

# **IMPACT OF BANKRUPTCY LAW REFORM ON CAPITAL MARKETS IN BRAZIL**

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## **Abstract**

New bankruptcy laws which give greater protection to creditors were signed into law in Brazil on Feb 9, 2005. The paper tests whether greater protection to creditors led to growth in capital markets in Brazil as predicted by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998, 2002 and 2006). Our analysis shows that the money market responded positively with a drop of 600 basis points in the Selic, the benchmark interest rate, after the new law went into effect. Aggregate stock market indexes reacted positively when the new rules were signed into law. Long-term returns to stock market indexes consisting of firms which offer greater protection to shareholders, are positive, which strongly supports the La Porta, et al predictions.

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## INTRODUCTION

Brazil sought to incorporate several provisions in US bankruptcy law when it embarked on a reform of its bankruptcy laws in October 1993. These reform efforts culminated in the passage of Nova Lei de Falências e Recuperação de Empresas, Law No.11101 on Feb 9, 2005. The new bankruptcy law encourages Chapter 11-style reorganization of claims in a bankrupt entity. In the event of liquidation, the new law rearranges the absolute priority rules in favor of secured creditors.<sup>1</sup> These reforms were intended to strengthen creditor's rights and to enable speedy resolution of bankruptcy filings. This paper studies the reaction of security markets in Brazil to these reforms.

The empirical analysis first ascertains whether the reforms were perceived by markets to be credible in their intent to protect creditors' rights by studying the reaction of the money market. Our analysis shows that the money market responded positively to the new reforms. The Selic which is the benchmark overnight rate on loans guaranteed by federal government securities, dropped 600 basis points in response to the passage of the new bankruptcy law. It averaged 24% in the year prior to Oct 14, 2003, the day when the new rules were presented for the first time to the Lower House of Congress for approval. In the one year after June 9, 2005, the day when the new rules went into effect in Brazil, the Selic had dropped to an average of 18%. The response of credit markets could not be analyzed due to lack of data on credit instruments.

We proceed to determine whether the Brazilian stock market benefited from the new law. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LaPorta, et al) (2006) show that laws that

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<sup>1</sup> A copy of the new law is available on the website, [www.dji.com.br/leis\\_ordinarias/2005-011101/2005-011101.htm](http://www.dji.com.br/leis_ordinarias/2005-011101/2005-011101.htm). Since the document is in Portuguese, this paper relies on interpretations of the law provided by various sources: i) Standard & Poor's 2005 note, ii) Mussacchio (2008), iii) Felsberg, et al (2006), and iv) Araunjo and Funchal (2005).

facilitate private enforcement through liability rules benefit stock markets. They also show that countries with greater investor protections benefit from larger and more developed capital markets (La Porta, et al (1997)). The La Porta, et al evidence is challenged by Mussacchio (2008) who uses a long time period (which includes the 2005 reform) to analyze bond market development in Brazil, that leads him to conclude that there is no stable relationship between creditor rights and bond market development. Funchal (2008) finds evidence in his firm-level analysis of leverage ratios in the post-bankruptcy period that is more supportive of La Porta (1997). He finds that the use of bank debt increased significantly in the post-bankruptcy reform Brazilian market. The stock market's response is not analyzed in Funchal (2008).

Our empirical analysis finds strong support for the La Porta, et al predictions. The reactions of four different stock indexes, the BOVESPA, IBX, IGCX and ITAG, are studied. These indexes capture the most liquid segment, the largest 100 stocks, the best governed firms, and firms which give controlling rights to minority shareholders, respectively. Each of these stock indexes earned positive abnormal returns when the new bankruptcy rules were passed into law. Long-run returns continued to be positive for indexes consisting of firms that are governed well and that offer greater protection to minority stockholders. The latter evidence is exactly as predicted by La Porta, et al (2002).

The new bankruptcy law in Brazil aimed to mimic important elements of US bankruptcy code, chiefly of the Chapter 11 clause. This study is important because there is considerable controversy in the US about who benefits from a Chapter 11 re-organization. Wruck (1990) and Weiss and Wruck (1998) argue that Chapter 11 promotes inefficiencies by allowing firms that are not economically viable to continue to operate. Denis and Rodgers (2007) argue the opposite. They show that a Chapter 11 filing allows economically viable firms to successfully

reorganize. There is also uncertainty about who gains from a Chapter 11 filing. Kalay, Singhal and Tashjian (2007) argue that a Chapter 11 filing benefits bankrupt firms at a cost to creditors. Kim (2006) argues that managerial ownership is an important factor that affects the choice of debt restructuring, with higher managerial ownership leading to a Chapter 11 filing.

The rest of this paper is organized as follows. Section 2 describes the changes to the bankruptcy code. Section 3 describes the data. Section 4 analyzes the reaction of the Selic, the money market rate of interest. Section 5 analyzes the reaction of stock indexes. Section 6 concludes.

## **2. The legal change to the bankruptcy code**

The old bankruptcy code in Brazil was enacted in 1945 and had remained largely unchanged until the 2005 bankruptcy law was enacted. The necessity of the new law is underscored by data on bankruptcy outcomes world-wide gathered by *Doing Business (2005)*, a co-publication of World Bank, International Finance Corporation (IFC), and Oxford University Press. Data from this publication is used to compare bankruptcy outcomes at the start of 2005 in Brazil (under the old bankruptcy law) to bankruptcy outcomes in the United States, and in the Latin American and Caribbean regions.

Panel A of Figure 1 compares the average duration, in years, required to resolve a bankruptcy filing. Bankruptcies in Brazil take ten years to be resolved, which is roughly three times longer than the time taken in the US (3 years) and in the Latin American and Caribbean region (3.6 years). The long bankruptcy resolution period in Brazil reduced the time value of assets and led to greater attrition through depreciation in the value of fixed assets. Panel B of Figure 1 compares amounts recovered by bondholders, reported as a fraction of the face value of

debt. Bondholders in Brazil came up almost empty handed after the long bankruptcy resolution process; they recovered only 0.2% of their claims! Bondholders in the US fare the best with a recovery rate of 68.2%, and those in the average Latin American and Caribbean countries recover 26.63%. The woeful recovery rate and the long time to process a filing deterred bondholders in Brazil from seeking bankruptcy protection under the old legal regime.

The inability of the old bankruptcy law to resolve bankruptcy filings efficiently increased the cost of debt and reduced its availability. Araujo and Funchal (2005) document that between 1997 and 2002, the ratio of private credit to GDP in Brazil was only 35% which was accompanied by soaring bank lending rates averaging 205% a year.

## **2A. The old bankruptcy law**

The outcomes in Figure 1 can be blamed on two main shortcomings in the old bankruptcy law in Brazil.<sup>2</sup> The first was that the old bankruptcy code precluded direct negotiations between secured creditors and debtors. Inclusion of secured creditors in a restructuring plan was onerous as it required the unanimous approval of all creditors. It was easier for unsecured creditors to reschedule their claims under an enterprise restructuring clause (concordata). These impediments to restructuring even economically viable entities led typically to liquidation of a bankrupt firm.

Liquidation proceedings were associated with the second shortcoming of the old law, namely inefficient priority rules in assigning liquidation proceeds. Payment of fees for the administration of the bankruptcy process took precedence over all listed claimholders. Labor and tax claimants came next. Secured creditors followed in the hierarchy with unsecured creditors ranking the lowest. Labor and tax claimants were the bottleneck in the process since verification of labor claims was a time-consuming process which prolonged bankruptcy

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<sup>2</sup> Sources referenced in footnote 1 are consulted for descriptions of the old and the new bankruptcy law.

proceedings for years. The poor prioritization had a direct effect on the absence of bankruptcy initiations, and even more so on bankruptcy filings. Unsecured creditors, and to a large extent, secured creditors who received very little after payments to administrators, and payments to labor and tax were made, had no incentive to force the firm into bankruptcy court.

## **2B . The new bankruptcy law**

Modeled after US bankruptcy code, the new law, Law No.11101 dated February 9, 2005, went into effect on June 9, 2005. The new law encourages extra-judicial restructuring (recuperação extrajudicial), which is crucial in Brazil where court costs can be very high. The restructuring is a prepackaged mechanism developed by the bankrupt firm in consultation with select creditors, whose outcome is binding upon minority creditors. The new law allows a bankrupt company to alternatively request a court restructuring (recuperação judicial). If the request is granted, the company has 180 days to present the court with a restructuring proposal. All lawsuits and collection procedures are suspended during the 180-day period. Feasibility of the restructuring proposal is influenced by whether it involves a substantial change in corporate governance, and/or changes to the asset structure of the firm.

The new law completely revamped the absolute priority rules. Any new credit that is extended during the restructuring process is given priority over all other claimants. The motive here is to encourage creditors to extend credit at better terms to enable the company to emerge out of bankruptcy, thus avoiding costly liquidation. The second critical change relates to labor credit. Labor's claims rank second in priority, but are severely restricted to not exceed 150 times the minimum wage. The cap on labors' claims is meant to discourage costly and protracted

verification. The new priority rules also give precedence to secured creditors over tax credit and even unsecured creditors take precedence over some tax credits.

The new law affords greater protection to creditors' claims and seeks to improve the efficiency of the bankruptcy process. The principle guiding the change is to encourage economically efficient firms to recover from insolvency while preserving intact the value of assets in these firms.<sup>3</sup>

In the next section, we ascertain the market's perception of the credibility of the new law in providing greater protection to creditors. We then proceed to determine the stock market's reaction.

### **3. Data**

Data for the empirical analysis was collected from Bloomberg for the period from October 2002 to June 2006. This period covers the one year prior to the initiation of legislation to the one year following its signage into law. The change in bankruptcy law was a long drawn out process that was initiated by the submission of the original draft of reforms for approval of the Lower House of Parliament on October 14, 2003, and culminated with the law going into effect on June 9, 2005. Appendix A lists the major milestones associated with the legislative process.

The money market rate used in the analysis is the Selic, which is reported at a daily frequency by Bloomberg. The Selic is the basic rate used as reference for monetary policy in Brazil and is the overnight rate on loans guaranteed by federal government securities. The Central Bank in Brazil maintains a target SELIC rate. Data is collected on the target SELIC rate to analyze how the daily SELIC deviated from its target.

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<sup>3</sup> See Felsberg, Acerbi and Kargman (2006)

Four different stock indexes which represent different groups of stocks traded in Brazil, are selected for analysis. Bloomberg reports volume, the open, high, low and closing values for each of these indexes at a daily frequency. The BOVESPA is a total return index weighted by traded volume which consists of the most liquid stocks traded on the Sao Paulo Stock Exchange. The IBX is a capitalization-weighted index that measures the performance of the top 100 stocks listed on the BOVESPA market. The third index, IGCX is designed to measure the performance of a theoretical portfolio of companies that follow sound corporate governance practices. Companies that fit this index are usually traded on the Novo Mercado, which is a special listing designed for firms that give the same rights to all shareholders, that have an elected board of directors, and that follow other governance practices that promote transparency. The last index is the ITAG, which is an index composed of stocks issued by companies which offer minority shareholders 80% of the ‘tag along’, or control premium obtained by controlling shareholders in the case of a sale of the company which involves transfer of control.

#### **4. Response of the Money market**

Figure 2 plots the reported Selic rate, during the period from October 2002, one year prior to the introduction of the new bankruptcy laws, to June 2006, one year after the new bankruptcy law went into effect. In the year prior to the initiation of legislative reform, the Selic averaged 24%. In the year after the law went into effect, the Selic declined to an average 18%. There is a secular downward trend in Figure 2 interrupted by brief periods of a surge in the Selic. The downward trend is predicted if the new bankruptcy law secured the rights of creditors to recover their debts, and thereby lowered the cost of debt. The brief surges in Selic are inconsistent with the hypothesis of a decrease in bankruptcy costs and instead suggest competing influences on the Selic. We isolate the impact of the change in bankruptcy law on the Selic by



conducting event studies around two key dates, Oct 14, 2003 when the new reforms were passed by the Lower House of the Brazilian legislature, and Feb 9, 2005, when the reforms were signed into law by the Brazilian President. The event studies should help to determine whether these two key events conveyed information to the money market.

The event window for each milestone is identified as the 10-day period surrounding the announcement. The narrow event window is a deliberate choice to reflect the fact that each milestone required a congressional vote, the outcome of which could not have been anticipated well in advance. The pre-event period is defined as day -40 to day -10, the post-event period is day +10 to day +40, with day 0 being the announcement day. The pre- and post-event windows are short to avoid contamination from other events, such as ratings changes announced by ratings agencies.

The average reported and target Selic rates during these periods are in Table 1 for each announcement. The table also reports the deviation of the Selic from its target. The money market applauded when the Lower House approved the first draft of the new law on October 14, 2003. The reported, and actual Selic rates dropped by about 104 basis points at the announcement, and continued to drop another 102 basis points in the post-event period. Chi-square tests for the statistical significance of the difference in rates between the pre-event and event periods, and between post-event and event periods, show that the decrease in the rate in each period is statistically significant. The deviation of the Selic from its target is negative in all three periods, averaging 15.8 basis points, but is statistically insignificant. Thus, the announcement of the first legislative success for the new law credibly conveyed greater protections to creditors.

The subsequent passage of the law on Feb 9, 2005 also led the money market to respond. However, in this case, the actual and target Selic rates *increased* after the announcement. The target rate increased by 41 basis points between the pre-event and event periods, and by 47 basis points between the event and post-event periods. Both these increases were statistically significant as indicated by the chi-square tests. The target and actual Selic rates did not deviate much during this event; the median deviation is 0.00 in the event and post-event periods.

The *increase* is inconsistent with the new law reducing the cost of debt. We investigate this further by testing whether the increase in the Selic reflected the impact of bankruptcy reform on the real economy. That such a link between the short rate of interest and future GDP growth exists is demonstrated by Ang, Piazzesi and Wei (2005) for the US economy. In results not reported in the paper, a vector auto-regression (VAR) estimated with real GDP growth in Brazil, the rate of inflation in Brazil, and the Selic rate, confirms that a higher Selic forecasted higher future growth in real GDP. Despite this increase, it is to be noted that the Selic never reached its pre-reform (prior to Oct 14, 2003) levels.

Reduction in the cost of debt is also predicted by a series of ratings upgrades announced by ratings agencies in the period preceding the passage of the law. Robustness of the results in Table 1 to these other credit-related events that occurred during the same time period is tested using an OLS regression. Rating agencies upgraded Brazil's sovereign debt on three separate occasions: the first occasion was April 29, 2003, when Standard & Poor's upgraded the country's long-term local and foreign currency sovereign credit ratings from negative to stable.<sup>4</sup> The second credit rating event occurred on September 9, 2004, when Moody's upgraded the

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<sup>4</sup> Raymond Colitt and Paivi Munter (April 30, 2003). "Enthusiastic reception for Brazil bond: S&P revises sovereign credit rating as issue puts paid to fears of debt default" :[EUROPE 1ST EDITION]. *Financial Times*, p. 1.

rating on long-term Brazilian foreign currency debt from B2 to B1.<sup>5</sup> Finally, on January 4, 2005, Moody's upgraded its outlook on Brazil from stable to positive.<sup>6</sup>

OLS regressions are estimated with indicator variables set to one (zero) if the day is within day -10 and day +10 with day 0 being the announcement date. There are five such indicator variables, two for the events associated with the passage of the new law, and three associated with rating changes. The dependent variable is the deviation of the actual Selic from its target calculated on a daily basis. The regression is estimated over the period from January 2003 to December 2005.

Results are reported in Table 2. The changes in Selic around the two events associated with the passage of the new law are robust to the inclusion of other events. The deviation of the Selic remains reliably negative on Oct 14, 2003 when the new bankruptcy law enjoyed its first legislative success, and also remains reliably positive when the new rules were signed into law on Feb 9, 2005. Of the three credit rating events, only the upgrade on April 29, 2003 is associated with a *decrease* in the Selic relative to its target. The Selic *increased* relative to its target at the announcement of the ratings upgrade on January 1, 2005. The rating event on September 9, 2004 had no significant impact on the deviation of the Selic from its target.

Tables 1 and 2 confirm that the first legislative success of the new bankruptcy law was credibly expected to lower borrowing costs by affording greater protection to creditors. The subsequent increase in the Selic at the passage of the law appears to reflect greater future demand for credit to finance economic growth.

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<sup>5</sup> Santiago Fittipaldi (Oct 2004) "At Last! An Upgrade": *Global Finance*, 18(9), 18.

<sup>6</sup> "Brazil on verge of deal as Moody's nudges outlook upwards". (2005, January). *Euroweek*, 24

## 5. Response of the stock market

The response of the stock market to bankruptcy reform is analyzed in this section. Limited liability of shareholders in the event of bankruptcy implies that shareholders should be unaffected by changes to bankruptcy law. The downside to a stockholder is limited to her initial investment; any attrition in value below the face value of debt should not affect stockholders. Nevertheless, there is a large literature in the US which argues that bankruptcy costs are substantial.<sup>7</sup> Whether the magnitude of these costs is large enough to affect equity values continues to be debated.<sup>8</sup> Other studies have investigated a related issue: Is bankruptcy risk a systematic risk factor that affects stock returns?<sup>9</sup> Our paper does not pursue the risk factor angle since the focus here is on aggregate stock indexes, rather than on individual stock returns.

The most compelling argument for why reform of bankruptcy law should affect stock values comes from a series of papers by La Porta, et al. In La Porta, et al (1997), they show that countries with strong investor protections have large capital markets. In a follow-up paper, La Porta, et al (1998) identify countries with strong investor protections as those that protect both shareholder and creditor rights. La Porta (2006) parse the nature of the law and its enforcement, to show that laws facilitating private enforcement of creditor rights through liability rules most

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<sup>7</sup> Estimates of administrative costs that include payments to lawyers, accountants, and other professionals, as a percent of firm value prior to default, range between 4% (Warner (1977)) and 7.5% (Altman (1984), Ang, Chua and McConnell (1982), Tashjian, Lease and McConnell (1996)). Deadweight costs which include loss of patents, trademarks, brands, R&D, verification costs of liquidation value and loss of investment opportunities are reported to average 10.3% of market value (Chen and Merville (1999)).

<sup>8</sup> Opler and Titman (1994) find that costly financial distress reduces stock values. They find that stock values of highly leveraged firms are lower than less leveraged competitors in industry downturns. Wruck (1990) argues that financial distress can improve firm values by forcing managers to make choices that maximize shareholder value. Bris, Welch and Zhu (2006) use a large and comprehensive sample of bankruptcies to conclude that bankruptcy costs are heterogeneous and are measurement sensitive.

<sup>9</sup> Shumway (1997) argues that firms that are likely to delist because of bankruptcy earn higher returns. Chan, Chen and Hsieh (1985) show that the small firm effect of Banz (1981) can be attributed to their higher default risk. Dichev (1998) finds the opposite; using measures of bankruptcy risk proposed by Ohlson (1980) and Altman (1968) to identify firms with a high likelihood of financial distress, he concludes that firms with high bankruptcy risk are not rewarded by higher average returns.

benefit stock markets. These papers by La Porta, et al would predict that reform of bankruptcy law in Brazil should lead to an expansion of both debt and equity markets in Brazil. The specific testable hypothesis that emerges for aggregate stock returns in Brazil is that they should be higher in the post-reform period.

Figure 3 plots cumulative monthly returns to the Bovespa index, the index of the most actively traded stocks, over the period from January 2002 (one full calendar year prior to the first announcement) to August 2007 (a little over two years after the law went into effect). Cumulative returns to the S&P 500 index calculated using Brazilian Real denominated index values, are also plotted for comparison. The Brazilian market strongly outperformed the S&P 500 index; the cumulative return to the Bovespa was in excess of 900%, which was far higher than the cumulative return of a little less than 200% earned by the S&P 500 index over the same time period.

How much of the superior performance of the Bovespa in Figure 3 can be attributed to bankruptcy reform is studied by examining short-term and long-term returns around announcements related to the new law. We chose to analyze four different aggregate stock indexes to determine whether the composition of the index affected its response to the change in bankruptcy law. Any impact of the law on the stock market should be captured efficiently by the BOVESPA index since it consists of the most liquid stocks in the Brazilian stock market. The IBX index should capture the reaction of large Brazilian stocks to the new bankruptcy law. Large stocks have a relatively lower risk of bankruptcy (Chan and Chen (1991)) which may enable them to take advantage of improved credit market conditions in the post-reform period to finance future growth. Unfortunately, we cannot compare the response of the IBX to that of a small stock index since a Brazilian small stock index, ISOMA, was discontinued in July 2005.

The IGCX index should reflect the impact of the new law on firms who have adopted sound governance practices. Well governed firms have low bankruptcy risk (Fich and Slezak (2008)), and, by definition, offer strong protections to existing stockholders. These benefits should enable well governed firms to exploit improving credit market conditions. Finally, the ITAG index should reflect the laws' impact on firms which grant some control to minority shareholders. Protection of minority shareholders' rights reduces agency problems within the firm (Lemmon and Lins (2003)). These firms should be well-positioned to finance future growth in a favorable credit market environment (La Porta, et al (2002)).

### **5A. Short run returns**

The short-run response of the indexes to announcements of the law's legislative success is analyzed with the help of event studies around the two key dates, Oct 14, 2003 and Feb 9, 2005. Panels A and B of Table 3 have the returns to the indexes at each of these announcements. The pre-event, event and post-event periods are exactly as described for the Selic event study; day -40 to day -10 for the pre-event period, day -10 to day +10 for the event period, and day +10 to day +40 for the post-event period. The table reports average daily returns during these periods.

Results are missing in Panel A for the ITAG index which was not compiled when the first announcement was made. The table shows that mean announcement returns to each of the other three indexes are positive, but are statistically insignificant and are in fact, *lower* in magnitude than mean returns in the pre-event period. Post-event period returns are higher than event-period returns, but the difference in returns is not statistically significant. Median returns show similar patterns.

Stock markets responded strongly only when it was announced on Feb 9, 2005 that the new bankruptcy rules had been signed into law. Panel B of the table shows positive and statistically significant event-period returns to each of the four indexes, which are also significantly higher than pre-event returns. The response of the ITAG index was the largest; the mean daily return of 0.97% in the event period is economically and statistically higher than the mean return of -0.31% in the pre-event period. Mean returns in the post-event period continued to be positive, but are of a lower magnitude than event-period returns.

Thus the stock market responded not to the initial legislative success of the law, but to its actual passage. We test whether the response at the passage of the new law differed across the four indexes. F-tests (not reported in the paper) show that the responses of the four indexes during the event period are statistically indistinguishable. So are post-event period returns. The lack of a significant difference in returns to the indexes suggests that the short-term impact of the new bankruptcy law is unrelated to the composition of the index.

Long-term returns to the four stock indexes are studied next. The response of the Selic at the passage of the law signaled an increase in future GDP. Aggregate stock market indexes should earn positive returns in the long-term to reflect expected GDP growth (Campbell and Shiller (1988)). Long-run returns are also predicted to be higher by the series of La Porta, et al papers that predict that stock market capitalizations increase when laws give greater protections to investors.

## **5B. Long-run returns**

Long run returns to the four indexes are reported in Table 4. Cumulative returns to each of the four indexes in the one year and two years following the passage of the law in Feb 2005 are reported in Table 4. Statistical significance of mean long term returns is determined by a

variation of a bootstrap approach described in Desai and Jain (1997). Daily stock returns to each of the four indexes during the period from 2002 to December 2004 are combined into a single time series. One-year long run returns are tested by drawing random samples of 250 daily returns from this series. This process of random sampling is repeated 10,000 times. The mean return to each of these 10,000 samples is recorded and the t-statistic associated with the series of mean returns is reported in the third column of Table 4. For the test of two-year returns, each random sample consists of 500 observations of daily returns. The choice of 250 and 500 daily returns is based on a 250-day trading year.

The table also reports excess returns to each index calculated with respect to the return to the Brazilian Real-denominated S&P 500 index. Bootstrapped returns are not reported for these returns. Panel A of Table 4 shows that one-year post-event returns are positive for all indexes, but only the returns to ITAG and IGCX indexes are statistically significant (at the 5% level) both at the mean and at the median. ITAG earns the highest mean daily return of 0.21% and the BOVESPA the lowest mean daily return (0.14%). The mean return to the IBX index is marginally significant, and the return to the BOVESPA index is insignificant both at the mean and at the median. Comparison with the t-statistic calculated from the bootstrapping procedure proves that the statistically significant mean returns to IBX and to IGCX cannot be attributed to randomly generated returns.

Panel B of Table 4 reports two-year post-event and excess returns. Two-year mean returns are uniformly lower than one-year returns, which is consistent with a dampening in the trend in long-run returns. Both returns and excess returns to the ITAG and to the IGCX indexes continue to be statistically significant at the mean and at the median. Stocks in these two unique indexes appear to have benefited more from bankruptcy reform than did stocks in the larger



indexes, IBX and BOVESPA. La Porta, et al (2002) predict better outcomes from a strengthening of investor rights for firms that are governed well. These firms benefit from good management and are well positioned to take advantage of an increase in future economic activity.

### **5C. Test of a single-factor model**

Long-run performance is evaluated in this section by estimating abnormal returns, or alpha, generated by a single factor model. We compare abnormal returns earned by each of these indexes in the year before the new law came up through the legislative process, to those earned in the one year after its passage into law. Specifically, the pre-law period covers Oct 14, 2002 to Oct 4, 2003. The pre-law period is chosen so as to end 10 days prior to Oct 14, 2003, when the new law had its first legislative success. The event period covers ten days prior to Oct 14, 2003 and ten days after Feb 9, 2005. The post-event period covers Feb 19, 2005 (ten days after the new rules were signed into law) to Feb 9, 2006.

Abnormal returns are calculated by estimating an OLS regression of daily excess index returns on the daily excess return to the S&P 500 index. Excess returns are calculated with respect to the daily Selic rate of interest. The relevant S&P 500 index return is the Brazilian real denominated return reported by Bloomberg. The justification for using this model is that a single-factor international capital asset pricing model (ICAPM) has been shown by de Lint (2002) to have explanatory power for emerging market stock returns. The author shows that the explanatory power of global variables is time varying, being higher during stable periods. The period under study in this paper can be characterized as a stable period as attested to by an upgrade of sovereign debt ratings of Brazil by the rating agencies (described in the previous section).

Table 5 reports the intercept, or alpha, the beta loading on the S&P 500 index and the adjusted R-squares from the estimation of the single factor ICAPM. Panel A shows that none of the indexes earned statistically significant abnormal returns during the pre-event period. Moreover, the single factor model has weak explanatory power, with the IGCX index recording the lowest R-square among the three indexes. The model was not estimated for the ITAG index which did not have data over this time period.

Panel B shows that the explanatory power of the single-factor model increased in the *event period*. Every one of the four indexes has a statistically significant factor loading (beta) on the market factor, although their magnitudes range only between 0.22 and 0.29. Importantly, abnormal returns continue to be statistically insignificant for each of the four indexes.

Strong evidence of positive abnormal returns comes from Panel C which reports results for the post-event period. The intercept, or alpha, the abnormal return, is positive and statistically significant for three of the four indexes. The alpha for the fourth index, the BOVESPA, is only marginally significant (t-statistic=1.75). A ranking of alphas shows that the highest alpha of 0.2% is earned by the ITAG index, followed by the alpha earned by the IGCX index. These rankings of alpha are identical to the rankings of one-year and two-year post event returns reported in Table 4.

In summary, the evidence from the stock market shows a positive and statistically significant short term and long-term response to bankruptcy reform. Long-term returns in the post-reform period are the highest for the ITAG and IGCX indexes, indexes consisting of firms that give rights to minority shareholders and of well-governed firms, respectively. These are the very types of firms predicted by La Porta, et al (2002) to benefit from an increase in legal protections offered to investors.

## 6. CONCLUSIONS

This paper studies the response of capital markets to a change in a country's securities law. We show that the change in bankruptcy law benefited Brazilian capital markets. The money market was the bigger beneficiary in that the benchmark Selic rate experienced a permanent drop of 600 basis points after bankruptcy reforms went into effect. The stock market also benefited, both in the short term and in the long term. Companies that follow good governance practices and those that offer some rights to minority shareholders were bigger long-term beneficiaries. The results here are consistent with the series of La Porta, et al papers that have argued that capital market development is dependent on strong legal protections offered to all groups of investors.

The results in this paper complement Funchal (2008) who studied the impact of the new bankruptcy law on leverage ratios of individual firms in Brazil. His finding that Brazilian firms increased their leverage ratios in the post-reform period confirms the event-study results from the Brazilian money market; the market perceived the new law to be effecting in protecting creditors' rights. Funchal (2008) did not examine the response of equities. We plan to extend our results in this paper to the reaction of individual stocks in a follow-up study.

## APPENDIX A

### MILESTONES IN THE PASSAGE OF THE 2005 BANKRUPTCY LAW IN BRAZIL

<b>Event</b>	<b>Date</b>
Original draft of proposed reforms to the 1945 Bankruptcy Law is approved by the House of Representatives. The bill is sent to the Senate	Oct 14, 2003
Senate passes amendments to the draft of the new law. Returns the amended bill to the House for its approval.	June 29, 2004
House of Representatives approves the New Bankruptcy Law	Dec 14, 2004
The 2005 Bankruptcy Law signed into law by President Luis Inacio Lula da Silva	February 9, 2005
The 2005 Bankruptcy Law goes into effect	June 9, 2005

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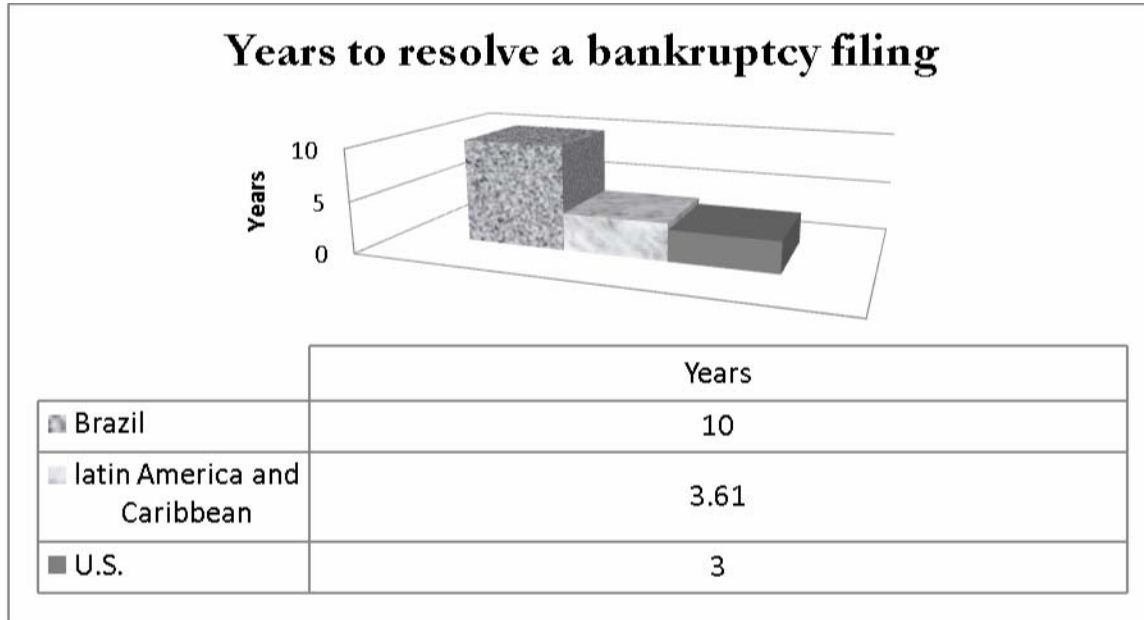
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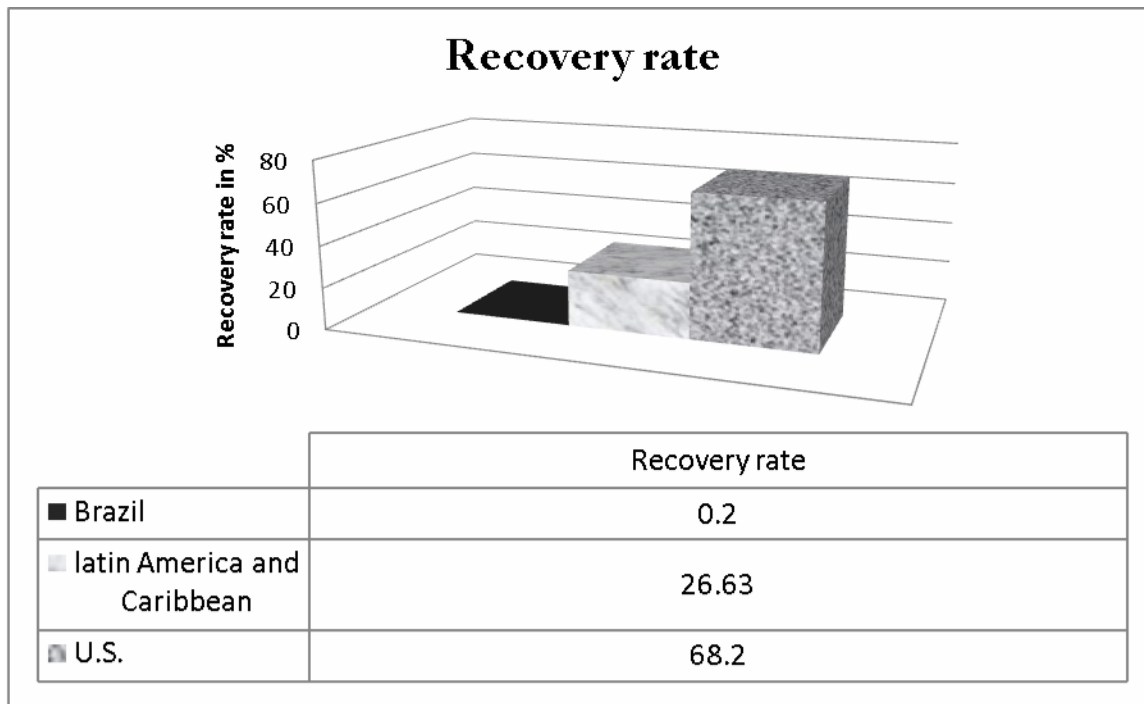
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**Figure 1**  
**Impact of old bankruptcy laws on recovery rate and time to dissolution**

**Panel A:** Comparison of times to process a bankruptcy filing for Brazil, United States, and Latin America



**Panel B:** Comparison of recovery rates for Brazil, the United States and Latin America.

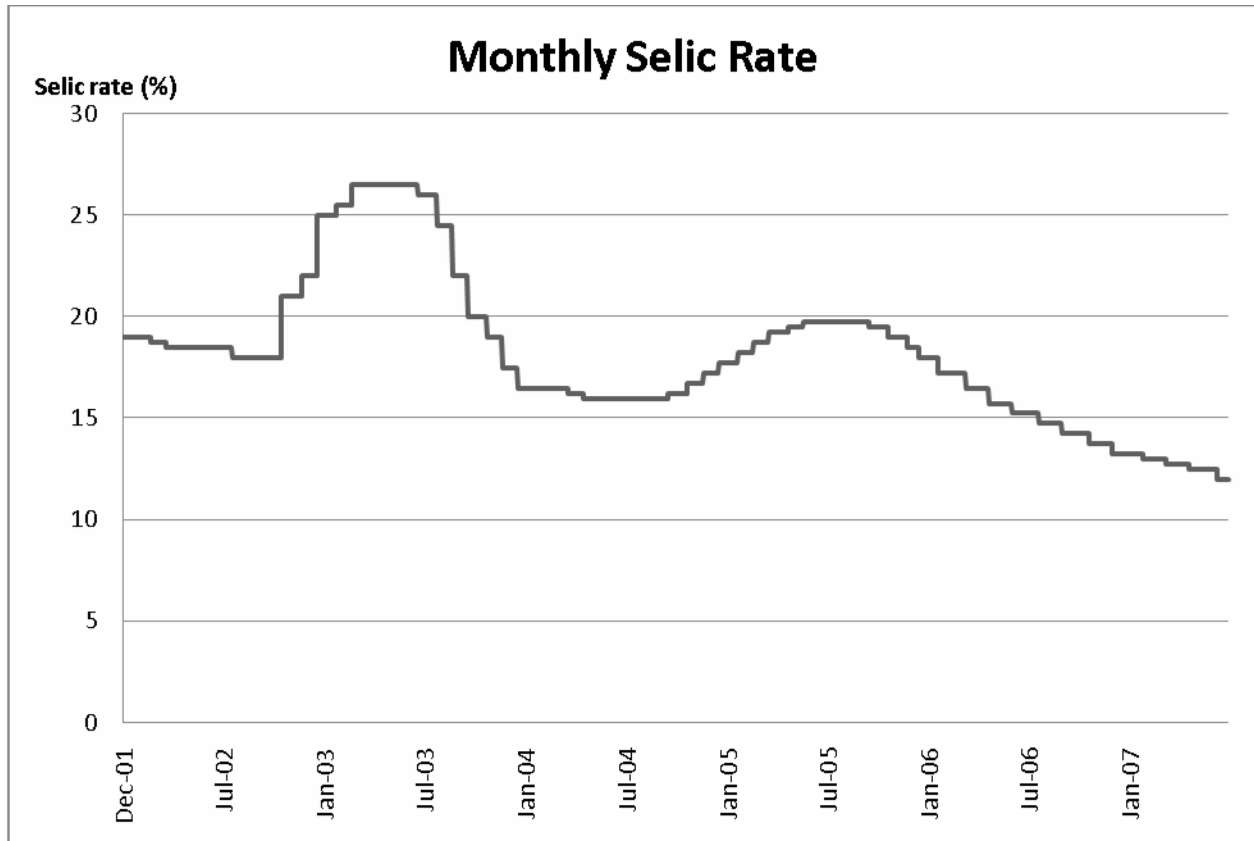


Source: *Doing Business* (2005)



**Figure 2**  
**Selic rate in Brazil during the bankruptcy reform period**

The figure plots the average monthly reported Selic rate (in %) during the period from December 2001 to June 2007. Daily Selic rates are obtained from Bloomberg.



**Table 1**  
**Selic rates around announcements related to bankruptcy law reform**

The table has the mean and median Selic rates (in %) during the pre-announcement window (day -11 to -40), the announcement window (-10 to +10), and the post-announcement window (+11 to +40). Daily Selic rates are from Bloomberg. Numbers in curly brackets are p-values for Wilcoxon tests of significance.

**Panel A: Selic rates around the first legislative success of the law on Oct 14, 2003**

	Actual – Target (%)		Actual rate (%)		Target rate (%)	
	Mean	Median	Mean	Median	Mean	Median
Pre-event period	-0.1582	-0.16	20.751	19.85	20.909	20.00
Event period	-0.1593	-0.16	19.707	19.84	19.867	20.00
Post-event period	-0.156	-0.15	18.694	18.85	18.85	19.00
$\chi^2$ test for diff. of pre-event and event rates	0.485	{0.49}	15.61	{0.00}	10.78	{0.00}
$\chi^2$ test for diff. of post-event and event rates	6.179	{0.01}	23.68	{0.00}	25.39	{0.00}

**Panel B: Selic rates when the regulation was signed into law on Feb 9, 2005**

	Actual-Target (%)		Actual rate (%)		Target rate(%)	
	Mean	Median	Mean	Median	Mean	Median
Pre-event period	-0.0090	-0.01	17.9076	17.74	17.9167	17.75
Event period	0.00154	0.00	18.329	18.25	18.327	18.25
Post-event period	-0.0035	0.00	18.797	18.75	18.800	18.75
$\chi^2$ test for diff. of pre-event and event rates	19.12	{0.00}	22.57	{0.00}	15.42	{0.00}
$\chi^2$ test for diff. of post-event and event rates	4.76	{0.03}	17.31	{0.00}	22.99	{0.00}

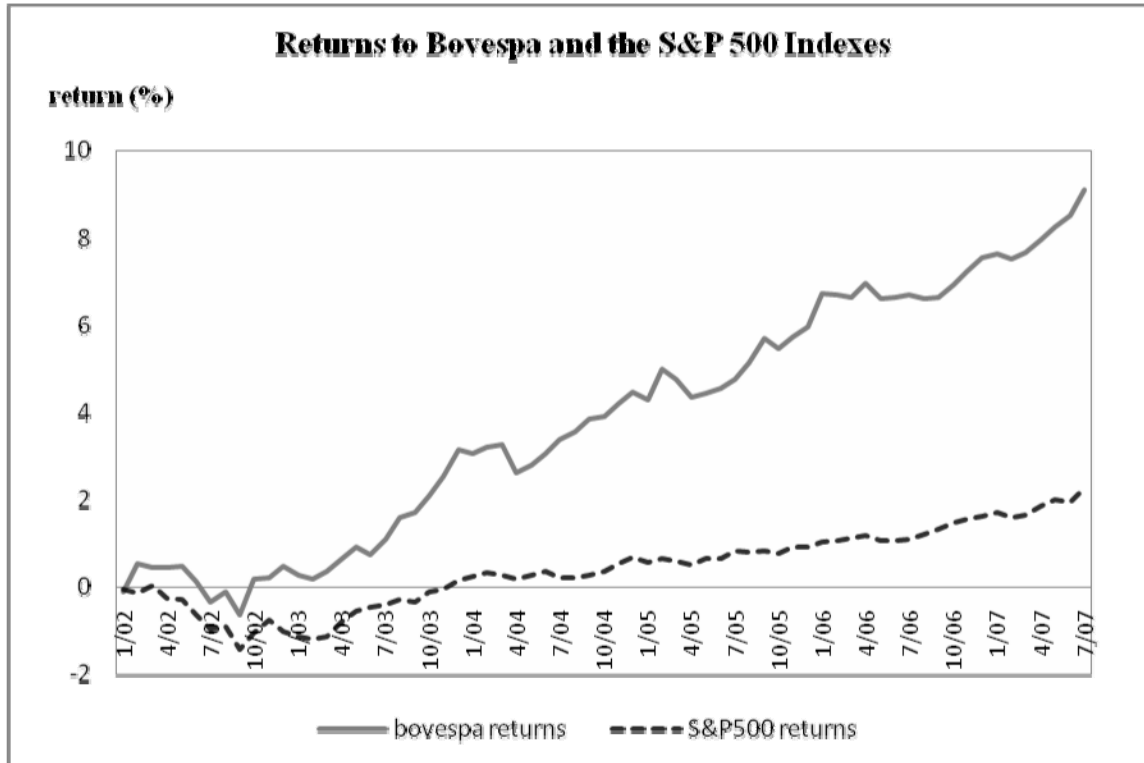
**Table 2**  
**OLS Regressions of the difference between the actual and target Selic**

The daily difference between the actual and target Selic rates is regressed on binary dummy variables for critical dates in the legislative period. These variables take a value of 1(0) if the date lies within (outside) a -10 to +10 day window around the critical date. Critical dates associated with the bankruptcy law are October 14, 2003 and February 9, 2005. Critical dates associated with sovereign rating changes are April 29, 2003, September 9, 2004 and January 4, 2005.

Independent variables	Coefficient	T-statistic
Intercept	-0.08469	-26.44
Oct 14, 2003	-0.07474	-2.45
February 9, 2005	0.08623	2.64
April 29, 2003	-0.09541	-2.92
September 9, 2004	0.02316	0.74
January 4, 2005	0.07592	2.49
Adj. R <sup>2</sup>	1.64%	
Obs.	1414	

**Figure 3**  
**Comparison of the Bovespa and the S&P 500 index**

Cumulative daily returns to the Bovespa Index and to the Brazilian Real-denominated S&P 500 index during the period from January 2002 to August 2007 are plotted in the figure. Daily returns to the indexes are obtained from Bloomberg.



**Table 3****Stock index returns around announcements related to bankruptcy law reform**

The table has the mean and median daily return to the IGCX, IBX, ITAG and BOVESPA indexes during the pre-announcement window (day -11 to -40), the announcement window (-10 to +10), and the post-announcement window (+11 to +40). Daily closing values of the indexes, denominated in Brazilian Real, are obtained from Bloomberg. Returns are calculated as: (index value on day t – index value on day (t-1))/index value on day (t-1). Numbers in curly brackets are p-values for Wilcoxon tests of significance.

**Panel A: Returns to stock indexes around the first legislative success of the law on Oct 14, 2003**

	Return to IGCX(%)		Return to IBX(%)		Return to ITAG(%)		Return to BOVESPA(%)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Pre-event period	0.0075	-0.314	0.242	0.089	N/A		0.417	0.620
Event period	0.0033	-0.076	0.032	0.028	N/A		0.289	0.430
Post-event period	0.22	0.132	0.263	0.317	N/A		0.397	0.193
$\chi^2$ test for diff.of:								
pre-event and event returns	$\chi^2=0.19$	{0.66}	$\chi^2=0.49$	{0.48}			$\chi^2=0.00$	{0.95}
post-event and event returns	$\chi^2=0.12$	{0.73}	$\chi^2=0.25$	{0.62}	N/A		$\chi^2=0.12$	{0.73}

**Panel B: Returns to Stock Indexes when the regulation was signed into law on Feb 9, 2005**

	Return to IGCX(%)		Return to IBX(%)		Return to ITAG(%)		Return to BOVESPA(%)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Pre-event period	-0.31	-0.41	-0.29	-0.35	-0.31	-0.51	-0.48	0.03
Event period	0.72**	0.55	0.75**	0.56	0.97**	0.72	0.86**	0.96
Post-event period	0.30	-0.23	0.24	-0.20	0.22*	0.04	0.18	0.09
$\chi^2$ test for diff.of								
pre-event and event returns	$\chi^2=4.33$	{0.04}	$\chi^2=4.50$	{0.03}	$\chi^2=4.81$	{0.03}	$\chi^2=3.85$	{0.05}
post-event and event returns	$\chi^2=1.20$	{0.27}	$\chi^2=1.37$	{0.24}	$\chi^2=1.75$	{0.19}	$\chi^2=2.30$	{0.13}

\* and \*\* denote statistical significance at the 10% and 5% levels respectively

**Table 4**  
**Long run returns**

Mean and median daily returns in the one-year and two-year period following Feb 9, 2005, are reported for the four stock indexes. Excess returns calculated with respect to the daily Brazilian Real denominated S&P 500 index are also reported. The t-statistic obtained from the bootstrapping procedure is calculated by combining daily stock returns to each of the four indexes during the period from 2002 to December 2004 into a single time series. One-year (two-year) long run returns are tested by drawing random samples of 250 (500) daily returns from this series. This process of random sampling is repeated 10,000 times. The mean return to each of these 10,000 samples is recorded and the t-statistic associated with the series of mean returns is reported in the third column.

**Panel A: One-year post-reform returns**

Index	Returns (%)			Excess returns (%)	
	Mean	Median	Bootstrap t-statistic	Mean	Median
IGCX	0.20**	0.19**	0.15	0.14	0.14
IBX	0.17*	0.09*	0.15	0.12	0.03
ITAG	0.21**	0.24**	0.15	0.16	0.19**
BOVESPA	0.14	0.07	0.15	0.09	0.02

**Panel B: Two-year post-reform returns**

Index	Returns (%)			Excess returns (%)	
	Mean	Median	Bootstrap t-statistic	Mean	Median
IGCX	0.16**	0.20**	0.15	0.11*	0.14**
IBX	0.13**	0.10	0.15	0.09	0.05
ITAG	0.17**	0.17**	0.15	0.12*	0.12**
BOVESPA	0.12*	0.14	0.15	0.07	0.09

\* and \*\* denote statistical significance at the 10% and 5% levels respectively

**Table 5**  
**Abnormal returns from single-factor international CAPM**

The single-factor international CAPM is estimated by regressing excess daily returns to the Brazilian-Real denominated stock indexes calculated relative to the daily Selic rate, on the Brazilian-Real denominated return to the S&P 500 index. The regression is estimated during three periods; a 'pre-reform' period which extends from Oct 14, 2002 to Oct 4, 2003, a 'reform' period which covers ten days prior to Oct 14, 2003 and ten days after Feb 9, 2005, and finally, a 'post-reform' period which covers Feb 19, 2005 to Feb 9, 2006.

**Panel A: Abnormal returns in the 'pre-reform' period**

	intercept	T-stat	S&P index	T-stat	Adj R <sup>2</sup>
IGCX	0.0004	0.66	0.0096	0.22	-0.22%
IBX	0.0004	0.62	0.1010	2.82	1.60%
BOVESPA	0.0001	0.14	0.1180	2.53	1.25%

**Panel B: Abnormal returns in the 'reform' period**

	Intercept	T-stat	S&P	T-stat	Adj R <sup>2</sup>
IGCX	0.0010	1.58	0.2320	2.95	1.84%
IBX	0.0010	1.43	0.2850	3.58	2.80%
ITAG	0.0002	0.15	0.2260	1.72	1.79%
BOVESPA	0.0008	0.96	0.2860	3.03	1.95%

**Panel C: Abnormal returns in the 'post-reform' period**

	Intercept	T-stat	S&P	T-stat	Adj R <sup>2</sup>
IGCX	0.0014	2.30	0.2067	3.25	1.63%
IBX	0.0012	2.06	0.2993	4.68	3.50%
ITAG	0.0014	2.22	0.1296	1.97	0.50%
BOVESPA	0.0011	1.75	0.2694	3.94	2.46%