Equity Rights Issue and Dilutive Effect: Evidence from Italian Listed Companies

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Abstract

This article studies the stock price reaction to Seasoned Equity Offerings (SEOs) through the right issue technique, for Italian listed companies in the period between 2007 and 2016. A few days before the starting date of the capital increase operation, investors are provided with a complete information set of the final characteristics of the equity offerings. The study investigates whether this further information is price sensitive. An event study analysis is performed around two price sensitive dates: the "announcement date" of the equity issue and the "communication date" of its final characteristics. It also focuses on the reasons underlying the offer and on the industry effect. The findings show a significant negative abnormal return at the communication date for the full sample and for companies collecting financial resources for "Corporate Finance Transaction", for "Capital Adequacy" and for "Restructuring". A negative market reaction for all sectors is observed as well. Eventually, the article examines the possible causes underlying the negative stock price reaction at the communication date. The results suggest that the dilutive effect is the main explanation to the stock price overreaction.

1. Introduction

The stock price reaction to Seasoned Equity Offerings (SEOs) has been studied by the researchers for several years providing the financial community with Signaling, Agency, and Adverse Selection theories. Several studies have been focused on the negative stock price reaction to the news of a capital increase to investigate the magnitude and the reasons underlying. However, most of them have been concentrated only on the US market, where capital increases occur mostly through the public offer technique, excluding the right issue option, getting to few studies about the market reaction through the right issue technique. De Vito et al. (1991), Bigelli (1996) and Bolognesi and Gallo (2013) are three of the main studies focused on the Italian context. Nevertheless, it is easy to identify some reasons suggesting the need for new studies. First, the reference framework is different, since in the last years, most of the capital increases has been driven by purposes of restructuring and guaranteeing going concern, rather than to collect financial resources for growth opportunities. Finally, especially for Italian banks, the regulation has imposed new stricter capital requirements, leading them to carry out numerous capital increases during the crisis.

The study, focusing on the Italian context during the period between 2007 and 2016, examines the market reaction around two different price sensitive dates: the "announcement date" (AD) of the equity issue and the "communication date" (CD) of its final characteristics. While at the announcement date investors are given only general information, such as the amount of equity offered and the period in which the operation will take place, at the communication date investors are provided with a more complete information set, such as the issue price and the dilutive coefficient of the existing equity stake. Since this last information set is made public only a few days before the starting of the capital increase operations, we study the stock price reaction to this information. Our hypothesis is that at the communication date investors are made more aware of the dilutive effect and react

more negatively than they do at the announcement date to incorporate this effect. Hence, we perform a comparative analysis of market reaction between the two dates through the event study methodology. For each event date, we also study the market reaction considering the "Reasons for the offer" and "Industry effects". Lastly, we investigate the possible causes underlying the overreaction to verify whether the dilutive effect contributes to explain the higher negative market price reaction at the communication date.

This article contributes to filling in the gap in the existent literature, since in the Italian context during the reference period it examines the stock price overreaction at the communication date of the final characteristics of the capital increase operations. It also provides an analysis by reason for the offer and by sector and investigates the possible underlying causes. The study strongly supports the enforcement of the "rolling model" implemented by the Italian Supervisory Authority for the Financial Market (CONSOB[1]).

The paper is structured as follows. Section 2 illustrates the theoretical framework of capital increases through right issue technique. Section 3 reviews the main streams of literature. Section 4 describes the sample. Section 5 describes the methodology. Section 6 details the results of the empirical analysis and Section 7 reports the conclusions.

2. Theoretical Framework: The Equity Rights Issues in the Italian Context

2.1 The Theory Underlying the Equity Rights Issue

Companies are used to raise capital through three main techniques:

- Private placement: companies directly assign the new securities to a relatively small number of institutional investors through a confidential negotiation between the parties. This procedure often takes place prior to listing on the financial market and shows a high degree of flexibility in the amount, characteristics, timing and costs.

- Public offer: the new shares are issued to all investors without offering an option to existing shareholders. This issuance method does not guarantee the existing shareholders to keep their stake unchanged and treats them on a par with other investors. In a public offer, the subscription price may be relevant. If the company sells the shares at discount with respect to the actual market price of the security, the new buyer will benefit at the expense of existing shareholders. This is the most common technique in the US market, where public companies prevail.

- Right issue: the new shares are offered to the existing shareholders, who have the option to subscribe the share capital increase proportionally to their current holdings. This is the most common technique in Italy (and more generally in Europe), as it allows shareholders not to dilute their stake in the company capital. An option right is offered for each share held by investors before the beginning of the capital increase operation. Since the option right is separated from the security, shareholders have two alternatives: to exercise these option rights and under a fixed issue ratio subscribe the new shares issued, or to sell the option rights on the financial market. In case the shareholders exercise the option rights, they undertake to pay the subscription price, thus receiving the newly issued shares at the end of the subscription period that usually lasts two weeks. Otherwise, their existing shareholding will be diluted post issue of new shares. If the offer has not been entirely subscribed at the end of the subscription period, an additional subscription period is envisaged. Shareholders who exercise their option rights have also the right to purchase the remaining ones. Only if the existing shareholders do not purchase these unexercised option rights, the latter are traded on the regulated market and might be acquired by new investors. Given the features of the capital increase, namely the issue ratio, the subscription price and the last cum-right price, in case of only one category of shares issued, the theoretical ex-right price firstly traded is:

$$P_{ex}^{Theor} = \frac{v * P_{cum} + n * P_{sub}}{v + n} \tag{1}$$

where is the theoretical ex-right price (TERP), P_{cum} is the last cum-right price, that is the security market price of the last trading day before the starting of the rights issue, P_{sub} is the subscription price of one share, v is the number of existing shares and n is the number of new shares to be issued. Therefore, the theoretical value of the options right (D) is given by:

$$D = P_{cum} - P_{ex}^{Theor} \tag{2}$$

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[1] CONSOB stands for Commissione Nazionale per le Società e la Borsa.

In the equity rights issue, compared to the public offer, the subscription price is irrelevant since, all else being equal, a lower subscription price compared to the last cum-right price is offset by a greater theoretical value of the options right, so that the same cash flow is guaranteed. Generally, the subscription price is fixed at a discount with respect to the last cum-right price for guaranteeing the success of the equity offering. Moreover, the higher is the discount, the greater is the dilutive effect on the price of the existing shares. During the subscription period, the options right attached to the share is separated and the two of them are traded separately. Hence, the no-arbitrage condition states that it is indifferent to investors to purchase securities directly on the market at an ex-right price or to purchase the option right and subscribe the capital increase, so the following equality should be respected:

$$P_{ex} = P_{sub} + D\frac{v}{n} \tag{3}$$

where P_{ex} is the ex-right price, that is the security price without the option right during the subscription period and v/n is the number of option rights required to subscribe a new share to be issued. For each security price, the option right price is therefore given by:

$$D = (P_{ex} - P_{sub})\frac{n}{v} \tag{4}$$

where the ratio n/v is the issue ratio. The options right is a "call option", where the security is the underlying stock, the strike price is the subscription price of the new shares to be issued and the time value depends on the length of the subscription period. If the security price goes below the subscription price, the implicit call option will be out of the money and investors will not subscribe the new shares to be issued, as they could buy the same number of shares on the market at a lower price than the subscription price.

2.2 The Highly Dilutive Equity Rights Issue in Italy

In the last few years, in Italy, the dilutive effect in the rights issues has become extremely significant since several capital increases have been mainly undertaken to guarantee the going concern. Starting from 2009, special capital increase operations, that CONSOB has defined "Capital increases with significant dilutive effect[2]", have been carried out (23 transactions between 2009 and 2014[3]). The capital increase operations with significant dilutive effect are characterized by a high issue ratio and by a significant gap between the last cum-right price and the subscription price of the new shares. To identify these potential dilutive effects, the supervisory authority uses the K factor, which measures the degree of dilution:

$$K\ factor = \frac{P_{ex}^{Theor}}{P_{cum}} \tag{5}$$

This factor is inversely proportional to the degree of dilution of the operation, therefore the maximum level of dilution corresponds to a value of the K factor near zero. CONSOB set a very conservative threshold for the K factor, equal to 0.3[4], below which a rights issue has a significant dilutive effect.

Consequently, following several public consultations, the supervisory authority has therefore introduced a corrective measure aimed at mitigating the significant dilutive effect. The so-called "rolling model" was implemented on 15 December 2016, in order to mitigate the significant price volatility during the offer period. "The "rolling model" consists of making the newly issued shares stemming from the subscription rights available on each day of the rights issue period, from day three (T+2) on, instead of only at the end of the operation, as foreseen under the ordinary model" (CONSOB, 2016). In this way, the rolling model makes it possible to carry out arbitrage activity between shares and subscription rights from the starting day of the rights issue, allowing to solve the price anomalies during the subscription period[5].

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[2] CONSOB – Capital Increases with significant dilutive effect – Consultation paper, 7 August 2014.

[3] As reported by CONSOB, examples of highly dilutive capital increase are settled by Saipem Spa in January 2016, by Banca Monte dei Paschi di Siena Spa in 2015 and 2014, by Fondiaria SAI Spa in 2012, by Seat Pagine Gialle Spa and Tiscali Spa in 2009.

[4] CONSOB – Aumenti di Capitale con Rilevante Effetto Diluitivo – Esiti delle Consultazioni, 28 Aprile 2016.

[5] Further details concerning the arbitrage activity are set in Communication no. 0088305 released by CONSOB.

3. Literature Review

Previous studies have explored the market reaction following the operations of the capital increase in many ways. Three main branches of research can be distinguished: Signaling, Agency and Adverse Selection theories. Apart from this latter, there are also some recent studies carried out after the financial crisis that examine also some sectors, such as the banking sector, due to the strict banking supervision on the regulatory capital. In addition, in the Italian context, further researches have been implemented following some capital increase operations, which have involved several changes in the handling of SEOs.

The Signaling theory focuses on collecting financial resources when the stock overvaluation prevails. According to Myers and Majluf (1984), in capital increases, a wealth transfer from new to old shareholders is observed when new shares are issued at a premium with respect to the current stock price. After the announcement of the equity issue, investors, not knowing the intrinsic value of the company, react negatively.

Another explanation for the market reaction is given by Masulis (1980, 1983), who proposed the leverage hypothesis. In this case, the company financial structure and the tax shield on debt are considered. By having higher expected profits, the company is raised to increase the level of debt to benefit from the deduction of the borrowing financial expenses (Modigliani & Miller, 1958, 1963). On the contrary, the level of debt decreases consistently with the expectation of lower future profits.

Besides the shares overvaluation and the change in profits expectations, riskiness is another parameter of reference on the company's value. In fact, the purpose of a capital increase could be the debt reduction, aimed at decreasing the company's riskiness. Based on these considerations, Healy and Palepu (1990) argue that a capital increase is associated with a signal of the higher expected riskiness of the company, so the market reacts negatively.

On the topic of capital, increases can be included in the Agency theory, whose biggest contribution was given by Jensen and Meckling (1976). The two authors define the relationship between principal and agent as a contract for which one or more people (principals) force another person (agent) to carry out a service for them. In the reference context, managers act on behalf and in the interests of the old shareholders, giving rise to a conflict of interest and to the subsequent *agency problems*. Since the diverging interest could be prompted by the separation between ownership and control of the company, following a capital increase, if the controlling stake is diluted, the agency costs will increase. Therefore, the market might react negatively following the announcement of a capital increase.

The last branch of research is represented by the Adverse Selection theory, whose one of the main contribution is provided by Lucas and McDonald (1990). According to the two authors, the management, by acting in the interests of the old shareholders, issues new shares for financing an investment opportunity when the company is overvalued. On the contrary, when the company is undervalued, the management waits until it goes back to reflect its intrinsic value again. Only at this moment, the capital increase takes place. Choe et al. (1993) concentrate on the relationship between the economic cycle and the market reaction after the announcement. They point out how the issue of new shares is concentrated in the expansion phases of the economic cycle, characterized by lower adverse selection costs related to the offering and by a less unfavorable market reaction. The hypothesis of less unfavorable reaction is also supported by the higher investment opportunities during a growing economic cycle. Myers and Majluf (1984) also try to explain the market reaction to an equity offering announcement by this theory.

Korajczyk et al. (1992) study the Time-Varying Asymmetric Information Phenomenon, by which a negative relation between the level of adverse selection and the market reaction to the announcement of the equity offering is observed. The information asymmetry level varies depending on the lapse of time from the last communication to the market about the company's results, so when the lapse of time increases, the negative effect increases as well. For this reason, companies prefer to issue new shares only when the market participants are more aware. Lastly, Berk and De Marzo (2014) propose the Market-Timing Hypothesis, which states that the sources of financing are selected by the company based on the conditions of the financial market at that moment. Therefore, capital increases are planned when shares are overvalued.

The above-mentioned theories do not investigate the different market reactions to the capital increase announcements made by multiple types of issuers. However, after the financial crisis, the issue of both capital adequacy in the banking sector and regulation have been relevant. Some hypotheses have been developed by which the market reaction to the announcement of a capital increase is less favorable to banking institutions because of their complex activity and the opacity of their financial assets (Haggard & Howe, 2012; Jones et al., 2012). According to Krishnan et al. (2010), the level of opacity causes an increased difficulty in the estimation of

the banking capital increases, which leads to a higher perception of the overvaluation of the company when the capital increases are announced. Li et al. (2016) study the different market reactions in the U.S. market distinguishing between banking and non-banking sectors. The hypothesis is that the information released by banks is different from the one released by other companies. Furthermore, in the banking sector the regulation imposes a higher mandatory disclosure, which reduces the information asymmetry and the adverse selection between issuers and investors.

The substantial differences between public offer and rights issue techniques bring researchers to study the market reaction under the two techniques of equity issue. However, the list of studies involving the right issue technique is quite short. Moreover, these few studies reach different conclusions.

Concerning the Italian context, the main studies have been carried out by De Vito et al. (1991), Bigelli (1996), and Bolognesi and Gallo (2013). De Vito et al. (1991) analyze the stock market reaction to the capital increases announced by the Italian listed companies between 1982 and 1988, considering different classes of shares. The authors find a positive stock price reaction following the approval date of the operation considering a five days event window. Nevertheless, they find a negative reaction considering a wider event window of 61 days. Likewise Myers and Majluf theory (1984), Bigelli (1996) develops a model based on the concept of adverse selection and adapted to the Italian context to explain both the market reaction to the capital increase announcement and the management decision to issue new shares (Bigelli, 1996). Eventually, Bolognesi and Gallo (2013) carry out the most recent study on the effects on stock prices of rights issue. The focus is on the market reaction around the "Ex-Rights Date" (ED) (the first ex-right trading day) and the "Capital increase Release Date" (CRD) (the announcement date). Considering 63 companies listed in the Italian Stock Market during the period between 2007 and 2011, the authors observe a positive statistically significant abnormal return on ED. This evidence is mostly due to the highly dilutive effect of the new shares to be issued.

Some authors have also studied the market reaction to a capital increase focusing on industry and on country effect. Asquith and Mullins (1986) study the market reaction to capital increases announced by U.S. companies belonging to the "Industrial" and "Public Utilities" sectors, showing a higher negative stock price reaction for industrial companies compared to the public utilities. The same results are found by Masulis and Korwar (1986).

Table 1. Main empirical studies on the market reaction after the announcement of a capital increase

Empirical Studies			Sample features			Market reaction		
Author	Year	Issue technique	Analyzed sector	Country	Reference period	Event Window	Final sample	CAR
Asquith & Mullins	1986	Public offer	Industrial	US	1963 - 1981	(-1; 0)	266	-2.70%
		Public offer	Utilities	US	1963 - 1981	(-1; 0)	265	-0.90%
Masulis & Korwar (extension of the Korwar Study)	1986	Public offer	Industrial	US	1963 - 1980	(0, +1)	690	-3.25%
		Public offer	Utilities	US	1963 - 1980	(0, +1)	716	-0.68%
Choe, Masulis & Nanda	1993	Public offer	Industrial	US	1963 - 1983	(0, +1)	669	-2.62%
		Public offer	Utilities	US	1963 - 1983	(0, +1)	787	-0.75%
De Vito, Nahmijas & Pera	1991	Right Issue *	-	IT	1982 - 1988	(-2; +2)	212	0.80%
		Right Issue *	-	IT	1982 - 1988	(-30; +30)	212	-1.13%
Bigelli	1996	Right Issue *	-	IT	1986 - 1992	(-1; +1)	42	2.23%
Marinova, Van Veldhuizen & Zwart	2014	n.a.	Banks	US	2007 - 2013	(-1; +1)	111	-0.82%
		n.a.	Banks	EU	2007 - 2013	(-1; +1)	74	-2.61%
Li, Liu, Siganos & Zhou	2016	Public offer	No – Banks	US	1982 - 2012	(-1; +1)	3388	-1.59%
		Public offer	Banks	US	1982 - 2012	(-1; +1)	375	-0.98%
Bolognesi & Gallo	2013	Right issue CRD	-	IT	2007-2011	CRD	70	-1.37%
		Right issue ED		IT	2007-2011	ED	70	5.85%

*Only ordinary shares are considered

The study carried out by Marinova et al. (2014) underlines the differences in the market reactions to the capital increase announcements between the U.S. companies and the European companies. A more negative reaction is found for the second ones, due to the higher average market value of American banks, to the European Sovereign Debt Crisis, and to the low issue size in relation to the company size.

The outputs of the major empirical studies on the market reaction to capital increase operations are summarized in Table 1. We point out right away the strong difference among the new shares issue technique involved in these works.

The article focuses on the Italian context during the recent financial crisis. We study the information content of equity rights issue around two event dates: the announcement date of the equity issue and communication date of its final characteristics. Our hypothesis is that at the communication date, investors are provided with a complete information set and are aware of all equity issue characteristics. Therefore, we believe that the stock price reaction might be much higher compared to the announcement date, due to the dilutive effect.

4. Sample Selection

Our sample consists of 156 equity rights issues offered by listed companies on the Milan Stock Exchange during the period between 2007 and 2016. We excluded capital increases carried out through private placement or in the form of contribution in kind. We developed our property database consulting the section "Analysis and Statistics" set in Borsa Italiana[6] website.

Table 2 shows the number and the total amount issued per year carried out by the sampled companies, appropriately clustered into three macro-sectors: "Financial", "Industrial" and "Other". Each one includes more sectors identified through the economic activities of statistical classification adopted by the European Commission NACE Rev. 2[7]. Most of the operations is concentrated in the "Industrial" sector with 66 capital increases (42.3% of the total), while in terms of total amount of capital issued the "Financial" sector collects 70.3% of the total, concentrated in 49 capital increases   (31.4% of the total). The "Other" sectors are marginal considering their amount issued (3.5% of total amount). The greater funding in the "Financial" sector is mainly explained by the stringent regulation of the Banking sector in Europe concerning the minimum capital requirements following the outcome of the stress tests (EBA – Results of 2014 EU-wide stress test. Report - 26 October 2014).

We have also examined the official prospectus published on the CONSOB website to draw the reasons for the offer declared by the company, by investigating the paragraphs Reasons for the offer and use of proceeds and/or Warnings for investors. We clustered the capital increases into five groups according to the following reasons:

- Growth Opportunities: it includes equity rights issues aimed at collecting financial resources to achieve the economics and financial target set in the strategic plans.

- Corporate Finance Transactions: it includes equity rights issues carried out for future financial transactions such as mergers and acquisitions.

- Capital Adequacy Operations – only for banks: it includes equity rights issues aimed at achieving the minimum capital requirements according to the recommendations of Basel II and subsequently Basel III.

- Restructuring: it includes equity rights issues aimed at reducing the high debt and at refinancing and restructuring.

- Others: it includes the residual number of equity rights issues for which we could not find the offer documents or other documents for identifying the reasons for the offer.

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[6] Borsa Italiana S.p.A. is responsible for the organization and management of the Italian Stock Exchange.

[7] NACE is the acronym of "Nomenclature statistique des Activités Économiques dans la Communauté Européenne". The "Financial" macro-sector includes companies identified as "K - Financial and insurance activities". The "Industrial" macro-sector includes the following sectors: "B - Mining and quarrying", "C – Manufacturing", "D - Electricity, gas, steam and air conditioning supply", "E - Water supply; sewerage, waste management and remediation activities", "F – Construction", "G - Wholesale and retail trade; repair of motor vehicles and motorcycles", "H - Transportation and storage". "Other" is residual and includes the following sectors: "A - Agriculture, forestry and fishing", "I - Accommodation and food service activities", "J - Information and communication", "L - Real estate activities", "M – Professional, scientific and technical activities", "N – Administrative and support service activities", "R - Arts, entertainment and recreation".

Table 2. Distribution over time and by Sector of equity rights issues for Italian companies

Year		Financial	Industrial	Others	Total
2007	N.	5	5	3	13
	Mln of Euro	2,435	1,347	168	3,949
2008	N.	5	7	3	15
	Mln of Euro	5,776	1,353	191	7,321
2009	N.	7	10	10	27
	Mln of Euro	5,765	11,784	984	18,534
2010	N.	7	11	1	19
	Mln of Euro	5,973	731	21	6,725
2011	N.	8	7	5	20
	Mln of Euro	11,837	232	476	12,545
2012	N.	4	4	6	14
	Mln of Euro	9,267	221	160	9,647
2013	N.	1	8	3	12
	Mln of Euro	100	701	130	931
2014	N.	8	7	5	20
	Mln of Euro	9,789	783	487	11,060
2015	N.	2	5	4	11
	Mln of Euro	3,843	111	122	4,075
2016	N.	2	2	1	5
	Mln of Euro	1,001	3,505	67	4,573
Total		49	66	41	156
%		31.4%	42.3%	26.3%	
	Total Amount	55,786	20,768	2,805	79,359
%		70.3%	26.2%	3.5%	

Table 3. Distribution over time and by Reasons for the Offer of equity rights issue for Italian companies

Year		Growth	Capital adequacy	Corporate Finance Transactions	Restructuring	Others	Total
2007	N.	5	1	2	3	2	13
	Mln of Euro	790	700	615	1,305	540	3,949
2008	N.	4	1	3	7	0	15
	Mln of Euro	710	957	4,154	1,500	0	7,321
2009	N.	3	5	1	16	2	27
	Mln of Euro	77	4,536	3,471	10,420	30	18,534
2010	N.	1	4	0	13	1	19
	Mln of Euro	58	5,437	0	982	248	6,725
2011	N.	0	6	1	12	1	20
	Mln of Euro	0	11,038	58	1,448	1	12,545
2012	N.	2	1	2	6	3	14
	Mln of Euro	40	7,499	1,763	277	69	9,647
2013	N.	1	1	0	9	1	12
	Mln of Euro	5	100	0	821	5	931
2014	N.	3	7	0	9	1	20
	Mln of Euro	233	4,790	0	6,032	5	11,060
2015	N.	2	0	0	9	0	11
	Mln of Euro	7	0	0	4,069	0	4,075
2016	N.	2	0	1	2	0	5
	Mln of Euro	10	0	996	3,566	0	4,573
Total		23	26	10	86	11	156
%		14.7%	16.7%	6.4%	55.1%	7.1%	
	Total amount	1,929	35,057	11,056	30,419	898	79,359
%		2.4%	44.2%	13.9%	38.3%	1.1%	

Table 3 shows that, in the reference period, the Italian companies which have carried out the capital increases for "Restructuring" represent 55.1% of the total number and the 38.3% in terms of total amount, while the increase in "Capital adequacy" represents the greatest weight in terms of amount with 44.2% although is only the 16.7% of the total number. This evidence is supported by the ratio analysis performed on the data sample. Table 4 shows many companies with a negative financial ratio or poor performances, confirming the idea that the main reason underlying the capital increases in the Italian context in the reference period is related to financially distressed situations or to the minimum capital requirement for banks. Concerning the banking sector, most of the capital increases has been due to the outcome of the stress test conducted by the European Banking Authority (EBA) and published in October 2014. Table 5 shows how 9 banks out of 15 did not pass the stress test.

In relation to the sample investigated and for the reference period, the adverse selection raised by researchers in

the previous studies seems not to be detected in the Italian context. If the reason for the capital increase is restructuring or the minimum capital requirement for banks, then the management will have no discretion in using the financial resources collected. Moreover, the evidence above is in contrast with the theories on equity issue developed by Myers and Majluf (1984) and Jensen (1986), since the reasons underlying the capital increases have not been justified by pecking order theory of financial resources, but by the purpose of guaranteeing the going concern.

Table 4. Ratio analysis for companies included in the sample

Ratio	N°Companies	Percentage on sample
ROE < 0	91	58,3%
ROE ≥ 0	58	37,2%
ROE n.a.	7	4,5%
Total	156	100%
Debt to Equity ratio < 1	29	18,6%
1 < Debt to Equity ratio <2	34	21,8%
Debt to Equity ratio ≥ 2	77	49,4%
Debt to Equity ratio n.a.	16	10,3%
Total	156	100%
ROA < 0	76	48,7%
ROA ≥ 0	41	26,3%
ROA n.a.	39	25,0%
Total	156	100%
ROA < 2.5%	93	59,6%
2.5% ≤ ROA < 5.0%	13	8,3%
ROA ≥ 5.0%	11	7,1%
ROA n.a.	39	25,0%
Total	156	100%
Interest coverage ratio < 0.5	85	54,5%
Interest coverage ratio ≥ 0.5	32	20,5%
Interest coverage ratio n.a.	39	25,0%
Total	156	100%
EBITDA < 0	58	37,2%
Net Financial Debt / EBITDA ≥ 3.0	47	30,1%
Net Financial Debt / EBITDA < 3.0	10	6,4%
EBITDA n.a.	41	26,3%
Total	156	100%
P/BV < 1	72	46,2%
1 ≤ P/BV < 1.5	20	12,8%
P/BV ≥ 1.5	44	28,2%
P/BV n.a.	20	12,8%
Total	156	100%

ROE - Return on Equity = Net Income $_t$ / Total Equity $_{t-1}$, calculated only for Total Equity > 0

Debt to Equity ratio = Total Debt $_t$ / Total Equity $_t$,calculated only for Total Equity > 0

ROA - Return on Assets = EBIT $_t$ / Total Asset $_{t-1}$

Interest coverage ratio = EBIT $_t$ / Net Financial Exepenses $_t$

Net Financial Debt / EBITDA is calculated only for EBITDA > 0

P/BV - Price to Book Value = Market Value $_t$ / Book Value $_{t-1}$

t = last reported data before the announcement date of the capital increase

n.a. = not available due to missing data.

Table 5. Stress test outcome for Italian Banks published by EBA on 26 October 2014

Data in mln of Euro	2013			2016			
Bank	Actual CET 1 Ratio (%) - 2013	CET 1 - Base scenario at 31/12/2016	CET 1 - Adv. scenario at 31/12/2016	Major Capital Measures 2016*	CET 1 capital - 2016	Total Risk Exposure - 2016	Stress Test outcome
Banca Carige	3.90%	2.34%	-2.36%	1,021	898	22,989	Negative
Banca Piccolo Credito Valtellinese	7.52%	7.07%	3.51%	415	1,368	18,203	Negative
Banca Popolare Dell'Emilia Romagna	8.38%	8.33%	5.22%	759	3,644	43,507	Negative
Banca Popolare di Milano	6.89%	6.88%	3.97%	518	2,998	43,528	Negative
Banca Popolare di Sondrio	7.37%	7.41%	4.20%	343	1,740	23,603	Negative
Banca Popolare di Vicenza	7.59%	7.69%	3.17%	654	2,178	28,712	Negative
Credito Emiliano	10.87%	11.02%	8.89%	0	1,756	16,158	Positive
Iccrea Holding	10.66%	11.21%	7.36%	0	1,437	13,480	Positive
Mediobanca	8.40%	9.21%	6.24%	0	4,272	50,841	Positive
Veneto Banca	5.70%	5.87%	2.73%	483	1,444	25,338	Negative
Intesa Sanpaolo	11.70%	11.23%	8.31%	1,756	33,333	284,781	Positive
UniCredit	9.58%	9.61%	6.79%	1,235	39,164	408,904	Positive
Banca Monte dei Paschi di Siena	6.99%	6.35%	-0.09%	5,139	5,687	81,393	Negative
Banco Popolare	7.94%	6.70%	4.73%	1,756	4,234	53,329	Negative
Unione di Banche Italiane	11.82%	10.88%	8.20%	18	7,526	63,669	Positive

* Impacting Tier 1 and Tier 2 Eligible Capital from 1 January 2014 to 30 September 2014
Source: Risk Analysis and Data - European Banking Authority

5. Methodology

We used the event study methodology (Ball & Brown, 1968, Fama, 1970, Peterson, 1989, Armitage, 1995, MacKinlay, 1997, McWilliams & Siegel, 1997 and Khotari & Warner, 2006) to investigate the stock price reaction around two price sensitive dates. The first date is the AD of the equity issue, which is the first release of the corporate announcement. This date was provided by Zephyr/Bureau VanDijk database, by the press releases published on the company investor relations section and by the official prospectus. Therefore, we considered the release of the outcome of the stress tests for banks if this date came before the announcement date of the capital increase and the outcome of the test was negative. At the announcement date, only few information, such as the number of financial resources to be raised and the starting date of the operation, are disclosed. The second date of our analysis is the date on which the technical description of the operation is communicated. On this date, a few days before the starting of the operation, the subscription price, the number of new shares to be issued and therefore the dilution coefficient is fixed. We label this date as the CD of the right issue characteristics.

We calculated the abnormal return for each day within the event window by subtracting an expected return from the actual return:

$$AR_{i,t} = R_{i,t} - E\left(R_{i,t}\right) \tag{6}$$

where $AR_{i,t}$, $R_{i,t}$ and $E(R_{i,t})$ are respectively the abnormal return, the actual return and the normal return or expected return of security i for the day t within the event window. Although Lo (2007) shows that the information contained in the equity issues may take several days to be fully reflected in stock prices, other authors such as Brown and Warner (1985) argue that an event window too broad could reduce the power of the analysis. Furthermore, McWilliams and Siegel (1997) show how a large event window could lead to a poor effect of the event. Dann et al. (1977) and Mitchell and Netter (1989) argue that a restricted event window could better or equally capture the stock price reaction. Based on the above theoretical contributions, different event windows combinations over -4 to +4 trading days were considered for the two event dates. There are several models to estimate the normal returns (Campbell et al., 1997, Kothari & Warner, 2006 and MacKinlay, 1997) so in this study we used the market model (Fama, 1970), which assumes a linear relation between the security return and the market return:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \tag{7}$$

where $R_{i,t}$ is the actual return security i for day t and $R_{m,t}$ is the market return for day t within the estimation period, α_i and β_i are OLS parameters estimates and $\varepsilon_{i,t}$ indicates the residual terms. All data are provided by

DataStream. The Italian stock index FTSE[8] Italia All-Shares are used to proxy the market portfolio. Consistently with Armitage (1995), Brown and Warner (1985) and Peterson (1989), who suggest that the estimation window should be between 100 and 300 days for daily observation, we performed our analysis using a 100 trading days' window for the estimation period. Furthermore, MacKinlay (1997) argues that the benefit of using the market model depends upon the R^2 coefficient of the OLS regression. In our analysis, we therefore considered only the market model parameters statistically significant with at least a p-value lower than 10% and an R^2 greater than 10%. These filters led to include 82 and 78 observations out of 156 respectively for the AD and the CD. Notwithstanding, the amount of financial resources to be raised represents respectively the 80.1% and the 78.4% of the total amount. The expected return within the two event dates for each company is computed by applying the OLS parameters:

$$E\left(R_{i,t}\right) = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} \tag{8}$$

where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the OLS estimated parameters of the market model. The average abnormal return (AR_t) for each t within the event window is calculated cross-sectionally:

$$AR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \tag{9}$$

where N indicates the number of the stocks in the sample and $AR_{i,t}$ is the abnormal return of security i for the day t within the event window. The cumulative abnormal return ($CAR_i(t_1,t_2)$) for each company i in the event window is then computed as the sum of the abnormal returns:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \tag{10}$$

where t_1 and t_2 are respectively the start date and the end date of the event window. The cumulative average abnormal return across all firms in the event window ($CAR(t_1,t_2)$) is computed based on the $CAR_i(t_1,t_2)$:

$$CAR(t_1, t_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(t_1, t_2) \tag{11}$$

The analysis of the statistical significance of the average AR and the average CAR is performed for testing the hypothesis that is statistically different from zero (Peterson, 1989). Thus, the test statistics for the average AR (SAR_t) and the average CAR ($SCAR(t_1,t_2)$) are given by:

$$SAR_t = \frac{AR_t}{\sqrt{\hat{\sigma}^2(AR_t)}} \tag{12}$$

$$SCAR(t_1, t_2) = \frac{CAR(t_1,t_2)}{\sqrt{\hat{\sigma}^2\left(CAR(t_1,t_2)\right)}} \tag{13}$$

where $\hat{\sigma}^2(AR_t)$ and $\hat{\sigma}^2\left(CAR(t_1, t_2)\right)$ are the variance estimators of the average AR and average CAR respectively (Brown & Warner, 1985).

Following the previous researches (Asquit & Mullins, 1986, Choe et al., 1993, Krishnan et al., 2010, Bolognesi & Gallo, 2013 and Li et al., 2016), we performed a multivariate regression having *CARs* as the dependent variable and several independent variables able to investigate the possible causes underlying the negative *CAR* at the communication date of the equity issue characteristics. We are interested in understanding whether the dilutive effect contributes to explain the more negative *CAR* when the characteristics of the capital increase are communicated. Consistently with the previous literature (Masulis & Korwar, 1986, Asquith & Mullins, 1986 and Miller & Rock, 1985), our first model (Model 1) aims at verifying whether in recent years in the Italian context the issue size and the level of leverage contribute to explain the abnormal returns around the communication date. As Choe et al. (1993) argue that there is a relation between the decision to raise financial resources through

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[8] FTSE stands for Financial Times Stock Exchange.

equity issue and the business cycle, we included in our model a variable able to capture this effect. Moreover, we also considered the firm profitability. Model 1 is the following:

$$CAR_i\ (t_1; t_2) = \alpha + \beta_1 LEV_i + \beta_2 ISSUE_{SIZE_i} + \beta_3 RET_{INDEX\ i}$$
$$+ \beta_4 ROE_i + \sum_{k=5}^{8} \beta_k D\_Reason_{Offer_{i,k}} + \sum_{s=9}^{10} \beta_s D\_Sector_{i,s} + \varepsilon_i$$

(14)

where $CAR_{i,}(t_1, t_2)$ is the cumulative abnormal return for each firm i computed in the event window -1 to +1 days (3 trading days) following Li et al. (2016). This CAR on average is statistically significant and shows a high magnitude strictly around the event date.

LEV is the leverage ratio calculated as total debt to book value of equity for firm i as of the last reported fiscal year before the communication date of the equity issue characteristics. A positive sign of the coefficient is expected, as for companies with high financial leverage, the equity issue allows to reduce debt and related bankruptcy costs, so this effect should be a positive signal for investors.

$ISSUE_{SIZE}$ is the natural logarithm of the amount of equity issue for firm i (Bolognesi & Gallo, 2013). Consistently with previous literature (Miller & Rock, 1985) the larger the size of the equity offering the greater the negative stock price reaction, so that the sign of the coefficient is expected to be negative.

RET_{INDEX} is the FTSE Italia All-Share return during the last six months before the communication date of each firm i to capture the most recent phase of the financial market. The sign of the coefficient is expected positive, since according to Choe, et al. (1993) when the business conditions improve, the negative stock price reaction to equity issue announcement is smaller.

ROE is the return on equity as of the last reported fiscal year before the communication date, calculated as the ratio of the net income of the last reported fiscal year before the communication date of equity issue and the book value of equity at the beginning of that fiscal year. Since previous literature has not controlled for company performance, we do not have any reference point about the sign of the coefficient. Nevertheless, we expect a negative sign, consistent with the adverse selection theory according to which the equity issue is associated with a negative signal to investors that believe the stock is overvalued when the board approves the equity issue. Companies showing high performance and collecting resources through equity issue could be considered overvalued by investors.

The study also investigates whether the stock price reaction is related to the "Reason for the Offer" and to the "Sector". The model includes the dummy variables D_REASON and D_SECTOR[9] that equals 1 for the specific reason or the specific sector and 0 otherwise. Concerning these variables, the relative sign is not clear.

In Model 2 the variable $DILUTION$ is introduced for each firm i to capture the dilutive effect. The variable is computed as the ratio between the number of new shares to be issued and the total number of shares given by the sum of the new shares and the exiting shares. This ratio represents the main characteristic communicated to investors a few days before the starting of the capital increase operation, since a higher dilution is related to a subscription price generally with a high discount from the last cum-right price. Our idea is that the information of dilution is strictly linked to the high negative stock price reaction. Therefore, we expect a negative sign of the coefficient. The intercept expresses on average, *ceteris paribus*, the stock price reaction in terms of CAR related to the communication of the equity issue characteristics, without distinguishing for any dilutive effect. Model 2 is the following:

$$CAR_i\ (t_1; t_2) = \alpha + \beta_1 LEV_i + \beta_2 ISSUE_{SIZE_i} + \beta_3 RET_{INDEX\ i}$$
$$+ \beta_4 ROE_i + \beta_5 DILUTION_i + \sum_{k=6}^{9} \beta_k D\_Reason_{Offer_{i,k}} + \sum_{s=10}^{11} \beta_s D\_Sector_{i,s} + \varepsilon_i$$

(15)

Table 6 summarizes the variables description and the predicted sign of the regression coefficients of the two models.

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[9] The regression includes n dummy variables, as many as the reasons for the offer, and the sectors variables minus 1 dummy for Restructuring and 1 dummy for Industrial sector, which are implicitly captured by the intercept.

Table 6. Variables description and predicted sign

Variables	Description	Predicted sign
Dependent variable		
CAR$_i$	Cumulative Abnormal Return for firm i in the event window [-1;+1] at the communication date of the equity rights issue characteristics	
Independent variables		
LEV$_i$	Leverage$_i$ = Total Debt$_{i,t}$ / Total Equity$_{i,t}$ for firm i	+
ISSUE SIZE$_i$	Natural logarithm of the equity rights issue amount for firm i	-
RET INDEX$_i$	FTSE Italia All Shares return during the last six months before the communication date of equity rights issue characteristics of firm i	+
ROE$_i$	Return on Equity$_i$ = Net Income$_{i,t}$ / Total Equity$_{i,t-1}$ for firm i	-
DILUTION$_i$	Dilution coefficient$_i$ = N° New shares / (N° New shares + N° Existing shares) for firm i	-
D_REASON$_i$	Dummy variable equal to 1 if the reason for the offer is GROWTH or CAPITAL ADEQUACY or CORPORATE FINANCE TRANSACTION or OTHER REASON and 0 otherwise for firm i	+/-
D_SECTOR$_i$	Dummy variable equal to 1 if the reason for the offer is FINANCIAL or OTHER SECTOR and 0 otherwise for firm i	+/-

6. Results

In this section, the findings of our analysis are illustrated. First, we show the stock price reaction at the AD of the equity rights issue and at the CD of its characteristics for the full sample by reason for the offer and by sector. We show the results of the regression analysis aimed at investigating the possible causes underlying the highly negative CARs observed at the communication date compared to the one observed at the announcement date.

Table 7 reports the CAR analysis at the AD across all 82 firms for which the estimated abnormal returns are consistent with the expected returns calculated using the statistically significant market model parameters. In the first column, the *AR*s are reported starting from -4 trading days before the event date until +4 days later. At the event date, the average AR is statistically significant and equal to -0.870%. As the abnormal returns, the other columns illustrate the average CAR computed starting from -4 days and going on cumulating the average abnormal return of each day within the event window. Based on the event window of three trading days [-1;+1], the average CAR equal to -1.555% is statistically significant. These findings differ from the Bigelli study (1996), which highlights a positive market reaction to the announcement of the equity rights issues for Italian companies. These opposite results could be explained by the different historical period of reference, by the context of financial crisis and by the reasons for the offer. On the contrary, our findings are consistent with Bolognesi and Gallo (2013).

In Table 8 we report the analysis of the stock price reaction at the CD for the 78 securities. As in the previous analysis, we find a negative statistically significant average AR at the event date equal to -0.603% and an average CAR (-1;+1) equal to -4.933%, much more negative compared to the previous one (-1.555%). This evidence confirms our hypothesis that the communication of the equity rights issue characteristics provides investors with a more complete information set and probably makes them more aware of the dilutive effect.

Table 7. Daily average ARs and average CARs across all 82 firms at the announcement date (AD) during the period 2007-2016

LAG	Average AR		Average CAR [-4;LAG]		Average CAR [-3;LAG]		Average CAR [-2;LAG]		Average CAR [-1;LAG]		Average CAR [0;LAG]	
-4	0.012%		0.012%									
	0.035		0.035									
-3	0.228%		0.240%		0.228%							
	0.671		0.408		0.671							
-2	0.716%	**	0.956%		0.944%	**	0.716%	**				
	2.109		1.626		1.966		2.109					
-1	0.474%		1.431%	**	1.419%	***	1.191%	***	0.474%			
	1.397		2.107		2.412		2.479		1.397			
AD	-0.870%	***	0.560%		0.548%		0.320%		-0.396%		-0.870%	***
	-2.563		0.738		0.807		0.545		-0.824		-2.563	
1	-1.159%	***	-0.599%		-0.611%		-0.839%		-1.555%	***	-2.030%	***
	-3.413		-0.720		-0.804		-1.235		-2.644		-4.226	
2	-0.443%		-1.042%		-1.054%		-1.282%	*	-1.998%	***	-2.472%	***
	-1.304		-1.159		-1.267		-1.688		-2.942		-4.203	
3	-0.365%		-1.407%		-1.419%		-1.647%	**	-2.363%	***	-2.837%	***
	-1.075		-1.464		-1.579		-1.980		-3.112		-4.178	
4	-0.204%		-1.611%		-1.623%	*	-1.851%	**	-2.567%	***	-3.042%	***
	-0.601		-1.581		-1.689		-2.060		-3.086		-4.005	

*** p<0.01, ** p<0.05, * p<0.1
t-stat in italic

Table 8. Daily average ARs and average CARs across all 78 firms at the communication date (CD) during the period 2007-2016

LAG	Average AR		Average CAR [-4;LAG]		Average CAR [-3;LAG]		Average CAR [-2;LAG]		Average CAR [-1;LAG]		Average CAR [0;LAG]	
-4	-0.666%	*	-0.666%	*								
	-1.915		-1.915									
-3	-0.343%		-1.009%	**	-0.343%							
	-0.986		-2.052		-0.986							
-2	-0.384%		-1.393%	**	-0.727%		-0.384%					
	-1.105		-2.313		-1.478		-1.105					
-1	-0.884%	***	-2.277%	***	-1.611%	***	-1.268%	***	-0.884%	***		
	-2.543		-3.274		-2.675		-2.579		-2.543			
CD	-0.603%	**	-2.880%	***	-2.214%	***	-1.871%	***	-1.487%	***	-0.603%	**
	-1.735		-3.705		-3.184		-3.108		-3.025		-1.735	
1	-3.445%	***	-6.325%	***	-5.659%	***	-5.317%	***	-4.933%	***	-4.048%	***
	-9.910		-7.428		-7.280		-7.646		-8.191		-8.234	
2	1.194%	***	-5.131%	***	-4.466%	***	-4.123%	***	-3.739%	***	-2.855%	***
	3.434		-5.579		-5.244		-5.303		-5.377		-4.741	
3	-0.195%		-5.327%	***	-4.661%	***	-4.318%	***	-3.934%	***	-3.050%	***
	-0.562		-5.417		-5.067		-5.071		-5.061		-4.387	
4	-0.291%		-5.618%	***	-4.952%	***	-4.610%	***	-4.226%	***	-3.341%	***
	-0.838		-5.387		-5.036		-5.011		-4.962		-4.298	

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
t-stat in italic

Table 9 shows the differences among the reasons for the offer, for both event dates based on the average *ARs* and average *CARs* calculated in the event window -1 to +1 trading days. At the communication date, the average *CARs* are negative for all reasons and, except for the unclassed reasons (Other), they are more negative than the ones at the announcement date. At this last date, the stock price reaction is positive for Growth and Corporate Finance Transactions, although neither the average *ARs* nor the average *CARs* are statistically significant.

In Table 10 the industry effect is illustrated. At both dates, the Financial sector shows an average *AR* and average *CAR* much more negative compared to the other sectors. Moreover, the table shows statistically significant negative *CARs* for each sector and more negative than the ones on the announcement date. Concerning the Financial sector, our findings are not in line with the results showed by Li et al. (2016) for the US market, since they show a worse reaction for non-bank compared to bank. However, Marinova et al. (2014), in a comparative analysis between European and US banks, show a more negative stock price reaction to the announcement of the capital increase for European banks. The authors argue that one of the possible causes refers to the greater capitalization of the American banks compared to the European ones, in addition to the sovereign debt crisis in the Euro area.

Table 9. Daily average ARs and average CARs (-1;+1) at the announcement date (AD) and at the communication date (CD) during the period 2007-2016 clustered by Reason for the Offer

Reason for the offer	Announcement Date						Communication Date					
	AR		CAR (-1;+1)		Observations		AR		CAR (-1;+1)		Observations	
All sample	-0.870%	***	-1.555%	***	82		-0.603%	*	-4.933%	***	78	
	-2.563		-2.644				-1.735		-8.191			
Growth	0.136%		0.311%		10		-0.206%		-2.584%	*	10	
	0.179		0.236				-0.264		-1.915			
Capital Adequacy	-0.305%		-2.083%	***	22		-1.683%	***	-4.577%	***	20	
	-0.636		-2.506				-3.531		-5.544			
Corporate Finance Transaction	0.185%		0.491%		5		-1.854%		-8.695%	***	4	
	0.099		0.152				-0.976		-2.642			
Restructuring	-1.564%	***	-1.889%	**	43		-0.060%		-5.454%	***	42	
	-2.977		-2.075				-0.111		-5.788			
Other	0.160%		-3.018%		2		-0.696%		-1.769%		2	
	0.105		-1.141				-0.697		-1.022			

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
t-stat in italic

Table 10. Daily average ARs and average CARs (-1;+1) at the announcement date (AD) and at the communication date (CD) during the period 2007-2016 clustered by Sector

	Announcement Date				Communication Date			
Sector	AR		CAR (-1;+1)		Observations	AR		CAR (-1;+1)		Observations
All sample	-0.870%	***	-1.555%	***	82	-0.603%	**	-4.933%	***	78
	-2.563		-2.644			-1.735		-8.191		
Financial	-1.175%	***	-2.448%	***	38	-1.451%	***	-5.694%	***	35
	-2.524		-3.036			-3.228		-7.315		
Industrial	-0.673%		-1.120%		24	-0.080%		-5.643%	***	22
	-1.030		-0.989			-0.112		-4.582		
Other	-0.527%		-0.381%		20	0.261%		-2.919%	**	21
	-0.717		-0.299			0.352		-2.269		

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
t-stat in italic

In order to investigate the potential causes underlying the high negative *CAR* at the communication date, Model 1 and Model 2 are run[10]. First, Table 11 and Table 12 report respectively the descriptive statistics for the variables used in the two models and the correlations matrix. The negative mean (median) of the *CAR* is equal to -0.055 (-0.021). The *CAR* is negatively correlated with the *DILUTION* variable with a negative correlation coefficient of -0.350; at the communication of a high dilution coefficient, the stock price reacts negatively. In our sample, the level of dilution is on average equal to 45.9% with a maximum level of about 99.6%. Consistently with previous literature (Choe et al., 1993), the correlation coefficient between the *DILUTION* and *RET INDEX* variables is negative (-0.114) meaning that when business conditions improve, in the Italian context, the company board fixes the subscription price at a low discount from the last cum-right price. The negative correlation between *DILUTION* and *ROE* variables (-0.372) indeed supports the idea that a high dilution ratio is observed for a company showing poor profitability.

Table 11. Descriptive Statistics for variables used in OLS Regressions

	CAR	LEV	ISSUE SIZE	RET INDEX	ROE	DILUTION
Mean	-0.055	9.189	5.323	-0.023	-0.252	0.459
SD	0.100	29.400	1.812	0.193	0.720	0.272
Min	-0.384	0.015	1.740	-0.375	-5.238	0.017
Q25	-0.085	1.260	3.689	-0.167	-0.380	0.252
Median	-0.021	2.985	5.479	-0.020	-0.015	0.444
Q75	0.003	5.785	6.550	0.129	0.050	0.674
Max	0.104	212.400	8.984	0.415	0.690	0.996
Observations	71	71	71	71	71	71

Table 12. Correlation among variables used in OLS Regressions for 71 observations

	CAR	LEV	ISSUE SIZE	RET INDEX	ROE	DILUTION
CAR	1.000					
LEV	0.189	1.000				
ISSUE SIZE	-0.027	-0.103	1.000			
RET INDEX	0.337	-0.012	-0.003	1.000		
ROE	-0.060	-0.321	0.238	-0.015	1.000	
DILUTION	-0.350	0.208	0.071	-0.114	-0.372	1.000

Table 13 reports the results of the two regression models. Model 1 presents an adjusted R^2 equal to 7.75% with a positive coefficient of *ISSUE SIZE* variable contrary to our expectation and to the previous studies (Miller & Rock, 1985) although not statistically significant. The variables *LEV, RET INDEX* and *ROE*, on the contrary, show the sign of the coefficients in line with our expectations. The coefficients of the first two variables are also statistically significant. The intercept is statistically significant and measures the average negative *CAR* (-0.101), all else being equal, for industrial companies and for companies stated in restructuring without distinguishing for the high dilutive or not dilutive equity issue. Only the dummy *GROWTH* is positive and statistically significant (0.073), meaning that for companies which issue equity to collect financial resources for investing in growth opportunities, the stock price reaction on average is much less negative.

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[10] The two models are run on 71 data out of 156 (our initial sample), due to 7 missing data and 78 excluded observations, as they present not statistically significant market model parameters.

Table 13. OLS Regressions output for Model 1 and Model 2

$$Model\ 1: CAR_i\ (t_1; t_2) = \alpha + \beta_1 LEV_i + \beta_2 ISSUE_{SIZE} + \beta_3 RET_{INDEX_i} + \beta_4 ROE_i + \sum_{k=5}^{8} \beta_k D\_Reason_{offer_{i,k}} + \sum_{s=9}^{10} \beta_s D\_Sector_{i,s} + \varepsilon_i$$

$$Model\ 2: CAR_i\ (t_1; t_2) = \alpha + \beta_1 LEV_i + \beta_2 ISSUE_{SIZE} + \beta_3 RET_{INDEX_i} + \beta_4 ROE_i + \beta_5 DILUTION_i + \sum_{k=6}^{9} \beta_k D_{Reason_{offer_{i,k}}} + \sum_{s=10}^{11} \beta_s D\_Sector_{i,s} + \varepsilon_i$$

Independent variables	Model 1		Model 2	
	Coefficients	t-stat	Coefficients	t-stat
LEV	0.001**	(2.010)	0.001***	(3.178)
ISSUE SIZE	0.003	(0.302)	0.009	(1.132)
RET INDEX	0.177***	(2.952)	0.172***	(3.193)
ROE	-0.012	(-1.343)	-0.029**	(-2.620)
DILUTION			-0.164***	(-3.776)
D-OTHER_SECTOR	0.041	(1.085)	0.035	(0.940)
D-FINANCIAL	-0.018	(-0.432)	-0.014	(-0.348)
D-CAP_ADEQUACY	0.052	(1.173)	0.014	(0.329)
D-OTHER_REASON	0.035	(0.813)	-0.025	(-0.495)
D-GROWTH	0.073**	(2.359)	0.044	(1.450)
D-CORP_TRANSACTION	0.035	(0.708)	0.054	(1.363)
Constant	-0.101**	(-2.061)	-0.050	(-1.026)
Observations	71		71	
R-squared	0.209		0.342	
Adjusted R-squared	0.0775		0.219	
F test	1.969		4.933	
Prob > F	0.0529		2.22e-05	

Robust t-statistics in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Model 2 extends the previous model with the introduction of the *DILUTION* as an explanatory variable to capture the dilutive effect. Its coefficient is negative (-0.164) according to our expectations and it is statistically significant. The introduction of this variable also increases the explanatory power of the model leading the adjusted R^2 to 21.90% from 7.75%. Moreover, the intercept of the regression is -0.050 compared to -0.101 of Model 1 and it is not statistically significant, as the *DILUTION* variable already captures the dilutive effect expressed in Model 1 by the intercept.

Our findings provide the evidence that on average in the Italian context the dilution coefficient effectively captures the stock price anomaly showed by higher negative *CARs* (Tables 8 and 9). This evidence supports once again the idea that, at the communication date of the final equity issue characteristics, the information set provided to investors is more complete and the stock price reflects this additional information.

7. Conclusions

In this article, we study the stock price reaction to Seasoned Equity Offerings (SEOs) through the right issue technique for Italian listed companies in the period between 2007 and 2016. We investigate whether the information of the final characteristics of the capital increase is price sensitive. Therefore, we perform an event study analysis at the AD of the equity issue and the CD of its final characteristics. Previous literature does not provide any evidence of the market reaction in the Italian context when the final characteristics of the equity issue are communicated to investors, so our study performs this analysis. We also focus on the reasons underlying the offer and on the industry effect.

The findings show that for the full sample at the communication date investors react more negatively than at the announcement date. A higher magnitude of negative stock price overreaction is observed for the sub-sample of companies collecting financial resources for "Corporate finance transaction", for "Capital Adequacy" and for "Restructuring". Likewise, the same evidence is observed across all sectors.

Lastly, we investigated the possible causes underlying the high negative magnitude of market reaction at the communication date through two regression models. Our findings suggest that, in the reference period for the Italian companies, the dilutive effect is the main explanation to the stock price overreaction.

This evidence supports the enforcement of the "rolling model" introduced in 2016 by CONSOB to mitigate the high stock price volatility during the capital increase operations characterized by a significant dilutive effect.

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