

# Osservazioni al position paper CONSOB del 7 agosto 2014

## “Gli aumenti di capitale con rilevante effetto diluitivo”

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29 settembre 2014

Già in passato avevamo avuto modo di intervenire sul tema degli aumenti di capitale fortemente diluitivi<sup>1</sup> evidenziando che, oltre alle anomalie sul mercato azionario, la previsione regolamentare in vigore sul mercato delle opzioni forzava l'investitore all'acquisto del sottostante, in molti casi a prezzi anomali. Conforta verificare che anche in questo Position paper, si confermano i livelli di onerosità che tali interventi hanno comportato (fino al 579% rispetto al prezzo teorico<sup>2</sup>), sebbene ad oggi la soluzione non risulti ancora sanata. Sebbene la presente consultazione sia rivolta principalmente all'individuazione e alla valutazione di soluzioni tecniche volte ad evitare il ripetersi di anomalie sul mercato azionario nella prospettiva, si intuisce, che esse possano *de relato* risolvere le problematiche che si verificano nel mercato delle opzioni riteniamo, per ciò che segue, nuovamente imprescindibile, trascorso ormai un quadriennio dalle prime verifiche empiriche, soffermarsi sull'individuazione e valutazione di soluzioni *ad hoc* circa le regole che governano il mercato degli strumenti finanziari derivati.

Cogliamo quindi l'occasione di quest'ultima consultazione per ribadire che si ritiene iniqua l'attuale metodologia per la gestione degli aumenti di capitale sul mercato IDEM, in particolare per quanto concerne gli aumenti di capitale iperdiluitivi. Si ritiene **incoerente, in particolare**, la circostanza che un investitore sia forzato a consegnare azioni “nuove”, rinvenienti dall'aumento di capitale (per effetto dell'aggiustamento delle quantità del contratto), in un momento in cui non ne potrebbe disporre, neppure se avesse esercitato il relativo diritto d'opzione. **Questa problematica dà origine ad un rischio regolamentare capace di creare perdite rilevanti e imprevedibili per quegli investitori che hanno implementato, avendo un profilo di rischio alquanto contenuto, strategie di covered call.**

In un nostro precedente articolo<sup>3</sup>, è stata proposta una **possibile soluzione, che prevede la sostituzione del titolo sottostante con un basket costituito dall'azione e dal relativo diritto d'opzione (soluzione basket)**. Questa proposta è in grado di garantire la **neutralità** della posizione dell'azionista venditore di *call* in quanto, in caso di esercizio anticipato, egli è tenuto a consegnare i due titoli (azione *ex* + diritto d'opzione) che rappresentano la “vecchia” azione *cum* in portafoglio.

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<sup>1</sup> Consultazione pubblica “Gli aumenti di capitale con rilevante effetto diluitivo” promossa da Consob il 19 aprile 2010. [http://www.consob.it/documenti/Regolamentazione/osservazioni\\_consultazione/aumenti\\_capitale\\_eff\\_diluitivo/osservazioni\\_position\\_paper\\_mercati\\_20100419\\_bolognesi.pdf](http://www.consob.it/documenti/Regolamentazione/osservazioni_consultazione/aumenti_capitale_eff_diluitivo/osservazioni_position_paper_mercati_20100419_bolognesi.pdf)

<sup>2</sup> Position paper Consob 2014, p. 7.

<sup>3</sup> Bolognesi E. Gallo A., 2013. “The ex-date effect of rights issues: evidence from the Italian Stock Market”, Applied Financial Economics, n.23 (in Allegato).

## **L'aumento di capitale di Banca Monte Paschi di Siena**

L'ultimo caso di aumento di capitale fortemente diluitivo cui si è assistito nello scorso mese di giugno, il caso Banca Monte Paschi di Siena (BMPS)<sup>4</sup>, ha prodotto prevedibili distorsioni sui mercati, come previsto nel Comunicato Consob n. DME/0047343 del 6-6-2014, che recita: *“L'aumento in parola presenta caratteristiche di forte diluizione. Tale circostanza determina un elevato rischio che durante il periodo di offerta in opzione delle nuove azioni si verifichino anomalie di prezzo, consistenti in una forte sopravvalutazione del prezzo di mercato delle azioni rispetto al loro valore teorico.”* In un passaggio successivo si legge: *“Si raccomanda inoltre a tutti gli attori del mercato l'adozione di comportamenti virtuosi per minimizzare il rischio che durante il periodo di offerta in opzione si verifichino le citate anomalie di prezzo. In particolare, si raccomanda agli operatori ammessi alle negoziazioni sul mercato regolamentato MTA, nel quale sono negoziate le azioni oggetto del predetto aumento di capitale, e sul mercato regolamentato IDEM, nel quale sono negoziati strumenti finanziari derivati aventi come sottostante le azioni Banca MPS, il puntuale rispetto dell'obbligo di consegna dei titoli in sede di liquidazione, obbligo previsto dal Regolamento dei Mercati organizzati e gestiti da Borsa Italiana S.p.A.”.*

E' bene perciò ricordare che, nel caso di BMPS, alle anomalie registrate nei precedenti aumenti di capitale fortemente diluitivi, si è sommata anche la sospensione del titolo dalle contrattazioni per i primi due giorni del Periodo di Offerta. Questa circostanza ha comportato per l'investitore l'improbabile ricopertura dei contratti *call* venduti attraverso l'acquisto di azioni sul mercato per adempiere il citato *“comportamento virtuoso”* per il *“puntuale rispetto dell'obbligo di consegna dei titoli in sede di liquidazione”*. E' necessario anche evidenziare che il numero di azioni sottostanti i contratti *call* aperti nel giorno precedente il Periodo di Offerta era pari a circa il 38% del numero delle vecchie azioni. Questa percentuale permette di comprendere la rilevanza del fenomeno oggetto di discussione, anche perché tale rapporto<sup>5</sup> è in aumento rispetto agli aumenti di capitale realizzati in passato. Valutando, a questo proposito, la scelta operata da Eurex Exchange di apportare il medesimo aggiustamento di Borsa Italiana nel caso di BMPS, posta in evidenza nel position paper 2014 (p.4), si deve considerare che le situazioni dei due mercati erano sostanzialmente diverse. Sull'Eurex l'*open interest* su tale strumento era estremamente basso, così come il rapporto tra azioni e contratti di opzione in circolazione, pari a circa 1/5 rispetto alla situazione del mercato italiano (0,1% contro il citato 38% registrato all'IDEM). Un altro importante segnale di tensione sui mercati finanziari prodotto dalla situazione dell'aumento di capitale era l'aumento repentino della volatilità implicita delle opzioni *call* nei giorni immediatamente precedenti il Periodo di Offerta: in sostanza, dopo la comunicazione delle condizioni dell'offerta di BMPS da parte di Borsa Italiana era pressoché impossibile chiudere posizioni corte a causa della scarsa presenza di market makers e di prezzi molto superiori rispetto al *fair value*.

## **La metodologia basket**

Leggendo il documento in consultazione (p.8) si apprende che tra le soluzioni proposte quella di un *basket*, pur essendo adottata di recente anche in altri mercati, è stata scartata dopo alcune consultazioni con gli operatori per le motivazioni sintetizzate in Tabella 3 (Allegato n.2). In particolare, gli svantaggi evidenziati sono di seguito riportati (in corsivo). Ad essi si pospongono puntuali considerazioni, in quanto si ritiene la metodologia proposta da Consob non preferibile sulla base di quanto indicato rispetto a quella proposta in alternativa. Gli svantaggi:

- 1) *Non risolve completamente le anomalie di prezzo.* Si ritiene che la soluzione delle anomalie debba essere contestuale su tutti i segmenti del mercato, ricomprendendo congiuntamente IDEM e MTA. Solo il pieno funzionamento di opportunità di arbitraggio minimizzerebbe la possibilità di trarre “profitto” da un errore della regolamentazione.
- 2) *Distorsione della competizione con mercati esteri.* Sebbene la metodologia utilizzata da Borsa Italiana (che prevede la rettifica dei contratti sulla base del fattore K) sia comunemente utilizzata anche da società estere di gestione dei mercati, si rileva che la sostituzione del sottostante con il basket sia stata utilizzata in passato in caso di aumento di capitale fortemente diluitivo (es. Eurex

<sup>4</sup> Le caratteristiche dell'operazione sono descritte a pag. 4 del position paper Consob 2014.

<sup>5</sup> Calcolato come numero di azioni sottostanti ai contratti *call* esistenti e numero di azioni *cum*.

Exchange nel caso di Oerlikon nel 2010 o, più recentemente, da Euronext Exchange nel caso di Royal Imtech NV, con nota del 12 settembre 2014). Come peraltro evidenziato nel position paper 2014 (p.4) si sottolinea che una metodologia *basket* sia stata adottata da FTSE, nella costruzione dell'indice, in occasione del recente aumento di capitale di BMPS, al termine del secondo giorno del Periodo di Offerta al fine di minimizzare gli effetti dell'aumento. Tale scelta è stata adottata anche da Société General per gli strumenti emessi sul mercato SEDEX. Sfugge quindi come le decisioni prese dalle società citate, che privilegiano una *soluzione basket*, possano rivelarsi sintomatiche della loro volontà di non essere concorrenziali.

- 3) *Richiede modifiche alle procedure interne di CCG e intermediari.* Non si conoscono i dettagli delle stime di costo che l'implementazione di tale metodologia potrebbe comportare per gli intermediari. Si ritiene comunque che andrebbero accostati anche i benefici che ne riverrebbero agli investitori, per i quali esiste un prioritario principio di tutela nell'art. 47 della Costituzione.

Volendo quindi contribuire alla ricerca di una soluzione ottimale al fenomeno in oggetto, si richiama l'attenzione sulla metodologia *basket*, anche in virtù di quanto affermato nelle risposte alla precedente consultazione del 2010. In quella sede, alla nostra segnalazione circa l'iniquità delle soluzioni proposte nei confronti dei vecchi azionisti venditori di opzioni *call* è stato risposto quanto segue<sup>6</sup>: “*Si ritiene, al contrario, che tutte le soluzioni proposte nel position paper permettano agli operatori che hanno attuato strategie di covered call di adempiere ad eventuali esercizi anticipati. Basterebbe infatti a tali operatori l'esercizio dei diritti di opzione ricevuti, sulla base delle azioni detenute, in tempo utile per la consegna delle azioni rivenienti nella prima finestra di consegna, per soddisfare tutte le eventuali richieste di esercizio anticipato che dovessero essere avanzate nel corso dell'intero periodo di offerta*”.

Alla luce di tale datata affermazione e dell'attuale proposta di metodologia denominata *rolling* è opportuno premettere due riflessioni:

- 1) è opportuno che il venditore di una *covered call* sia chiamato ad aderire obbligatoriamente all'aumento per evitare le perdite che altrimenti conseguirebbe? L'adesione ad un aumento di capitale è una scelta onerosa che richiede l'investimento di risorse aggiuntive per il vecchio azionista. Al contrario, la strategia *covered call* nasce come investimento a basso rischio che richiede solamente la consegna del sottostante da parte dell'azionista.
- 2) Il meccanismo proposto deve garantire la massima tempestività di esercizio del diritto d'opzione da parte dell'azionista. Nella prospettiva dell'investitore *retail*, le procedure devono garantire sia l'efficace informativa in merito all'opportunità di esercizio del diritto d'opzione, sia la certezza assoluta che i titoli siano già caricati nel dossier nel primo giorno del Periodo di Offerta.

**Proprio se ci si concentra sulla soluzione *rolling* presentata nel position paper 2014**, sorgono alcuni dubbi in merito all'efficace risposta alle questioni poste. Essa prevede, infatti, la consegna delle azioni di compendio per tutto il Periodo di Offerta al fine di permettere l'operatività agli arbitraggisti per il riequilibrio dei prezzi sull'MTA, ma non risolve contestualmente tutti i problemi del segmento IDEM. Infatti, sebbene, tale soluzione vada nella corretta direzione di risolvere la questione del *timing* nell'esercizio del diritto lascia irrisolto il tema della salvaguardia della neutralità dei contratti *call* in essere al momento dell'aumento di capitale. In altre parole, **l'esercizio anticipato dell'opzione *call* determina l'obbligo di adesione all'aumento di capitale, operazione che dovrebbe invece essere facoltativa e che richiede la disponibilità ulteriore all'investitore.** Inoltre, permangono perplessità circa l'effettivo tempismo nella consegna delle azioni di compendio nel caso di esercizio anticipato.

Un'ulteriore conferma della validità della *soluzione basket* (o di una sua evoluzione) si riscontra nel comunicato diffuso da Euronext Exchange<sup>7</sup> relativo all'aumento di capitale, atteso fortemente diluitivo, di Royal Imtech NV. In questo documento si legge che l'applicazione della metodologia di aggiustamento dei contratti presentata nel comunicato (la *soluzione basket*) è necessaria al fine di mitigare i potenziali effetti distorsivi sui mercati derivanti dalla consegna delle azioni Imtech durante, e subito dopo, la rettifica dei

<sup>6</sup> [http://www.consob.it/documenti/Regolamentazione/lavori\\_preparatori/esiti\\_position\\_paper\\_mercati\\_20100803.pdf](http://www.consob.it/documenti/Regolamentazione/lavori_preparatori/esiti_position_paper_mercati_20100803.pdf)

<sup>7</sup> Notice No. CA/2014/044/A emesso il 12 settembre 2014.

contratti derivati<sup>8</sup>.

In conclusione, si continua a ritenere più efficace una *soluzione basket* rispetto alla *rolling* non solo per gli aumenti di capitale iperdiluitivi, ma per **tutti** gli aumenti di capitale. Anche in assenza di anomalie, infatti, si ritiene concettualmente errato imporre la consegna delle azioni di compendio quando esse non sono ancora disponibili oppure l'adesione forzata all'aumento di capitale agli investitori.

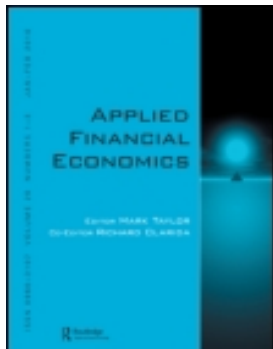
Infine, per quanto concerne l'invito ad esprimersi rispondendo alle domande poste nell'Allegato n.1 del position paper 2014, si ritiene più efficace richiamare un'evidenza empirica in merito alla questione posta nella seconda parte del quesito n.1 (*Come andrebbero definiti gli aumenti di capitale fortemente diluitivi?*), che conferma la soglia adottata nella redazione del position paper 2014 (p.3). Nel citato articolo del 2013<sup>9</sup>, dopo aver testato varie soglie di diluizione del capitale, in relazione alle anomalie riscontrate sul mercato azionario, viene individuata la soglia del 50% ( $k=0,5$ ) quale limite all'aggettivo "fortemente diluitivo" con un definitivo sostegno a quanto richiesto dalla Consultazione Consob.

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<sup>8</sup> "The potential scenarios as presented by Imtech have a highly dilutive character, therefore Euronext believes that the anticipated adjustment methods as presented in this Notice are required to mitigate potential disruptive market conditions as a result of the delivery of Imtech shares during, and shortly after the adjustment of Imtech derivatives contracts" (p.1).

<sup>9</sup> Bolognesi E. Gallo A., 2013. "The ex-date effect of rights issues: evidence from the Italian Stock Market", Applied Financial Economics, n.23.

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### The ex-date effect of rights issues: evidence from the Italian stock market

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# The ex-date effect of rights issues: evidence from the Italian stock market†

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We investigate the effects on stock prices around the Ex-rights Dates (EDs) of rights offerings by firms listed on the Italian Stock Exchange. We focus on the period from January 2007 to April 2011, whereby several operations have been highly dilutive. Highly dilutive rights offerings show high subscription price discount of the new equities issued with respect to the prevailing stock market price. The anomalous behaviour of the prices attracted the attention of the Italian Authority for the Financial Markets (CONSOB). Our results demonstrate a significant average abnormal return of 5.85% on the ex-rights date, which is mostly driven by highly dilutive operations. In particular, we try to explain abnormal returns considering several variables related to the issue and to the issuer. We also control for differences across sectors. We find that the price-adjustment coefficient  $K$  explains most of the abnormal returns. We highlight that the stock price adjustment at the ED is so relevant in the case of highly dilutive operations to be similar to a stock splits and could have puzzled investors about the stock's fair price. Furthermore, we examine the consequences on the option rights market, the trading volume and the Italian derivative market.

**Keywords:** rights issues; ex-rights date abnormal returns; event study

**JEL Classification:** G14; G32

## I. Introduction

Rights issues have been a traditional way to raise funds from the existing shareholders in Europe, the UK and Australasia. Existing shareholders are offered the chance to acquire new shares, at a discount, in proportion to their existing holdings. One of the reasons for a rights issue is the company's

restructuring of the balance sheet that often occurs in times of financial distress. Since the 2007 financial turmoil, many companies have chosen to recapitalize through a rights offer on the Italian Stock Market (Mercato Telematico Azionario, MTA) held by Borsa Italiana. Remarkably, several of them have been characterized by a high dilution effect that was uncommon before the crisis. A high dilution effect

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†Although the article is the result of a joint effort, Sections I–III, VI and VII are due to E. Bolognesi; Sections IV, V, VII and IX are due to A. Gallo. The authors are in alphabetical order.

implies that a huge number of shares are issued in order to maximize the price discount and determine a dilution of the existing equity stakes (up to 97%).

These dilutive operations have drawn the attention of the financial community as well as of the supervisors for the complexity of their structure and their impact on the Italian financial markets. In particular, these operations were characterized by an impressive positive stock price reaction at the beginning of their offer period (Ex-rights Date (ED)) up to +750% in few days. Besides, significant price discrepancies were recorded between the stock and the option rights in the same period, although those assets should be constantly aligned. According to the Italian Authority for the Financial Markets (CONSOB), the prohibition of short selling from 10 October 2008<sup>1</sup> can be responsible for this price misalignment, because it prevented arbitrageurs to operate in this market. In a position paper, CONSOB (2010a) has highlighted the drawbacks of high dilutive rights offerings, suggesting different technical adjustments of the market regulation aiming to prevent the observed stock market anomalies. Furthermore, CONSOB has organized a public discussion based on its proposals and completed in June 2010 (CONSOB, 2010b). It is worth considering that so far, CONSOB has not released any structural change to the rights issue regulations.

In this article, we examine the behaviour of stock prices around the ex-date of rights offerings by firms listed on the Italian Stock Market. Our purpose is to verify whether a statistically significant excess return exists and if it is driven by highly dilutive operations. If this is the case, as we expect, we investigate possible explanations to the phenomenon through the identification of several explanatory variables. Then, we examine the option rights market comparing the market price of the option right and its theoretical value with the aim to verify the effects of the trading restrictions imposed by CONSOB. Moreover, we highlight some consequences of highly dilutive rights issues on the Italian Derivatives Market (IDEM) being some of the stocks in our sample underlying assets of option contracts. Finally, we analyse the stock trading volumes during the offer period in order to verify whether there is an increasing trading volume around the ED and if it is greater in the case of highly dilutive rights offerings. Our original findings provide evidence that investors are puzzled by the characteristics of the highly dilutive rights issues and that the existing Italian market regulation has the effect of amplifying rather than moderating

the misleading effects on the financial markets. Relying on the results obtained in these analyses, we suggest appropriate measures aimed to mitigate the drawback of highly dilutive rights issues.

Our analyses are based on a sample of rights issues undertaken in the period between January 2007 and December 2011. The sample is composed of 70 rights issues by 63 listed firms on MTA. According to the event study methodology, we measure the average abnormal returns and cumulative abnormal returns around two dates of the rights issue, namely the capital increase release date (as the announcement date) and the execution date (ED). Given several thresholds of capital dilution, we divide the sample according to these levels, to test whether there is a statistically significant difference between the subsamples. Therefore, we investigate whether the differences in the stock market reaction, due to the level of dilution, can be explained by the adjustment coefficient  $K$ ,<sup>2</sup> the gross amount of funds raised at the offering, the firm's market-to-book value, the historical stock's price volatility and the business sector of the issuer. The first of these variables allows us to test whether the abnormal returns can be explained by the investors' misperception of the offering terms. In particular, one of the most misleading features of these offerings is the high discount in the price of the new shares issued when compared to the prevailing stock price. In addition, this price discount is combined with a high ratio of new shares for every share held by shareholders. One implication of these offering terms (summarized by  $K$ ) is that the stock price adjustment, at the execution date, is so relevant to be similar to a stock split. Therefore, the price adjustment can puzzle investors about the stock market price. Moreover, we test the gross amount of funds raised by issuers to verify if the size of the capital increase can lead to price pressure as well as the firm's market-to-book ratio as a proxy of the investment opportunities. Finally, we verify whether riskier stocks can lead to higher abnormal returns and if there are differences across sectors.

The remainder of this article is organized as follows. Section II reviews the main studies focused on the impact of rights issues on stock prices. Section III describes the sample of rights issues. Section IV describes the methodology applied. The empirical results are given in Section V. Further evidence on the consequences of highly dilutive rights offerings on the option rights market, on the trading volumes and the derivative market are presented in Sections VI, VII

<sup>1</sup> See CONSOB (2009).

<sup>2</sup> See Section III.

and VIII, respectively. Summary and conclusions are discussed in Section IX.

## II. Literature Overview

An extensive body of research has focused on the consequences of capital increases on the financial markets, both from a theoretical and empirical perspective. The empirical literature has mainly focused on the effects of the rights offerings observing the stock market reaction to their announcement date (see Eckbo and Masulis, 1995, for a survey). Based on the US data, rights offerings generate negative but modest announcement-related abnormal returns, indicating that the equity issuance conveys unfavourable information about the firm value. Nevertheless, rights offerings have been rare in the US since the early 1980s (Eckbo and Masulis, 1992), and in the 1960s and 1970s made up less than 5% of the seasoned equity issued by firms listed on the New York Stock Exchange (NYSE) or American Stock Exchange (Amex) (Smith, 1977). In the UK, firms conduct a majority of seasoned equity issuance in the form of rights offerings, which are typically insured. Slovin *et al.* (2000) demonstrate that the announcement of rights offerings by British firms is a negative signal of firm value. In the period 1986–1994, they find a statistically significant two-day average excess return of  $-2.9\%$  and  $-5\%$  in the case of insured and uninsured rights offerings, respectively. Similarly, Burton *et al.* (2000), focusing on new equity announcements in the UK over the period 1989 to 1991, provide evidence of  $-2.89\%$  2-day abnormal returns. In France, a rights issue is the primary flotation method, representing 90% of all common stock offerings. Gajewski and Ginglinger (2002) find, over the period 1986 to 1996, a significant 2-day average excess return of  $-0.74\%$  for standby rights issues and  $-1.11\%$  for uninsured rights issues by French firms. Negative average excess returns are also shown, in the first 2 days after the announcements, by Owen and Suchard (2008), as far as regards the Australian Stock market ( $-1.83\%$ ). In contrast with these results, Kang and Stulz (1996), focusing on the Japanese Stock Market in the period 1985 to 1991, find a stock price reaction to rights offerings strongly positive on the announcement day. Price increases, as a result of rights offering announcements, were also observed in developing markets such as Singapore, Malaysia and Korea (among others Cai, 1998; Salamudin *et al.*, 1999; McGuinness, 2001). The evidence suggests that the heterogeneity of the results of the studies in the different financial markets may be due to both individual market

characteristics and development levels and to the type of rights offered.

A minor number of studies investigate the effects of the rights offerings at the execution date, instead of the announcement date. The reason is that, theoretically, the ED is a *nonevent* because it does not release additional price sensitive information concerning the firm. In other words, at the ED, we should expect a mere technical stock price adjustment, because the capital increase has been already announced in the previous weeks or months. The results on the studies focused on the impact of the ex-rights on the stock prices appear quite contradictory. Asquith and Mullins (1986) examine the ED average excess returns for industrial and utility equity issues in the US market. Their findings suggest that, for the period 1963–1981, the market prices already reflect the effect of the announcement and no significant price pressure effects are apparent around the issue date. Focusing on the Japanese rights offerings in the period 1985–1991, Kang and Stulz (1996) find insignificant cumulative abnormal returns around the ED. Similarly, McGuinness shows that the adjustment for rights issues in Hong Kong during the years 1998 and 1999 does not lead to excess returns.

Evidence of negative excess returns is instead provided by Eckbo and Masulis (1992) and Gajewski and Ginglinger (2002) at the ED. Eckbo and Masulis argue that the average negative abnormal returns over the first day of the offer period may be caused by short selling designed to take advantage of the offering price, or by the necessity to compensate investors for transaction costs of absorbing new issue. Moreover, the negative abnormal returns may also reflect the fact that the primary market, where there are no purchaser-borne fees, draws buyers away from the secondary market. Focusing on the French issues over the period 1986–1996, Gajewski and Ginglinger (2002) find a significant negative abnormal reaction after the beginning of the rights issue subscription period (5-day return of  $-2.6\%$  and  $-1.56\%$  for uninsured rights and standby rights, respectively). In the attempt to explain the average negative returns of the stock prices during the rights settlement period, Singh (1997) highlights the role of underwriters who are liable for the purchase of any unsubscribed rights upon expiration of the offer. As a consequence, during the offering period, underwriters do not provide price support in the rights offering period, being net sellers of common stocks and thus contributing to the stock price decline.

Opposite results are provided by Goyal *et al.* (1994), highlighting a significant positive abnormal return of  $7.10\%$  on the ED of an offering by firms listed on the Tokyo Stock Exchange as well as a



significant increase in trading activity. They explore several possible explanations for these results (calendar time, firm size bias and contamination of announcement effect), but find no single satisfactory explanation.

It is worth underlying that, from a theoretical perspective, positive excess returns at the ED of a rights offering can be assimilated to the 'puzzling ex-day behaviour' of stock splits largely explored in the literature. Research on stock splits finds that a large majority of firms experience a positive return on the execution date (Eades *et al.*, 1984; Grinblatt, 1984; Lamoureux and Poon, 1987; Maloney and Mulherin, 1992). This evidence is hardly explicable in the light of the fact that the ED occurs merely at a downward adjustment of the stock price.

Widening the existing literature, we provide evidence of significant positive abnormal returns at the ED, especially in the case of highly dilutive rights issues. We focus on the Italian Stock Market, where, since 2007 a growing number of companies have raised huge amount of funds through capital increases with effects on the financial markets that required the intervention of the market authorities. Moreover, we calculate the misalignment between the market price of the option rights and their theoretical values at the beginning of the offer period caused by the short-selling prohibition imposed by CONSOB. Finally, we highlight some of the consequences of rights issues on the derivative markets.

### III. Data and Sample

This study analyses 70 rights offerings undertaken by 63 firms listed on the Italian Stock Market in the period between January 2007 and December 2011. We examine only the rights offerings of common shares and the capital increases with an official prospectus registered with CONSOB. We collected the terms of the offering from each firm's official prospectus. In particular, we focused on the following data: new shares issue price, total amount of the offering, ratio of newly issued shares for every old ordinary shares, Extraordinary Shareholders' Meeting of the company date and the subscription period timetable. Stock market data (open price, close price, volumes of the stocks, close price of the option rights and call option open interest) and market-to-book ratios were collected from Datastream Thomson Financial. The Datastream historical price series are fully adjusted for the split

effect of the rights offerings applying the adjustment coefficient  $K$  released by the AIAF (Financial Analyst Italian Association) and defined as follows:

$$K = \frac{P_{ex}}{P_{cum}}$$

where  $P_{ex}$  is the theoretical price of 'ex right' and  $P_{cum}$  is the price of 'cum right'.<sup>3</sup>

As in the previous studies, we decided to observe the stock market reaction to the rights offerings around two dates. The first date corresponds to the first time that the news of the capital increase was published on the Thomson Reuters website, one of the main international news agencies. We label this date as Capital Increase Release Date (CRD). Whenever the news agency does not release this information before the Extraordinary Shareholders' Meeting (whereas the company defines all the details about the rights offering), we use the date of its announcement as CRD. It is worth mentioning that previous studies observe the stock market reaction at the date of the filling with the SEC, defining this date as the announcement date (see Eckbo and Masulis, 1995, for a survey). Usually, the announcement date occurs few days before the beginning of the offering period. We choose to focus on the CRD because it represents the first date where the information about the intention of the company to raise capital becomes public and should be the one associated with a greater impact on the stock markets. The second date of our analysis is the ED, which is the first day of the offer period.

Table 1 shows the distribution of rights issues by listed firms over the period 2007–2011 on a yearly basis. Most Italian rights issues in our sample were made after 2009 and were characterized by higher levels of capital dilutions. The distribution across industries reveals that the majority of the rights issues are made by financial firms (27.14%), reflecting the composition of the MTA.

Table 2 presents descriptive statistics regarding issue characteristics for the sample of rights offerings. The average issue size, in terms of proceeds, is €593.31M and the relative issue size is 73%. The relative average size of the Italian issues is in line with that reported by Owen and Suchard (2008) for the Australian firms (70%), but higher than that for the US firms (13.44%) provided by Eckbo and Masulis (1992) and that related to Japanese firms (27.64%) registered by Goyal *et al.* (1994). The average market capitalization of Italian firms issuing rights issues is €2 204.95M. The average SD of the stocks, based on the 100 trading days before the announcement date, is 3%. The average offer price discount is 39% with a

<sup>3</sup> The AIAF website provides information on the coefficient  $K$  from 2007, so we cannot extend our period of analysis.

**Table 1. Distribution over time and by sector of 70 rights issues of equity by listed firms on the MTA over the period 2007–2011**

Years	Number of issues	Percentage of total	Average aggregate $K$	Finance	Technology, Media and Communication	Consumer goods	Industrials	Others
2011	19	26.76%	0.73	7	1	3	1	6
2010	17	23.94%	0.72	2	2	4	2	7
2009	18	25.35%	0.67	2	3	0	2	11
2008	11	15.49%	0.88	5	2	1	3	0
2007	6	8.45%	0.818	3	0	0	1	2
Total	70	100%	–	19	8	8	9	26

**Table 2. Descriptive statistics for a sample of 70 rights issues of equity by listed firms on the MTA over the period 2007–2011**

Whole sample	Mean	Median	SD	Minimum	Maximum
Proceeds (in millions of Euro) <sup>a</sup>	593.31	58.60	1383.26	0.88	7978.01
Relative issue size <sup>b</sup>	0.73	0.42	0.85	0.03	5.07
Firm size (in millions of Euro) <sup>c</sup>	2204.95	193.04	6509.27	9.37	40 489.51
Risk of the firm <sup>d</sup>	0.03	0.03	0.01	0.01	0.07
Dilution <sup>e</sup>	0.46	0.40	0.27	0.05	0.98
Discount <sup>f</sup>	0.39	0.41	0.30	–0.33	0.98
Adjustment coefficient, $K^g$	0.74	0.82	0.27	0.04	1.00
Length of subscription period (days) <sup>h</sup>	15.10	15.00	1.84	10.00	25.00

Notes: <sup>a</sup>Euro amount received from the issue = Number of shares issued \* issue price.

<sup>b</sup>Proceeds/market value of equity = Amount received from issue/number of shares outstanding at last year end \* closing price of shares the day before the ex-date.

<sup>c</sup>Market value of equity = Number of shares outstanding at last balance date \* closing price of shares the day before the ex-date.

<sup>d</sup>SD of stock returns in the 100 days prior to the announcement date.

<sup>e</sup>Number of shares issued/number of shares outstanding after the issue.

<sup>f</sup>Closing price the day before the ex-date less the offer price as percentage of the closing price.

<sup>g</sup>The ratio of the theoretical 'ex right' to the 'cum right' price.

<sup>h</sup>Number of days from the ED to the termination of the offer period.

maximum of 98%. The discount of the new equities issued in our sample is more evident if compared with the 20% characterizing the French issues (Gajewski and Ginglinger, 2002) and with the 19% characterizing the Australian ones (Owen and Suchard, 2008). The average adjustment coefficient  $K$  is 0.74 with a minimum (representing the highest level of dilution) of 0.04. The length of the subscription period is 15 days (median) and varies from 13 to 30 trading days.

#### IV. Methodology

The event study methodology<sup>4</sup> is used to examine the price behaviour of rights issues around two

events: the CRD and the ED. First, the abnormal returns were calculated for each day within the period of interest, then they have been averaged in cross-section and finally, the cumulated abnormal returns ( $CARs$ ) were calculated. The stock price reaction to the events is measured using daily returns. The abnormal returns are estimated using daily stock returns computed in logarithmic terms. The abnormal return of a stock,  $A_{it}$ , is the difference between the stock market return and its expected return:

$$A_{it} = R_{it} - E(R_{it}) \quad (1)$$

where  $A_{it}$  is the abnormal return of stock  $i$  for the day  $t$ ,  $t$  is the day measured relative to the event of interest,  $R_{it}$  the market return on stock  $i$  at day  $t$  and

<sup>4</sup>The event study as developed by Ball and Brown (1968) and Fama *et al.* (1969) has been subsequently refined by Brown and Warner (1985). As the method is well entrenched in several studies, no further details are given in this article.

$E(R_{it})$  is the expected return of stock  $i$  for day  $t$ . Several models are available in the literature to estimate the expected returns: among others, the market models (Fama *et al.*, 1969), deviations from the one-factor Sharpe (1964) to Lintner (1965) Capital Asset Pricing Model (CAPM) or the Black (1972) CAPM, the mean-adjusted model, risk-adjusted model and the market-adjusted model (Brown and Warner, 1980, 1985). The latter is applied in this research. The market-adjusted return method assumes that the expected return on security  $i$  at day  $t$  is equivalent to the return on the market portfolio. The Italian stock market index FTSE MIB is used to approximate the market portfolio to estimate the expected return. Use of the market-adjusted model has been showed to yield valid findings by several studies. For example, Dyckman *et al.* (1984) showed that the commonly used model have similar ability to detect the presence of an abnormal performance. Another simulation study by Brown and Warner (1985) found that the market-adjusted model produces approximately the same results as the more complex market model, which adjusts for risk (see also Chandra *et al.*, 1990; Korajczyk *et al.*, 1990; Krueger and Johnson, 1991).

The average abnormal return ( $AAR_t$ ) for each day  $t$  is computed cross-sectionally as follows:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N A_{it} \quad (2)$$

where  $N$  refers to the number of firms in the sample and  $A_{it}$  is the abnormal return of the  $i$ -th stock at time  $t$ . The cumulative average abnormal return is then computed by summing the average abnormal returns over a test window, from day  $H$  to  $L$ , which represents a specific time window around the event day

$$CAR_{(H,L)} = \sum_{t=H}^L AAR_t \quad (3)$$

Test of significance is done by calculating the  $t$ -statistics, which is the ratio of day  $t$  average abnormal returns to its estimated SD. The SD of each stock is estimated using the time-series mean excess returns over the trading days  $-200$  to  $-1$  from the CRD, representing a 200 days estimation window. The  $t$ -value is given by (Brown and Warner, 1985)

$$t = AAR_t / S(AAR_t) \quad (4)$$

where  $S(AAR_t)$  is the SD of average abnormal returns. It is estimated using time series from the

estimation windows. In a similar way, the  $t$ -statistics can be computed for the  $CAR$  as follows:

$$t = CAR_{(H,L)} / S(CAR_{(H,L)}) \quad (5)$$

where  $S(CAR_{(H,L)})$  refers to the SD of cumulative average abnormal returns from days  $H$  to  $L$ , calculated by

$$S(CAR_{(H,L)}) = \sqrt{(T \text{var}(AAR_t))} \quad (6)$$

where  $T$  equals the number of days in the  $CAR$  statistics and  $\text{var}(AAR_t)$  is the variance of abnormal returns during the estimation period. The market adjusted abnormal returns are calculated over days  $-10$  to  $+10$  relative to the two event dates, the CRD and the ED, which represent the day 0. Then, the average abnormal returns are cumulated in several event windows (including pre-event and post-event windows) to detect the dynamics of the abnormal returns around the event. Moreover, we identify the event windows characterized by the higher abnormal returns. In particular, we are interested in understanding if the  $CAR$ s associated with our whole sample are driven by the level of capital dilution. Therefore, we run a simple regression having the  $CAR$ s as the dependent variable and a dummy variable as an independent variable ( $D\_DIL$ ) that takes value 1 for the highly dilutive rights offerings and value 0 otherwise. The model is specified as follows:

$$CAR_{(H,L),i} = \alpha + \beta_1 D\_DIL_i + \varepsilon_i \quad (7)$$

where  $CAR_{(H,L),i}$  is the cumulative average abnormal return over different event windows for each firm  $i$ ,  $\alpha$  and  $\beta_1$  are the intercept and the coefficient in the regression, respectively. The alpha represents the  $CAR$  for the nonhighly dilutive rights offerings, whereas the coefficient of the dummy is the difference, on average, between the  $CAR$ s of the highly dilutive and the nonhighly dilutive rights offering. We expect this coefficient to be statistically positive and significant. However, since highly dilutive rights offerings were unusual before 2009, there is no academic literature that gives a level of capital dilution that defines a rights issue as highly dilutive. Therefore, we refer to the CONSOB position paper (2010), which is the only official document focusing on these operations. This article was published at the beginning of 2010, so that it focuses only on the rights offerings that took place during the year 2009. This article defines four rights offerings that were characterized by a percentage of change in shares greater than 90% as highly dilutive. Nevertheless, CONSOB does not examine other rights issues characterized by

a capital dilution lower than 70% that took place on the same time period. Therefore, we decide to test our sample for different capital dilution thresholds: 90%, 80%, 70%, 60%, 50% and 40%. We also add a criterion that defines as dilutive those rights issues placed in the first quartile of the dilution distribution. This allows us to verify up to which threshold we observe an anomaly. Once we determine this critical threshold, our analysis proceeds by investigating possible explanations of the anomaly by means of a multiple regression analysis. The regression is run with *CARs* as the dependent variable and selected variables as independent variables, so that we have an extension of the model in formula (7). In the first model, we add specific characteristics of the issue as the *K*-factor, the amount of proceeds and the market-to-book value of the firm as independent variables. To control for the firm risk, we also add the historical *SD* of the stock price in the period before the announcement date. In the second model, we extend the first regression to investigate whether the abnormal returns of highly dilutive issues are related to the business sector of the issuer. Therefore, we include dummy variables for each of the following sectors – Finance (*D\_FIN*), Consumer Goods (*D\_CONS*) and Technology, Media and Communication (*D\_TMC*) – and combine them with the dummy identifying the highly dilutive operations. The independent variables employed in the regression show low correlation coefficients to avoid problems of multicollinearity. Thus, the following regressions are tested:

Model 1:

$$CAR_{(H^*,L^*),i} = \alpha + \beta_1 D\_DIL_i + \beta_2 K_i + \beta_3 LPROC_i + \beta_4 LMBV_i + \beta_5 SD_i + \varepsilon_i \quad (8)$$

Model 2:

$$CAR_{(H^*,L^*),i} = \alpha + \beta_1 D\_DIL_i + \beta_2 K_i + \beta_3 LPROC_i + \beta_4 LMBV_i + \beta_5 SD_i + \beta_6 D\_FIN_i + \beta_7 D\_CONS_i + \beta_8 D\_TMC_i + \beta_9 D\_FIN_i * DIL_i + \beta_{10} D\_CONS_i * DIL_i + \beta_{11} D\_TMC_i * DIL_i + \varepsilon_i \quad (9)$$

where  $CAR_{(H^*,L^*),i}$  are the cumulative abnormal returns for each firm  $i$  for the interval from  $H$  to  $L$ , which are starred because they stand for the event window with the highest *CAR*.

<sup>5</sup> In these cases, information for each rights issue undertaken by the same firms is weighted according to the size of the capital increase in terms of proceeds.

Independent variables used in the regression are the following:

<i>K</i>	price adjustment factor at the ED (see Section III).
<i>LPROC</i>	gross amount of funds rose at offering, in logarithmic specification.
<i>LMBV</i>	the market-to-book value, in logarithmic specification.
<i>SD</i>	SD of stock returns in the 100 days prior to the announcement date.
<i>FIN, CONS, TMC</i>	Finance, Consumer Goods and Technology, Media and Communication sectors.

## V. Results

The market-adjusted abnormal returns and the cumulative abnormal returns for the sample of rights issues made over the period January 2007 to December 2011 are given in Table 3. We clustered the data at the firm level when more than one rights issue were made by the same firm in our sample. Hence, 70 rights issues made by 63 listed firms compose the sample.<sup>5</sup>

The event study is undertaken around the two event dates: the CRD, provided by Thomson Reuters, which represents the first public announcement of the rights issue, and the ED, which represents the first day of the offer period. Day 0 being the day of the event, we compute the *AARs* and the *CARs* in each day around the event, from day  $-10$  to day  $+14$ , the average length of the offer period being 15 in our sample. Our aim is to investigate the dynamics of the *ARs* in pre-event and post-event windows. In the first analysis, we find negative *AR* ( $-1.37\%$ ) in the CRD and in day  $+3$  ( $-1.22\%$ ), both statistically significant at the 5% level. Moreover, the table shows negative *CARs*, highly statistically significant, in each post-event window. These results confirm the main findings of previous studies, highlighting the investors' negative reaction to a capital increase announcement.

In the second analysis, we find a positive statistically significant *AR* ( $5.85\%$ ) on day 0 (the ED). The results on the post-event windows indicate significant and negative *ARs* on day 11 and day 12, consistent with the evidence that the stock price retraces to the pre-offer value at the end of the offer period.

**Table 3.** Daily average abnormal returns and cumulative average abnormal returns around the two event dates of 70 rights issues by 63 Italian listed firms on the MTA during the period 2007–2011

Days	Day 0: Capital increase public release			Day 0 = ED		
	Average abnormal return ( <i>ARR</i> )	<i>t</i> -value	<i>CAR</i>	Average abnormal return ( <i>ARR</i> )	<i>t</i> -value	<i>CAR</i>
-10	0.0022	0.3700	0.0022	-0.0064	-0.4048	-0.0064
-9	0.0050	0.8314	0.0073	-0.0017	-0.1080	-0.0081
-8	0.0068	1.1237	0.0140	-0.0020	-0.1288	-0.0101
-7	0.0002	0.0375	0.0143	-0.0032	-0.2056	-0.0133
-6	-0.0078	-1.2961	0.0064	0.0026	0.1637	-0.0107
-5	-0.0081	-1.3471	-0.0017	-0.0067	-0.4248	-0.0174
-4	0.0022	0.3686	0.0005	-0.0070	-0.4476	-0.0244
-3	0.0016	0.2705	0.0022	0.0083	0.5309	-0.0161
-2	0.0009	0.1477	0.0031	-0.0049	-0.3127	-0.0210
-1	0.0073	1.2053	0.0103	-0.0119	-0.7608	-0.0329
0	-0.0137	-2.2703**	-0.0034	0.0585	3.7230***	0.0255
1	-0.0094	-1.5604	-0.0128	0.0027	0.1694	0.0282
2	-0.0092	-1.5182	-0.0220	0.0140	0.8925	0.0422
3	-0.0122	-2.018**	-0.0341	-0.0150	-0.9535	0.0272
4	-0.0059	-0.9701	-0.0400	-0.0018	-0.1119	0.0254
5	-0.0054	-0.8879	-0.0454	-0.0198	-1.2611	0.0056
6	-0.0059	-0.9840	-0.0513	-0.0136	-0.8678	-0.0080
7	-0.0036	-0.5968	-0.0549	-0.0105	-0.6706	-0.0185
8	-0.0035	-0.5873	-0.0585	-0.0125	-0.7947	-0.0310
9	-0.0009	-0.1469	-0.0593	-0.0228	-1.4518	-0.0538
10	-0.0004	-0.0671	-0.0598	-0.0127	-0.8060	-0.0664
11				-0.0279	-1.7760*	-0.0943
12				-0.0434	-2.7631***	-0.1377
13				-0.0051	-0.3253	-0.1428
14				-0.0206	-1.3119	-0.1634
(-10 to -1)		0.5412	0.0103		-0.6636	-0.0329
(-3 to -1)		0.9373	0.0098		-0.3133	-0.0085
(-1 to 0)		-0.7531	-0.0064		2.0946**	0.0465
(0 to +1)		-2.7087***	-0.0231		2.7523***	0.0611
(0 to +2)		-3.0882***	-0.0323		2.7625***	0.0751
(0 to +3)		-3.6836***	-0.0445		1.9156*	0.0602
(0 to +7)		-3.8205***	-0.0652		0.3253	0.0144
(+7 to +14)					-3.3099***	-0.1559
Number of observations		63				

*Notes:* The event dates are the capital increase public release provided by *Thomson Reuters* or, when unavailable, the official announcement of the Shareholder's Meeting, which represents first public announcement of the operation and the ED, which represents the first day of the offer period. The analysis considers different event windows relative to the event date, which is Day 0.

\*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

Moreover, the *CARs* for the event and post-event periods are statistically significant around the ED, showing positive excess returns until the day +3 of the offer period. In particular, we observe positive and significant *CARs* calculated from the day before the event, showing the maximum value of +7.51% between day 0 and day 2. Afterwards, we find a statistically significant *CAR* of -15.59% at the end of the offering period, between day +7 and day +14.

Table 4 summarizes the results of our simple regression model where a dummy variable is used as an independent variable to distinguish between

non- and highly dilutive rights offerings. We only show the results for the following thresholds: 80%, 70%, 50%, 40% and the last quartile of the sample distribution. In each analysis, the intercept measures the average *CARs* for nonhighly dilutive rights offerings and the coefficient of the dummy measures the difference, on average, between the *CAR* of non- and highly dilutive operations. In three out of five cases examined, we find (80%, 70% and last quartile) significant positive *CARs* in each event window, starting from day -1. These findings indicate that highly dilutive rights offerings are the driver of the

Table 4. OLS estimates of coefficients in linear cross-sectional regressions with the cumulative abnormal returns as the dependent variables and the dummy variable taking 1 for different dilution thresholds and 0 otherwise for 70 rights issues corresponding to 63 Italian listed firms on the MTA during the period 2007–2011

Day 0 = ED	Mean		D = 1 for dilution over 80%		Mean		D = 1 for last quartile of dilution		Mean		D = 1 for dilution over 50%		Mean		D = 1 for dilution over 40%	
	CAAR of nondilutive issues	$\alpha$	$\beta_1$	$\alpha$	CAAR of nondilutive issues	$\alpha$	$\beta_1$	$\alpha$	CAAR of nondilutive issues	$\alpha$	$\beta_1$	$\alpha$	CAAR of nondilutive issues	$\alpha$	$\beta_1$	$\alpha$
CAAR (-3 to -1)	-0.0123	0.0241	-0.0178	0.0453	-0.0075	-0.0038	0.0024	-0.0277	0.0023	-0.0220						
t-test	-0.6733	0.5240	-0.9538	1.0990	-0.3869	-0.0984	0.1153	-0.8093	0.0981	-0.6551						
CAAR (-1 to 0)	-0.0108	0.3611	-0.0155	0.3005	-0.0117	0.2293	0.0099	0.0921	0.0139	0.0663						
t-test	-0.3629	4.824***	-0.4909	4.323***	-0.3439	3.384***	0.2443	1.4250	0.3103	1.0401						
CAAR (0 to +1)	-0.0211	0.5185	-0.0209	0.3978	-0.0197	0.3185	-0.0016	0.1582	0.0010	0.1224						
t-test	-0.6392	6.231***	-0.5663	4.879***	-0.4936	4.005***	-0.0345	2.058***	0.0199	1.6010						
CAAR (0 to +2)	-0.0293	0.6584	-0.0296	0.5079	-0.0354	0.4354	-0.0176	0.2338	-0.0126	0.1783						
t-test	-0.7153	6.384***	-0.6459	5.019***	-0.7257	4.491***	-0.2957	2.464**	-0.1901	1.8840						
CAAR (0 to +3)	-0.0425	0.6469	-0.0422	0.4961	-0.0449	0.4136	-0.0260	0.2171	-0.0209	0.1647						
t-test	-1.1941	7.236***	-1.034	5.519***	-1.018	4.725***	-0.4763	2.505**	-0.3444	1.903*						
CAAR (0 to +7)	-0.0701	0.5326	-0.0662	0.3908	-0.0681	0.3250	-0.0443	0.1481	-0.0406	0.1120						
t-test	-1.904*	5.764***	-1.6041	4.302***	-1.554	3.737***	-0.8415	1.771*	-0.7013	1.3550						
CAAR (+7 to +14)	-0.0425	-0.6722	-0.0114	-0.3358	-0.0438	-0.4148	-0.0368	-0.2831	-0.0369	-0.2281						
t-test	-1.300	-8.188***	-0.4346	-5.787***	-1.029	-4.906***	-0.7212	-3.491***	-0.6437	-2.785***						
Number of observations	53	10	50	13	47	16	38	25	32	31						

Note: \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

**Table 5. OLS estimates of coefficients in linear cross-sectional regressions with the *CAR* over the event window (0 to +2) as dependent variable and issue and issuer characteristics as explanatory variables for 70 rights issues of equity issued by 63 firms listed on the MTA during the period 2007–2011**

Independent variables	Model 1		Model 2	
	Coefficient	<i>t</i> -test	Coefficient	<i>t</i> -test
Constant	-0.1189	-0.1815	0.0011	0.0016
<i>D_DIL</i> (50%) <sup>a</sup>	0.0101	0.0939	-0.1506	-1.2121
<i>K</i> <sup>b</sup>	-0.4888	-2.408**	-0.4819	-2.482**
<i>LPROC</i> <sup>c</sup>	0.0393	0.6271	0.0288	0.4535
<i>LMBV</i> <sup>d</sup>	-0.0281	-0.5660	-0.0349	-0.6963
<i>SD</i> <sup>e</sup>	10.1242	2.228**	8.1654	1.696*
<i>D_FIN</i> <sup>f</sup>			0.0787	0.5561
<i>D_CONS</i> <sup>g</sup>			0.1488	0.5776
<i>D_TMC</i> <sup>h</sup>			-0.1909	-0.957
<i>D_FIN*DIL</i> <sup>i</sup>			-0.0364	-0.1755
<i>D_CONS*DIL</i> <sup>j</sup>			0.1467	0.4675
<i>D_TMC*DIL</i> <sup>k</sup>			0.7085	2.848***
<i>R</i> <sup>2</sup>	0.27		0.44	
Number of observations	63		63	

Notes: <sup>a</sup>Dummy variable = 1 if the right issue has a dilution (number of shares issued/number of shares outstanding after the issue) beyond 50%.

<sup>b</sup>The ratio of the theoretical 'ex right' to the cum right 'price'.

<sup>c</sup> $\ln(\text{Proceeds}) = \text{number of shares issued} * \text{issue price}$ .

<sup>d</sup> $\ln(\text{Market to book value}) = \text{Number of shares outstanding at last balance date} * \text{closing price of the shares the day before the announcement/the book value of the firm at the last balance date}$ .

<sup>e</sup>*SD* of stock returns in the 100 days prior to the announcement date.

<sup>f</sup>Dummy variable = 1 if the firm belongs to the Financial sector (banks and insurance firms).

<sup>g</sup>Dummy variable = 1 if the firm belongs to the Consumer goods sector.

<sup>h</sup>Dummy variable = 1 if the firm belongs to the Technology, Media and Communication sector.

<sup>i</sup>Dummy variable = 1 if the firm belongs to the Financial sector and the issue's dilution is above 50%.

<sup>j</sup>Dummy variable = 1 if the firm belongs to the Consumer goods sector and the issue's dilution is above 50%.

<sup>k</sup>Dummy variable = 1 if the firm belongs to the Technology, Media and Communication sector and the issue's dilution is above 50%.

\*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

observed stock price anomaly. Moreover, we notice that the significance of the *CARs*, starting from day 0, disappears when approaching the level of 40%. This last result allows us to define the operations characterized by a capital dilution higher than 50% as highly dilutive. Furthermore, it is worth noting that negative *CARs* between day +7 and day +14 are highly significant at each dilution level considered.

In the subsequent analyses, we focus exclusively on the event window, where the *CAR* is maximized for each threshold of dilution (higher than 50%), which is (0 to +2). We run two multiple regression analyses considering *CAR* (0 to +2) as the dependent variable. In the first model, we set *K*, *LPROC*, *LMBV* and *SD* as explanatory variables. As shown in Table 5, the coefficient of *K* is negative and significant. This implies that a lower value of *K* corresponds to a higher price adjustment, and then to a potential higher misperception among investors. Moreover, the positive and significant coefficient of *SD* reveals the positive relationship between *CARs* (0 to +2) and the stocks volatility. In the second model, the analysis

is extended to consider separate subsamples identified according to the sample firm sectors classified as Finance (*D\_FIN*), Consumer goods (*D\_CONS*) and Technology, Media and Communications (*D\_TMC*). The results reveal a positive and highly significant coefficient of *D\_TMC* combined in the case of a dilution greater than 50%, suggesting that the *ARs* are associated with the highly dilutive operations occurred in this sector. These results confirm the hypothesis that the investors' reaction at the ED is affected by the terms of the offer, since the rights offerings in the TMC sector were characterized by both the lowest adjustment coefficients *K* and the highest price discount of the new shares issued.

## VI. The ED Impact of Rights Offerings on Option Rights Market

The architecture of the rights offerings examined had important consequences also on the value of the

option rights. In particular, highly dilutive rights offerings were characterized by a high subscription price discount of the new equities issued combined with a high ratio of the number of newly issued shares for every share held by each shareholder. In this framework, the option right assumes an extraordinary high value whenever compared to the adjusted market price of the related stock. Moved by the importance of the option rights for the shareholders, we examine the market behaviour of this security in the light of the short-selling prohibition imposed by the CONSOB. This trading restriction prevents the arbitrageurs from buying and selling the two securities (the option right and the stock) at the same time, taking advantage of the potential value difference in the two markets. Aiming to analyse the relationship between the two securities for each firm of our sample, we calculated the option rights mispricing as follows:

$$AROR_t = \frac{1}{N} \sum_{i=1}^N (OR_{it} - ThOR_{it}) \quad (10)$$

where  $AROR_t$  is the average abnormal return of the options rights at time  $t$ ,  $N$  refers to the number of firms in the sample,  $OR_{it}$  and  $ThOR_{it}$  are the close market price and the theoretical value<sup>6</sup> of the  $i$ -th option right at time  $t$ , respectively. The cumulative average abnormal returns are then computed by summing the daily average abnormal returns of the option rights ( $AROR$ ) in correspondence to the highest  $CAR$  registered by the related shares, as shown in the previous analyses.

Afterwards, we performed three regression analyses, similar to the one described by the formula (7), where the dependent variables are:  $AR$  in day 0;  $CAR$  of the option rights in (0 to +1) and (0 to +2). Table 6 contains our main findings. We show highly significant negative excess returns of the option rights with respect to the theoretical value of the option right in each event window and for each level of capital dilution considered. Under efficient markets condition, this mispricing should not exist. Rational investors would buy the rights instead of the related stocks because they are deeply undervalued. We can try to explain this further anomaly in the financial markets reaction on the ED by assuming that investors are more interested in a short-term trading rather than in the stock purchase for an investment with a longer time horizon. In other words, investors prefer to buy stocks on the secondary market because they recognize a trading opportunity. The evidence

that, after the bounce on the first few days of the offering period, the stock price sharply retraces to the pre-offer value supports this explanation. Moreover, a share purchase with a longer time horizon would have been implemented by subscribing new shares on the primary market through the purchase of the related option rights, taking advantage of their mispricing.

## VII. The Behaviour of Trading Volume Around the ED of Rights Offerings

The impact on trading volume is evaluated using a mean-adjusted method. In particular, the 'normal' level of trading volume is assumed to be equal to the average daily trading volume in the period starting -110 days and ending -10 days before the ED. The trading volume is defined as the percentage of outstanding shares traded on a given day:

$$V_{it} = \frac{(n_{it} \times 100)}{S_{it}} \quad (11)$$

where  $n_{it}$  is the number of shares traded for stock  $i$  on day  $t$  and  $S_{it}$  is the firm's outstanding shares on day  $t$ . Abnormal trading volume on any day is measured as the difference between the market volume on that day and the 'normal' volume. Following Ajinkya and Jain (1989) and Cready and Ramanan (1991), we use a log-transformation of the raw trading volume. This allows us to transform volumes in a normal distribution so that the standard  $t$ -test can be applied to detect the abnormal volume. We use the natural log of the percentage of outstanding shares traded in Equation 11. Before transformation, we add a small constant of 0.000255 to preclude taking the log of 0 trading volume on a given day (Cready and Ramanan, 1991). Mean-adjusted abnormal trading volume is computed as in Campbell and Wasley (1996):

$$AV_{it} = V_{it} - \bar{V}_i \quad (12)$$

where  $\bar{V}_i$  is the estimated mean of the trading volume in the estimation period. Similar to the previous analysis, we compute the average abnormal volume across firms to compute  $AAV_t$  and construct the parametric  $t$ -statistics as

$$t = AAV_t / S(AAV_t) \quad (13)$$

<sup>6</sup> The theoretical value of the right is defined as the difference between the stock price and the subscription price multiplied by the ratio of the number of newly issued shares for every share held by each shareholder.



Table 6. OLS estimates of coefficients in linear cross-sectional regressions with the abnormal returns on option rights (*AROR*) at the beginning of the offer period as the dependent variables and dummy variables taking 1 for different dilution thresholds and 0 otherwise for 47 rights issues during period 2007–2011

Day 0 = ED	Mean <i>AROR</i> of nondilutive issues		Mean <i>AROR</i> of nondilutive issues		Mean <i>AROR</i> of nondilutive issues		Mean <i>AROR</i> of nondilutive issues		Mean <i>AROR</i> of nondilutive issues	
	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$
<i>AROR</i> (day = 0)	-0.1650	-0.1662	-1.5620	-0.1478	-1.4004	-0.1036	-1.0843	-0.0958	-0.8480	-0.8480
<i>t</i> -test	-0.9726	-0.8574	-4.072***	-0.7254	-3.750***	-0.4396	-3.002***	-0.3459	-2.275**	-2.275**
<i>CAROR</i> (0 to +1)	-0.1397	-0.1378	-1.8159	-0.1281	-1.5890	-0.0889	-1.2044	-0.0667	-0.9665	-0.9665
<i>t</i> -test	-0.8557	-0.7155	-4.764***	-0.6217	-4.208***	-0.3672	-3.245***	-0.2339	-2.518**	-2.518**
<i>CAROR</i> (0 to +2)	-0.2679	-0.2692	-1.9095	-0.1969	-1.8793	-0.0957	-1.5533	-0.0195	-1.3327	-1.3327
<i>t</i> -test	-1.450	-1.249	-4.475***	-0.900	-4.688***	-0.3778	-3.997***	-0.0649	-3.302***	-3.302***
Number of observations	37	34	13	32	15	26	21	20	27	27

*Notes:* The number of observations is 47 instead of 63 because, in 16 cases, the theoretical value of the option right is zero due to the higher subscription price with respect to the ED market price of the stock.

\*\* and \*\*\* denote significance at the 5 and 1% levels, respectively.

where  $S(AAV_t)$  is the SD of  $AAV_t$  estimated using time series data from the estimation period, which means it explicitly accounts for any cross-sectional dependence in an abnormal trading volume. If the row volumes are normal, independent and identically distributed random variables, this test is the distributed Student  $t$  with  $T-1$  degrees of freedom. Cumulative average abnormal trading volumes are calculated using the same methodology adopted for abnormal returns. Table 7 reports the results for our sample. We observe a statistically significant average  $AV$  at the days from  $-2$  to  $+13$ . These results can be explained by the fact that, during the offering period, the number of outstanding shares is very low because the additional share, resulting from the rights issues, are still not tradable. This evidence is confirmed by the results on the  $CAVs$ , positive and highly significant in each event window.

Our final analysis of the  $CAVs$  demonstrates a substantial indifference between rights issues defined by different levels of dilution (Table 8). It is worth highlighting the positive coefficients of the dummy variable in correspondence to the (7 to +14) event window. This result provides evidence for the increase in trading during the last days of the subscription period due to the activity of the arbitrageurs who can rely on the additional shares at the time of settlement.

### VIII. Further Evidences on the Derivatives Market

The anomalies recorded on the stock market behaviour had repercussions also on the IDEM, due to the fact that some of the stocks in our sample are underlying assets of stock option contracts. In the case of a capital increase, Borsa Italiana notifies the adjustment intervention on all stock option series open for trade before the offer period. In particular, according to Borsa Italiana's instruction, the strike prices and the number of shares (lot) underlying the stock option contracts must be adjusted. The adjustment intervention is obtained by applying the coefficient  $K$ .

Our analysis focuses on the only stocks in our sample that are subject to a highly dilutive rights offering: Seat Pg and Tiscali. In the case of Seat Pg,  $K$  being equal to 0.040688, the number of underlying shares increased from 500 to 12 289 stocks. For Tiscali,  $K$  was equal to 0.05738 and the lot increased from 100 to 1743 shares. The ARs registered by Seat Pg and Tiscali (+300% and +750%, respectively, in

**Table 7. Daily average abnormal volume and cumulative average abnormal volume around the ED of 70 rights issues by 63 Italian listed firms on the MTA during the period 2007–2011**

Days	Day 0 = ED	
	Average abnormal volume ( $AV$ )	$t$ -value
-10	0.0461	0.0787
-9	-0.1454	-0.2481
-8	0.1402	0.2392
-7	0.1181	0.2016
-6	0.2010	0.3431
-5	0.1117	0.1906
-4	0.1424	0.2431
-3	0.6383	1.089
-2	1.1762	2.007**
-1	1.5950	2.722***
0	1.5921	2.717***
1	1.5229	2.5991**
2	1.2916	2.2044**
3	1.3063	2.2295**
4	1.2589	2.1485**
5	1.0681	1.822*
6	1.1994	2.0469**
7	1.3049	2.2271**
8	1.5026	2.5645**
9	1.7200	2.9354***
10	1.2079	2.0614**
11	1.2210	2.0838**
12	1.2218	2.0853**
13	-0.1550	1.727*
14	0.2478	1.5263
Days	Cumulative $AV$	$t$ -value
(-10 to -1)	4.0236	2.171**
(-3 to -1)	3.4094	3.359***
(-1 to 0)	3.1871	3.846***
(0 to +1)	3.1150	3.759***
(0 to +2)	4.4066	4.342***
(0 to +3)	5.7129	4.875***
(0 to +7)	10.5441	6.3626
(+7 to +14)	10.0848	7.0268
Number of observations	63	

Note: \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

the first 3 days) has determined a proportional increase in the call options premiums. As a consequence, the contracts become, suddenly, deep-in-the-money. Generally, this circumstance encourages the early exercise of the option by the buyer of the call, allowing him to take advantage of the difference between the stock market price and the strike price.<sup>7</sup> On the other hand, the writer of the call is obligated to sell the stock at the strike price. Often

<sup>7</sup> Alternatively, under normal market conditions the buyer can choose to sell the option rather than exercise the right. In the case of high volatility, the stock option market is illiquid and the early exercise is more convenient.

**Table 8. OLS estimates of coefficients in linear cross-sectional regressions with the cumulative abnormal volume (CAV) as the dependent variable and the dummy variable taking 1 for different dilution thresholds and 0 otherwise for 70 rights issues corresponding to 63 Italian listed firms on the MTA during the period 2007–2011**

Day 0 = ED	Mean CAV of nondilutive issues		D = 1 for dilution over 80%		Mean AV of nondilutive issues		D = 1 for last quartile of dilution		Mean AV of nondilutive issues		D = 1 for dilution over 50%		Mean AV of nondilutive issues		D = 1 for dilution over 40%		
	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	$\alpha$	$\beta_1$	
CAV (-10 to -1)	3.8435	-1.5592	4.1169	-2.3439	4.3999	-3.1653	3.5238	0.1748	2.4519	2.2524	2.4519	0.1748	2.4519	2.2524	2.4519	0.1748	2.2524
t-test	2.916***	-0.4714	3.014***	-0.8090	3.172***	-1.150	2.23**	0.0711	1.4300	0.9365	1.4300	0.0711	1.4300	0.9365	1.4300	0.0711	0.9365
CAV (-3 to -1)	3.350	-0.6663	3.4978	-1.1395	3.544	-1.1788	3.1001	0.3500	2.5557	1.3563	2.5557	0.3500	2.5557	1.3563	2.5557	0.3500	1.3563
t-test	6.916***	-0.5480	6.99***	-1.074	6.948***	-1.165	5.34***	0.3873	4.103***	1.5520	4.103***	0.3873	4.103***	1.5520	4.103***	0.3873	1.5520
CAV (-1 to 0)	3.197	-1.4295	3.2298	-1.1665	3.251	-1.1050	3.1004	-0.3147	2.6045	0.7205	2.6045	-0.3147	2.6045	0.7205	2.6045	-0.3147	0.7205
t-test	9.038***	-1.610	8.753***	-1.490	8.626***	-1.478	7.185***	-0.4685	5.569***	1.0980	5.569***	-0.4685	5.569***	1.0980	5.569***	-0.4685	1.0980
CAV (0 to +1)	3.150	-1.9727	3.2400	-1.8139	3.270	-1.7067	2.9154	-0.1903	2.4920	0.6790	2.4920	-0.1903	2.4920	0.6790	2.4920	-0.1903	0.6790
t-test	7.818***	-1.951*	7.755***	-2.047**	7.658***	-2.014**	5.869***	-0.2462	4.619***	0.8970	4.619***	-0.2462	4.619***	0.8970	4.619***	-0.2462	0.8970
CAV (0 to +2)	4.414	-2.3861	4.5264	-2.2087	4.564	-2.0817	2.9154	-0.1903	3.4567	1.1398	3.4567	-0.1903	3.4567	1.1398	3.4567	-0.1903	1.1398
t-test	7.495***	-1.614	7.407***	-1.704*	7.31***	-1.680*	5.849***	-0.2462	4.435***	1.0420	4.435***	-0.2462	4.435***	1.0420	4.435***	-0.2462	1.0420
CAV (0 to +3)	5.676	-2.6670	5.8328	-2.6111	5.857	-2.3812	4.0430	-0.0180	4.3860	1.7060	4.3860	-0.0180	4.3860	1.7060	4.3860	-0.0180	1.7060
t-test	7.426***	-1.390	7.366***	-1.555	7.232***	-1.482	5.617***	-0.0160	4.373***	1.2120	4.373***	-0.0160	4.373***	1.2120	4.373***	-0.0160	1.2120
CAV (0 to +7)	10.1971	-2.6265	10.4284	-2.9172	10.4577	-2.6679	9.1921	1.4248	7.5924	4.3070	7.5924	1.4248	7.5924	4.3070	7.5924	1.4248	4.3070
t-test	7.411***	-0.7605	7.308***	-0.9638	7.173***	-0.9222	5.57***	0.5546	4.303***	1.74*	4.303***	0.5546	4.303***	1.74*	4.303***	0.5546	1.74*
CAV (7 to +14)	8.5187	6.1331	8.5735	4.1342	8.6515	3.3106	7.2715	5.3809	5.5255	7.8095	5.5255	5.3809	5.5255	7.8095	5.5255	5.3809	7.8095
t-test	6.479***	1.858*	6.198***	1.4090	6.096***	1.176	4.674***	2.222**	3.417***	3.442***	3.417***	2.222**	3.417***	3.442***	3.417***	2.222**	3.442***
Number of observations	53	10	50	13	47	16	38	25	32	31	31	25	32	31	31	25	31

Note: \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

the writer of the call does not actually own the underlying asset and has to purchase it in the open market in order to be able to sell it to the buyer. In other cases, the investor, opting for a 'covered call strategy' (or buy-write), will sell a call option contract, owning at the same time an equivalent number of shares of the underlying stock. This strategy is the most basic and the most widely used option strategy where the risk of an unexpected rise in the underlying asset price is covered by the stock ownership.

In the case of a capital increase, the risk of this strategy is altered by the fact that, in spite of the exercise of the subscription rights linked to the stocks held, the delivery of the new shares occurs after the end of the offering period. We define this delay as a 'regulatory' time gap, that is to say, the misalignment between the ED (where the adjustment intervention takes place) and the delivery date of the new shares. Specifically, in the case of early exercise, the writer of the call is forced to buy an amount of shares determined by the lot adjustment in order to be able to sell it to the buyer. In the two cases examined, in order to verify the impact of this misalignment, we analyse the dynamics of the open interest together with the volumes of the call options. During the first 3 days of the offering period, the open interest of the Seat Pg call options decreased from 1028 to 55. We have the same evidence for Tiscali, where the open interest falls from 5186 to 54. Moreover, the volume of the call option contracts reveals that, in both cases, the decrease in the open interest is due to the early exercise rather than to the close of option positions before expiration. This dynamics in the open interest suggests that a part of the price pressure on the stock market can be attributable to the substantial early exercise of call options at the beginning of the offering period driven by the regulatory gap.

## IX. Summary and Conclusion

In this examination of the impact of rights offerings on stock prices in the MTA, we find statistically significant positive abnormal returns around the ED even if, at this date, there is a mere price adjustment and no new information is released. We show that these abnormal returns are mostly driven by highly dilutive rights offerings, where this definition applies for those operations having capital dilution greater than 50%. The results indicate that the price adjustment factor  $K$  is statistically significant in the explanation of the observed phenomenon.  $K$  reflects the impact of the capital dilution on the stock prices and is related to the discount in the subscription price

and the number of newly issued shares for every share held by each shareholder. One implication of the offering terms in the case of highly dilutive operations is that the ED stock price adjustment is so relevant to be similar to stock splits. As a consequence, the downward price adjustment is able to puzzle the investors about the stock's fair price. CONSOB, in a position paper, has highlighted the drawbacks of highly dilutive rights offerings, suggesting several technical adjustments aiming to prevent the observed stock market anomalies. Our first proposal is to impose a limit on the level of the price discount in these operations. This measure would prevent the occurrence of anomalies related to the misunderstanding of investors, mainly retail, about the price adjustment at the beginning of the offer period.

Moreover, the analysis of the option rights market has demonstrated a huge mispricing between the option rights and their theoretical value in the case of highly dilutive rights offering. The short selling prohibition imposed by CONSOB in the case of capital increase explains this evidence and raises questions about the side effects of this prohibition.

The consequences of high levels of capital dilution are also evident in the IDEM. In fact, some stocks involved in a capital increase in our research period are also underlying assets of option contracts. To this regard, we have discussed the evidence of the massive early exercise of the deep-in-the-money call options due to the huge stock price increase of the underlying assets at the beginning of the offer period. This event has caused relevant losses for the writers of call options even if they have implemented a covered call strategy. In order to prevent its occurrence in the future, we propose a different adjustment intervention of the stock option series open for trade before the offering period. In particular, we suggest a modification of the underlying asset of the contracts instead of the strike price and the number of shares of each contract based on the  $K$  coefficient. Thus, the pre-offering shares should be substituted with a basket of two assets, the post-offering shares and the related option rights. This would allow a protection of the call option writers because, in the case of an early exercise, they would not be forced to buy new shares in the market but only required to deliver to the counterparty a number of shares equal to the old lot and the option rights associated with them.

## References

- Ajinkya, B. P. and Jain, P. C. (1989) The behavior of daily stock market trading volume, *Journal of Accounting and Economics*, **11**, 331–60.

- Asquith, P. and Mullins, D. W. (1986) Equity issues and offering dilution, *Journal of Financial Economics*, **15**, 61–89.
- Ball, R. and Brown, P. (1968) An empirical evaluation of accounting income number, *Journal of Accounting Research*, **6**, 159–78.
- Black, F. (1972) Capital market equilibrium with restricted borrowing, *Journal of Business*, **45**, 444–54.
- Brown, S. J. and Warner, J. B. (1980) Measuring security price performance, *Journal of Financial Economics*, **8**, 205–58.
- Brown, S. J. and Warner, J. B. (1985) Using daily stock returns: the case of event studies, *Journal of Financial Economics*, **14**, 3–31.
- Burton, B. M., Lonie, A. A. and Power, D. M. (2000) The impact of corporate growth opportunities on the market response to new equity announcements, *Applied Financial Economics*, **10**, 27–36.
- Cai, J. (1998) The long-run performance following Japanese rights issues, *Applied Financial Economics*, **8**, 419–34.
- Campbell, C. J. and Wasley, C. E. (1996) Measuring abnormal daily trading volume for samples of NYSE/ASE and NASDAQ securities using parametric and nonparametric test statistics, *Review of Quantitative Finance and Accounting*, **6**, 309–26.
- Chandra, R., Moriarity, S. and Willinger, G. L. (1990) A re-examination of the power of alternative return-generating models and the effect of accounting for cross-sectional dependencies in event studies, *Journal of Accounting Research*, **28**, 398–408.
- Cready, W. M. and Ramanan, R. (1991) The power of tests employing log-transformed trading volume in detecting abnormal trading, *Journal of Accounting and Economics*, **14**, 203–15.
- CONSOB (2009) Position paper CONSOB in tema di short-selling, Position Paper, 27 May. Available at [http://www.consob.it/main/aree/novita/short\\_selling\\_esiti.htm](http://www.consob.it/main/aree/novita/short_selling_esiti.htm) (accessed 30 July 2012).
- CONSOB (2010a) Gli aumenti di capitale con rilevante effetto diluitivo, Position Paper, 19 April. Available at [http://www.consob.it/main/aree/novita/esiti\\_consultazioni\\_position\\_paper\\_20100803.htm](http://www.consob.it/main/aree/novita/esiti_consultazioni_position_paper_20100803.htm) (accessed 30 July 2012).
- CONSOB (2010b) Gli aumenti di capitale con rilevante effetto diluitivo, Esiti delle consultazioni, 3 August. Available at [http://www.consob.it/main/aree/novita/esiti\\_consultazioni\\_position\\_paper\\_20100803.htm](http://www.consob.it/main/aree/novita/esiti_consultazioni_position_paper_20100803.htm) (accessed 30 July 2012).
- Dyckman, T., Philbrick, D. and Stephan, J. (1984) A comparison of event study methodologies using daily stock returns: a simulation approach, *Journal of Accounting Research*, **22**, 1–30.
- Eades, K. M., Hess, P. J. and Kim, E. H. (1984) On interpreting security returns during the ex-dividend period, *Journal of Financial Economics*, **13**, 3–34.
- Eckbo, B. E. and Masulis, R. W. (1992) Adverse selection and the rights offer paradox, *Journal of Financial Economics*, **32**, 293–332.
- Eckbo, B. E. and Masulis, R. W. (1995) Seasoned equity offerings: a survey, in *Handbooks in Operations Research and Management Science Series – Finance*, Chap. 31 (Eds) R. A. Jarrow, V. Maksimovic and W. T. Ziemba, Elsevier/North-Holland, Amsterdam, pp. 1017–72.
- Fama, E. F., Fisher, L., Jensen, M. C. and Roll, R. (1969) The adjustment of stock prices to new information, *International Economic Review*, **10**, 1–21.
- Gajewski, J. and Ginglinger, E. (2002) Seasoned equity issues in a closely held market: evidence from France, *European Finance Review*, **6**, 291–319.
- Goyal, V., Hwang, C., Jayaraman, N. and Shastri, K. (1994) The ex-date impact of rights offerings: the evidence from firms listed on the Tokyo Stock Exchange, *Pacific-Basin Finance Journal*, **2**, 277–91.
- Grinblatt, M. S. (1984) The valuation effects of stock splits and stock dividends, *Journal of Financial Economics*, **13**, 461–90.
- Kang, J. K. and Stulz, R. M. (1996) How different is Japanese corporate finance? An investigation of the information content of new equity issues, *Review of Financial Studies*, **9**, 109–39.
- Korajczyk, R. A., Lucas, D. and McDonald, R. L. (1990) Understanding stock price behavior around the time of equity issues, in *Asymmetric Information, Corporate Finance and Investment* (Ed.) R. G. Hubbard, University of Chicago Press, Chicago, pp. 257–78.
- Krueger, T. M. and Johnson, K. H. (1991) Parameter specifications that make little difference in anomaly studies, *Journal of Business Finance and Accounting*, **18**, 567–82.
- Lamoureux, G. and Poon, P. (1987) The market reaction to stock splits, *The Journal of Finance*, **42**, 1347–70.
- Lintner, J. (1965) The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets, *Review of Economics and Statistics*, **47**, 13–37.
- Maloney, M. T. and Mulherin, J. H. (1992) The effects of splitting on the Ex: a microstructure reconciliation, *Financial Management*, **21**, 44–59.
- McGuinness, P. (2001) Ex-day effects for right issues in Hong Kong, *Applied Economics Letters*, **8**, 5–7.
- Owen, S. A. and Suchard, J. (2008) The pricing and impact of rights issues of equity in Australia, *Applied Financial Economics*, **18**, 1147–60.
- Salamudin, N., Ariff, M. and Nassir, A. M. (1999) Economic influence on rights issue announcement behavior in Malaysia, *Pacific-Basin Finance Journal*, **7**, 405–27.
- Sharpe, W. F. (1964) Capital asset prices: a theory of market equilibrium under conditions of risk, *The Journal of Finance*, **19**, 425–42.
- Singh, A. K. (1997) Layoffs and underwritten rights offers, *Journal of Financial Economics*, **43**, 105–30.
- Slovin, M. B., Sushka, M. E. and Lai, W. (2000) Alternative flotation methods, adverse selection and ownership structure: evidence from seasoned equity issuance in the UK, *Journal of Financial Economics*, **57**, 157–90.
- Smith, C. W. (1977) Alternative methods for raising capital: rights versus underwritten offerings, *Journal of Financial Economics*, **6**, 273–307.