

## TESTING SHARE REPURCHASES HYPOTHESES: A CONDITIONAL STUDY

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### Abstract

In the past 20 years share buybacks have experienced a tremendous growth. Yet, we still don't have a clear understanding of this phenomenon, also because of limited samples available on these corporate decisions. This paper aims at testing the main hypotheses on buybacks drivers and effects by analysing the impact of share repurchase announcements on the performance of companies listed on the Italian Stock Exchange, conditional and unconditional on the 1998 introduction of the Capital Market Reform. Our findings show that, by imposing more stringent rules on transparency and equal treatment of shareholders in buybacks operations, the change in regulation has increased the volume and frequency of share repurchases announcements. Analogously, the number of repurchasing companies has soared as well. Finally, market reaction to buybacks, as measured by abnormal returns and cumulative abnormal returns has consistently reversed switching from negative to positive long term CARs.

**Keywords:** share repurchases, market efficiency, price patterns, payout policy.

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### 1. Introduction

In the past 20 years, an increasing number of companies have opted for paying out cash to stockholders through share buybacks rather than cash dividends (Bagwell and Shoven, 1989; Fama and French, 2001; Grullon and Michaely, 2002).

What are the reasons for such a change in corporate payout policy? Are there any advantages in terms of shareholder value-creation behind open market share repurchases? Why companies didn't start buying back shares much earlier?

The literature provides a large number of motivations for why firms might repurchase their own stocks: a) exploiting tax benefits (Bernheim, 1991; Grinblatt and Titman, 1998; Brav *et al.*, 2004; Bratton, 2004); b) distributing excess cash (Bhattacharya, 1979; Vermaelen, 1981; Easterbrook, 1984; Miller and Rock, 1985; Jensen, 1986); c) substituting cash dividends (De Angelo *et al.* 2001; Jagannathan *et al.* 2000; Grullon and Michaely, 2002); d) improving liquidity, the costs incurred by shareholders in buying and selling shares (Allen and Michaely, 1995; Cook, Krigmand and Leach, 2004; Fried, 2005); e) lowering shareholders' transaction costs (Elton and Gruber, 1995; Fried, 2005); f) remunerating short-term investors (Harris and

Ramsay, 1995; Gaspar *et al.*, 2004); g) funding employees stock option plans (De Angelo and De Angelo, 1990; Rogers, 2004); h) expropriating wealth from bondholders (Kalay, 1982; Allen and Michaely, 2003); i) adjusting capital structures (Amaro de Matos, 2001; Kadam *et al.*, 2002); j) signalling a situation of current stock prices undervaluation (Dann, 1983; Kose and Williams, 1985; Ofer and Thakor, 1987; Wansley, Lane and Sarkar, 1989; Ikenberry *et al.* 1995 and 2000; Allen *et al.* 2000; Mitchell and Pulvino 2001) defensive mechanism against potential takeovers (Stulz, 1988; Bagwell, 1991; Dittmar, 2000).

A limited number of contributions, however, tried to empirically verify the relative explanatory power of these hypotheses, due to both the absence of sufficiently large and homogeneous samples on one side, and, on the other side, to the fact that many countries have only recently allowed companies to undertake share repurchase programs.

Furthermore, neither existing theories nor empirical contributions do provide a unique prediction on what should be the relation between dividends and stock repurchases (Grullon and Michaely, 2002): do companies buy back shares with funds that otherwise would have been used to pay dividends? Or do they strategically trade?

This paper aims first at analysing the impact of share repurchase announcements on the performance of companies listed in the Italian stock exchange. Second, the paper focuses on the analysis of whether share repurchases are being used as a substitute for dividends. Third, we analyse the impact on corporate financial decisions of the 1998 Capital Markets Reform (known as “Draghi Act”), which has been designed to provide issuers and investors with a more stable and transparent set of rules. Finally, we relate share repurchase announcements with a number of company’s fundamentals, in order to identify, if any, a common strategy behind buyback decisions.

Our major findings can be summarized as follows:

1. after the introduction of the Draghi Act the volume and frequency of buybacks has sharply increased, and the number of repurchasing companies as well;
2. the market reaction to buybacks, as measured by abnormal returns and cumulative abnormal returns (calculated over an event window of 120 days) has changed, generating positive returns instead of negative ones;
3. following the introduction of the reform of the financial system, we observe a negative correlation between dividend payout policies and share repurchases, providing support to the substitution hypothesis, which states that that under a broad set of conditions buybacks can be a more appealing payout mechanism to investors;
4. Finally, we also provide evidence for the undervaluation hypothesis, according to which buybacks are announced only when a company market price doesn’t incorporate the full firm value therefore making repurchases an optimal solution for paying back money to shareholders while maximizing company value.

The rest of the paper is structured as follows: Section II present the motivation for this research, Section III presents the research questions, Section IV show Data collection and research methodology, Section V presents results, Section VI concludes.

## **2. Main motivation: the new capital markets regulatory framework**

In countries with informationally efficient capital markets – like, the U.S., Canada and the United Kingdom – share repurchases are a fast growing cash payout methodology and, more generally, are increasingly adopted in corporate payout policy.

Only recently such a financial policy has become an effective option by companies located in other developed economies and, among them, in Italy.

This evidence can be partially explained by an information asymmetries argument: if capital markets are opaque from an informational standpoint, there is a strong incentive for managers – the informed side of the market – to behave opportunistically and, therefore, to repurchase shares strategically, in order

to influence current stock prices making them to deviate from stock intrinsic values. In such a setup, investors – the less informed side of the market – interpret buybacks as a strategy for transferring wealth from both debtholders and minority shareholders to majority shareholders and corporate managers. Since investors anticipate this effect, share repurchases announcement are generally followed by sharp and consistent decreases in stock prices.

Italy is an ideal testing ground for these issues for in 1998, the Italian Government passed a new regulation on financial markets (Legislative Decree 28<sup>th</sup> February 1998, n. 58, better known as the “Draghi Act”) which re-organizes the whole financial sector activity including, among others, underwriting and brokerage activity on capital markets, and specific rules applying to listed companies. This reform introduced a wide range of “exit” and “voice” rights into the Italian system, in order to protect minority shareholders, and introduced rules for institutional investors and closed-end investment funds. Furthermore, the Draghi Act significantly empowered intelligence and enforcement activity of the Regulatory Authorities increasing the level and quality of information that listed companies are required to share with the market.

On share repurchases, the Draghi Act sets a specific procedure aimed at preventing speculative trading by corporate managers at minority shareholders expenses. More precisely, if a buyback doesn’t take the form of a public bid, but it is just an open market repurchase, the buyer company has to agree with Borsa Italia – the company managing Italian Stock Exchange – the criteria according to which the share repurchase has to take place. It is worth noticing that, before the regulatory change, there were no explicit rules safeguarding the homogeneity of treatment across all shareholders classes in case of share repurchases by imposing the use of a compulsory tender offer. More specifically, before the regulatory change, shares could be repurchased from single investors without an obligation of equal offer and treatment to all investors. This, intuitively, could determine significant differences in the quality and stability of cash flows across investors.

Finally, the new set of rules has introduced equal tax treatment for dividends and capital gains, levying a 12.5% flat tax on both incomes.

This regulatory breakthrough has apparently changed the rules of the game, introducing incentives for companies to consider buybacks as viable alternatives to cash dividends. We therefore state the following research hypothesis:

*Hp 1: After the regulatory change, share repurchases should become a substitute for dividends measured by the absolute and relative value and number of share repurchases.*

A corollary to the previous hypothesis is that, if the regulatory change has hit the target, investors

should show increased confidence in this market instrument. Therefore:

*Hp 2: reaction to share repurchases announcements should be positive after the regulatory change in both the short and long term.*

Under such a more transparent rule, companies may profit from the availability of an efficient mechanism. Accordingly, we state that:

*Hp 3: after the regulatory change, buybacks should be increasingly used as a payout mechanism, as measured by the number of companies repurchasing own shares and the overall number of yearly buybacks.*

In a more transparent environment, companies can effectively use share repurchases as a substitute to dividends: since investors are equally offered the chance of tendering shares in a repurchase, they have less rational reasons to interpret buybacks as a way to transfer wealth from uninformed to informed investors. Rather, we expect them to regard buyback announcements as undervaluation signals positively reacting in accordance with Hypothesis 2. Since firms can now anticipate this behaviour, they will have an incentive in repurchasing shares when the market price doesn't fully reflect the company value. Therefore, we state the following:

*Hp 4: share repurchases will be positively correlated with undervalued companies and*

### 3. Data and methodology

#### 3.1 Data

Given that no systematic data are available for Italy (as for most of Europe), we have collected buyback announcements by scanning public financial press and performing a word-specific software search for relevant keywords in the period January 1990 to December 2003. This methodology is consistent with Ikenberry et al. (2000). In our data collection we have analyzed all the relevant financial publications available for each fiscal year. Sample biases may exist whenever a listed company doesn't disclose timely the information about its governance decisions. Yet, since these decisions are usually taken during board meetings or shareholders meetings which carefully followed by the financial press, we believe the sample to be sufficiently accurate. Furthermore, our study focus on market reactions to public announcements, therefore even small sample biases would not affect the significance and interpretation of our results.

The collection process resulted in 816 announcements over a 13 years period which represent, to the best of our knowledge, a consistent figure of the total number of announced repurchases.

**[Insert Table 1 here]**

Summary statistics show that the introduction of the regulation reform has resulted in several non-negligible effects: first, the mean number of repurchases announced has soared 37,4% from 51,4 to

70,6. Significance based on two-tailed Z-test –  $P(Z < z = 0,009)$  allow us to reject the zero difference null hypothesis, thus suggesting an increase in the propensity of managers to adopt this mechanism in their financial structure decisions. Second the mean number of firms announcing a buyback increases to 46,4 firms from the original 28,3, or 63,9%, up, further suggesting that the use of buybacks has become increasingly common cross-sectionally. Third the number of companies announcing only one buyback during the sample period has increased from 51,2% to 61,8% which, even after controlling for the sample size, represent a significant increase and a signal that the use of buyback announcements has become a more widespread payback option.

We further integrated the database by collecting historical accounting data for every single firm announcing a repurchase at every single date. Specifically we extracted from the Thomson Financial-Datastream database, information on ROE, Net profits, Dividend yield, Size, Leverage, Price-to-book ratio and Beta for every firm for the whole sample period.

**[Insert Table 2 here]**

Data show that the reform has played a significant role in changing the characteristics of repurchases actions and arguably motivations. Size of companies announcing repurchases has increased significantly from a median figure of 1,4 bn/euro up to 2,5. More impressively, profitability ratios like ROE and P/BV have increased suggesting an increase in the intrinsic values of companies pursuing repurchases programs. The modest reduction in betas, confirm that, for any given level of risk, companies have improved their profitability ratios. Consistent with the substitution hypothesis, dividend yields have lowered, suggesting that repurchases have somehow replaced straight cash payments to shareholders.

#### 3.1 Methodology

Following a classical event study methodology, we first calculate the abnormal returns (AR<sub>i</sub>) of the  $n$  equity securities constituting the selected sample, by implementing a standard one-factor CAPM regression:

$$r_{i,t} = \alpha_{i,t} + \beta_{i,t} \times r_{m,t} + \varepsilon_{i,t} ,$$

where

$r_{i,t}$  = return of the  $i^{\text{th}}$  equity security in period  $t$ ;

$\alpha_{i,t}$  = regression coefficient;

$\beta_{i,t}$  = regression coefficient, measuring the sensitivity of the  $i^{\text{th}}$  equity security to market portfolio returns in period  $t$ ;

$r_{m,t}$  = return of the market portfolio in period  $t$ ;

$\varepsilon_{i,t}$  = random error.

Since:

$$\alpha_{i,t} = rf_t \times (1 - \beta_{i,t}),^1$$

we derive abnormal returns for the  $i^{\text{th}}$  equity security in period  $t$  in the following way:

$$AR_{i,t} = r_{i,t} - rf_t - \beta_{i,t} \times (r_{m,t} - rf_t)$$

where  $AR_{i,t}$  shows the divergence existing between the observed return for the  $i^{\text{th}}$  equity security in period  $t$  and its expected return, as predicted by the standard CAPM. Beta estimates for the selected time period, observed returns for the  $n$  above mentioned equity securities and yield to maturities on 10-years Italian treasury bonds - as proxy for risk free rates - are extracted from the Datastream database.

Finally, following Fama *et al.* (1969) procedure, we calculate the cumulative abnormal returns for the  $i^{\text{th}}$  equity security ( $CAR_{i,t}$ ) surrounding the share repurchases announcements over two different event windows, the first one starting 3 days before and ending 2 days after the announcement itself, the second one starting 3 days before and ending 117 days after the buyback.

$$CAR_{i,t} = \sum_{t=1}^n AR_{i,t}$$

Empirical evidence reported in Table 3 indicates that both ARs and CARs have significantly changed over time, as predicted by Hypotheses 2.

### [Insert Table 3 here]

Before the introduction of the capital markets' reform, the announcement effect measured by the AR was not significantly different from zero but a positive CAR of slightly over 1% is registered in a 5 days CAR window, suggesting that the market didn't react to this piece of information immediately but incorporated some positive effect due probably to portfolios rebalancing (the "spike" on the 5 days CAR) as confirmed by the long term CAR ( $CAR_{120}$ ) which was consistently large and negative. Differently, after the reform the AR and CAR patterns are consistently larger in size and positive in sign. The most significant evidence is on long term CAR pattern: by looking at the 6 months CAR figure ( $CAR_{120}$ ) we notice that the mean abnormal return after the introduction of the reform reverts from negative to positive with a cumulative positive net effect of 2,54%

Mapping the AR and CAR patterns over time allows drawing further inferences.

### [Insert Figure 1 here]

While the AR pattern is substantially homogeneous with almost identical means and standard deviations in the two periods, CARs are surprisingly different:

companies announcing repurchases after the introduction of the reform, show a substantial positive CAR over a six months time window, while companies performing the same strategy before the law show a negative CAR. The Standard Z-test for differences in the mean of the CARs show a  $P(Z < z = 0,000)$  allowing us to reject the hypothesis of normal difference in the two means.

This evidence strongly suggests that the change in regulation determined that announcing and executing repurchases has become efficient mostly for undervalued companies showing solid financial ratios which is also consistent with evidence on the modification of the accounting ratios expressed by announcing companies. These results support the theory of strategic use of payout policy when information is asymmetrically distributed as in Miller and Rock (1984) and Ofer and Thakor (1987).

This evidence is supported also by the relative analysis of dividend yields presented in Table 2 which show to be decreasing over time with increasing profitability ratios. This evidence supports Hypothesis 4 i.e. that buybacks are announced only when a company's market price doesn't incorporate the full firm value therefore making repurchases an optimal solution for paying back money to shareholders while maximizing company value.

## 4. Drivers of abnormal returns

Panel A, B, C of Table 4 report full sample results obtained by regressing AR, 5 days CARs and 120 days CARs on a set of value drivers reported in Vermaelen (1981), Ikenberry *et al.* (1995), (2000), Grullon and Ikenberry (2000). In particular our independent variables are: Dividends, ROE, Price-to-Book Value, Net Profit, Size, Leverage, Beta and the number of announced repurchases in one year. We complete the test design by introducing four dummy variables to control for the type of share announced to be repurchased: DUMMYORD, DUMMYPRIV, DUMMYRISP and DUMMYRNC, indicate ordinary shares, preferred shares with limited voting rights, convertible preferred shares with no voting rights and preferred shares with no voting and conversion rights, respectively. Finally, we introduce an additional dummy to control whether we can reject the hypothesis that differences in repurchases patterns are generated conditional on the announcement date (DUMMY\_TUF). This last dummy variable takes a value of one if the announcement has been published before the change in law regulation and 0 otherwise.

The functional form of our equations goes as follows:

$$AR, CAR_5, CAR_{120} = \alpha + \beta_1 DIV + \beta_2 Net\_PROFIT + \beta_3 SIZE + \beta_4 LEVERAGE + \beta_5 ROE + \beta_6 P/BV + \beta_7 Beta + \beta_8 DUMMYORD + \beta_9 DUMMYRNC + \beta_{10} DUMMYRISP + \beta_{11} DUMMYPRIV + \beta_{12} DUMMYTUF + \epsilon$$

### [Insert Table 4 Panel A here]

<sup>1</sup> See Elton and Gruber (1995).

Regressions results show a generally modest R-squared for every regression, but a statistically good significance, as testified by the good F-values. Independent variables parameters are generally non significant: for AR regression with only leverage as a significant parameter. The negative sign seem to suggest that on the overall sample, firms with higher degree of initial leverage (therefore increase additionally the weight of debt in their financial structure) are not generally well rewarded by the market.

**[Insert Table 4 Panel B here]**

For 5-days CARs, beta is the only significant parameter and its sign is positive. This is rather surprising since it suggests that riskier firms announcing buybacks may convey a signal to the market of inherent increased stability in their business combination (higher degree of confidence by the management) or, more simply, a positive private information on the future prospects which is more valuable for higher risk (and therefore higher return) firms.

**[Insert Table 4 Panel C here]**

For 120-days CAR we obtain more interesting results: ROE and P/BV parameters are significant at the 1% level and both are positive in sign, consistently again with the undervaluation hypothesis. Significance for the overall regression is high and also the explanatory power is the largest across the three regressions.

Summary statistics for partial regressions signal robustly that across our sample undervaluation seem to be the main motivation for companies announcing share repurchases programs.

To further check the robustness of our results we resampled our data by adopting a standard bootstrapping technique as in Efron (1979) and Efron and Tibshirani (1993). We allowed 500 quartile replications thus generating a sufficiently large pseudo-population. Results strongly support the initial evidence, indicating that, after the reform, buybacks announcements are associated with stronger market reactions the soundest is the inherent firm's profitability measured by ROE and P/BV. This test provides additional evidence that when regulation is more transparent and information more effectively shared among investors, dividends can be substituted by share repurchases and this is more frequently observed when stocks are relatively undervalued.

**[Insert Table 5 here]**

**5. Conclusions and suggestions for future research**

Our analysis has focused on motivations behind share repurchases announcements. Traditionally, several alternative explanations exists with at least two of

them playing a leading role: the substitution hypothesis stating that, buybacks can be considered an alternative solution to dividends for giving back cash to shareholders and the undervaluation hypothesis which indicates that when a company is undervalued (or the managers believe so) it may be worth buying back shares in order to maximize shareholder value, increase company control reduce the risk of hostile takeovers.

In 1998 Italy has introduced a regulatory change, which, among others, outlined more stringent and transparent rules for share repurchases. This provides an ideal event study testing ground for buybacks hypotheses, because the new regulation levels tax treatment of dividends and capital gains, offers equal treatment of shareholders by introducing compulsory tender offers and introduces higher standards of corporate governance transparency for companies. Given this setup, we have collected a unique database to tests the major repurchases hypotheses obtaining a strong case for both the substitution and the undervaluation hypotheses. In particular we show that the new regulation by providing more transparency and equalizing tax treatment has made share repurchases a viable alternative to dividends. Companies have reacted to the new framework by increasing the number of repurchases and, more generally, showing a more widespread use of buybacks. This behaviour is far stronger for undervalued companies, which provides additional evidence on the undervaluation hypothesis.

The new set of rules has been favourably received by the market that shows a positive short and long term price reaction to buybacks announcements. Before the introduction of the regulatory change the reaction was negative indicating that the market understood share repurchases as a way to funnel value to informed shareholders.

Our analysis couldn't control for actual repurchases as in Ikenberry et al. (2000) since there is no binding requirement to report this information. Yet, our results and anecdotal evidence suggest a similar pattern as in Ikenberry et al. (2000) allowing us to conclude that in a sufficiently efficient and transparent market, if taxes do not distort decisions, investors are indifferent to receive cash or shares as a payout mechanism and consider the choice between the two as a signal on the overall, long-term company value.

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## Appendices

Table 1

Share repurchases announcement descriptive statistics (1990-2003)

This table presents summary statistics on the buybacks announcements between 1990 and 2003. The three panels presents descriptive statistics on share repurchases announcements for the full sample, before and after the regulatory change respectively a-b reports Z-test values for differences in mean between the two sub-samples. Significance at 1%, 5% and 10% level is denoted by \*\*\*, \*\*, \* respectively.

<b>Full sample</b>						
Year	Numb. Buybacks	Numb. repurchasing companies	% Companies with 1 buyback	% Companies with >1 buyback	Shares repurchased:	
					% Ordinary shares	% Non ordinary shares
Total (a+b)	816	0				
Mean value	58,3	34,8	55,0%	45,0%	75,7%	24,3%
<b>Pre-reform</b>						
Year	Numb. Buybacks	Numb. repurchasing companies	% Companies with 1 buyback	% Companies with >1 buyback	Shares repurchased:	
					% Ordinary shares	% Non ordinary shares
1990	41	23	60,9%	39,1%	68,3%	31,7%
1991	43	25	64,0%	36,0%	74,4%	25,6%
1992	56	24	29,2%	70,8%	71,4%	28,6%
1993	40	25	64,0%	36,0%	70,0%	30,0%
1994	32	19	47,4%	52,6%	65,6%	34,4%
1995	56	26	30,8%	69,2%	69,6%	30,4%
1996	60	32	53,1%	46,9%	81,7%	18,3%
1997	65	39	59,0%	41,0%	70,8%	29,2%
1998	70	42	52,4%	47,6%	80,0%	20,0%
Sub total (a)	463		-	-	-	-
Mean value	51,4	28,3	51,2%	48,8%	72,4%	27,6%
<b>Post reform</b>						
Year	Numb. Buybacks	Numb. repurchasing companies	% Companies with 1 buyback	% Companies with >1 buyback	Shares repurchased:	
					% Ordinary shares	% Non ordinary shares
1999	77	42	54,8%	45,2%	64,9%	35,1%
2000	82	55	56,4%	43,6%	78,0%	22,0%
2001	61	38	57,9%	42,1%	88,5%	11,5%
2002	66	47	70,2%	29,8%	90,9%	9,1%
2003	67	50	70,0%	30,0%	85,1%	14,9%
Sub total (b)	353		-	-	-	-
Mean value	70,6	46,4	61,8%	38,2%	81,5%	18,5%
a-b (Z-test)	-2,589***	-4,593***		-1,912**		-1,815**

**Table 2**  
Summary accounting statistic

This table shows summary financial information on the companies included in the database and extracted from Thomson Financial DataStream. Absolute figures (size, profits) are in euro/000, Relative figures share in percentage. Beta is measured as per OLS regression leverages is the gearing ratio define din DataStream. Z- test significance at the 1%, 5% and 10% level is denoted by \*\*\*, \*\*, and \* respectively.

	Pre Reform (a)						
	Divi. Yield	Net Profit	Size	Leverage	ROE	P/BV	Beta
Mean	3,45	119890,20	11425331,22	27,76	1,48	1,80	0,80
Standard Dev	5,16	312389,76	22567925,55	23,37	8,86	2,56	0,30
Median	2,22	21920,00	1462970,00	23,35	1,01	1,21	0,81
Top 25th	3,80	73663,30	7960485,00	43,58	2,36	1,88	1,03
Lower 25 th	1,23	4556,05	471746,00	6,37	0,34	0,75	0,60
	Post Reform (b)						
Mean	2,85	197157,50	24155098,81	31,00	2,96	2,06	0,79
Standard Dev	3,99	1057241,23	48531662,55	26,29	12,77	2,31	0,33
Median	2,09	22395,00	2468019,00	25,97	1,52	1,38	0,78
Top 25th	3,66	127692,00	20439025,51	53,69	4,42	2,23	0,98
Lower 25 th	1,19	3842,00	574202,50	5,02	0,41	1,05	0,55
a-b (Z-test)	1,533*	-1,189	-3,998***	-1,576	-1,583*	-1,298	0,379

**Table 3**  
Abnormal and Cumulative Abnormal returns 1990-2003

This table reports abnormal and cumulative abnormal returns calculated over a 5 days window (-3;+2) and a 120 days window (-3;+117) for the full sample, thepre reform sub sample and the post reform sub sample. A-b reports Z-Test score for the difference in means against the null hypothesis of zero difference. Significance at the 1%, 5% and 10% level is denoted by \*\*\*, \*\* and \* respectively.

	AR (5 days)	AR (120 days)	CAR (5 days)	CAR (120 days)
Full sample	0,200% (0,225%)	0,001% (0,12%)	0,790% (6,29%)	0,092% (23,94%)
Pre reform (a)	0,234% (1,121%)	-0,017% (0,186%)	1,172% (5,605%)	-2,118% (22,770%)
Pre reform (b)	0,163% (1,460%)	0,020% (0,229%)	0,778% (8,307%)	2,542% (27,761%)
a-b (Z-test)	0,701	-2,293**	0,701	-2,356***



Table 4 Panel A

**Buyback announcement abnormal returns**

This table reports multivariate regression results as standardized beta coefficients, for the full sample and the two sub-samples obtained by dividing the data in PRE and POST Law reform i.e. July 1st 1998..AR is the market model abnormal return. Variables are measured as the reported balance sheet values or the announcement date market values. t-stat are in parentheses. \* indicates significance at 5%, \*\* at 1% levels

	Announcement date Abnormal returns														
	Full sample					PRE reform					POST reform				
	1	3	5	7	all	1	3	5	7	all	1	3	5	7	all
ROE	0,000 (-0,91)	0,000 (-0,85)	0,000 (-0,86)	0,000 (-0,89)	0,000 (-1,04)	0,000 (0,50)	0,000 (0,48)	0,000 (0,51)	0,000 (0,46)	0,000 (0,49)	0,000 (-1,27)	0,000 (-1,20)	0,000 (-1,21)	0,000 (-0,93)	0,00 (-0,85)
P/BV		0,000 (0,19)	0,001 (0,15)	0,000 (-0,56)	0,000 (-0,59)		0,000 (-0,53)	0,000 (-0,61)	0,000 (-0,74)	0,000 (-0,58)		0,001 (0,54)	0,001 (0,56)	0,000 (-0,12)	0,00 (0,07)
Dividend Yield		0,000 (-0,31)	0,000 (-0,37)	0,000 (-0,62)	0,000 (-0,40)		0,000 (0,25)	0,000 (0,31)	0,000 (0,30)	0,000 (0,48)		-0,004 (-0,51)	0,000 (-0,60)	-0,001 (-0,89)	0,00 (-0,74)
Net profit			0,000 (0,70)	0,000 (0,81)	0,000 (0,74)			0,000 (-0,42)	0,000 (0,17)	0,000 (0,04)			0,000 (0,71)	0,000 (0,84)	0,00 (0,85)
Size			0,000 (0,18)	0,000 (0,39)	0,000 (0,00)			0,000 (-1,60)	0,000 (-1,52)	0,000 (-1,44)			0,000 (0,53)	0,000 (0,32)	0,00 (0,31)
Leverage				-0,002 (-1,83)	-0,001 (-1,96)				0,000 (-0,85)	0,000 (-0,86)				-0,001 (-1,34)	0,00 (-1,34)
Beta				0,006 (0,37)	0,008 (1,88)				-0,007 (-1,25)	-0,006 (-1,13)				0,171 (2,36)*	0,02 (2,84)**
NUM_BB					-0,003 (-0,90)					-0,002 (-0,50)					0,00 (-0,73)
DUMMY_ORD					0,001 (0,13)					0,010 (1,56)					0,00 (-0,08)
DUMMY_RNC					0,003 (0,48)					0,013 (1,89)					0,00 (0,17)
DUMMY_PRIV					0,000 (-0,02)					0,012 (1,48)					0,00 (0,16)
DUMMY_TUF					0,007 (2,59)**										
Constant	0,002 (1,71)	0,003 (1,49)	0,030 (1,30)	0,027 (0,65)		0,000 (0,04)	0,001 (0,30)	0,002 (0,94)	0,009 (1,86)		0,005 (2,04)*	0,006 (1,51)	0,005 (1,18)	-0,001 (-0,19)	
F-test	0,830	0,340	0,330	0,920	1,760	0,25	0,23	0,95	1,08	0,74	1,61	0,79	0,68	1,51	1,84
R <sup>2</sup>	0,002	0,002	0,003	0,013	0,041	0,001	0,003	0,018	0,028	0,031	0,006	0,009	0,013	0,043	0,081
No. Of obs.	602	602	602	602	602	315	315	315	315	315	287	287	287	287	287

**Table 4 Panel B**

**Buyback announcement abnormal returns**

This table reports multivariate regression results as standardized beta coefficients, for the full sample and the two sub-samples obtained by dividing the data in PRE and POST Law reform i.e. July 1st 1998. 5-days CARs are the market model abnormal return over a -2;+3 days event window. Variables are measured as the reported balance sheet values or the announcement date market values. t-stat are in parentheses. \* indicates significance at 5%. \*\* at 1% levels

	5-days Cumulative Abnormal Returns														
	Full sample					PRE reform					POST reform				
	1	3	5	7	all	1	3	5	7	all	1	3	5	7	all
ROE	0,000 (0,73)	0,000 (0,73)	0,000 (0,70)	0,000 (0,97)	0,000 (0,97)	0,001 (1,15)	0,001 (1,36)	0,001 (1,35)	0,001 (1,31)	0,001 (1,35)	0,000 (0,25)	0,000 (0,15)	0,000 (0,14)	0,000 (0,52)	0,000 (0,64)
P/BV		0,002 (0,74)	0,001 (0,62)	0,000 (0,27)	0,000 (0,32)		0,003 (1,84)	0,002 (1,50)	0,002 (1,39)	0,003 (1,72)		-0,001 (-0,48)	-0,001 (-0,46)	-0,003 (-1,42)	-0,003 (-1,43)
Dividend Yield		-0,001 (-0,49)	-0,001 (-0,59)	-0,001 (-0,94)	-0,001 (-0,85)		-0,001 (-0,72)	-0,001 (-0,74)	-0,001 (-0,77)	-0,001 (-0,49)		0,000 (-0,13)	0,000 (-0,26)	-0,001 (-0,59)	-0,008 (-0,63)
Net profit			0,000 (1,52)	0,000 (1,80)	0,000 (1,81)			0,000 (0,63)	0,000 (0,65)	0,000 (-0,02)			0,000 (1,31)	0,000 (1,95)	0,000 (2,01)*
Size			0,000 (-0,10)	0,000 (-0,28)	0,000 (-0,27)			0,000 (-1,92)	0,000 (-1,80)	0,000 (-1,65)			0,000 (0,58)	0,000 (0,17)	0,000 (0,50)
Leverage				0,000 (-1,39)	0,000 (-1,47)				0,000 (-0,33)	0,000 (-0,04)				-2E-04 (-1,15)	0,000 (-1,33)
Beta				0,214 (2,18)*	0,025 (2,52)**				0,001 (0,03)	-0,001 (-0,09)				0,355 (2,72)**	0,041 (3,28)
NUM_BB					-0,007 (-1,05)					0,010 (0,95)					-0,020 (-2,06)
DUMMY_ORD					0,003 (0,29)					-0,005 (-0,29)					0,137 (0,97)
DUMMY_RNC					0,005 (0,39)					0,002 (0,13)					0,140 (0,78)
DUMMY_PRIV					0,000 (0,03)					0,017 (0,77)					-0,012 (-0,43)
DUMMY_TUF					0,002 (0,33)										
Constant	0,007 (1,85)	0,006 (1,11)	0,006 (0,94)	-0,001 (-0,14)		0,009 (2,38)*	0,006 (0,93)	0,011 (1,51)	0,012 (0,85)		0,003 (0,54)	0,009 (0,87)	0,005 (0,47)	-0,006 (-0,51)	
F-test	0,53	0,71	0,75	1,59	2,08	1,32	2,06	1,99	1,43	1,57	0,06	0,08	0,56	1,93	2,63
R <sup>2</sup>	0,001	0,003	0,007	0,022	0,048	0,004	0,023	0,036	0,037	0,063	0,000	0,001	0,011	0,055	0,112
No. Of obs.	602	602	602	602	602	315	315	315	315	315	287	287	287	287	287

Table 4 Panel C

**Buyback announcement abnormal returns**

This table reports multivariate regression results as standardized beta coefficients, for the full sample and the two sub-samples obtained by dividing the data in PRE and POST Law reform i.e. July 1st 1998. 120-days CARs are the market model abnormal return over a -2;+120 days event window. Variables are measured as the reported balance sheet values or the announcement date market values. t-stat are in parentheses. \* indicates significance at 5%, \*\* at 1% levels

	120-days Cumulative Abnormal Returns														
	Full sample					PRE reform					POST reform				
	1	3	5	7	all	1	3	5	7	all	1	3	5	7	all
ROE	0,031 (3,04)**	0,030 (2,70)**	0,029 (2,68)**	0,003 (2,84)**	0,003 (2,80)**	0,002 (1,62)	0,002 (1,54)	0,003 (1,60)	0,003 (1,68)	0,003 (1,64)	0,003 (2,32)*	0,003 (1,99)*	0,003 (1,97)*	0,003 (2,47)*	0,003 (2,56)**
P/BV		0,137 (2,96)**	0,014 (2,91)**	0,015 (3,41)**	0,015 (3,26)**		0,137 (2,59)**	0,015 (2,73)**	0,015 (2,79)**	0,016 (2,92)**		0,013 (1,61)	0,013 (1,60)	0,014 (1,86)	0,014 (1,92)
Dividend Yield		0,003 (0,82)	0,003 (0,83)	0,003 (0,89)	0,003 (0,86)		0,001 (0,11)	0,001 (0,25)	0,001 (0,27)	0,001 (0,25)		0,005 (0,91)	0,005 (0,89)	0,005 (1,00)	0,005 (1,00)
Net profit			0,000 (0,25)	0,000 (0,11)	0,000 (0,00)			0,000 (-1,57)	0,000 (-0,83)	0,000 (-1,31)			0,000 (0,60)	0,000 (0,43)	0,000 (0,45)
Size			0,000 (-0,20)	0,000 (-0,79)	0,000 (-0,98)			0,000 (0,64)	0,000 (-0,84)	0,000 (-0,97)			0,000 (0,03)	0,000 (-1,13)	0,000 (-0,92)
Leverage				0,001 (1,43)	0,001 (1,45)				0,000 (0,26)	0,000 (0,68)				0,001 (1,89)	0,001 (1,78)
Beta				-0,051 (-1,41)	-0,040 (-1,12)				-0,116 (-2,27)*	-0,122 (-2,35)*				0,031 (0,59)	0,046 (0,90)
NUM_BB					-0,011 (-0,41)					0,027 (0,79)					-0,050 (-1,22)
DUMMY_ORD					-0,021 (-0,53)					0,019 (0,33)					-0,035 (-0,60)
DUMMY_RNC					-0,065 (-1,38)					-0,035 (-0,55)					-0,048 (-0,65)
DUMMY_PRIV					-0,004 (-0,19)					0,087 (1,19)					-0,048 (-0,65)
DUMMY_TUF					-0,038 (1,72)										
Constant	-0,016 (3,04)**	-0,047 (-2,54)**	-0,478 (-2,43)*	-0,017 (-0,52)		-0,03 (-2,04)*	-0,497 (-2,23)*	-0,039 (-1,65)	0,044 (0,97)		-0,003 (-0,16)	-0,041 (-1,34)	-0,046 (-1,38)	-0,081 (-1,55)	
F-test	9,22	5,94	3,59	3,54	2,59	2,61	3,19	2,85	2,78	2,49	5,40	2,73	1,73	2,11	1,75
R <sup>2</sup>	0,016	0,033	0,033	0,047	0,059	0,009	0,035	0,051	0,069	0,096	0,020	0,032	0,034	0,060	0,077
No. Of obs.	602	602	602	602	602	315	315	315	315	315	287	287	287	287	287

**Table 5**

Buyback announcement boots rapped abnormal returns

This table reports boots rapped multivariate regression as standardized beta coefficients, results for the full sample for Abnormal Returns, 5-days and 120-days Cumulative Abnormal Returns. Boots rapping has been performed by 500 quartile replications of the original sample 120-days CARs are the market model abnormal return over a -2;+120 days event window. Variables are measured as the reported balance sheet values or the announcement date market values. T-stat are in parentheses. \* indicates significance at 5%, \*\* at 1 % levels.

	AR	CAR_5	CAR_120
ROE	0,000 (-0,86)	0,000 (1,05)	0,004 (2,90)**
P/BV	0,000 (-0,07)	0,001 (-0,440)	0,005 (-0,750)
Dividend Yield	0,000 (0,29)	0,000 (0,170)	0,005 (1,41)
Net profit	0,000 (1,69)	0,000 91,84)	0,000 (0,15)
Size	0,000 (-0,50)	0,000 (-0,52)	0,000 (0,16)
Leverage	0,000 (-0,79)	0,000 (0,15)	0,000 (-0,60)
Beta	-0,006 (-1,18)	0,022 (1,55)	0,021 (0,50)
NUM_BB	-0,002 (-0,66)	-0,008 (-1,03)	-0,008 (-0,35)
Dummy_ORD	-0,011 (-2,00)	-0,035 (-1,35)	-0,043 (-0,90)
Dummy_RNC	-0,008 (-1,35)	-0,036 (-1,33)	-0,137 (-2,66)**
Dummy_PRIV	-0,010 (-1,50)	-0,039 (-1,36)	-0,093 (-1,48)
Dummy_TUF	0,001 (0,49)	-0,004 (-0,54)	0,057 (2,02)
Constant	0,007 (0,88)	0,000 (-0,00)	-0,102 (-1,67)
Raw sum of deviations	7,393506	18,42543	75,27601
Pseudo R <sup>2</sup>	0,06	0,03	0,05
No.Of obs.	602	602	602

Figure 1

**Abnormal and Cumulative Abnormal Returns 1990-2003**

This figure plots abnormal and cumulative abnormal returns calculated over a 5 days window (-3;+2) and a 120 days window (-3;+117) for the full sample, the pre-reform subsample and the post reform sub sample.

