abnormal return was directly related to the relative size of the equity issue.

Resumen

Este artículo analiza el impacto de los anuncios de oferta de títulos sobre los precios accionarios, para una muestra de 172 emisiones de títulos en el mercado financiero chileno, durante el período 1993-2002. Se encuentra que la autorización de emisiones de bonos dada por la SVS (Superintendencia de Valores y Seguros) produce retornos anormales no significativos y que la autorización de emisiones de capital dada por la SVS produce retornos anormales negativos y significativos. Se encuentra además que la magnitud de los retornos anormales negativos está directamente relacionada con el tamaño relativo de la emisión de capital.

JEL Codes: *C2, G14.*

Keywords: *Equity and bond issues, event studies.*

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1. Introduction

This paper looks at the impact in the market value of the stocks of a company, generated by the announcement of debt or equity issues of that firm. This study focuses on announcements made by Chilean companies that were listed in the local stock market at the time of the announcement.

Even though there is an extensive amount of research available with very compelling theories, which propose the effects that those announcements should have, and many authors have reviewed the empirical evidence in developed markets such as the American, there is no previous known study reviewing this empirical evidence for the Chilean financial market.

What effect should we expect the announcement of a security issued by a company to have on equity prices? There is no single answer to this question since different authors have developed competing theories. From the point of view of the impact of the announcement of bond issues, and Following Eckbo (1986), we can group those theories in three:

(i) The zero impact hypotheses proposed by Modigliani and Miller (1958), and by Miller (1977) basically state that the leverage ratio has no effect on the firm's market value. This implies that the announcement of a bond issue, or the announcement of an equity issue should generate no abnormal returns.

(ii) The positive impact hypotheses, proposed among others by Modigliani and Miller (1963), Kraus and Litzenberger (1973), Brennan and Schwartz (1978), DeAngelo and Masulis (1980), Myers (1977), Jensen and Meckling (1976), Galai and Masulis (1976), Leland and Pyle (1977), and Heinkel (1982), state that debt has a positive impact in a firm's market value. Modigliani and Miller (1963) assume that there is a tax shield generated by debt that makes the value of the company to increase with the proportion of debt over assets. Kraus and Litzenberger (1973), Brennan and Schwartz (1978), and De Angelo and Masulis (1980) assume there is a trade off between a tax advantage of debt and a cost of financial distress. Myers (1977) assumes a trade off between a tax advantage of debt and agency costs and adverse managerial effects of debt. Jensen and Meckling (1976) assume a tradeoff between agency costs of debt and agency costs of equity. Finally both Leland and Pyle (1977) and Heinkel (1982) present models with information asymmetries where managers posses superior information relative to investors. All these models imply that the announcement of a bond issue should generate a positive abnormal return, and by the same logic the announcement of an equity issue, that would reduce the proportion of assets financed with debt, should generate a negative abnormal return;

(iii) The negative impact hypotheses, proposed among others by Miller and Rock (1985), Myers and Majluf (1984), and Covitz and Harrison (1999). Miller and Rock (1985) present an asymmetric information model where a larger than expected external financing reveals a lower than expected generated cash flow. Myers and Majluf (1984) present an asymmetric information model where facing an issue of stocks or bonds the uninformed investors will ask for a discount to hedge against the risk of buying an overvalued security. Covitz and Harrison (1999) develop and test a recursive model of

> debt issuance and rating migration, where rating agencies reveal information over time. This adverse selection model assumes that firms possess private information and use it to time their bond issuance. As a result, debt issuance provides a negative signal of debt rating migration. They also predict that the signal strengthens with economic downturns. From these theories we conclude that the announcement of a risky debt issue should have a negative impact on a firm's market value, and that the announcement of an equity issue should also have an even bigger negative impact on that company's market value.

Empirical evidence for the American Market generally shows that the announcement of equity and convertible debt issues results in stock price decreases, while the announcement of straight debt issues generates either stock price increases or no significant impact on stock prices. The evidence found by Asquith and Mullins (1986), Dann and Mikkelson (1984), Eckbo (1986), Linn and Pinegar (1988), Masulis and Korwar (1986), Mikkelson and Partch (1986), Schipper and Smith (1986), Szewczyk (1992), Jain (1992), Manuel, Brooks, and Schadler (1993), and Shyam-Sunder (1991) among others, can be summarized as follows:

- The announcement of equity issues generates more negative abnormal returns than the announcement of any other kind of securities. Those announcements generate most of the time negative and significant abnormal returns.
- Abnormal returns associated with the announcement of issues of convertible debt are also negative and significant.
- Abnormal returns associated with the announcement of issues of straight debt are either positive or negative, but in general they are not significantly different from zero.

Four studies provide empirical evidence about the association between bond rating and the stock price reaction to bond issues. Mikkelson and Partch (1986), Eckbo (1986), and Shyam-Sunder (1991) all conclude that there is no statistically significant difference in stock price reactions to debt issues across rating classes. Castillo (2001) finds that announcement of offerings of Junk Bonds have either a negative and significant impact on stock returns (when convertible bonds are offered) or no significantly different from zero impact on stock returns (when straight bonds are issued).

There is not much evidence on the impact of offering announcements of debt and equity in Chile. Saens (1999) finds positive abnormal return to the announcement of American Depositary Receipts (ADR). These American Depositary Receipts correspond to equity offerings of Chilean companies in a foreign (the American) market. There is no other evidence available on the impact that local debt or equity offerings had in the value of the equity of companies trading in the Chilean market.

A study by Celis and Maturana (1998) look at the impact of Initial Public Offerings in Chile but they focus in the short and long term abnormal return presented by companies following an IPO. Since they look at companies that are issuing equity by the first time, they are not able of computing the market response to the announcement of those first issues.

In this paper I examine the impact of the announcement of issues of bonds and equity on the stock prices of the issuing firms for 172 issues made between 1993 and 2002. The firms in the sample correspond to companies listed in the Chilean stock market at the moment of the announcement. The rest of this paper is organized as follows. Section 2 describes the main characteristics of the issues of debt and equity observed in the Chilean market during the period, and describes how the sample of issues to be employed in the study was selected. Section 3 presents an outline of the methodologies applied to perform the event study. The empirical results are shown in section 4, while section 5 concludes the paper.

2. Characteristics of Issues of Debt and Equity in Chile, and Sample Design

2.1. Characteristics of Debt and Equity Offerings in Chile

Bond and equity offerings of public companies have to be previously approved by the Superintendencia de Valores y Seguros (SVS from now on), a government organization.

2.1.1. *Bond Offerings*

During the 1993-2002 period a total of 154 bond issues of public companies were approved by the SVS, in the Chilean market. The number of offerings increased by the end of the period, with more than 51% of those offerings concentrated in the last two years, as shown by Figure 1. Figure 2 shows the total amount of offerings in Chilean UF year by year. Again the offerings in terms of amount of money issued shows an enormous increment in the second half of the period, with the last two years accounting for more than 58% of the total amount of UF issued over the entire 10 years period[1]. Table 1 shows number of issues per year, amount issued per year, and average size of the issues per year. There we see that the average size of the issues are really small during the 1995-1996 period, and in general bigger during the second half of the period.

2.1.2. *Equity Offerings*

During the 1993-2002 period a total of 408 equity issues of public companies were approved by the SVS, in the Chilean market. The number of offerings per year shows a small increase during 1996 and 1997, and an important reduction during the 2000-2002 period, as shown by Figure 3. Figure 4 shows the total amount of offerings (in Chilean UF) year by year. The only clear pattern observed here is an increase in the total amount of equity issued per year in the 1996-1999 period, compared to the 1993-1995 period,

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[1] The increase in total amount of bond offerings and number of bond offerings observed from 1999 to 2002 seems to explained at least partially by the reduction of interest rates observed in the Chilean economy over the same period.

FIGURE 1
NUMBER OF BOND OFFERINGS PER YEAR, 1993-2002

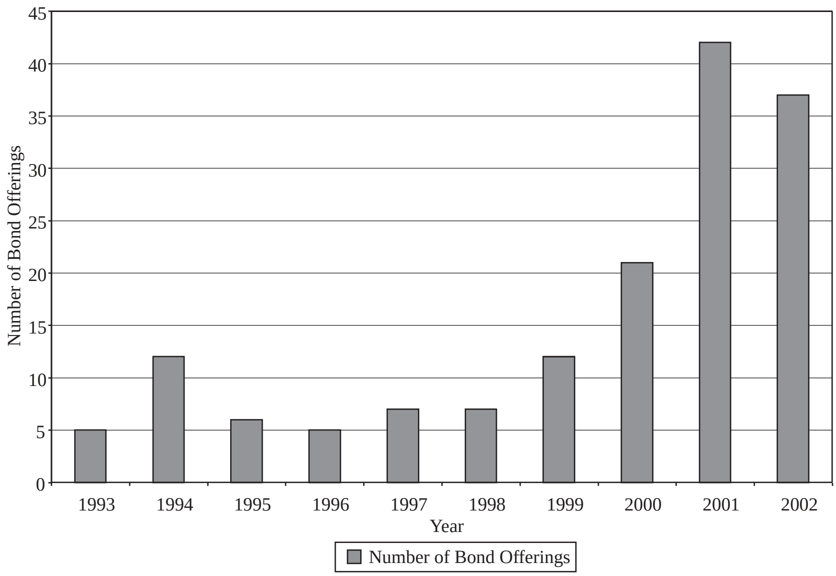
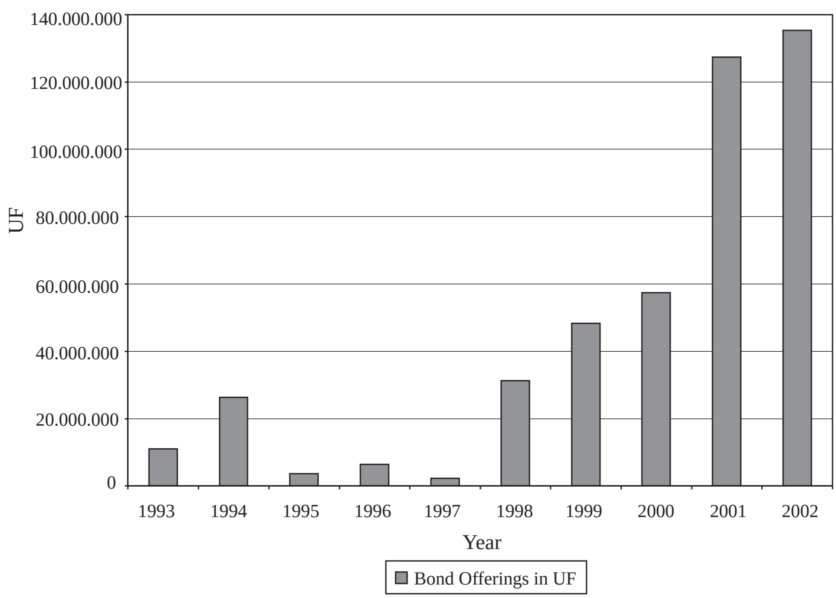


FIGURE 2
TOTAL AMOUNT OF BOND OFFERINGS PER YEAR, IN UF, 1993-2002



followed by a significant reduction of equity issued during the 2001-2002 period. Table 2 shows the number of equity issues per year, the amount of equity issued per year (in Chilean UF), and the average size of the issues per year (in Chilean UF). There we see that the average size of the issues shows no clear tendency during the period.

TABLE 1

BOND OFFERINGS IN THE CHILEAN MARKET*, 1993-2002

Year	Number of Issues	Total Amount**	Average Size of Issues**
1993	5	10,949.8	2,190.0
1994	12	26,230.3	2,185.9
1995	6	3,580.0	596.7
1996	5	6,332.0	1,266.4
1997	7	2,271.0	324.4
1998	7	31,262.3	4,466.0
1999	12	48,261.6	4,021.8
2000	21	57,330.7	2,730.0
2001	42	127,276.2	3,030.4
2002	37	135,207.6	3,654.3
Total Period	154.00	448,701.5	2,913.6

* *Source:* Superintendencia de Valores y Seguros de Chile (SVS).
** In thousands of UF.

FIGURE 3

NUMBER OF EQUITY OFFERINGS PER YEAR, 1993-2002

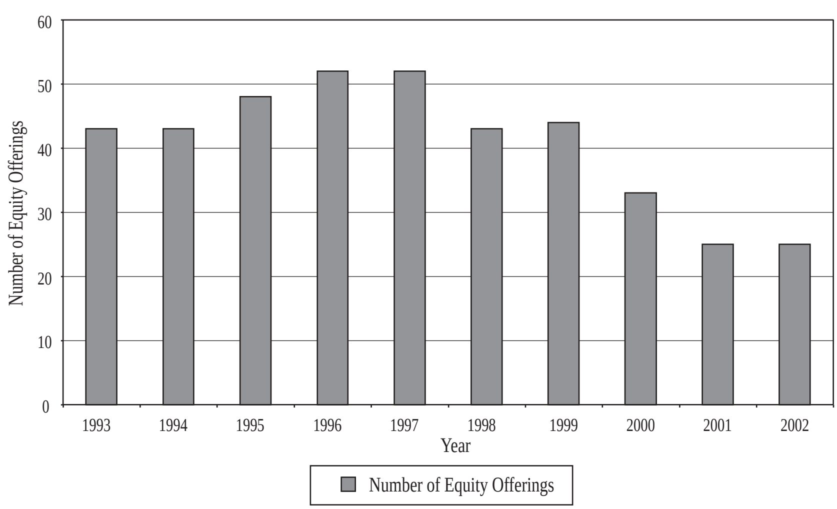


FIGURE 4
VALUE OF EQUITY OFFERINGS PER YEAR, 1993-2002

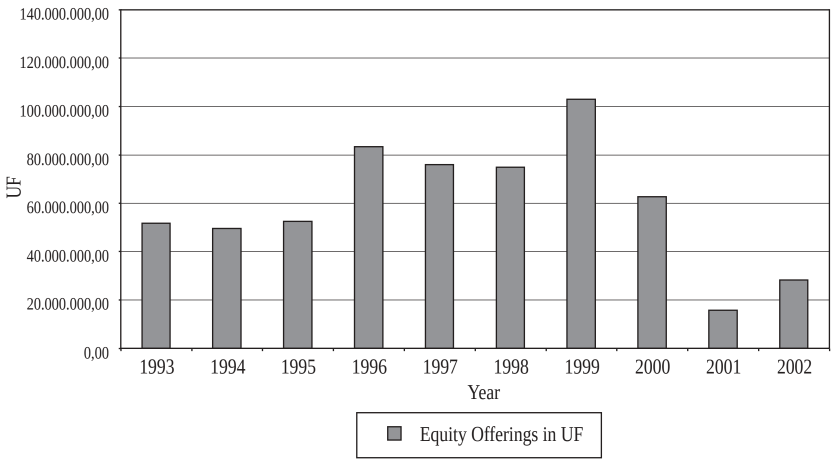


TABLE 2
EQUITY OFFERINGS IN THE CHILEAN MARKET*, 1993-2002

Year	Number of Issues	Total Amount**	Average Size of Issues**
1993	43	51,644.1	1,201.0
1994	43	49,529.9	1,151.9
1995	48	52,370.9	1,091.1
1996	52	83,294.2	1,601.8
1997	52	75,840.4	1,458.5
1998	43	74,719.2	1,737.7
1999	44	102,819.1	2,336.8
2000	33	62,576.0	1,896.2
2001	25	15,800.8	632.0
2002	25	28,272.5	1,130.9
Total	408	596,867.2	1,462.9

* *Source:* Superintendencia de Valores y Seguros de Chile (SVS).
** In thousands of UF.

If we look at the aggregated amount of issues of equity and debt during the 1993-2002 period, we appreciate a clear tendency to increases in the total amount issued year by year. We also appreciate that years with small amounts of equity issued are usually those with big amounts of debt issued. The same happens the other way around, suggesting a clear substitution effect between these two sources of funds for the companies.

2.2. Criteria to select the sample

The final sample considered in this study is composed by 56 bond offerings and 116 equity offerings. The steps followed to select the sample were the following:

(i) We defined the event to be studied as the announcement made by the SVS of the approval of the issue[2].
(ii) We verified if the companies issuing were traded in the local stock exchange at the time the issue was approved.
(iii) An event window and an estimation window were defined and we verified that enough trading information were available for those companies in each of the windows.

All the issues that satisfy those conditions were included in the final sample.

2.3. Characteristics of the sample

Tables 3 and 4 summarize information regarding number of issues in the sample; amount of money issued; and average size of the issues of securities. In Table 3 we see that bond offerings included in the final sample show similar characteristics in terms of time distribution and average size as the total sample of bond offerings described in table 1. In Table 4 we see that the average size of the equity issues of the final sample is much bigger than the average size of the issues in the original sample of stock issues, described in Table 2.

TABLE 3
BOND OFFERINGS CONSIDERED IN THE SAMPLE*, 1993-2002

Year	Number of Issues	Total Amount**	Average Size of Issues**
1993	1	8,243.3	8,243.3
1994	5	12,533.0	2,506.6
1995	1	900.0	900.0
1996	1	2,500.0	2,500.0
1997	0	0.0	0.0
1998	2	9,200.0	4,600.0
1999	6	18,232.6	3,038.8
2000	13	38,857.2	2,989.0
2001	15	48,804.7	3,253.6
2002	12	44,270.1	3,689.2
Total Period	56	183,540.8	3,277.5

* *Source:* Own elaboration.
** In thousands of UF.

[2] Most studies would define the event as the announcement of the intention to issue securities made by the company at a shareholders meeting. Problems to obtain those dates made us select the announcement made by the SVS as the event in our study.

TABLE 4
EQUITY OFFERINGS CONSIDERED IN THE SAMPLE*, 1993-2002

Year	Number of Issues	Total Amount**	Average Size of Issues**
1993	12	22,276.4	1,856.4
1994	10	18,514.2	1,851.4
1995	16	29,489.7	1,843.1
1996	11	28,757.8	2,614.3
1997	11	15,121.8	1,374.7
1998	13	30,786.0	2,368.2
1999	16	78,565.6	4,910.4
2000	15	57,598.0	3,839.9
2001	6	10,314.5	1,719.1
2002	6	25,842.7	4,307.1
Total Period	116	317,266.8	2,735.1

* *Source:* Own elaboration.
** In thousands of UF.

3. Methodology

3.1. Measuring Abnormal Returns

The effect of the announcement can be estimated as the deviation of the return of each security from its normal return on the dates around the event. For each company *i* and period *t* we have

$$\varepsilon_{it} = R_{it} - E[R_{it} \mid X_t] \tag{1}$$

where ε_{it} is the abnormal return of company *i* in period *t*, R_{it} is the return of that firm in that period, $E[R_{it} \mid X_t]$ is the normal or expected return for company *i* in period *t*, and X_t corresponds to the conditioning information for the model of normal performance.

The normal return can be modeled in different ways. Two of the most commonly used models are (i) The Market Corrected Model, where $E[R_{it} \mid X_t]$ is assumed to be the return of the market portfolio, and (ii) the Market Model, where X_t corresponds to the return of the market portfolio in period *t*, and a stable linear relationship is assumed to exist between the market portfolio return and the return of the security.

The Market Corrected Model is represented by

$$R_{it} = R_{mt} + \varepsilon_{it} \tag{2}$$

$$E[\varepsilon_{it}] = 0 \qquad Var[\varepsilon_{it}] = \sigma_{ei}^2$$

where R_{mt} corresponds to the market portfolio return, and ε_{it} represents the deviation from the market portfolio return for security *i* in period *t*. As Brown and Warner (1985) show, this is one of the simplest models for normal returns, but it usually gives results that are very similar to the ones generated by more sophisticated models over short time window intervals.

The Market Model has the following linear specification

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{3}$$

$$E[\varepsilon_{it}] = 0 \qquad Var[\varepsilon_{it}] = \sigma^2_{ei}$$

where R_{it} and R_{mt} are the return on period *t* of security *i*, and the return of the market portfolio on that same period, and ε_{it} correspond to the disturbance term. The parameters of the Market Model are $\alpha_i, \beta_i,$ and σ^2_{ei}. The Market Model removes the portion of the returns that are related to the movements of the market. This reduces the variance of abnormal returns, and therefore increases the ability of the model to detect event effects.

A usual problem in illiquid markets such as the Chilean, is that only a small fraction of stocks would trade every day. Computing betas for the market model in such a case presents a serious drawback, since estimated betas of infrequently traded stocks would be biased downwards. Dimson (1979) developed a methodology that allowed him to solve the problem and to obtain unbiased betas. His methodology is inspired in the notion that, when a stock that has not traded lately trades again, the price of the last trade will capture at the same time both past and present true returns.

The normal return has also been modeled using more constrained models such as the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory model (APT). The CAPM was extensively used in the 1970’s, but the validity of both this model and of the restrictions we need to impose are not universally accepted today. On the other hand a properly chosen APT model does not impose false restrictions on mean returns, but complicates the implementation of an event study and does not offer much advantage relative to the unrestricted market model.

Brown and Warner (1980) compare the different methodologies used in event studies to measure security price performance, and conclude that beyond a simple one-factor market model, there is no evidence that more complicated methodologies convey any benefit. In fact they conclude that those more sophisticated methodologies can make the researcher worse off. Brown and Warner (1985) confirm the conclusions using daily instead of monthly returns.

Considering the arguments given above, in this paper I report the results using the Market Corrected Model, the Market Model, and the Dimson Model. A description of the Dimson Model is included in the next section. Regarding the stock indexes selected to perform the study, even though it has been proved by other researchers that the IPSA index is a reasonable proxy for the Chilean market portfolio, I also use here the IGPA index. As expected, the results using both indexes are very similar.

3.2. Size of the Windows, Estimation of Parameters, and Computation of Abnormal Returns

3.2.1. *Size of the Windows*

Some notation must be defined here. Let t = 0 be the event date, T_1 = –190 (190 trading days before the event) to T_2 = –11 (11 trading days before the event) be the estimation window, and T_2 +1 = –10 (10 trading days before the event) to T_3 = +10 (10 trading days after the event) be the event window. Define $L_{21} = T_2 – T_1 = 180$, and $L_{32} = T_3 – T_2 = 21$ as the lengths of the estimation window and the event window respectively. Figure 5 shows the estimation period and the event window schematically. We do not need an estimation window to apply the Market Corrected Model, but we do need it to estimate the parameters of the Market Model and the Dimson Model.

FIGURE 5
THE ESTIMATION WINDOW AND THE EVENT WINDOW

The estimation window goes from T_1 = –190 (190 trading days before the event) to T_2 = –11 (11 trading days before the event). The event window goes from T_2 + 1 = –10 (10 trading days before the event) to T_3 = + 10 (10 trading days after the event). The day of the event is represented here by day T = 0 or E.

3.2.2. *Estimation of Parameters*

We start by estimating the Market Model parameters over the estimation period. The returns from the estimation window can be represented with the regression system

$$R_i = \alpha_i + \beta_i R_m + \varepsilon_i \tag{4}$$

where R_i is the vector of company *i* returns during the estimation window period, α_i represents a vector composed by the intercept parameter α_i, β_i is the slope parameter for firm *i*, and R_m is a vector of market return observations.

The parameters are estimated by ordinary least squares (OLS). Brown and Warner (1985) explored how potential problems such as (i) non-normality of returns and excess returns, (ii) bias in OLS estimates of market model parameters in the presence of non-synchronous trading, (iii) autocorrelation in daily excess returns, and (iv) variance increases on the days around an event, affected the event study methodologies. They compared the OLS market model to other alternatives such as the Scholes-Williams (1977) and the Dimson (1979) methodologies. Their results reinforced the conclusion of previous work with monthly data: methodologies based on the OLS market model and using standard parametric tests are well specified under a variety of conditions, and alternative methodologies convey no clear-cut benefit in an event study. In this paper we will use the traditional market model methodology, but since the Dimson (1979) methodology seems to be particularly recommended in illiquid markets (such as the Chilean) where absence of every day's trading can be a serious problem, we will also use this alternative methodology.

Using the OLS parameter estimates we can now compute the vector $\hat{\varepsilon}_i^*$ of abnormal returns over the event window as

$$\hat{\varepsilon}_i^* = R_i^* - \hat{\alpha}_i - \hat{\beta}_i R_m^* \tag{5}$$

where R_i^* corresponds to a vector of event window returns, $\hat{\alpha}_i$ and $\hat{\beta}_i$ represent the previously estimated parameters, and R_m^* is a vector of market return observations. Table 4b report a summary of the $\hat{\alpha}_i$ and $\hat{\beta}_i$ parameter estimates for the firms in the final sample of bond and equity issues, and their significance.

TABLE 4b

DISTRIBUTION OF MARKET MODEL PARAMETER ESTIMATES

Bond Issue

Estimates	Alpha	Beta	R^2
Maximun	0.54%	1.44	0.71
90 percentile	0.17%	1.12	0.48
75 percentile	0.11%	0.63	0.15
Median	0.03%	0.38	0.08
25 percentile	–0.05%	0.25	0.03
10 percentile	–0.13%	0.05	0.01
Minimum	–0.28%	–0.21	0.00
Mean	0.04%	0.49	0.13

DISTRIBUTION OF MARKET MODEL PARAMETER ESTIMATES

Equity Issue

Estimates	Alpha	Beta	R^2
Maximun	0.87%	1.76	0.79
90 percentile	0.26%	1.08	0.46
75 percentile	0.12%	0.76	0.16
Median	0.02%	0.40	0.04
25 percentile	–0.10%	0.16	0.01
10 percentile	–0.24%	0.05	0.00
Minimum	–0.93%	–0.08	0.00
Mean	0.02%	0.49	0.13

A usual problem in illiquid markets such as the Chilean, is that only a small fraction of stocks would trade every day. Computing betas for the market model in such a case presents a serious drawback, since estimated betas of infrequently traded stocks would be biased downwards. Dimson (1979) developed a methodology that allowed him to solve the problem and to obtain unbiased betas. His methodology is inspired in the notion that, when a stock that has not traded lately trades again, the price of the last trade will capture at the same time both past and present true returns.

The methodology requires running the following regression to compute the parameters using the estimation window data:

(6) $$R_{it} = \alpha_i + \sum_{k=-n}^{n} \beta_{i,k} R_{m,t+k} + \varepsilon_{it}$$

where the dependent variable is the return of a given stock at a given day and the independent variables are not only the contemporaneous market return (as with the market model) but also some leads and lags of the market return.[3] Equation (6) would replace equation (4) from the previous section. Once the $2n+1$ betas of the regression are computed, the procedure requires to compute the unbiased beta estimate for each stock in the following way:

(7) $$\beta_i = \sum_{k=-n}^{n} \beta_{i,k}$$

where the beta of each stock is obtained as the sum of the betas computed as described in equation (6). Using the alphas from equation (6) and the betas from equation (7) we can compute the normal return of each stock during the event window, and obtain the abnormal returns on each day of the event window using equation (4) in the same way it was used when we were applying the traditional market model. Table 4c summarizes the Dimson parameter estimates.

3.2.3. *Aggregation of Abnormal Returns*

In order to be able to draw inferences for the event, the abnormal returns must be aggregated both across securities and through time[4]. To aggregate across securities we define the (L_{32} x 1) vector of average abnormal returns AR as

(8) $$AR = \frac{1}{N} \sum_{i=1}^{N} \hat{\varepsilon}_i^*$$

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3 The exact number of leads and lags to be considered, that we will denote as n here, must be determined using an econometric procedure.

4 The aggregation presented here assumes that there is no overlapping in the event windows of the included securities. This would result in independent abnormal returns and cumulative abnormal returns across securities. We will correct for clustering later.

TABLE 4c
DISTRIBUTION OF DIMSON'S PARAMETER ESTIMATES
Bond Issue

Estimates	Alpha	Beta	R^2
Maximun	0.53%	1.72	0.71
90 percentile	0.16%	1.16	0.47
75 percentile	0.11%	0.93	0.13
Median	0.03%	0.50	0.05
25 percentile	–0.03%	0.32	0.02
10 percentile	–0.12%	0.11	–0.01
Minimum	–0.28%	–0.31	–0.03
Mean	0.03%	0.58	0.12

DISTRIBUTION OF DIMSON'S PARAMETER ESTIMATES
Equity Issue

Estimates	Alpha	Beta	R^2
Maximun	0.87%	1.54	0.79
90 percentile	0.28%	1.18	0.46
75 percentile	0.11%	0.88	0.14
Median	0.01%	0.52	0.03
25 percentile	–0.10%	0.29	0.00
10 percentile	–0.24%	0.11	–0.01
Minimum	–0.93%	–0.21	–0.10
Mean	0.01%	0.59	0.12

where N is the number of securities in the sample. The variance of AR, under the assumption of no correlation of excess returns across securities, is computed as

(9) $$Var[AR] = V = \frac{1}{N^2}\sum_{i=1}^{N} V_i$$

where V_i represents the conditional covariance matrix of $\hat{\varepsilon}_i^*$. We can now aggregate the average abnormal returns through time. Define $CAR(t_1, t_2)$ as the cumulative average abnormal return from t_1 to t_2, where $T_2 + 1 \leq t_1 \leq t_2 \leq T_3$. Then we have

(10) $$CAR(t_1, t_2) = \gamma' \; AR$$

where $CAR_i(t_1, t_2)$ would follow a normal distribution process with mean zero and variance given by

(11) $$Var[CAR(t_1,t_2)] = \bar{\sigma}^2(t_1,t_2) = \gamma' V\gamma$$

In both (10) and (11), γ represents a (L_{32} x 1) vector with ones in positions $t_1 - T_2$ to $t_2 - T_2$ and zeros elsewhere. We can now test the null hypothesis of zero cumulative abnormal returns using t_{CAR} where

(12) $$t_{CAR}(t_1,t_2) = \frac{CAR(t_1,t_2)}{\bar{\sigma}^2(t_1,t_2)^{1/2}} \overset{a}{\sim} N(0,1)$$

3.4. Correcting for Clustering

The methodology described in the previous section assumed that abnormal returns are uncorrelated across securities which is a reasonable assumption when there is no overlapping among the event windows. The sample in this study does present some degree of overlapping of the windows, so we have to correct for clustering to check if the results change. Both Schipper and Thompson (1983), and Malatesta and Thompson (1985) propose to handle clustering by analyzing the abnormal returns on a security by security basis. Their approach has the advantage of being able to handle partial clustering, where the event dates are not exactly the same across firms, but there is some overlap among the event windows. The procedure requires calculation of the cumulative abnormal returns (*CAR*) and their significance (t_{CAR}) company by company, and the computation of the average t_{CAR} for the companies in the sample to test the hypothesis that this average t–statistic is zero. If the hypothesis is rejected we conclude that abnormal returns do exist

3.5. A Non Parametric Test

The methodology and tests for abnormal returns applied up to here were parametric. The disadvantage of the parametric tests is that they are based in the assumption that we know the underlying model that determines the normal return that a given security should present, and therefore we are really measuring properly the abnormal returns of those securities during the event window.

In this section I describe a non parametric rank test proposed by Corrado (1989). This rank test solve the problem faced by parametric tests and at the same time is well specified even when the distribution of abnormal returns is skewed.

To implement the rank test we need for each security in the sample to rank the L_{32} = 21 abnormal returns in the event window from 1 to 21. Under the null hypothesis of no abnormal returns during the event day, the expected rank for the abnormal return on that day is (L_{32}+1)/2 = 11. The tests statistic for the null hypothesis of no abnormal return on event day zero is

(13) $$J_4 = \frac{1}{N}\sum_{i=1}^{N}\left(K_{i0} - \frac{L_2+1}{2}\right) / S(L_2)$$

with

(14) $$S(L_2) = \sqrt{\frac{1}{L_2} \sum_{t=T_2+1}^{T_3} \left(\frac{1}{N} \sum_{i=1}^{N} \left(K_{it} - \frac{L_2+1}{2}\right)\right)^2}$$

where K_{it} represents the rank of the abnormal return of security i on day t. Tests of the null hypothesis can be implemented using the result that the asymptotic null distribution of J_4 is standard normal.

4. Empirical Results

4.1. Analysis of Abnormal Returns and Cumulative Abnormal Returns Using the Market Corrected Model

Tables 5a and 5b show the impact of the bond issue announcements using the market corrected model[5]. The effect of the announcement is negative but not significant for both *AR* and *CAR* over the event window. This result is consistent with most of the empirical evidence available from studies in the US market and other developed markets.

Tables 6a and 6b show the impact of the equity issue announcements using the market corrected model[6]. The effect of the announcement is negative and not significant if we look at the daily *AR* over the event window, but the *CAR* over the sub-period from day 0 to day 2 is negative and significant[7]. Again the results are consistent with most of the empirical evidence from previous studies in developed countries.

4.2. Analysis of Abnormal Returns and Cumulative Abnormal Returns Using the Market Model

Table 7 shows the impact of the bond issue announcements using the traditional market model. The effect of the announcement is negative but not significant for both *AR* and *CAR* over the event window. This result is consistent with the results obtained using the market corrected model and with most of the empirical evidence available from studies in the US market.

Table 8 shows the impact of the equity issue announcements using the traditional market model. The effect of the announcement is negative and not significant if we look at the daily *AR* over the event window, but the *CAR* over the sub-period from day 0 to day 2 is negative and significant. Again, these results are consistent with the ones we obtained using the market corrected model.

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5 Table 5a was generated using the IPSA index as proxy for the market return, and Table 5b was generated using the IGPA index as proxy for the market return.

6 Table 6a was generated using the IPSA index as proxy for the market return, and Table 6b was generated using the IGPA index as proxy for the market return.

7 Given that we are using the day the SVS authorized the issue as day 0 in the event window, it makes sense to expect that the market would be informed at day 0 some times and at days 1 or 2 in other cases.

TABLE 5a
ABNORMAL RETURNS AROUND THE BOND ISSUE ANNOUNCEMENTS
Market Corrected Model

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.15%	0.68	0.15%	0.68
–9	–0.12%	–0.53	0.03%	0.10
–8	0.32%	1.43	0.35%	0.91
–7	–0.08%	–0.38	0.27%	0.60
–6	0.08%	0.36	0.35%	0.70
–5	0.00%	–0.01	0.35%	0.63
–4	0.05%	0.21	0.39%	0.66
–3	0.01%	0.07	0.41%	0.64
–2	0.40%	1.79	0.81%	1.21
–1	0.04%	0.19	0.85%	1.20
0	–0.30%	–1.34	0.55%	0.74
1	–0.11%	–0.48	0.44%	0.57
2	0.27%	1.22	0.71%	0.89
3	0.33%	1.46	1.04%	1.25
4	0.00%	–0.02	1.04%	1.20
5	–0.28%	–1.23	0.76%	0.85
6	–0.18%	–0.79	0.59%	0.64
7	–0.36%	–1.62	0.22%	0.24
8	0.03%	0.14	0.26%	0.26
9	–0.19%	–0.87	0.06%	0.06
10	0.05%	0.21	0.11%	0.11

Interval (Days)	CAR(%)	t statistic
–10 to –3	0.41%	0.64
–2 to 0	0.14%	0.37
0 to 2	–0.13%	–0.35
3 to 10	–0.61%	–0.96
–10 to 10	0.11%	0.11

* Significant at 5% level (two-tailed test).

TABLE 5b
ABNORMAL RETURNS AROUND THE BOND ISSUE ANNOUNCEMENTS
Market Corrected Model (IGPA)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.25%	1.18	0.25%	1.18
–9	–0.06%	–0.29	0.19%	0.63
–8	0.29%	1.41	0.48%	1.33
–7	–0.10%	–0.50	0.38%	0.90
–6	0.01%	0.04	0.38%	0.82
–5	–0.07%	–0.36	0.31%	0.61
–4	0.12%	0.57	0.43%	0.78
–3	–0.09%	–0.45	0.33%	0.57
–2	0.29%	1.41	0.63%	1.01
–1	0.03%	0.14	0.66%	1.00
0	–0.24%	–1.14	0.42%	0.61
1	–0.10%	–0.47	0.32%	0.45
2	0.27%	1.29	0.59%	0.79
3	0.30%	1.44	0.89%	1.15
4	–0.03%	–0.15	0.86%	1.07
5	–0.22%	–1.05	0.64%	0.77
6	–0.04%	–0.20	0.60%	0.70
7	–0.27%	–1.30	0.33%	0.37
8	0.06%	0.30	0.39%	0.43
9	–0.15%	–0.72	0.24%	0.26
10	0.07%	0.33	0.31%	0.33

Interval (Days)	CAR(%)	t statistic
–10 to –3	0.33%	0.57
–2 to 0	0.09%	0.24
0 to 2	–0.07%	–0.18
3 to 10	–0.28%	–0.48
–10 to 10	0.31%	0.33

* Significant at 5% level (two-tailed test).

TABLE 6a

ABNORMAL RETURNS AROUND THE EQUITY ISSUE ANNOUNCEMENTS

Market Corrected Model

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.10%	0.45	0.10%	0.45
–9	0.02%	0.09	0.12%	0.38
–8	–0.25%	–1.10	–0.13%	–0.33
–7	–0.29%	–1.25	–0.42%	–0.91
–6	0.18%	0.79	–0.24%	–0.46
–5	–0.11%	–0.48	–0.35%	–0.62
–4	–0.01%	–0.05	–0.36%	–0.59
–3	–0.13%	–0.55	–0.49%	–0.75
–2	–0.06%	–0.27	–0.55%	–0.79
–1	0.18%	0.77	–0.37%	–0.51
0	–0.41%	–1.80	–0.78%	–1.03
1	–0.29%	–1.27	–1.08%	–1.35
2	–0.26%	–1.11	–1.33%	–1.60
3	0.10%	0.45	–1.23%	–1.42
4	0.02%	0.10	–1.21%	–1.35
5	–0.27%	–1.17	–1.48%	–1.60
6	0.39%	1.69	–1.09%	–1.14
7	–0.09%	–0.41	–1.18%	–1.21
8	0.13%	0.54	–1.05%	–1.05
9	–0.13%	–0.58	–1.19%	–1.15
10	–0.34%	–1.47	–1.53%	–1.44

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.49%	–0.75
–2 to 0	–0.30%	–0.75
0 to 2	–0.96%	* –2.41
3 to 10	–0.19%	–0.30
–10 to 10	–1.53%	–1.44

* Significant at 5% level (two-tailed test).

TABLE 6b
ABNORMAL RETURNS AROUND THE EQUITY ISSUE ANNOUNCEMENTS
Market Corrected Model (IGPA)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.12%	0.53	0.12%	0.53
–9	–0.07%	–0.31	0.05%	0.16
–8	–0.32%	–1.42	–0.27%	–0.69
–7	–0.19%	–0.86	–0.46%	–1.03
–6	0.25%	1.13	–0.21%	–0.42
–5	–0.08%	–0.35	–0.29%	–0.52
–4	0.01%	0.06	–0.27%	–0.46
–3	–0.16%	–0.71	–0.43%	–0.68
–2	–0.14%	–0.64	–0.57%	–0.86
–1	0.16%	0.72	–0.41%	–0.59
0	–0.31%	–1.41	–0.72%	–0.98
1	–0.23%	–1.05	–0.96%	–1.25
2	–0.30%	–1.34	–1.26%	–1.57
3	0.06%	0.25	–1.20%	–1.45
4	0.00%	0.00	–1.20%	–1.40
5	–0.30%	–1.34	–1.50%	–1.69
6	0.40%	1.80	–1.10%	–1.20
7	–0.12%	–0.55	–1.22%	–1.29
8	0.03%	0.15	–1.19%	–1.22
9	–0.12%	–0.56	–1.31%	–1.32
10	–0.28%	–1.24	–1.58%	–1.56

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.43%	–0.68
–2 to 0	–0.30%	–0.77
0 to 2	–0.85%	* –2.20
3 to 10	–0.33%	–0.52
–10 to 10	–1.58%	–1.56

* Significant at 5% level (two-tailed test).

TABLE 7
ABNORMAL RETURNS AROUND THE BOND ISSUE ANNOUNCEMENTS
(The Traditional Market Model)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.17%	0.84	0.17%	0.84
–9	–0.08%	–0.40	0.09%	0.31
–8	0.18%	0.89	0.27%	0.77
–7	–0.17%	–0.84	0.10%	0.25
–6	–0.06%	–0.30	0.04%	0.09
–5	–0.17%	–0.86	–0.13%	–0.27
–4	0.15%	0.72	0.01%	0.02
–3	–0.12%	–0.59	–0.11%	–0.19
–2	0.25%	1.23	0.14%	0.23
–1	–0.09%	–0.43	0.05%	0.08
0	–0.23%	–1.15	–0.18%	–0.27
1	–0.13%	–0.66	–0.31%	–0.45
2	0.19%	0.93	–0.13%	–0.17
3	0.24%	1.17	0.11%	0.15
4	–0.12%	–0.57	0.00%	0.00
5	–0.21%	–1.05	–0.22%	–0.27
6	–0.02%	–0.09	–0.24%	–0.28
7	–0.30%	–1.48	–0.54%	–0.62
8	0.07%	0.34	–0.47%	–0.53
9	–0.10%	–0.47	–0.56%	–0.62
10	0.13%	0.66	–0.43%	–0.46

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.11%	–0.19
–2 to 0	–0.07%	–0.20
0 to 2	–0.18%	–0.51
3 to 10	–0.30%	–0.53
–10 to 10	–0.43%	–0.46

* Significant at 5% level (two-tailed test).

TABLE 8
ABNORMAL RETURNS AROUND THE EQUITY ISSUE ANNOUNCEMENTS
(The Traditional Market Model)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.04%	0.19	0.04%	0.19
–9	–0.03%	–0.14	0.01%	0.04
–8	–0.28%	–1.27	–0.27%	–0.70
–7	–0.22%	–0.98	–0.48%	–1.10
–6	0.22%	0.99	–0.27%	–0.54
–5	–0.12%	–0.57	–0.39%	–0.73
–4	0.00%	0.01	–0.39%	–0.67
–3	–0.12%	–0.53	–0.50%	–0.81
–2	–0.17%	–0.76	–0.67%	–1.02
–1	0.19%	0.86	–0.48%	–0.69
0	–0.21%	–0.98	–0.70%	–0.96
1	–0.20%	–0.93	–0.90%	–1.18
2	–0.36%	–1.64	–1.26%	–1.59
3	0.03%	0.13	–1.23%	–1.50
4	–0.02%	–0.07	–1.25%	–1.47
5	–0.29%	–1.30	–1.53%	–1.75
6	0.32%	1.44	–1.22%	–1.34
7	–0.16%	–0.74	–1.38%	–1.48
8	0.02%	0.09	–1.36%	–1.42
9	–0.12%	–0.56	–1.48%	–1.51
10	–0.17%	–0.79	–1.66%	–1.65

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.50%	–0.81
–2 to 0	–0.19%	–0.51
0 to 2	–0.78%	* –2.05
3 to 10	–0.40%	–0.57
–10 to 10	–1.66%	–1.65

* Significant at 5% level (two-tailed test).

4.3. Analysis of Abnormal Returns and Cumulative Abnormal Returns Using the Dimson Model

Table 9 shows the impact of the bond issue announcements using the Dimson model. As with the other models, the effect of the announcement is negative but not significant for both *AR* and *CAR* over the event window.

Table 10 shows the impact of the equity issue announcements using the Dimson model. As with the previous models, the effect of the announcement is negative and not significant if we look at the daily *AR* over the event window, but the *CAR* over the sub-period from day 0 to day 2 is negative and significant. The results with the three methodologies applied in this study are very similar not only for the bond issues sample but also for the equity issues sample.

4.4. Correcting for Clustering

We computed the *AR* and the *CAR* company by company and computed the average t statistic for both the *AR* and the *CAR* in both the bond issue announcements sample and the equity issue announcements sample. The results show an average t statistic for the *CAR* computed for 0 to 2 event day interval of 0.42 in the case of our bond issues sample and an average t statistic for the *CAR* computed for 0 to 2 event day interval of 2.05 in the case of our equity issues sample. These results are consistent with all our previous results before correcting for clustering.

4.5. A Non Parametric Test

We performed the non parametric rank test developed by Corrado (1989) to both samples. The results of the test are summarized in Table 11. When applied to the bond issues announcements sample, the test shows no significant results. When applied to the equity issues announcements, the rank test shows a negative and significant result both at day 0 and for the 0 to 2 time period. This is consistent with the results obtained by all the other methodologies applied in this paper.

4.6. Cross Section Analysis of Abnormal Returns of the Equity Issues

Given that we found a significant negative abnormal return for the equity issue announcements, we explored if the abnormal return was somehow related to some of the characteristics of the issue. We had to characteristics to work with. One was the size of the issue, and the other one was the relative size of the issue[8].

Finding a positive relationship between size of the issue and negative abnormal return could give support to the negative slope demand theory. Finding a positive relationship between relative size and negative abnormal return would give support to the asymmetric information theories, in particular those proposed by Miller and Rock (1985) and by Myers and Majluf (1984). Table 12 shows that size does not help to explain the amount of abnormal returns, and relative size does help to explain it. There is a direct relationship between relative size of the issue of equity announced and the magnitude of negative abnormal return, as predicted by the asymmetric information theories.

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8 Size of the issue was defined as the amount of money issued. Relative size was defined as the proportion that the issue represented on the total market value of the equity of the company at the moment of the announcement.

TABLE 9
ABNORMAL RETURNS AROUND THE BOND ISSUE ANNOUNCEMENTS
(Dimson Model)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.14%	0.67	0.14%	0.67
–9	–0.07%	–0.33	0.07%	0.24
–8	0.20%	0.99	0.27%	0.77
–7	–0.17%	–0.83	0.10%	0.25
–6	–0.04%	–0.18	0.06%	0.14
–5	–0.15%	–0.72	–0.08%	–0.17
–4	0.15%	0.75	0.07%	0.13
–3	–0.10%	–0.50	–0.03%	–0.06
–2	0.30%	1.46	0.26%	0.43
–1	–0.05%	–0.25	0.21%	0.33
0	–0.26%	–1.28	–0.05%	–0.07
1	–0.12%	–0.61	–0.17%	–0.24
2	0.20%	1.00	0.03%	0.04
3	0.27%	1.31	0.30%	0.39
4	–0.08%	–0.39	0.22%	0.28
5	–0.25%	–1.24	–0.03%	–0.04
6	–0.03%	–0.17	–0.07%	–0.08
7	–0.35%	–1.70	–0.42%	–0.48
8	0.04%	0.18	–0.38%	–0.42
9	–0.12%	–0.61	–0.50%	–0.55
10	0.13%	0.66	–0.37%	–0.39

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.03%	–0.06
–2 to 0	–0.01%	–0.04
0 to 2	–0.18%	–0.51
3 to 10	–0.40%	–0.69
–10 to 10	–0.37%	–0.39

* Significant at 5% level (two-tailed test).

TABLE 10
ABNORMAL RETURNS AROUND THE EQUITY ISSUE ANNOUNCEMENTS
(Dimson Model)

Day	AR(%)	t statistic	CAR(%)	t statistic
–10	0.05%	0.23	0.05%	0.23
–9	–0.01%	–0.05	0.04%	0.12
–8	–0.29%	–1.33	–0.26%	–0.67
–7	–0.25%	–1.14	–0.51%	–1.15
–6	0.20%	0.90	–0.31%	–0.62
–5	–0.12%	–0.53	–0.43%	–0.79
–4	0.02%	0.10	–0.40%	–0.69
–3	–0.11%	–0.48	–0.51%	–0.82
–2	–0.17%	–0.75	–0.68%	–1.02
–1	0.21%	0.93	–0.47%	–0.67
0	–0.24%	–1.07	–0.71%	–0.97
1	–0.23%	–1.04	–0.94%	–1.23
2	–0.36%	–1.63	–1.30%	–1.63
3	0.05%	0.24	–1.24%	–1.51
4	–0.02%	–0.09	–1.26%	–1.48
5	–0.29%	–1.31	–1.55%	–1.76
6	0.35%	1.58	–1.20%	–1.32
7	–0.14%	–0.63	–1.34%	–1.43
8	0.09%	0.41	–1.25%	–1.30
9	–0.13%	–0.58	–1.38%	–1.40
10	–0.21%	–0.96	–1.59%	–1.57

Interval (Days)	CAR(%)	t statistic
–10 to –3	–0.51%	–0.82
–2 to 0	–0.20%	–0.52
0 to 2	–0.83%	* –2.16
3 to 10	–0.30%	–0.47
–10 to 10	–1.59%	–1.57

* Significant at 5% level (two-tailed test).

TABLE 11

NON PARAMETRIC RANK TEST

Window	Bonds	Equity
0	–1.18	–2.55*
1	–0.67	–0.68
2	–0.86	–1.40
0 to 2	–1.59	–1.99*

This table shows the *t* value for the *J* non parametric test developed by Corrado (1989) and described by equations (13) and (14).

* Significant at the 99%.

TABLE 12

CROSS SECTION ANALYSIS OF 0 TO 2 CAR OF EQUITY ISSUE ANNOUNCEMENTS

Panel A: Size and Relative Size as Independent Variables

Dependent Variable: 0 TO 2 CAR
Method: Least Squares
Sample: 1 111
Included observations: 111

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Relative Size	–0.013984	0.005833	–2.397434	0.0182
Size	–7.24E-15	6.60E-14	–0.109717	0.9128

R-squared	0.025806	Mean dependent var	–0.009527
Adjusted R-squared	0.016868	S.D. dependent var	0.050025
S.E. of regression	0.049602	Akaike info criterion	–3.151737
Sum squared residual	0.268174	Schwarz criterion	–3.102917
Log likelihood	176.9214	Durbin-Watson statistic	1.968930

Panel B: Relative Size as Independent Variable

Dependent Variable: 0 to 2 CAR
Method: Least Squares
Sample: 1 111
Included observations: 111

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Relative Size	–0.014229	0.005365	–2.652110	0.0092

R-squared	0.025698	Mean dependent var	–0.009527
Adjusted R-squared	0.025698	S.D. dependent var	0.050025
S.E. of regression	0.049378	Akaike info criterion	–3.169645
Sum squared residual	0.268203	Schwarz criterion	–3.145235
Log likelihood	176.9153	Durbin-Watson stat	1.970994

5. Summary and Conclusions

The main results of the paper are consistent with the empirical evidence available for developed markets. The approval given by the SVS to bond issues do not generate significant abnormal returns. These results are consistent either with the no news theory or with the no impact theories presented in the paper. It is also consistent with the Myers and Majluf (1984) asymmetric information theory, whose prediction is that the announcement of issue of debt should produce either no effect on the price of the stocks or a very small negative effect, as the evidence of this study presents.

The Myers Majluf (1984) model proposes that given the informational asymmetry between managers of a company and the market, there would be an incentive to issue equity when the stocks are overpriced. The market would then assign some positive probability to the event that a company is overvalued whenever the company decides to issue new equity. From here comes the conclusion that the price of the stocks should decrease when firms announce an equity issue, making this form of financing more expensive. The approval given by the SVS to equity issues in our study do generate negative abnormal returns. This evidence is consistent with the asymmetric information models proposed both by Miller and Rock (1985) and also by Myers and Majluf (1984).

The cross section analysis shows also that the amount of negative abnormal return registered with the announcement of equity issues is directly proportional to the relative size of the issue, as predicted by the asymmetric information theories.

An extension of this study will look at the effect of the announcement of the issue made by the companies after stockholders meetings.

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