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CHOICES IN EQUITY FINANCE A GLOBAL PERSPECTIVE

Massimo Massa, Virginie Mataigne, Theo
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Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
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CHOICES IN EQUITY FINANCE A GLOBAL PERSPECTIVE

Abstract

Equity issues can be structured as cash or rights offers and depending on the country's legislation firms can allow or restrict tradability of the rights. We study these choices using a worldwide sample of equity issues announced in 127 countries. We consider whether these choices as well as the short and long-term stock returns can be explained by a number of hypotheses proposed in the literature. The empirical findings confirm that the issuing method is driven by adverse selection and financial distress concerns, while the tradability decision reflects execution risk as well as transactions costs.

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Massimo Massa - massimo.massa@insead.edu
INSEAD and CEPR

Virginie Mataigne - Virginie.Mataigne@ugent.be
University of Ghent

Theo Vermaelen - Theo.Vermaelen@insead.edu
INSEAD

Moqi Xu - m.xu1@lse.ac.uk
LSE

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Choices in Equity Finance

A Global Perspective

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Contact

Massa and Vermaelen: INSEAD, Boulevard de Constance, 77305 Fontainebleau, France, +33 1 60 72 40 00; Mataigne: Ghent University, Sint-Pietersplein 7, 9000 Gent, Belgium, +32 9 264 35 68; Xu: LSE, Houghton Street, London WC2A 2AE, UK, +44 20 7849 4654.

Email: Massimo.Massa@insead.edu, Virginie.Mataigne@ugent.be, Theo.Vermaelen@insead.edu, M.Xu1@lse.ac.uk.

Choices in Equity Finance

A Global Perspective

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Equity issues can be structured as cash or rights offers and depending on the country's legislation firms can allow or restrict tradability of the rights. We study these choices using a worldwide sample of equity issues announced in 127 countries. We consider whether these choices as well as the short and long-term stock returns can be explained by a number of hypotheses proposed in the literature. The empirical findings confirm that the issuing method is driven by adverse selection and financial distress concerns, while the tradability decision reflects execution risk as well as transaction costs.

I. Introduction

When listed companies raise equity capital (i.e., make seasoned equity offers) they can either make a rights issue or a cash offer. While theory has provided a lot of insights on this topic, the empirical analysis has been much more limited. Indeed, the focus in the academic literature has traditionally been on the U.S., where the overwhelming majority of equity issues have taken the form of cash offers. However, this is not the case if we look at the rest of the world. Indeed, out of 37,767 equity issues around the world in the period 1995-2011, over 41% have been rights issues. Moreover, what is less widely known is that, in many countries, when firms make rights issues they have an additional choice: to have the rights traded or not. Specifically, out of 8,193 rights issues over the same period announced in countries in which the companies are allowed to make rights non-tradable (“choice countries”), approximately 37% of the issues did not have tradable rights. The purpose of this paper is to improve our understanding of the SEO process using a global (worldwide) view that accounts for the choice of rights versus cash offers as well as the choice of tradability. This approach allows us to provide new insights on a topic traditionally studied with a US-centric perspective mostly focused on cash offers.

In the case of rights issues, the company gives the existing shareholders a priority to buy the newly issued shares. If the rights are tradable, the shareholders who do not want to subscribe are supposed to sell the rights in the market. However, if shareholders don’t sell either because they forget ¹ or because the rights market does not exist or is not liquid enough, they will lose. Their loss will be a gain to the underwriter (in an underwritten offer) or to other shareholders (in a non-

¹ Investors may “forget” to reply to their broker if, for example, they are on holiday. Evidence that in the U.S. 36 % of investors forget to exercise or sell rights is documented by Holderness and Pontiff (2016).

underwritten offer) who are given an oversubscription privilege. In the case of cash offers, firms sell their shares without giving priority to the existing shareholders, effectively putting them on an equal footing with outside investors. Because these investors can always buy shares in the open market, in cash offers shares are offered at a small discount from market prices.

Why should firms prefer rights to cash offers? We entertain three alternative hypotheses. First, according to the *adverse selection hypothesis*, rights issues avoid the adverse selection problem that arises when informed managers – caring about existing shareholders more than new shareholders – have an incentive to issue equity if the shares are overvalued (Myers and Majluf (1984)). In a rights issue such an incentive does not exist as long as all shareholders exercise their rights, in which case new and existing shareholders are the same. That is, rights issues do not send the signal that the stock is overvalued. In fact, exactly² because existing shareholders are solicited, rights issues should be preferred to cash offers if the shares are undervalued.

A second hypothesis is linked to the private benefits of control. According to this *control hypothesis*, when choosing between cash offers and rights issues, large shareholders prefer rights issues to preserve private benefits of control (Wu, Wang, and Yao (2016)). In a cash offer, new equity is sold to outside investors and the incumbent ownership will be diluted, whereas in a rights issue there is no dilution as long as the incumbent shareholder exercises all her subscription rights. Hence, in contrast to the adverse selection hypothesis, the control hypothesis posits that rights issues reveal negative information: the private benefits of control (which are ultimately paid for by

² However, to the extent that rights are not exercised but sold, current shareholders can still suffer if the rights are undervalued (Eckbo and Masulis (1992)). One solution would be to discourage selling the rights by making the rights non-tradable. However, this is an imperfect solution as the investor could always sell her shares before the ex-rights date or exercise the rights and sell the undervalued shares afterwards.

non-controlling minority shareholders) are so large that the controlling shareholders prefer a rights issue.³

A third hypothesis posits that rights issues are a financing of last resort to reduce financial distress (*distress hypothesis*). Indeed, in a cash offer new investors may be reluctant to bail out the firm unless they are offered a large discount that dilutes current investors and the underwriter may refuse to underwrite in order to protect his reputation (Carter and Manaster (1990)). Therefore, the managers have incentives to target the existing shareholders – who have a larger incentive than new shareholders to keep their option alive and avoid losing everything in bankruptcy – by issuing rights. In this context, issuing rights, may give a bad signal (distress) that may be worse than any signal provided by a cash offer. Consistent with this hypothesis Heron and Lie (2004) and Ursel (2006) find that in the U.S. rights issuers are typically in financial distress and Ursel (2006) reports that thirty-eight percent of her sample contains subscription pre-commitments.

The three hypotheses provide different implications on the effect of the issuance on share prices. The adverse selection hypothesis posits that cash offers generate negative announcement returns and rights offers generate positive or at least non-negative announcement returns. The control hypothesis makes the opposite prediction. It argues that rights issues are chosen when there are large private benefits of control. To the extent the market was not fully aware of the size of

³ However, dilution of control can still happen if non-controlling investors sell their rights to newly emerging substantial shareholders who intend to share the private benefits with the incumbent. Making the rights non-tradable will prevent such a control transfer and may signal to the market that the private benefits of control are large. However, this assumes that accumulating a controlling block in the rights market is less costly than simply buying shares in the open market. This looks implausible considering that investors can only buy rights during a limited time period and the rights market may be illiquid as we will document infra.

these benefits (an assumption made by Wu, Wang, and Yao (2016)) rights issues will generate more negative returns than cash offers in the short run. It also predicts that such negative effect will be even more negative when private benefits of control are large, i.e. in firms with concentrated ownership. Finally, the distress hypothesis also predicts negative announcement returns after a rights issue as it reveals the fact that the firm is in financial distress. Note that these predictions may also be reflected in long-term operating performance and, to the extent the market underreacts, in long-term excess returns. As such, in this paper we study short-term returns, long-term returns and operating performance.

The three hypotheses also make different predictions about which firms are more likely to make rights offers rather than cash offers. The adverse selection hypothesis predicts that cash offers are more likely when firms are overvalued, a hypothesis that can be tested not only using ex-post measures such as long-term excess returns but also using ex-ante indicators such as high market-to-book ratios and pre-announcement price run-ups. The control hypothesis predicts that rights issues are more prevalent when private benefits of control are larger, i.e. in the presence of large blockholders. Finally, the distress hypothesis predicts that a rights issue is more likely when the probability of financial distress is larger.

The second major choice we examine is the choice to make rights tradable. We consider two hypotheses: the *execution risk hypothesis* and the *transaction cost hypothesis*. According to the execution risk hypothesis, making rights non-tradable reduces execution risk, i.e. the risk that a rights issue fails. This would be consistent with the hypothesis of Balachandran, Faff and Theobald (2008) who argue that firms make rights non-tradable when they expect take-up in a tradable issue to be low. The fact that rights are non-tradable is interpreted as a positive signal as the existing large shareholders have pre-committed to subscribe to the issue. It also may avoid giving negative signals in the case in which the rights may be undervalued. Indeed, rights undervaluation would

signal that the existing shareholders sell rights below fair value as they perceive the stock to be overvalued. Also, if rights appear to be undervalued, this may signal low take-up by insiders and lack of confidence of current shareholders in the future of the company. Evidence that rights are underpriced is reported by Hietala (1994), Poitras (2002) and Rantupaska and Knupfer (2008) and we confirm their results in this paper.

While a firm could reduce execution risk by arranging a deep discount non-underwritten rights offering, such a strategy may send a negative signal especially in opaque and risky firms (Heinkel and Schwartz (1986)) and transfer wealth from non-participating shareholders to participating shareholders (Holderness and Pontiff (2016)). Reducing execution risk through sub-underwriting may be expensive (Marsh (1980)) especially if underwriters, which are better capable of valuing the company than outside investors, believe the shares are overvalued. These considerations point in different directions. On the one hand, non-tradability will be seen as a good signal, i.e. more positive announcement returns when rights are non-tradable. On the other hand, the fact that reputable⁴ underwriters refuse to insure the rights issue may mean that the stock is overvalued. Large shareholders who commit to exercising their rights and often engage in standby underwriting may be too optimistic or concerned about avoiding bankruptcy. As a result, long-term excess returns will be more negative in non-tradable rights issues.

The transactions cost hypothesis argues that tradability of rights is expensive, i.e. it requires a prospectus and hiring an investment banker willing to make a market in rights. As for small firms

⁴ Balachandran, Faff and Theobald (2008) find that 37 % of non-renounceable Australian rights issues are underwritten. However, in many cases the underwriter is a large shareholder or a low tier investment bank, which is not surprising, considering that the average size of the issue is only \$ 5 million. In renounceable rights issues that are underwritten the average issue size is almost 6 times larger.

these costs may be material, the transaction cost hypothesis simply predicts that it is more likely that large firms have their rights traded.

Because rights issues are almost non-existent in the U.S. (let alone a proper market for rights), in order to test these hypotheses, we have to examine equity issues in foreign countries. Such a world-wide focus will also provide the critical information on differences in the market for rights. This can now be done in a proper way given the growing trend of international equity issuances. Within this trend, rights issues have become increasingly important (Figure 1). For example, in 2011, firms around the world raised \$214 billion through rights issues, compared with \$356 billion through cash offers and \$170 billion by initial public offers. The popularity of rights issues in foreign countries is partially a result of the fact that they are mandatory in many European and Latin American countries (Spamann (2010)), unless shareholders give explicit approval for cash offers. In some countries brokers and banks will automatically sell rights if investors don't specify whether they want to exercise the rights or not (Holderness and Pontiff (2016)). If firms are concerned about wealth transfer from small investors who don't pay attention, they may prefer to use cash offers. We will explicitly control for all these effects.

[Insert Figure 1 about here]

We use a sample of 15,751 rights issues and 22,016 cash offers around the world announced during the period 1995-2011. Unsurprisingly, not all results are consistent with one specific hypothesis. Consistent with the adverse selection hypothesis, short-term and long-term excess returns are more negative after cash offers and cash offers are more likely when firms appear to be more overvalued (i.e. the firm has a high market-to-book ratio and a pre-announcement stock price run-up). On the other hand, the large negative long-term excess returns of -35 % after rights issues are more consistent with the distress hypothesis than with the adverse selection hypothesis.

Some findings are supportive of the distress hypothesis. These are the fact that both the Altman Z-score and the Merton default probability measure are positively correlated with the probability of a rights issue as well as the fact that rights issues are followed by significantly lower growth in assets and capital expenditures.

However, we find very little evidence in support of the control hypothesis. In particular, the likelihood of a rights issue decreases when blockownership increases, which is the opposite of the prediction of the control hypothesis. Moreover, the large negative excess returns of -35 % after rights issues are simply too large to be explained by wealth transfers to controlling shareholders.

When we focus on the tradability choice, in line with the execution cost hypothesis, we find that, consistent with past research, rights tend to be undervalued, the short-term announcement returns are positive when rights are non-tradable and negative otherwise and the long-run excess returns are significantly more negative when rights are non-tradable, suggesting these companies were more overvalued. We also find that firms are more likely to make rights non-tradable when firms have high growth prospects, strong prior stock price performance and low probability of financial distress.

On the other hand, these firms are also small and risky which makes it more likely they are mispriced, i.e. overvalued. This valuation risk may well explain why these firms were not able to convince a reputable underwriter to reduce execution risk. However, the fact that larger firms tend to make rights tradable is also consistent with the transactions cost hypothesis. Again it is difficult to explain non-tradable rights with one theory.

This paper is, as far as we know, the first comprehensive international study of equity issues and contributes to the literature in several ways. First, previous research on long-run returns has been largely based on cash offers because the alternative issue method – i.e., rights issues – is largely non-existent in the U.S. (e.g., Loughran and Ritter (1995); Spiess and Affleck-Graves

(1995); Eckbo, Masulis, and Norli (2000)). Moreover, many international studies on long-run returns after seasoned equity offers (SEOs) (e.g., Foerster and Karolyi (1999); McLean, Pontiff, and Watanabe (2009)) do not distinguish between rights and cash offers. Also, previous research on long-run returns after SEOs is mostly country specific and focuses primarily on cash offers or does not make a distinction between cash offers and rights issues. Even more importantly, we are only aware of one paper that studies the determinants of tradability: Balachandran, Faff and Theobald (2008) argue that Australian firms make rights non-renounceable (i.e. non-tradable) when they expect take-up in a renounceable issue to be low. They find that the market does not respond differently to renounceable and non-renounceable issues (the average abnormal return is significantly negative in both samples). They also find that firms with high ownership concentration, low risk, high leverage, dividend payers, large firms, large issues and larger prior price run-up tend to select renounceable issues. Therefore, the main contribution of this paper is to make a clear distinction between cash offers and rights issues, as well as between rights issues with tradable rights and non-tradable rights.

Second, in contrast to our global perspective, the existing research on SEOs is mainly country specific. In the U.S., only a few companies have made rights issues in recent decades. This “disappearing rights phenomenon” has been documented by Smith (1977), Hansen (1988), Eckbo and Masulis (1992), Kothare (1997), Armitage (1998), Heron and Lie (2004), and Ursel (2006). Holderness and Pontiff (2016) explain the lack of U.S. rights issues by arguing that they do not offer sufficient protection to uninformed or irrational shareholders. In a direct survey of issuers, these authors document that fewer than two-thirds of shareholders sell or exercise rights. Rantapuska and Knupfer (2008) find similarly low participation rates in Finland and also document that Finnish shareholders exercise rights too early or sell them below the intrinsic value. Balachandran, Faff, and Theobald (2008) and Balachandran et al. (2012) document take-up,

liquidity, and announcement returns for non-tradable rights in Australia. In one other international study, McLean, Zhang, and Zhao (2008) report a relation between country-wide governance standards and the choice between rights and cash offers.

Also, our documentation of the existence and liquidity of the secondary rights market contributes to the discussion on the costs and benefits of rights issues relative to cash offers. We provide evidence on both the undervaluation and tradability of rights in a larger international sample and describe how they are linked to the regulatory framework. Rights tend to be undervalued and illiquid which may be one reason why firms don't believe it is in the interest of the current shareholders to make them tradable.

Finally, we add to the literature on law and finance. La Porta et al. (1998) list the countries where rights issues are mandatory, a feature that has been widely used, sometimes (Spamann 2010) in refined form, as a measure of shareholder protection. We show that the effect of rights issues on shareholder protection is more complex than previously indicated.

II. Institutional Characteristics of Rights Issues

A. Anatomy of a rights issue

In this section, we provide an overview of the rights issue process and describe its main features.

The offer. In a rights issue, the issuer's shareholders have the preemptive right to purchase a pro rata portion of the new shares. The subscription price is typically set at a discount to the recent market price to encourage participation. Some issuers (notably, U.S. and Austrian firms) first announce a range for the subscription price or the discount and do not actually set the price until after the subscription period. This procedure ensures that the stock price does not fall below the

subscription price.⁵ The number of rights given to shareholders is based on the number of shares owned on a specified “record date”. That is, shareholders have a window of time during which to sell their shares if they prefer not to participate. The record date is, on average, five days after announcement of the rights issue. In only 15 of the non-tradable rights issues in our sample is the record date *before* the announcement.

Tradability of rights. In tradable rights issues, shareholders who choose not to exercise their rights can trade them in a secondary market during the offer period. Tradability in the absence of a market is rare and costly, and it typically involves larger blocks of rights. Thus, issuers effectively restrict the tradability of rights when they do not provide a market for them.

Non-exercised rights. After the subscription period, the issuer can sell any rights that were not exercised (or sell the non-purchased new shares directly) to a so-called standby buyer or place them in the public market. Standby buyers are usually controlling shareholders, related parties, or underwriters. Public placements typically occur in an accelerated book-building process that is comparable to cash offers. Issuers can also give shareholders an “oversubscription privilege” that entitles subscribers to a second preemptive right to the unsubscribed shares. Very few regulators (notably, Hong Kong and the U.K.) require issuers to reimburse non-exercising shareholders from the proceeds due to purchased new shares.

⁵ Curiously, the main source of transaction risk is the number of shares subscribed rather than the event that the market price falls below the subscription price. Some offers are fully subscribed despite a market price below the subscription price, and many offers are not fully subscribed despite a market price far above the subscription price, especially in illiquid markets. The stock price also only rarely falls below the subscription price, 21 times in our sample. Consistent with the execution risk hypothesis, all 21 transactions involved tradable rights.

Regulations and discretion. Rights issues, tradability, and reimbursements are regulated by securities laws and listing rules. By definition, preemptive rights are optional; hence, shareholders can waive them (subject to country-specific limitations), typically in a majority vote. This fact makes rights issues susceptible to possible conflicts of interest between groups of shareholders. For example, issuers in most countries exclude foreign shareholders from the distribution and/or tradability of rights. Further variants arise as a function of differences in brokerage agreements. In many European countries, most brokers will sell rights even when shareholders give no instructions to exercise or sell. Such behavior reduces the losses of the investors who do not actively decide about the subscription (e.g., Holderness and Pontiff (2016)).

Prospectus. Issuers must provide a prospectus that details the offer's characteristics and states its objectives and the risks involved. Exemptions to this rule typically apply to small offers and offers to a limited number of (new) shareholders. These exemptions apply to most offers with non-tradable rights.

B. Regulations and tradability

Regulations in different countries require, enable, or are silent on the tradability of rights. As a result, depending on the country, all, some, or none of the issued rights are tradable. Following La Porta et al. (1998) and Spamann (2010), we investigated the rationale for such variation by interviewing lawyers, investment bankers, and regulators about the existence and regulation of secondary rights markets.⁶ While we asked for and recorded explicitly the state of the regulations

⁶ For general descriptions of regulations on rights issues, see Myners (2005) for an overview of European regulations. See also Balanchandran, Faff, and Theobald (2008) for Australia, Fung, Leung, and Zhu (2008) for China, Rantapuska and Knupfer (2008) for Finland, Gajewski and Ginglinger (2002) for France, Stehle, Ehrhardt, and Przyborowsky (2000) for Germany, Tsangarakis (1996) for Greece, Ching, Firth, and Rui (2006) for Hong Kong, Marisetty, Marsden,

at the end of 2011, we also verified whether changes occurred throughout our sample period. Non-tradable rights are the norm in only a few countries, most of whom are former communist countries that have seen a wave of privatization and in which the government still holds a large stake in public firms.⁷

At the other end of the spectrum are many countries in Europe and Asia (and in all of Latin America), where issuers are required to make a market for rights. We refer to such countries as “mandatory trading” countries. In the rest of the world, companies can choose whether or not the rights will be tradable. We refer to these as “choice” countries. Within most of the Commonwealth, this choice is structured and regulated. In Hong Kong, Singapore, and the U.K., offers without tradable rights are called *open offers* and are subject to a separate set of regulations (Korteweg and Renneboog (2002)). In Australia and New Zealand, offers without a secondary rights market are called *non-renounceable* (Balachandran, Faff, and Theobald (2008)). Open and non-renounceable rights issues often have size or discount requirements. In the U.K., for example, open offers are allowed unless the discount exceeds 10%. Open offers require only a simplified prospectus (or none at all). In contrast, U.S. and Swiss firms are free to choose whether to make their rights

and Veeraraghavan (2008) for India, Bigelli (1998) for Italy, Kang and Stulz (1996) for Japan, Salamudin, Ariff, and Nassir (1999) for Malaysia, Marsden (2000) for New Zealand, Bøhren, Eckbo, and Michalsen (1997) for Norway, Tan, Chang, and Tong (2002) for Singapore, Dhatt, Kim, and Mukherji (1996) for South Korea, Pastor-Llorca and Martin-Ugedo (2004) for Spain, Cronqvist and Nilsson (2005) for Sweden, Loderer and Zimmermann (1987) for Switzerland, Limpaphayom and Ngamwutikul (2004) for Thailand, Adaoglu (2006) for Turkey, and Armitage (1998) for the U.K. and U.S.

⁷ For example, Atanasov et al. (2010) give a detailed description of diluted minority shareholder value due to Bulgarian rights issues before a 2002 reform that required rights to be tradable. As in Bulgaria prior to 2002, tradability occurs only rarely in Russia and China.

tradable. In other countries (e.g., Germany, Austria, Belgium, and the Netherlands), rights are always tradable but issuers are not required to provide a market for them. It is typical in these countries for issuers to be (at least partially) exempt from prospectus requirements if existing shareholders are the only ones subscribing to the new rights.

III. Data and Descriptive Statistics

A. Data

We use a sample of SEOs obtained from Bloomberg, SDC, and Capital IQ. Our sample starts in 1995 (when data on tradability of rights became available from Bloomberg) and ends in 2011. We exclude offers of preferred stocks, loan stocks, shares in related companies, rights with warrant sweeteners, and poison-pill rights. If the offer extends to cross-listed securities, we include only the main security.

Bloomberg lists rights and cash offers in its corporate action calendar. Most of this information is reported on dedicated screens for each transaction that can be accessed from the corporate action calendar list. We collect this information by looking up the transaction window for each offer. These screens state whether the right is tradable and provide trading dates and sometimes tickers in addition to event dates, currency, subscription price, number of rights issued, and number of rights needed to buy one share. When no ticker is listed, we identify the ticker as the related security that was listed and delisted on the dates provided. These tickers are named after country-specific conventions and are usually identifiable as rights (e.g., by a suffix “R”). Accounting and market data on the underlying stock are obtained from Datastream.

Based on Bloomberg, SDC, and Capital IQ our sample consists of 15,751 rights issues for which we were able to find accounting information from Thomson Datastream and for which we were able to determine if rights were tradable. We find 5,150 (63%) of the offers in choice countries are

tradable. Bloomberg provides rights trading data for most countries. We lose observations because of Bloomberg's policy of storing and reusing security tickers, which varies across countries. For example, Bloomberg recycles security tickers for rights in Hong Kong and does not maintain records of all their trading histories; hence, we are able to retrieve trading data for only 10% of the tradable Hong Kong rights issues. Overall, our sample covers 127 countries and is not dominated by the largest markets. For stock exchanges that are large and more developed, the number of events per country is in line with data reported by the European study of Rinne and Suominen (2008) and also with other data sources such as the Securities Data Corporation (SDC). The SDC data includes more transaction details than are available from Bloomberg, but only for a select sample of large offers. The coverage of smaller, less developed markets (e.g., Panama, Turkey, Brazil) varies across databases. Appendix A compares the number of cash and rights issues listed in Bloomberg with those listed by SDC (ordered by the number of transactions). Bloomberg lists cash offers as a corporate actions category separate from rights issues; in contrast, SDC simply "flags" rights issues within its single list of all offers. As a consequence, mixed offers may appear in each Bloomberg list but only once in SDC (sometimes flagged as a rights issue), which may explain the discrepancy between the two databases in the fraction of rights issues.

SDC in general provides better coverage on cash offers. This advantage is consistent with its widespread use in the cash offer literature [for an overview, see Eckbo, Masulis, and Norli (2007)]. However, Bloomberg offers a more comprehensive coverage of rights issues in all countries but Japan (56 vs. 68 covered by SDC). In total, Bloomberg describes 28,240 rights issues, compared with 12,694 described by SDC, for the period 1995-2011. Another potential source of equity issuance data is Capital IQ, which is available starting from 2003. In Appendix A, we also provide a comparison of the number of rights issues per country covered by Bloomberg and Capital IQ, in this time period. Capital IQ covers a similar number of offers in most markets, but misses many

observations in important markets such as Australia, China, and South Korea. In total, it covers 7,677 rights issues in the period 2003-2011, compared with 15,897 covered by Bloomberg.⁸ We integrated our existing sample based on Bloomberg and SDC with the information from Capital IQ when missing in Bloomberg or SDC.

B. Descriptive statistics and univariate tests

In Table 1, we list the countries that are part of our sample and the number of rights that are tradable for which Datastream data is available. We also document the number of cash offers for which Datastream data are available. In total, we have 22,016 cash offers. A first interesting feature is the limited number of firms that choose the rights issue method in the U.S., Canada and Japan. In contrast, if we focus on rights issues, we see that the number of rights issues with a secondary rights market varies. In the U.S. and in most British Commonwealth countries, a substantial portion of rights is non-tradable. In particular, the fraction of offers without tradable rights is 55% in the U.S., where issuers have a free choice;⁹ 7% in the U.K., where such open offers are allowed only if the discount does not exceed 10%, and 23% and 73% in Hong Kong and Australia (respectively), where neither has a discount limit. In Singapore, where the 10% discount limit does apply, companies provide a market for rights in all but 7% of the offers. In Western Europe, issuers in several countries restrict tradability of rights: 40% of offers in Germany provide no rights market; the fraction is 24% in Belgium and 20% in Switzerland. In most Scandinavian, Southern European,

⁸ Curiously, Capital IQ's coverage of US issuers is much more comprehensive than the other two databases, with 834 designated rights issues compared to 325 identified by Bloomberg (and 372 by SDC in the entire period between 1995 and 2001). Many of these offerings, however, seem to be shelf offers for which we are not able to find information on subscription rights.

⁹ This figure is similar to the 51% reported by Holderness and Pontiff (2016).

and Latin American countries, nearly all rights are tradable, except for a few small offers that involve controlling shareholders.

[Insert Table 1 about here]

As we mentioned above, we use the term “choice countries” when we refer to the countries that allow the issuer to restrict the tradability of the rights. We identify these countries by observing the de facto incidence of secondary rights markets. Thus, choice countries are those in which each type (tradable and non-tradable) accounts for more than 5% of the market. Actual trading incidences are important because they reflect a true market choice, rather than merely a rule imposed by regulations, which may or may not actually be enforced. We employ a 5% threshold because there are exceptional cases where issuers deviate from their regulatory regime; for example, when they cater to foreign shareholders or to a controlling shareholder. A 1% threshold yields similar results, but it would misclassify certain countries as choice countries when both regulators and issuers regard tradability as mandatory.

It is important to note that a classification based on interviews with regulators and lawyers confirms our assessment for almost all countries. The only exception is Malaysia where issuers have a choice yet 99% of all rights are tradable. None of our results changes qualitatively when we employ a 1% threshold. In Table 2, we describe the characteristics of the cash and rights issues in our sample for all 127 countries. In line with the adverse selection hypothesis, firms issuing cash offers have higher market-to-book and higher run-up than firms that issue rights. Rights issuers typically have a lower Altman Z-score, higher Merton probability of default and higher leverage, which lends support to the distress hypothesis. Ownership concentration is higher in cash issuers compared to rights issuers, which is the opposite of what we would expect based on the control hypothesis. Furthermore, firms choosing a rights issue rather than a cash offer tend to have larger

assets, but smaller market capitalization. Typically, the percentage of new shares issued is much higher in rights issues than in cash offers.

[Insert Table 2 about here]

In Table 3, we compare the characteristics of rights issues in choice countries, distinguishing the offers with and without rights markets. (See Appendix B for a description of all variables.) There are 8,193 rights issues made in choice countries. Consistent with the transactions cost hypothesis, issuers that choose non-tradable rights (in choice countries) tend to be smaller, with average assets of \$2,172 million versus \$4,293 million for offers with rights markets. A similar relationship holds if we compare tradable and non-tradable offers in all countries.

[Insert Table 3 about here]

However, small firms are also more opaque and engender a greater dispersion of opinions. They also tend to be covered by fewer analysts (13 vs. 29). Hence, markets may assume that insiders are better informed than outsiders. Moreover, we find that, in choice countries, issuers with non-tradable rights are less liquid [with a mean Amihud (2002) illiquidity measure of 3.84×10^{-5} vs. 2.76×10^{-5} for issuers with tradable rights]. So small firm size may also proxy for higher execution risk which may also explain why they want to avoid rights tradability.

We can make a similar argument for firms in financial distress: the success of the transaction should be more important for such firms, but the distressed state will make it more difficult to convince investors to insert new equity capital (e.g., Myers (1977)). However, issuers with non-tradable rights have, on average, a significantly higher Altman Z-score (7 vs. 4) and are less leveraged than those with tradable rights (29% vs. 49%) which is inconsistent with the argument that the high likelihood of financial distress predicts a low take-up and therefore firms have to give a credible signal that existing shareholders are confident in the future. However, consistent with this execution cost argument, issuers with non-tradable rights are far less profitable (ROA of -15%

vs. -5%) and a greater proportion of non-tradable offers is made during the financial crisis (15% vs. 12% of all offers). Finally, issuers of non-tradable rights have significantly higher market-to-book values but a negative run-up (-4.5%) compared to issuers of tradable rights which have a small but insignificant run-up (+2%). We measure ownership concentration as the total percentage held in blocks of 5% (or more) of ownership. Table 3 shows that, in choice countries, tradable rights are associated with more concentrated ownership than non-tradable offers (8.9% vs. 6.0%). Many of our results, i.e. the fact that firms that make non-tradable rights issues are smaller, have lower leverage and have less concentrated ownership are consistent with the findings of Balachandran, Faff and Theobald (2008) in their study of Australian rights issues.

Finally, we document transaction-specific characteristics. Recall that some countries allow non-tradability only if the offer does not exceed certain size and discount limits. We measure the offer size with the number of shares offered as a percentage of shares outstanding prior to the offer, and the discount as the offer price relative to the closing stock price five days prior to the announcement. In line with such rules, offers with non-tradable rights in choice countries are smaller (42% vs. 64%) and have smaller discounts (22% vs. 27%).¹⁰ This finding is consistent also with the execution risk hypothesis which assumes that firms use non-tradability to avoid the negative signal associated with a deep discount.

Tradability takes time: on average, rights are traded over a span of 14 days in choice countries. Altogether, 28 days pass between the announcement and the effective date when rights are traded, which is 11 days more than for offers with non-tradable rights. Eleven days can lead to considerably

¹⁰ The first result is consistent with Balachandran, Faff and Theobald (2008), but the second is not: they find the average subscription discount of non-tradable offerings (19.78%) is not significantly different from the average subscription discount of tradable offers (18.61%).

higher execution risk, especially during a financial crisis. The Australian Securities Exchange (2010, p. 25) points out that “during times of extreme market disturbances the longer timetable for completing a renounceable issue (issue with tradable rights) carries the potential for exposure of the issuer to greater market risk.”

Table 4 provides descriptive statistics of characteristics for countries with different tradability regimes. Choice countries have a significantly higher gross domestic product (GDP) per capita and a larger equity market. This reflects the prevalence of developed countries in this group, which includes most Commonwealth countries and the U.S. However, choice and non-choice countries do not differ in terms of real interest rate, government debt, or inflow of foreign direct investment. This suggests that they are also not fundamentally different in terms of their equity markets or investor sophistication.

[Insert Table 4 about here]

Owing to the predominance of British Commonwealth countries in the choice country sample, the legal system of the majority is of English origin. The other choice countries are mostly European, and 25% (resp., 17%) of them feature a legal system of French (resp., German) origin. Overall, the choice countries are less often governed by civil law (only 50%) than by common law. Table 4 also shows that, as a group, choice countries have better governance than countries where tradability is mandatory. This difference is significant when governance is measured by judicial efficiency and the quality of accounting standards. The implication is that, in countries where shareholder rights are promoted, regulators will more likely support the freedom of companies to deny rights tradability. Regulators may well believe that there are good reasons, based on maximizing shareholder value (via reduced transaction costs, execution risk), for allowing non-tradable rights.

IV. The Choice Between Rights and Cash Offers: Multivariate Tests

We now formally study the choice between rights issues and cash offers in a multivariate setting. In Table 5, we estimate probit specifications of issuance choice. Given that in some countries firms have to use rights issues unless shareholders approve a cash offer, we use country fixed effects. These country fixed effects also control for the fact that in some countries brokers do automatically sell the rights if the investors don't specify whether they want to exercise the rights.

In line with the idea that firms time the market, we find that firms with a higher market-to-book and higher run-up are more likely to choose a cash offer. The results also indicate that firms with low Altman Z-scores (model 1 & 2) and high Merton default probabilities (model 3 & 4) are more likely to choose a rights issue. This confirms that less financially healthy firms prefer turning to existing shareholders who, they believe, might be easier to convince to provide more resources. Also, firms with high ownership concentration are more likely to use a cash offer to raise equity. This suggests that, in contrast to the prediction of the control hypothesis, large blockownership does not induce firms to opt for rights in order to secure the private benefits of control of the blockowners. Additionally, larger firms and firms with more analyst coverage prefer cash offers. This confirms the concern of small and opaque firms for execution risk as well as transaction costs.

In columns (2 & 4) of Table 5, we provide specifications with more country-specific variables. We see that firms are more likely to use rights issues in choice countries, suggesting that the possibility to choose whether the rights are tradable makes it more desirable to select a rights offer. Also, we see that rights issues are more common than cash offers in more “financially sophisticated” countries – i.e., countries with more substantial debt markets and equity markets (measured by Debt/GDP and Market/GDP, respectively).

Column (5) focuses on the choice countries and tests for the relevance of another country-

specific variable: pre-right which is the Spamann (2010) estimate: it is set equal to 1 if pre-emptive rights can be waived under special conditions¹¹. The pre-right variable has a statistically significant negative coefficient as expected: when shareholders' pre-emptive rights can be waived, rights issues are less likely. The results for the other variables are qualitatively similar to the results of the overall sample.

[Insert Table 5 about here]

Overall, these results are consistent with a number of the hypotheses discussed before. In line with the adverse selection hypothesis, firms use cash offers when their stock is more overvalued. In line with the distress hypothesis, firms use rights issues when they display signs of financial distress (according to the Altman Z-score or the Merton probability of default). In contrast, we find evidence inconsistent with the control hypothesis as firms with concentrated ownership prefer cash offers to rights offers. To further distinguish between the alternative hypotheses, we now focus on the market reaction.

V. Market returns of Cash and Rights Issues

In this section, we examine the short- and long-term responses to cash offers and rights issues.

A. Short-term announcement returns

¹¹ The Spamann (2012) "preright" extends the "preemptive rights" definition of La Porta et al. (1998). "Preemptive rights: Equals one when the company law or commercial code grants shareholders the first opportunity to buy new issues of stock, and this right can be waived only by a shareholders' vote; equals zero otherwise." "Preright: Completes the definition in the sense that it equals one only if the waiver is subject to special conditions, such as supermajority rules or substantive conditions. Also equals one if shares cannot be issued except with supermajority/-quorum approval in the first place."

We use Datastream-adjusted returns¹² and follow the usual procedure of short-term event studies by cumulating excess returns from day -1 until day +1 relative to the announcement date. We estimate the parameters of the market model using returns from 250 until 42 trading days before the announcement. We use the regional MSCI index to which the firm belongs as a proxy for the market index. We cumulate the abnormal returns from the day before the announcement until the day after.

The results are reported in Panel A of Table 6. We find that the market reacts negatively to rights issues in general: on average, -0.42% ($t = -3.81$) over the (-1,1) event window. The negative announcement returns for rights offers are clearly inconsistent with the adverse selection hypothesis but consistent with the control and financial distress hypotheses. The average announcement returns for cash offers, are also negative (-1.02%) and statistically significantly different from zero ($t = -12.55$).

[Insert Table 6 about here]

Market reactions to cash and rights issues are highly dependent on whether the firm has the option to make rights non-tradable. In countries where firms are free to restrict the tradability of the rights, the announcement returns of rights issues are significantly negative (-0.66%; $t = -4.13$) and the reaction does not differ much from the reaction to a cash offer (-0.96%, $t = -10.34$). We see quite the opposite picture in countries in which firms are not free to restrict the tradability of the rights: on average, the excess returns are significantly negative -1.35 % ($t = -8.73$) for cash offers and not significantly different from zero -0.17 % ($t = -1.10$) for rights issues.

Also, Panel B of Table 6 shows that the announcement returns after rights issues in choice countries are only negative when rights are tradable. In other words, while excess returns after cash

¹² Datastream-adjusted returns take into account reinvestment of dividend payments.

offers are always negative, excess returns after rights issues are only significantly negative in choice countries and only when rights are tradable. This result is consistent with the execution risk hypothesis: the markets interpret the non-tradability decision as evidence of pre-commitments of large shareholders, and therefore a good signal. Note that our results differ from the results reported by Balachandran, Faff and Theobald (2008) who find significant negative abnormal returns for both tradable and non-tradable rights issues in Australia.

The next panels C, D, and E compare cash offers and rights offer returns, but now for the 2 subsamples. Panel C of Table 6 compares the announcement returns of the 25% firms with the largest run-up and the 25% firms with the lowest run-up. The assumption is that high run-up firms are more likely to be overvalued. We find that the difference between announcement returns in cash and rights offers is significant only in the top run-up subsample. In the low run-up subsample, instead, the announcement returns of cash offers do not differ from announcement returns of rights offers. This is consistent with the adverse selection hypothesis: markets believe it is more likely that a cash offer is driven by market timing when the stock appears overvalued.

Panel D of Table 6 distinguishes between the highest and lowest ownership concentration firms. The prediction of the control hypothesis is that rights issues should generate lower (higher) excess returns than cash offers when ownership concentration is high (low). Consistent with this prediction, when ownership is highly dispersed (and private benefits of control should be irrelevant), cash offers generate significantly lower announcement returns ($t = -3.06$) than rights issues. On the other hand, when ownership concentration is high, excess returns in cash offers and rights offers are not significantly different, something which is not consistent with the argument that the private benefits of control are the main driver of announcement returns. So the difference in market responses between cash and rights offers can't be fully explained by the control hypothesis.

Panel E of Table 6 distinguishes between the firms with the highest and lowest distress probability. According to the distress hypothesis, a rights issue should signal that the firm is distressed while a cash offer would suggest that the firm is not distressed. Hence, *ceteris paribus*, announcement returns should be more negative for rights issues, especially when markets are concerned about distress, i.e. when Merton's default probabilities are high. However, Panel E shows the opposite result: when the probability of default is high, on average, announcement returns in rights offerings are -0.86 %, less negative than the -1.38 % in cash offers.

Summarizing, short-run announcement returns tend to support the adverse selection hypothesis more than any other hypothesis. Announcement returns after cash offers are always negative and smaller than announcement returns in rights issues, except when stock prices don't appear overvalued (i.e. the case of no price run-ups).

B. Long-term returns

We now focus on the long-term. If the markets are not efficient, the impact of tradability and/or choice of issuance method on shareholder value will not be confined to short-term announcement returns. Indeed, it will take time for the market to properly react to the information content of the issuance, diverging from the potential short-term over- or under-reaction.

We concentrate on the monthly abnormal returns in the two years starting from the month after the effective date.¹³ We use the IRATS (Ibbotson (1975)) event study method which adjusts for risk changes after the event. Such risk changes are likely especially if the rights issue is motivated by financial distress. It also gives equal weight to each event unlike other methods such as the calendar time method which forms an equally weighted portfolio each calendar month. As

¹³ We impose the one-month embargo to avoid any systematic Datastream mistakes in adjusting for the rights and new shares, as documented by Espenlaub, Iqbal, and Strong (2012) for UK open (i.e., non-tradable) offers.

Loughran and Ritter (2000) point out, if there is time-variation in market efficiency more managers will take advantage of mispricing (i.e. issuing overvalued stock) in months when markets are more inefficient. As a result, the calendar time method will underestimate the benefits from market timing.

The IRATS method involves running each event month cross-sectional regression of returns against a number of factors. The results presented are based on the Carhart (1997) and Fama and French (2012) global factors. The results, however, are qualitatively similar when using regional factors. The intercept of the regression is the abnormal return in the event month. Abnormal returns are cumulated and the results for cash offers and rights issues are shown in Figure 2a in choice countries and in Figure 2b for non-choice countries. Cumulative abnormal returns for various horizons are shown in Table 7.

[Insert Fig 2A and Fig 2B here]

The most striking result is that rights issues are bad in the long run. This means that investors who buy rights and exercise them overpay, on average. In section VI, we will test to what extent this is anticipated by the investors during the rights trading period. If we focus on the choice countries, we find that, after 36 months, long-term excess returns for cash offers are -61%. This is significantly more negative than the -46% return observed after rights issues ($t = -2.81$). However, when the rights are non-tradable, the excess return after 36 months becomes an even more negative -55%, which is significantly ($t = -3.19$) smaller than the negative -38% experienced by tradable rights. However, such a -55% is now not significantly different from the 36-month cumulative excess returns after cash offers ($t = 1.01$). This is strong evidence that restricting the tradability of the rights is not a good signal of long-term profitability, in contrast to the short-run response (Table 6, panel B).

These results are inconsistent with the adverse selection hypothesis that predicts positive or non-negative long-term excess returns after rights offers and negative excess returns after cash offers. Also, while the control hypothesis predicts negative excess returns after rights offerings, a negative abnormal return of -35 % is too large to provide a plausible estimate of the private benefits of control. In contrast, the financial distress hypothesis is consistent with the negative long-term returns after rights issues, but by itself cannot explain why long-term returns after cash offers (which are supposedly not driven by distress) are more negative than after rights offers. It seems that both effects are present here: adverse selection and financial distress. Also, these results are consistent with the execution risk hypothesis: small risky overvalued firms have to obtain pre-commitments from large investors to manage execution risk.

Panel C of Table 7 repeats the experiment of panel C of Table 6, but now focusing on long-term excess returns. In contrast to the short-term results of Table 6, now rights issues experience significantly lower (higher) excess returns over all horizons than cash offers in the top (bottom) quartile run-up, a result clearly inconsistent with the adverse selection hypothesis. In other words, when stocks look more (less) overvalued cash offers do better (worse) than rights offers in the long run, a result clearly inconsistent with the theory that the choice between rights and cash offers is mainly driven by adverse selection.

Panel D re-examines the control hypothesis extending the short-term analysis of Table 6 (panel D). The fact that long-term excess returns after cash offers are always smaller than after rights issues, regardless of ownership concentration, is clearly not consistent with the control hypothesis.

Finally, Panel E provides some additional tests of the distress hypothesis. We find that in the long run firms that appear ex-ante to be in financial distress experience more negative long-run excess returns in cash offers than in rights offers. Again this result is difficult to reconcile with a

theory that the choice between rights offers and cash offers is only driven by financial distress, i.e. cash issuers are financially healthy firms and rights issuers are distressed.

[Insert Table 7 here]

C. Multivariate Analyses

In this section, we provide a multivariate analysis of both the short and long-term abnormal returns. This allows us to better understand why these returns differ between rights issues and cash offerings. We start with an unconditional OLS specification, and then we control for self-selection into cash or rights offers by using a two-step switching regression model with endogenous switching, as described in Li and Prabhala (2007). We model the choice between cash or rights using the same specification of Table 5. We model the cumulative abnormal returns as:

$$CAR^{Cash}_i = \beta_0 + \beta_1 \text{Transaction and firm characteristics}_i + \beta_2 \text{Year}_i + \varepsilon_i. \quad (1a)$$

$$CAR^{Rights}_i = \beta_3 + \beta_4 \text{Transaction and firm characteristics}_i + \beta_5 \text{Year}_i + \gamma_i. \quad (1b)$$

Here, we allow the residuals ε_i and γ_i to correlate with the residual of the selection equation. Because the error terms are correlated, the conditional expectations of the residuals are nonzero. Augmenting equations (1a) and (1b) with generalized residuals from the selection regression, we are able to obtain consistent estimators via a straightforward extension of the Heckman (1979) procedure (Idson and Feaster (1990)). For each offer i , our set of explanatory variables includes the firm's market-to-book, run-up, ownership concentration, Altman Z, Merton default probability, volatility, number of analysts, logarithm of book assets, leverage, and profitability.

[Insert Table 8 here]

The results are reported in Table 8. They show that larger firms have lower short-term announcement returns, irrespective of the issuing method. In line with the adverse selection hypothesis, after controlling for selection into cash or rights, we find that market-to-book

negatively affects returns of cash issuers, while it positively affects rights issuers. Indeed, a cash offer by a high market-to-book firm sends a message that the stock is probably overvalued. A rights offer reassures markets that the high market-to-book ratio does not signal overvaluation, but possibly higher growth prospects. Furthermore, ownership concentration as well as Altman Z have a positive impact on announcement returns but only for cash issuers.

An interesting result is that the offer size is negatively correlated with the announcement returns for cash issues and positively correlated with announcement returns for rights issues. The opposite is true for leverage: leverage positively affects cash issuers but negatively affects rights issuers. Hence, consistent with adverse selection, a large cash offer is bad news because it signals large overvaluation while a large rights offer is good news because it signals that the management believes the stock is clearly not overvalued. At the same time when leverage is high it reassures investors in a cash offer that the issue is made to manage capital structure, not to issue overvalued stock. When a rights issue is made in a highly levered firm, on the other hand, consistent with the distress hypothesis, it signals that the issue is made to reduce financial distress, not to finance new growth opportunities. Note that after controlling for firm specific variables, short-term excess returns are no longer significantly smaller in cash offers than in rights issues. So, the conclusion from Table 6 that “rights are always better than cash offers” needs to be qualified.

Turning to long-run excess returns, high market-to-book firms and firms with a large price run-up prior to the equity announcement, experience more negative long-run returns, regardless of the issuance method, suggesting that these firms tend to be overvalued. The fact that high Altman Z-scores (i.e. ex-ante very financially healthy firms) predict future negative returns suggests one source of overvaluation, i.e. the probability of financial distress is underestimated.

Also, firm size is negatively correlated with abnormal long-run¹⁴ returns. Moreover, higher analyst coverage positively affects cash issuers, while it negatively affects rights issuers. One explanation consistent with adverse selection is that larger firms with higher analyst coverage are priced more correctly. Ownership concentration positively affects returns of cash issuers, but not in rights issues. The last finding is inconsistent with the prediction of the control hypothesis. In contrast with the results on short-term earnings, introducing control variables does not influence the conclusion of Table 7 that rights issues earn significantly larger excess returns of 17 % (t = 10) after 24 months. This is strong evidence in line with the prediction of the adverse selection hypothesis.

Combining all pieces of evidence on short-term and long-term excess returns, we can't conclude that all the results are consistent with one particular hypothesis. The short-term and especially long-term announcement returns are less negative after rights offers than cash offers, which is consistent with the adverse selection hypothesis: companies tend to use cash offers when their stock is more overvalued and the market apparently underreacts to the announcement. On the other hand, the fact that rights issues are also followed by significant long-run negative returns shows that adverse selection is not the full story. Rights issuers seem to be in trouble (they have high ex-ante probability of financial distress) and try to improve their capital structure by issuing equity.

VI. The Market for Rights

Finance textbooks often assume that investors are indifferent between exercising rights and selling rights to other investors. This idea assumes that rights are liquid and priced correctly. In this section,

¹⁴ For the purpose of these multivariate analyses long-term abnormal returns are computed following the approach of Brennan, Chordia, and Subrahmanyam (1998).

we address two fundamental questions. First, just how liquid are the rights? Second, are the rights priced close to their intrinsic value? Answering these questions may help us better understand why firms can justify making rights non-tradable. Indeed, undervaluation of the rights may send a negative signal: insiders are selling rights because they believe the stock is overvalued, increasing execution risk.

A. Liquidity of the rights market

Panel A of Table 9 displays univariate statistics on the liquidity measures for the rights and for the underlying stocks. The average sample firm has zero returns (Lesmond, Ogden, and Trzcinka (1999); Bekaert, Harvey, and Lundblad (2007)) for 23% of the rights trading period and a bid-ask spread of 4%, which is in line with previous research on the liquidity of international firms (e.g., Lesmond (2005), Lang, Lins, and Maffett (2012)).

We also report the Amihud (2002) illiquidity measure; following Lesmond (2005), we exclude prices that exceed $\pm 50\%$ of the prior day's price. The mean of this measure is 1.57×10^{-5} , a value comparable to the estimates of Lesmond (2005).

[Insert Table 9 about here]

The rights are less liquid than the underlying shares. The mean bid-ask spread of rights is 28%, or seven times the 4% spread of the underlying stock. Rights are not traded on average 28% of all the days listed on the market. The mean Amihud illiquidity measure is almost ten times that of the stock.

B. Mispricing in the rights market

To compare the quoted and theoretical prices, we follow the methodology of Hietala (1994), Poitras (2002), and Rantapuska and Knupfer (2008) in counting the days on which the quoted price is

lower (higher) than the lower PCP bound. Violations of the PCP bound enable positive returns from an arbitrage strategy that involves shorting the stock and buying the right.

Given that short selling is not possible in all countries, we compute an additional, more conservative lower bound. We therefore first assume an underlying risk arbitrage strategy of buying the right and exercising it only if the share price exceeds the exercise price on the day before expiration. Then, we calculate the subsequent returns and count the number of days on which they are positive. To obtain an even more conservative estimate, we calculate the returns after transaction costs. In other words, these are the returns after compensating the investor for the trouble of buying and exercising the right. Following Lesmond (2005), we use data from Bloomberg and various exchanges to find the commissions and fees paid. We use the worldwide average commission and transaction fee for the countries for which we cannot find (respectively) an estimate of commissions or a list of official fees. As a conservative proxy for price impact, we use the full bid-ask spread at the close of the trading day.

Panel B of Table 9 reports the statistics for our measures of undervaluation. The mean right is cheaper (62%, on average) than the lower bound on 17% of all days (*% violated*). These results are not much affected if we consider bid-ask prices instead of closing prices. Our estimates are comparable with the results of single-country studies. For example, in his analysis of a sample of Finnish rights during the period 1977-1981, Hietala (1994) finds that 58% of rights are mispriced. Poitras (2002) documents violations on 91% of all days in a sample of Singaporean rights issues for the period 1992–1998. In a more recent Finnish sample for 1995–2002, Rantapuska and Knupfer (2008) find that rights are underpriced by 15% on average. These values are much higher than the 3% of underpriced days observed for U.S. S&P 500 Index options (Ackert and Tian (2001)), 1% for the French CAC 40 Index options (Capelle-Blancard and Chaudhury (2001)), and 2% for the Italian MIB 30 Index options (Brunetti and Torricelli (2007)). The bound based on a

risk arbitrage strategy reduces the proportion of positive-arbitrage days to 9%. Even after transaction costs, 5% of trading days allow for positive arbitrage. While relative mispricing may indicate that either the stock itself is overvalued or that the rights traders have (negative) inside information, these results still suggest that shareholders who prefer not to exercise their rights will not be fully compensated for the dilution entailed by selling those rights.

Overall, these findings document that rights markets are illiquid and the rights are often undervalued. In this case, a restriction in tradability on the one hand helps to avoid sending the negative signal that the existing shareholders are selling their rights because they have serious doubts about the company's prospects, while on the other hand, it helps to manage execution risk.

In the next section we more formally investigate with a multivariate analysis the motivation to make rights non-tradable.

VII. Choice of Tradability

We now provide a multivariate analysis of the decision to make rights tradable. We estimate a probit model in which the probability of making rights tradable is explained in terms of firm, transaction, and country characteristics. We control for the prior choice between a rights and a cash offer by estimating a Heckman (1979) model in which the first stage is defined as in model 5 of Table 5. We use the variable *Preright* (Spamann (2010)) as an identifying restriction for our first stage choice between cash or rights. This variable identifies countries in which waiving preemptive rights is only allowed in special cases – e.g., with supermajority rules or substantive conditions. Given that this variable is likely to be unrelated to the tradability choice and therefore makes it a good identifying restriction. We control for year and country fixed effects. The independent variables are: volatility and the number of analysts to test for execution risk and the natural logarithm of assets to control for transaction cost considerations. We add market-to-book and run-

up to control for whether potential overvaluation influences the decision to make rights non-tradable. Finally, we include ownership concentration to control for the private benefits of control and Altman Z and Merton probability of default to control for financial distress.

We report the results in Table 10. They show that issuers with tradable rights are significantly larger than issuers with non-tradable rights. Typically, issuers of tradable rights have lower stock price volatility and lower analyst coverage. Hence, firms without tradable rights are risky small firms that may appear overvalued to an outside investor. Making the rights non-tradable may reassure investors that large shareholders are willing to pre-commit, thereby reducing execution risk. However, the fact that small firms are less likely to have tradable rights is also consistent with the transaction cost hypothesis, a conclusion also supported by the univariate results (Table 3). Furthermore, tradability is associated with lower run-up and higher default risk (measured by Altman Z and Merton default).

[Insert Table 10 about here]

In columns 2 and 4 of Table 10, we add country-specific variables related to market development (GDP/capita, the real interest rate, ratios of debt, market capitalization, and foreign direct investment inflows to GDP). Tradability is positively associated with GDP per capita as well as debt and equity market size. Overall, firms that restrict tradability differ from firms that allow rights to be traded, especially with respect to size, financial health, risk and pre-announcement stock price behavior.

It is interesting to compare our results with Balachandran, Faff and Theobald (2008). Consistent with our results, they find that low risk firms and larger firms tend to make rights tradable. However, in contrast to our findings, they find a significant positive relation between tradability and both run-up as well as ownership concentration.

VIII. Post-offer performance

We have documented that seasoned equity offers are followed by significant negative long-run excess returns regardless of the issue method and the difference between rights offers and cash offers disappears in the case rights are non-tradable. One explanation for these abnormal returns is misspecification of the assumed model of market equilibrium (as suggested by Eckbo, Masulis, and Norli (2000)). An alternative explanation is that the negative excess returns reflect deteriorating profitability after the issuance.

To address this issue, in Table 11, we report the difference between the ROA in the year of the offer and the ROA in each of the three following years. We see that all equity issues seem to be followed by a decline in ROA. Cash issuers, however, suffer from a more severe drop in ROA compared to rights issuers. This is consistent with the adverse selection hypothesis, in that firms issue cash offers when they are overvalued and know that performance is at its highest level. However, the significant negative ROA after rights offers is clearly not consistent with the adverse selection hypothesis.

[Insert Table 11 about here]

Furthermore, cash issuers are characterized by a higher growth in total assets, leverage, and capital expenditures compared to rights issuers in the 3 years after the equity issue. As we know that the average offer size of cash offers is significantly smaller than a rights offer, the higher growth in total assets is noteworthy. Hence, it seems that rights issuers are more likely to use the proceeds of the issue to rebalance their capital structure (e.g. to repay debt) to avoid financial distress, rather than grow assets.

On average, profitability of non-tradable rights issuers declines by 11% in the first and second year after the offer and recovers only by 4% in the third year after the offer. This performance is significantly better for issuers of tradable rights: in the first year after the offer, the change in ROA

of issuers of tradable rights is 7% higher than that of issuers of non-tradable rights. Hence our finding (Table 7) that non-tradability is followed by more negative long-term stock returns is reflecting real economic underperformance, not misspecification of the assumed model of market equilibrium.

IX. Conclusion

We study how firms choose between alternative ways of raising equity. We exploit a unique dataset with all the worldwide equity issues over the period 1995-2011 with a detailed breakdown between cash and rights issues, with rights either tradable or non-tradable.

We entertain three alternative hypotheses. The first (adverse selection hypothesis) posits that rights issues help to prevent the wealth transfer from existing to new shareholders when shares are undervalued. The second hypothesis (control hypothesis) posits that rights issues are designed to preserve private benefits of managerial control. The third hypothesis (financial distress hypothesis) posits that rights issues are a “financing of last resort” method mostly used when the firm is unable to attract outside investors through a cash offer.

The adverse selection hypothesis is supported by the fact that cash offers have more negative short-term and long-term excess returns than rights offers, as well as lower profitability in the 3 years following the issue. Moreover, long-term excess returns after cash offers are more negative when ex-ante measures of overvaluation such as market-to-book ratio and price run-up are larger. On the other hand, this hypothesis cannot explain why rights issues (1) are followed by significant negative long-term excess returns and returns on assets and (2) are more likely when the probability of financial distress is higher. These results are more consistent with the financial distress hypothesis which assumes that existing shareholders are more willing to bail out a firm in financial distress than new shareholders. The control hypothesis is not consistent with many of our findings.

The likelihood of a rights issue falls if ownership concentration increases, which is the opposite of the prediction of the control hypothesis. There is no evidence that ownership concentration has an impact on short-term or long-term excess returns. Moreover, the long-term negative excess returns of -35 % after three years of the announcement of a rights issue are simply too large to be explained by a destruction in shareholder value as a result of private benefits of control.

When studying the choice to make rights tradable we consider two hypotheses: the execution risk hypothesis and the transactions cost hypothesis. Consistent with the execution risk hypothesis, we find that rights typically tend to be undervalued and short-term announcement returns are positive when rights are non-tradable and negative otherwise. At the same time, long-run excess returns are significantly more negative when rights are non-tradable, suggesting these companies were more overvalued, consistent with their high market-to-book ratios and price run-up.

Overall, these results stimulate further research in this field, towards a more general theory that is able to encompass all these features.

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Appendix A: Bloomberg versus other data sources

This table reports the number of cash offers and rights issues listed in the Bloomberg, SDC, and Capital IQ databases, in order of the country's SEO frequency.

| Country (underlying) | Bloomberg (1995-2011) | | SDC (1995-2011) | | Bloomberg (2003-2011) | Capital IQ (2003-2011) | SDC> Bloomberg (Rights) | Capital IQ> Bloomberg (Rights) |
|----------------------|--------------------------|--------|--------------------|--------|--------------------------|---------------------------|-------------------------------|--------------------------------------|
| | Cash | Rights | Cash | Rights | Rights | Rights | | |
| UNITED STATES | 9,357 | 689 | 16,035 | 372 | 325 | 834 | | x |
| UNITED KINGDOM | 4,159 | 1,430 | 6,164 | 571 | 377 | 312 | | |
| AUSTRALIA | 4,563 | 3,294 | 13,589 | 3,401 | 2,166 | 1,719 | x | |
| CHINA | 1,717 | 2,172 | 1,026 | 171 | 1,362 | 71 | | |
| JAPAN | 2,278 | 56 | 3,746 | 68 | 17 | 1 | x | |
| HONG KONG | 2,305 | 973 | 3,541 | 651 | 637 | 33 | | |
| SOUTH KOREA | 1,559 | 2,298 | 3,006 | 934 | 1,070 | 23 | | |
| CANADA | 8,756 | 363 | 18,955 | 130 | 122 | 149 | | x |
| GERMANY | 401 | 1,097 | 819 | 452 | 540 | 195 | | |
| TAIWAN | 951 | 1,167 | 928 | 470 | 397 | 11 | | |
| FRANCE | 340 | 685 | 1,039 | 355 | 455 | 120 | | |
| MALAYSIA | 443 | 564 | 628 | 443 | 269 | 173 | | |
| SWEDEN | 212 | 1,075 | 470 | 499 | 794 | 276 | | |
| SINGAPORE | 503 | 284 | 818 | 367 | 188 | 182 | x | |
| BRAZIL | 277 | 1,179 | 623 | 83 | 527 | 18 | | |
| GREECE | 153 | 753 | 197 | 67 | 421 | 43 | | |
| TURKEY | 58 | 1,297 | 83 | 73 | 792 | 4 | | |
| ITALY | 162 | 402 | 405 | 186 | 252 | 63 | | |
| SOUTH AFRICA | 144 | 423 | 248 | 74 | 60 | 69 | | x |
| THAILAND | 102 | 394 | 352 | 287 | 195 | 85 | | |
| NORWAY | 283 | 356 | 476 | 116 | 215 | 91 | | |
| INDONESIA | 129 | 366 | 159 | 259 | 191 | 85 | | |
| SWITZERLAND | 174 | 244 | 319 | 115 | 93 | 49 | | |
| INDIA | 647 | 669 | 975 | 262 | 269 | 224 | | |
| SPAIN | 146 | 392 | 364 | 97 | 290 | 37 | | |
| POLAND | 210 | 187 | 233 | 42 | 146 | 21 | | |
| CHILE | 53 | 272 | 149 | 313 | 91 | 13 | x | |
| MEXICO | 64 | 215 | 185 | 40 | 66 | 6 | | |
| AUSTRIA | 74 | 190 | 116 | 74 | 114 | 42 | | |
| NETHERLANDS | 236 | 38 | 529 | 47 | 22 | 27 | x | x |
| DENMARK | 100 | 157 | 221 | 107 | 92 | 22 | | |
| NEW ZEALAND | 108 | 179 | 297 | 110 | 101 | 59 | | |
| IRELAND | 266 | 55 | 306 | 23 | 17 | 19 | | x |
| PORTUGAL | 43 | 113 | 114 | 67 | 23 | 11 | | |
| PHILIPPINES | 93 | 106 | 205 | 111 | 35 | 50 | x | x |
| BELGIUM | 93 | 81 | 202 | 44 | 28 | 13 | | |
| PAKISTAN | 5 | 306 | 32 | 0 | 223 | 55 | | |
| FINLAND | 88 | 64 | 231 | 60 | 42 | 26 | | |
| BERMUDA | 220 | 80 | 236 | 3 | 64 | 181 | | x |
| ISRAEL | 188 | 153 | 227 | 11 | 65 | 34 | | |
| PERU | 7 | 232 | 57 | 41 | 81 | 0 | | |
| EGYPT | 12 | 120 | 65 | 105 | 108 | 30 | | |
| ARGENTINA | 13 | 114 | 55 | 87 | 38 | 6 | | |
| KUWAIT | 4 | 103 | 16 | 28 | 103 | 12 | | |
| SRI LANKA | 4 | 208 | 7 | 71 | 186 | 54 | | |
| RUSSIA | 123 | 131 | 248 | 23 | 125 | 5 | | |
| JORDAN | 1 | 121 | 21 | 29 | 119 | 1 | | |
| UAE | 8 | 42 | 13 | 4 | 40 | 14 | | |
| QATAR | 1 | 28 | 7 | 16 | 28 | 11 | | |
| OMAN | 1 | 57 | 8 | 12 | 55 | 12 | | |
| Others | 710 | 2,266 | 1,621 | 723 | 1,861 | 2,086 | | |
| Total | 42,544 | 28,240 | 80,366 | 12,694 | 15,897 | 7,677 | | |

APPENDIX B: Definitions of variables.

| Variable | Definition |
|------------------------------|--|
| <i>Country/Market</i> | |
| Accounting | LLSV (1998) estimate of accounting standards (where 90 represents a high level of transparency) |
| Anti-director | LLSV (1998) estimate of shareholder protection, ranging from 0 to 6 (where 6 represents a high level of protection) |
| Debt/GDP | Ratio of government debt to GDP |
| FDI inflow/GDP | Ratio of net foreign direct investment inflow to GDP |
| GDP/capita | Gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current US dollars. |
| Governance (GMI) | GMI country governance index |
| Index returns | Log return on the regional MSCI index |
| Judicial efficiency | LLSV (1998) estimate of the efficiency of the judicial system, ranging from 0 to 10 (where 10 represents a high level of efficiency) |
| Legal origin | LLSV (1998) legal origin |
| Market/GDP | Ratio of equity market size to GDP |
| Prevote | Spamann (2010) estimate: 1 if preemptive rights can be waived by a simple majority vote (0 otherwise) |
| Preright | Spamann (2010) estimate: 1 if waiver is subject to special conditions (0 otherwise) |
| Preexpl | Spamann (2010) estimate: 1 if the law makes special mention of shareholders' first opportunity to buy shares (0 otherwise) |
| Real interest | Real interest rate |
| Tradability Choice | One if tradability of preemptive rights is not mandatory and 0 otherwise |
| <i>Liquidity</i> | |
| Amihud | Amihud (2002) measure with data corrections according to Lesmond (2005) |
| Bid-ask | Bid-ask spread divided by the average of bid and ask |
| % violated | Percentage of trading days on which the last price was below the put-call parity bound |
| #violated | Number of trading days on which the last price was below the put-call parity bound |
| Underpriced by | One minus the ratio of price to put-call parity bound if price is below the bound (0 otherwise) |
| Zero return days | Fraction of days with zero return to total days traded |
| <i>Transaction</i> | |
| Discount | Discount to the closing price five days prior to the announcement |
| Offer size | Percentage of new shares sold as a fraction of shares outstanding prior to the offer |
| Tradable | One if a market for rights existed (0 otherwise) |
| Trading days (actual) | Number of trading dates with positive volume |

Firm

| | |
|---------------------------------------|--|
| Altman Z | Altman Z-score |
| # Analysts | Number of analysts covering the firm (on I/B/E/S) |
| Assets | Total assets (thousands of US dollars) |
| EBIT | Earnings before interest and taxes (thousands of US dollars) |
| Employees | Number of employees (000) |
| Leverage | Net market leverage |
| Market cap | Price multiplied by shares outstanding (thousands of US dollars) |
| Market-to-book | Market to book ratio |
| Merton Probability of Default (prob.) | Probability of default measure derived from Merton (1974) bond pricing model, based on market equity and equity volatility |
| Ownership concentration | Sum of percentage of shares held in blocks of 5% or more |
| Profitability | EBIT/assets |
| Run-up | Returns 6 months to 42 days before the announcement |
| Sales | Sales (thousands of US dollars) |
| Volatility | Stock price volatility in the year prior to the issue |

Table 1. Sample data by country

This table gives a breakdown of the sample by country of incorporation (50 largest in terms of all offers) listed by the number of offers. “Choice countries” are those in which firms have the possibility to issue non-tradable rights. The last column indicates countries in which there was a change in regime from no-choice to choice country during our sample frame 1995-2011.

| Country | Total | Offer | | Rights | | Choice country | Change in regime |
|--------------|-------|-------|--------|--------------|----------|----------------|------------------|
| | | Cash | Rights | Non-tradable | Tradable | | |
| Australia | 5438 | 3318 | 2120 | 73% | 27% | X | |
| Canada | 4407 | 4283 | 124 | 1% | 99% | | x |
| US | 4258 | 4016 | 242 | 55% | 45% | X | |
| UK | 3148 | 2708 | 440 | 7% | 93% | X | |
| China | 2755 | 1144 | 1611 | 0% | 100% | | |
| Hong Kong | 1651 | 1195 | 456 | 23% | 77% | X | |
| Taiwan | 1137 | 595 | 542 | 0% | 100% | | |
| South Korea | 1132 | 0 | 1132 | 0% | 100% | | |
| Japan | 949 | 897 | 52 | 0% | 100% | | |
| Sweden | 913 | 116 | 797 | 3% | 97% | | x |
| Germany | 845 | 251 | 594 | 40% | 60% | X | |
| Brazil | 749 | 191 | 558 | 1% | 99% | | x |
| Turkey | 720 | 37 | 683 | 31% | 69% | | x |
| Greece | 653 | 94 | 559 | 29% | 71% | | x |
| France | 652 | 167 | 485 | 7% | 93% | | x |
| Malaysia | 593 | 296 | 297 | 1% | 99% | | x |
| India | 524 | 390 | 134 | 1% | 99% | | x |
| Singapore | 483 | 289 | 194 | 7% | 93% | X | |
| Spain | 398 | 78 | 320 | 3% | 97% | | x |
| Italy | 389 | 94 | 295 | 1% | 99% | | x |
| Norway | 379 | 181 | 198 | 6% | 94% | X | |
| Indonesia | 342 | 86 | 256 | 1% | 99% | | x |
| Vietnam | 327 | 29 | 298 | 52% | 48% | | x |
| South Africa | 281 | 89 | 192 | 0% | 100% | | |
| Thailand | 258 | 53 | 205 | 14% | 86% | | x |
| Poland | 241 | 94 | 147 | 0% | 100% | | |
| Ireland | 200 | 158 | 42 | 5% | 95% | | x |
| Denmark | 196 | 53 | 143 | 0% | 100% | | |
| New Zealand | 180 | 77 | 103 | 17% | 83% | X | |
| Switzerland | 178 | 96 | 82 | 20% | 80% | X | |
| Chile | 171 | 19 | 152 | 0% | 100% | | |
| Austria | 159 | 41 | 118 | 20% | 80% | X | |
| Mexico | 157 | 32 | 125 | 0% | 100% | | |
| Bermuda | 144 | 125 | 19 | 5% | 95% | X | |
| Netherlands | 127 | 112 | 15 | 33% | 67% | X | |
| Philippines | 126 | 56 | 70 | 0% | 100% | | |
| Israel | 123 | 85 | 38 | 0% | 100% | | |
| Sri Lanka | 106 | 1 | 105 | 0% | 100% | | |
| Portugal | 105 | 22 | 83 | 0% | 100% | | |
| Finland | 102 | 47 | 55 | 98% | 2% | | x |
| Peru | 96 | 3 | 93 | 0% | 100% | | |
| Kuwait | 95 | 2 | 93 | 0% | 100% | | |
| Russia | 94 | 0 | 94 | 100% | 0% | X | |
| Belgium | 92 | 50 | 42 | 24% | 76% | X | |
| Ivory Coast | 88 | 16 | 72 | 0% | 100% | X | |
| Pakistan | 86 | 1 | 85 | 0% | 100% | | |
| Jersey | 83 | 72 | 11 | 0% | 100% | X | |
| Jordan | 82 | 0 | 82 | 0% | 100% | | |
| Isle of Man | 75 | 0 | 75 | 9% | 91% | | |
| Bulgaria | 75 | 0 | 75 | 0% | 100% | | |
| Others | 1205 | 257 | 948 | 8% | 92% | | |

Table 2. Equity offers: cash /versus/ rights issues. Descriptive statistics.

Table 2 provides statistics for the 37,767 world-wide equity offers in our sample, distinguishing between cash and rights issues. †, *, and ** denote statistical significance at (respectively) the 10%, 5% and 1% level.

| | | Cash offers | | Rights issues | | t-stat of difference |
|-------------------------------------|---------------------------------|-------------|----------|---------------|----------|----------------------|
| | | Mean | median | mean | median | |
| <i><u>HYPOTHESES</u></i> | | | | | | |
| <i>Adverse Selection</i> | Market-to-book | 1.70 | 1.26 | 1.40 | 1.08 | 24.82 ** |
| | Run-up | 20.90% | 10.40% | 3.00% | 0.00% | 17.42 ** |
| <i>Control</i> | Ownership concentration | 10.89% | 0% | 7.31% | 0% | 19.57 ** |
| <i>Financial Distress</i> | Altman Z | 7.09 | 3.88 | 3.97 | 2.55 | 39.28 ** |
| | Merton prob. | 0.043 | 0.000 | 0.073 | 0.001 | -15.87 ** |
| <i><u>CONTROLS</u></i> | | | | | | |
| <i>Execution Risk</i> | Volatility | 0.162 | 0.128 | 0.159 | 0.126 | 2.20 * |
| | # Analysts | 58.61 | 3 | 19.24 | 0 | 34.44 ** |
| <i>Transaction costs</i> | Assets (thousands of US \$) | 2,844,703 | 121,443 | 4,716,445 | 180,634 | -18.79 ** |
| <i>General firm characteristics</i> | Market cap (thousands of US \$) | 674,055 | 94,985 | 381,100 | 67,821 | 24.33 ** |
| | EBIT (thousands of US \$) | 116,286 | 1,113 | 163,358 | 5,235 | -11.66 ** |
| | Sales (thousands of US \$) | 1,153,553 | 50,183 | 1,808,979 | 89,935 | -17.49 ** |
| | Employees (thousands) | 3,387 | 486 | 2,576 | 534 | 11.2 ** |
| | Leverage | 18.40% | 29.70% | 46.60% | 32.40% | -34.45 ** |
| | Profitability | -9.10% | 0.90% | -4.20% | 2.90% | -18.03 ** |
| | Amihud | 1.52E-05 | 2.00E-07 | 2.22E-05 | 4.38E-07 | -13.04 ** |
| <i>Transaction characteristics</i> | Offer size | 19% | 11% | 57% | 33% | -64.06 ** |
| | Discount | 2% | 1% | 27% | 24% | -21.45 ** |
| | Trading days (actual) | | | 14.79 | 11 | |
| | During financial crisis | 12% | | 13% | | 0.95 |
| <i>N</i> | | 22,016 | | 15,751 | | |

Table 3. Rights issues: tradable /versus/ non-tradable. Descriptive statistics.

Table 3 provides statistics for the 8,193 rights issues in choice countries, distinguishing between tradable and non-tradable rights issues. †, *, and ** denote statistical significance at (respectively) the 10%, 5% and 1% level.

| | | Rights issues Tradable | | Rights issues Non-tradable | | t-stat of difference | |
|--|---------------------------------|---------------------------|----------|-------------------------------|----------|-------------------------|----|
| | | mean | median | mean | median | | |
| <i><u>HYPOTHESES</u></i> | | | | | | | |
| <i>Execution Risk</i> | Volatility | 0.149 | 0.117 | 0.186 | 0.152 | 12.04 | ** |
| | # Analysts | 29.38 | 1 | 13.21 | 0 | -9.93 | ** |
| <i>Transaction costs</i> | Assets (thousands of US \$) | 4,293,881 | 160,400 | 2,172,402 | 21,563 | -9.34 | ** |
| <i><u>CONTROLS</u></i> | | | | | | | |
| <i>Adverse Selection</i> | Market-to-book | 1.41 | 1.07 | 1.65 | 1.25 | 9.64 | ** |
| | Run-up | 2.00% | 0.00% | -4.50% | -6.00% | -3.21 | ** |
| <i>Control</i> | Ownership concentration | 8.90% | 0% | 6.01% | 0% | -7.14 | ** |
| <i>Financial Distress</i> | Altman Z | 4.33 | 3.8 | 6.9 | 5.11 | 16.19 | ** |
| | Merton prob. | 0.088 | 0.003 | 0.080 | 0.003 | -1.50 | |
| <i>General firm characteristics</i> | Market cap (thousands of US \$) | 474,498 | 68,402 | 236,585 | 16,682 | -10.63 | ** |
| | EBIT (thousands of US \$) | 142,410 | 3,174 | 79,204 | -389 | -7.17 | ** |
| | Sales (thousands of US \$) | 1,510,581 | 69,563 | 737,252 | 6,355 | -9.54 | ** |
| | Employees (thousands) | 2,803 | 393 | 1,534 | 125 | -8.12 | ** |
| | Leverage | 49.20% | 40% | 29.00% | 14% | -18.19 | ** |
| | Profitability | -5.00% | 2.10% | -14.60% | -2.30% | -15.74 | ** |
| | Amihud | 2.76E-05 | 1.14E-06 | 3.84E-05 | 6.01E-06 | 7.17 | ** |
| <i>Transaction characteristics</i> | Offer size | 64% | 40% | 42% | 25% | -14.52 | ** |
| | Discount | 27% | 24% | 22% | 17% | -9.56 | ** |
| | Trading days (actual) | 14.4 | 11 | | | | |
| | During financial crisis | 12% | | 15% | | 16.1 | ** |
| <i>N</i> | | 5,150 | | 3,043 | | | |

Table 4 Country characteristics

This table shows univariate statistics for countries under different rights tradability regimes. Listed are the means for mandatory tradability versus choice countries and the results of tests for differences between them (i.e., 24% of countries with mandatory regime have legal systems of English origin, and those countries have an average GDP/capita of USD 17,509). †, *, and ** denote statistical significance at (respectively) the 10%, 5%, and 1% level.

| | | Tradability | | |
|----------------------------------|---------------------|-------------|--------|----------------------|
| | | Mandatory | Choice | t-stat of difference |
| Economic | GDP/capita | 13,670 | 43,878 | -5.92 ** |
| | Real interest | 1.84 | 3.17 | -0.62 |
| | Debt/GDP | 52.58 | 52.10 | 0.04 |
| | Market/GDP | 38.38 | 98.99 | -2.86** |
| | FDI inflow/GDP | 6.40 | 8.09 | -0.70 |
| Legal Origin | English | 26% | 50% | -1.65† |
| | French | 51% | 25% | 1.63 |
| | German | 19% | 17% | 0.19 |
| | Nordic | 4% | 8% | -0.57 |
| | Civil | 74% | 50% | -1.65† |
| Regulation of pre-emptive rights | Preright | 2.40 | 2.25 | 0.48 |
| | Prevote | 2.53 | 2.58 | -0.19 |
| | Preexpl | 2.53 | 2.50 | -0.57 |
| Governance | Anti-director | 3.57 | 4.40 | -1.38 |
| | Judicial efficiency | 8.18 | 10.00 | -2.13* |
| | Accounting | 63.45 | 71.80 | -1.65† |
| | Governance (GMI) | 4.42 | 5.95 | -1.09 |

Table 5. Choice of offer type: cash versus rights

This table shows the results of probit regressions in which the dependent indicator variable is set equal to 1 if a rights issue is used and zero for a cash offer. †, *, and ** denote statistical significance at (respectively) the 10%, 5%, and 1% level.

| Dependent variable = rights | | <i>All countries</i> | <i>All countries</i> | <i>All countries</i> | <i>All countries</i> | <i>Choice countries</i> |
|-----------------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| | | (1) | (2) | (3) | (4) | (5) |
| <u>HYPOTHESES</u> | | | | | | |
| Adverse Selection | Market-to-book | -0.115 ** (-9.14) | -0.114 ** (-9.05) | -0.141 ** (-9.57) | -0.140 ** (-9.46) | -0.114 ** (-7.90) |
| | Run-up | -0.220 ** (-15.29) | -0.219 ** (-15.22) | -0.203 ** (-12.42) | -0.202 ** (-12.34) | -0.196 ** (-11.46) |
| Control | Ownership concentration | -0.003 ** (-4.83) | -0.003 ** (-4.68) | -0.002 ** (-3.27) | -0.002 ** (-3.09) | -0.002 ** (-3.20) |
| Financial Distress | Altman Z | -0.012 ** (-7.52) | -0.012 ** (-7.47) | | | -0.010 ** (-5.85) |
| | Merton prob. | | | 0.990 ** (10.58) | 0.989 ** (10.55) | |
| <u>CONTROLS</u> | | | | | | |
| Execution Risk | Volatility | -0.018 (-0.18) | 0.022 (0.22) | -0.291 * (-2.27) | -0.237 † (-1.84) | -0.131 (-1.12) |
| | Number of analysts | -0.002 ** (-15.37) | -0.002 ** (-15.33) | -0.002 ** (-14.12) | -0.002 ** (-14.07) | -0.002 ** (-12.14) |
| Transaction Costs | Firm Size | -0.095 ** (-14.46) | -0.093 ** (-14.16) | -0.087 ** (-11.74) | -0.084 ** (-11.39) | -0.082 ** (-10.48) |
| <u>COUNTRY LEVEL</u> | | | | | | |
| | Choice Country | | 0.477 ** (7.10) | | 0.459 ** (6.56) | |
| | GDP/capita | | 0.000 (-0.13) | | 0.000 (-0.07) | |
| | Real Interest | | -0.010 * (-2.04) | | -0.010 † (-1.95) | |
| | Debt/GDP | | 0.008 ** (6.17) | | 0.010 ** (6.95) | |
| | Market/GDP | | 0.001 ** (6.20) | | 0.001 ** (6.31) | |
| | FDI inflow/GDP | | -0.011 ** (-2.73) | | -0.013 ** (-3.01) | |
| | Preright | | | | | -2.713 ** (-11.09) |
| | Constant | 3.780 ** (7.08) | 3.408 ** (6.24) | 3.564 ** (6.54) | 3.079 ** (5.51) | 4.302 ** (14.54) |
| FIXED EFFECTS | Country | Yes | Yes | Yes | Yes | Yes |
| | Year | Yes | Yes | Yes | Yes | Yes |
| | N | 22,243 | 22,243 | 17,777 | 17,777 | 14,323 |
| | Pseudo-R ² | 0.405 | 0.409 | 0.399 | 0.405 | 0.327 |

Table 6. Announcement returns

| Panel A: Cash versus rights issues | | | | | | | | |
|---|------------------|--------|----|------------------|--------|----------------------|-------|----|
| Announcement return (-1,+1) | | Cash | | Rights | | t-stat of difference | | |
| All countries | <i>n</i> = 22016 | -1.02% | ** | <i>n</i> = 15751 | -0.42% | ** | -4.47 | ** |
| Choice countries | <i>n</i> = 18387 | -0.96% | ** | <i>n</i> = 8193 | -0.66% | ** | -1.72 | † |
| No choice countries | <i>n</i> = 3629 | -1.35% | ** | <i>n</i> = 7558 | -0.17% | | -4.80 | ** |

| Panel B: Tradable versus non-tradable rights issues | | | | | | | | |
|--|-----------------|-----------------|----|---------------------|-------|----------------------|------|----|
| Announcement return (-1,+1) | | Tradable rights | | Non-tradable rights | | t-stat of difference | | |
| Choice countries | <i>n</i> = 5150 | -1.08% | ** | <i>n</i> = 3043 | 0.05% | | 3.44 | ** |

| Panel C: Adverse Selection Hypothesis | | | | | | | |
|--|--|--------|----|--------|---|----------------------|----|
| | | Cash | | Rights | | t-stat of difference | |
| Top quartile Run-up | | -1.65% | ** | -0.54% | * | -3.86 | ** |
| Lowest quartile Run-up | | -0.46% | † | -0.60% | * | 0.34 | |

| Panel D: Control Hypothesis | | | | | | | |
|---|--|--------|----|--------|----|----------------------|----|
| | | Cash | | Rights | | t-stat of difference | |
| Top quartile Ownership concentration | | -1.30% | ** | -1.09% | ** | -0.78 | |
| Lowest quartile Ownership concentration | | -0.78% | ** | -0.25% | * | -3.06 | ** |

| Panel E: Financial Distress Hypothesis | | | | | | | |
|---|--|--------|----|--------|----|----------------------|----|
| | | Cash | | Rights | | t-stat of difference | |
| Top quartile Merton prob. | | -1.38% | ** | -0.86% | ** | -1.10 | |
| Lowest quartile Merton prob. | | -1.30% | ** | -0.32% | * | -5.68 | ** |

Table 7. Long-term abnormal returns: Ibbotson RATS methodology

| Panel A: Cash versus rights issues | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|----------------------|--------------|--------------|
| Cumulative abnormal returns | Cash | | | Rights | | | t-stat of difference | | |
| | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) |
| All countries | -20% | -41% | -57% | -13% | -24% | -35% | -1.83 | -3.18 | -3.61 |
| Choice countries | -21% | -43% | -61% | -19% | -34% | -46% | -0.77 | -1.98 | -2.81 |
| No choice countries | -13% | -26% | -34% | -5% | -10% | -20% | -1.61 | -2.44 | -1.78 |

| Panel B: Tradable versus Non-tradable Rights Issues | | | | | | | | | |
|--|------------------------|--------|--------|----------------------------|--------|--------|----------------------|-------------|-------------|
| Cumulative abnormal returns | Tradable rights issues | | | Non-tradable rights issues | | | t-stat of difference | | |
| | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) |
| Choice countries | -16% | -28% | -38% | -23% | -41% | -55% | 2.42 | 2.86 | 3.19 |

| Panel C: Adverse Selection Hypothesis | | | | | | | | | |
|--|--------|--------|--------|--------|--------|--------|----------------------|--------------|--------------|
| | Cash | | | Rights | | | t-stat of difference | | |
| | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) |
| Top quartile Run-up | -19% | -29% | -39% | -22% | -39% | -48% | 3.10 | 3.86 | 3.87 |
| Lowest quartile Run-up | -32% | -54% | -63% | -14% | -25% | -34% | -1.70 | -2.23 | -2.27 |

| Panel D: Control Hypothesis | | | | | | | | | |
|------------------------------------|--------|--------|--------|--------|--------|--------|----------------------|--------------|--------------|
| | Cash | | | Rights | | | t-stat of difference | | |
| | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) |
| Top Ownership concentration | -12% | -21% | -27% | -10% | -20% | -11% | -1.50 | -2.18 | -0.57 |
| Lowest Ownership concentration | -26% | -51% | -70% | -14% | -26% | -37% | -2.42 | -2.86 | -3.33 |

| Panel E: Financial Distress Hypothesis | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|----------------------|--------------|--------------|
| | Cash | | | Rights | | | t-stat of difference | | |
| | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) | (1,12) | (1,24) | (1,36) |
| Top Merton prob. | -25% | -51% | -56% | -17% | -35% | -35% | -2.28 | -3.54 | -2.02 |
| Lowest Merton prob. | -6% | -11% | -17% | -3% | -7% | -15% | -0.66 | -0.76 | -1.51 |

Table 8. Cash /vs/ Rights: Multivariate analyses

| DEPENDENT: | SHORT-TERM ANNOUNCEMENT RETURN [-1,+1] | | | LONG-TERM ABNORMAL RETURN [1,24] | | |
|-------------------------|--|---------------------------------------|----------------------|----------------------------------|---------------------------------------|----------------------|
| | (1) | (2) | | (3) | (4) | |
| | <i>OLS Entire Sample</i> | <i>Switching regressions Cash</i> | <i>Rights</i> | <i>OLS Entire Sample</i> | <i>Switching regressions Cash</i> | <i>Rights</i> |
| Constant | 0.040 (0.85) | 0.022 (1.18) | 0.042 * (2.52) | 1.899 ** (6.03) | 1.023 ** (9.87) | 1.122 ** (10.26) |
| Right | -0.003 (-1.04) | | | 0.171 ** (10.08) | | |
| Market-to-book | 0.000 (0.29) | -0.003 † (-1.81) | 0.005 † (1.88) | -0.053 ** (-6.59) | -0.055 ** (-5.04) | -0.069 ** (-3.83) |
| Run-up | -0.003 * (-2.32) | -0.003 (-1.55) | 0.001 (0.23) | -0.050 ** (-6.49) | -0.017 (-1.47) | -0.106 ** (-6.46) |
| Ownership concentration | 0.000 (0.38) | 0.000 * (2.42) | 0.000 (-1.45) | 0.001 ** (4.12) | 0.002 ** (4.78) | -0.001 (-1.28) |
| Altman Z | 0.000 (0.42) | 0.000 † (1.68) | 0.000 (0.51) | -0.002 (-1.63) | -0.004 * (-2.54) | -0.008 * (-2.29) |
| Merton prob. | 0.006 (0.88) | -0.008 (-0.83) | 0.020 (1.51) | 0.046 (0.96) | -0.121 (-1.63) | 0.132 (1.63) |
| Volatility | -0.012 (-1.27) | -0.004 (-0.29) | -0.047 ** (-2.63) | -0.465 ** (-7.29) | -0.548 ** (-5.92) | -0.174 (-1.55) |
| Number of analysts | 0.000 (0.19) | 0.000 (-0.44) | 0.000 (0.62) | 0.000 ** (3.33) | 0.000 * (2.27) | -0.001 ** (-3.27) |
| Firm Size | -0.002 ** (-3.48) | -0.004 ** (-5.23) | -0.003 ** (-3.01) | -0.011 ** (-2.90) | -0.004 (-0.85) | -0.020 ** (-3.30) |
| Offer size | 0.000 (0.17) | -0.021 ** (-4.12) | 0.010 * (2.42) | 0.044 ** (2.71) | 0.050 (1.33) | 0.016 (0.68) |
| Leverage | -0.002 (-0.68) | 0.014 ** (4.06) | -0.009 † (-1.86) | 0.044 ** (2.71) | 0.081 ** (3.34) | 0.014 (0.53) |
| Profitability | 0.009 † (1.69) | -0.005 (-0.77) | 0.040 ** (3.73) | -0.166 ** (-4.57) | -0.168 ** (-3.46) | -0.075 (-1.18) |
| Tradability choice | -0.004 (-0.77) | | | -0.113 ** (-3.37) | | |
| GDP/capita | 0.000 (-0.28) | | | 0.000 ** (-7.81) | | |
| Real Interest | 0.000 (1.46) | | | -0.009 ** (-3.81) | | |
| Debt/GDP | 0.000 (0.63) | | | 0.004 ** (5.55) | | |
| Market/GDP | 0.000 * (2.07) | | | 0.000 (-0.79) | | |
| FDI inflow/GDP | 0.000 (-1.39) | | | -0.003 (-1.57) | | |
| Country Fixed Effects | Yes | No | | Yes | No | |
| Year Fixed Effects | Yes | Yes | | Yes | Yes | |
| N | 18,714 | 14,456 | | 18,714 | 14,456 | |
| R ² | 0.028 | | | 0.219 | | |

Table 9. Liquidity and mispricing characteristics

This table reports the mean, standard deviation, and minimum and maximum of rights liquidity and of the underlying stock (Panel A) in addition to underpricing characteristics (Panel B).

| | Mean | SD | Min | Max |
|---|----------|----------|----------|----------|
| Panel A: Liquidity measures | | | | |
| <i>Right</i> | | | | |
| Bid-ask | 28% | 34% | 0% | 159% |
| Zero return days | 27% | 29% | 0% | 93% |
| Amihud | 1.50E-04 | 6.77E-04 | 0.00E+00 | 5.31E-03 |
| <i>Underlying</i> | | | | |
| Bid-ask | 4% | 6% | 0% | 34% |
| Zero return days | 23% | 20% | 0% | 100% |
| Amihud | 1.57E-05 | 3.66E-05 | 0.00E+00 | 1.45E-04 |
| Panel B: Underpricing | | | | |
| <i>% Violated</i> | | | | |
| Close | 17% | 34% | 0 | 100% |
| Ask | 13% | 31% | 0 | 100% |
| Bid | 14% | 31% | 0 | 100% |
| <i>If violated, underpriced by</i> | | | | |
| Close | 62% | 34% | 10% | 100% |
| Ask | 64% | 33% | 11% | 100% |
| Bid | 60% | 34% | 8% | 100% |
| <i>% risk arbitrage possible (no short sales)</i> | | | | |
| No transaction costs | 9% | 27% | 0% | 100% |
| Transaction costs | 5% | 18% | 0% | 92% |

Table 10. Choice of offer type: Tradable versus non-tradable rights issues.

This table shows the results of probit regressions in which the dependent indicator variable is set equal to 1 if a tradable rights issue is used and zero for a non-tradable rights issue. The models presented are a Heckman model, in which the Inverse Mills ratio is retrieved from Table 5 (model 5). This table is based on a subsample of choice countries only. †, *, and ** denote statistical significance at (respectively) the 10%, 5%, and 1% level.

| Dependent variable = Tradable rights | | <i>Choice countries</i> | <i>Choice countries</i> | <i>Choice countries</i> | <i>Choice countries</i> |
|--------------------------------------|---|-------------------------|-------------------------|-------------------------|-------------------------|
| | | (1) | (2) | (3) | (4) |
| <i>HYPOTHESES</i> | | | | | |
| <i>Execution Risk</i> | Volatility | -0.492 * (-2.39) | -0.479 * (-2.29) | -0.468 † (-1.68) | -0.445 (-1.58) |
| | Number of analysts | -0.002 ** (-3.59) | -0.002 * (-2.55) | -0.001 * (-2.15) | -0.001 (-1.32) |
| <i>Transaction Costs</i> | Firm Size | 0.036 † (1.75) | 0.049 * (2.37) | 0.024 (1.08) | 0.033 (1.49) |
| <i>CONTROLS</i> | | | | | |
| <i>Adverse Selection</i> | Market-to-book | -0.027 (-0.80) | -0.005 (-0.14) | -0.071 † (-1.74) | -0.055 (-1.36) |
| | Run-up | -0.125 ** (-2.78) | -0.079 † (-1.72) | -0.074 (-1.48) | -0.035 (-0.69) |
| <i>Control</i> | Ownership concentration | -0.002 (-1.64) | -0.002 (-1.19) | -0.001 (-0.60) | 0.000 (-0.26) |
| <i>Financial Distress</i> | Altman Z | -0.019 ** (-4.85) | -0.017 ** (-4.29) | | |
| | Merton prob. | | | 0.460 * (2.53) | 0.416 * (2.27) |
| <i>COUNTRY LEVEL</i> | GDP/capita | | 0.000 * (2.42) | | 0.000 ** (3.60) |
| | Real Interest | | 0.026 * (2.52) | | 0.011 (0.93) |
| | Debt/GDP | | 0.015 ** (4.90) | | 0.011 ** (3.18) |
| | Market/GDP | | 0.000 (1.26) | | 0.001 † (1.87) |
| | FDI inflow/GDP | | 0.005 (0.52) | | 0.000 (0.03) |
| | Inverse Mills (<i>model 5 - Table 5</i>) | 1.560 ** (5.41) | 1.160 ** (3.93) | 1.211 ** (4.06) | 0.877 ** (2.88) |
| | Constant | 2.393 ** (2.88) | 1.180 (1.37) | 2.363 ** (2.71) | 1.670 † (1.84) |
| <i>FIXED EFFECTS</i> | Country | Yes | Yes | Yes | Yes |
| | Year | Yes | Yes | Yes | Yes |
| | N | 4,421 | 4,421 | 3,429 | 3,429 |
| | Pseudo-R ² | 0.400 | 0.407 | 0.365 | 0.372 |

Table 11. Post-offer operating performance and investment*Post-offer descriptives*

| | CASH | | | RIGHT | | | T-STAT | | |
|---------------------|-----------------|--------|--------|---------------------|--------|--------|---------------|----------|----------|
| | Year 1 | Year 2 | Year 3 | Year 1 | Year 2 | Year 3 | Year 1 | Year 2 | Year 3 |
| Change in ROA | -0.042 | -0.068 | -0.064 | -0.045 | -0.040 | -0.029 | 0.72 | -4.71 ** | -5.80 ** |
| Total Assets Growth | 0.380 | 0.972 | 1.743 | 0.254 | 0.606 | 1.071 | 17.78 ** | 21.49 ** | 20.77 ** |
| Leverage Growth | 0.025 | 0.045 | 0.058 | 0.011 | 0.024 | 0.027 | 3.57 ** | 4.04 ** | 4.98 ** |
| CAPEX Growth | 0.010 | 0.018 | 0.002 | 0.001 | -0.002 | -0.010 | 3.88 ** | 6.82 ** | 4.50 ** |
| | TRADABLE | | | NON-TRADABLE | | | T-STAT | | |
| | Year 1 | Year 2 | Year 3 | Year 1 | Year 2 | Year 3 | Year 1 | Year 2 | Year 3 |
| Change in ROA | -0.044 | -0.039 | -0.031 | -0.105 | -0.111 | -0.075 | -5.42 ** | -5.01 ** | -2.74 ** |
| Total Assets Growth | 0.223 | 0.543 | 0.972 | 0.264 | 0.633 | 1.190 | 2.80 ** | 2.70 ** | 3.54 ** |
| Leverage Growth | 0.007 | 0.003 | 0.004 | 0.014 | 0.025 | 0.026 | 0.76 | 1.80 † | 1.35 |
| CAPEX Growth | -0.006 | -0.005 | -0.014 | 0.004 | -0.014 | -0.023 | 1.87 † | -1.31 | -1.35 |

Figure 1. Seasoned equity offers over time

Source: Securities Data Corporation.

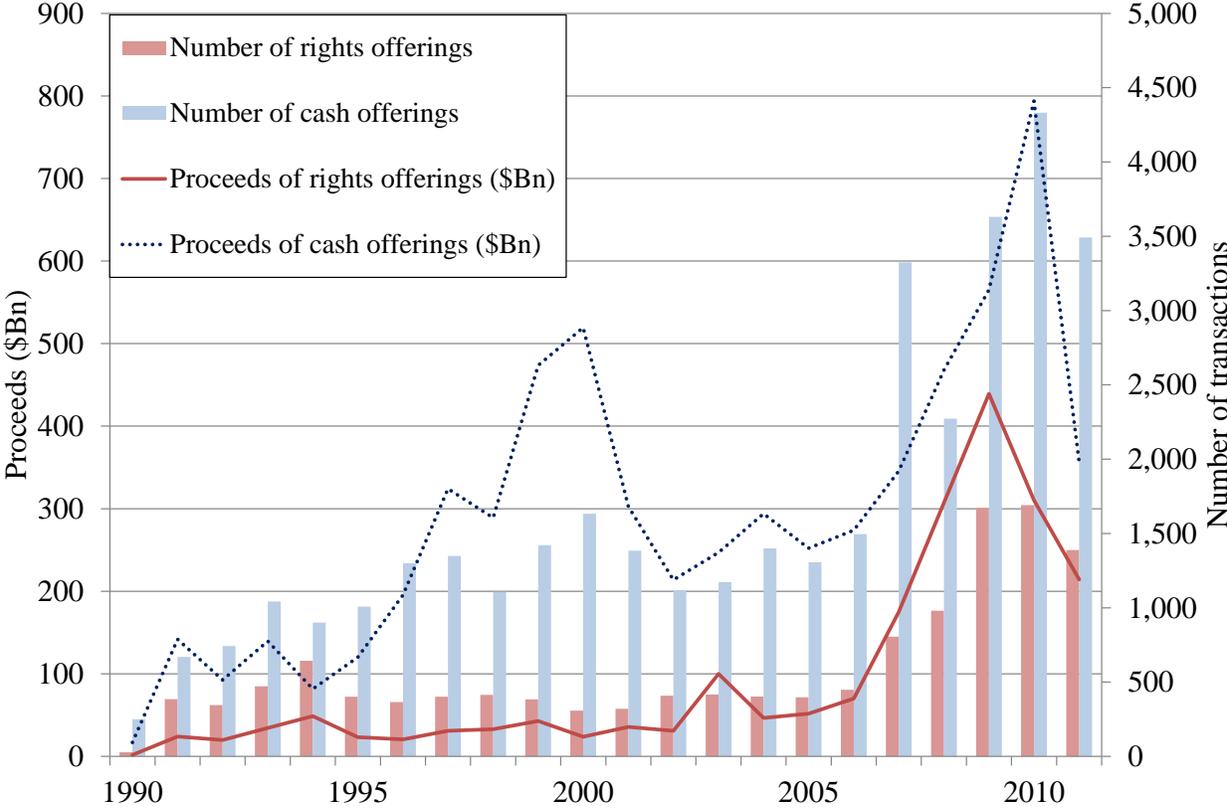


Figure 2. Long-term returns following the Ibbotson RATS methodology

Figure 2A: Choice countries

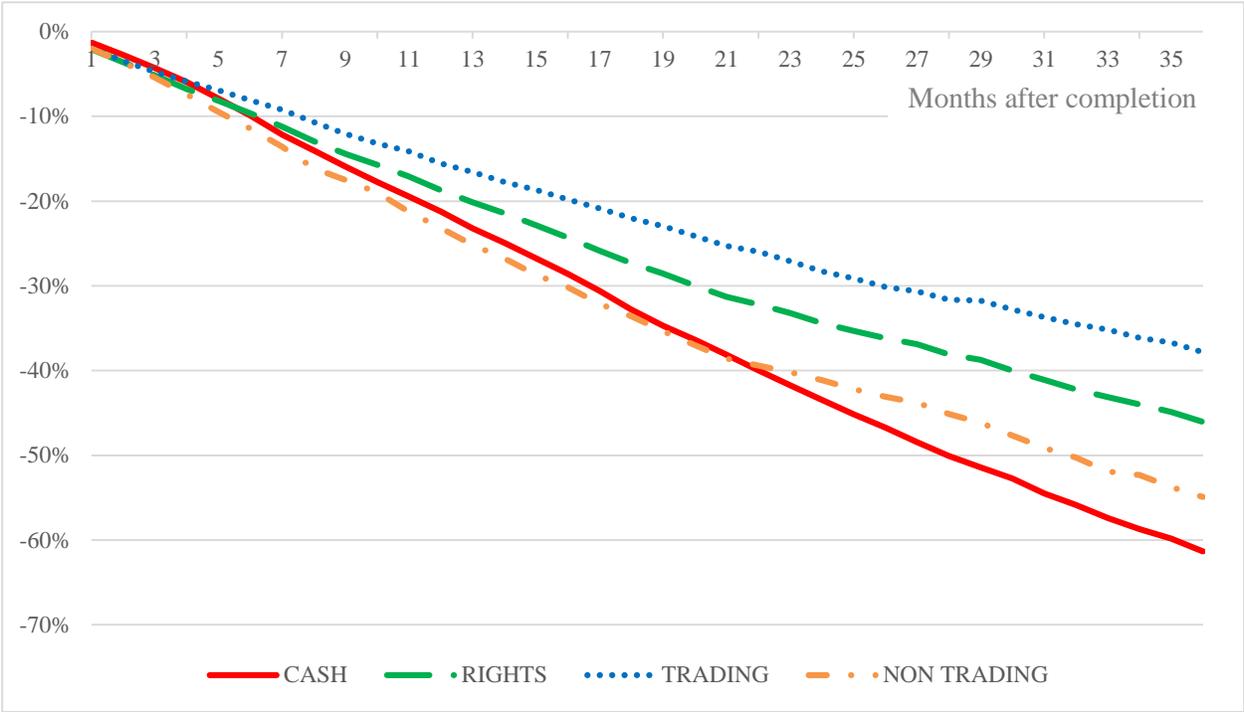


Figure 2B: No choice countries

