Popularity of Rights Offers: Evidence from Down Under ᵠ

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Abstract

We use daily ownership data to examine participation rates and associated wealth transfers for retail and institutional shareholders in a large sample of rights offers. The median participation rates for retail and institutional shareholders are 60% and 94% respectively, with median wealth transfer between the two being 0.25% (1.34%) of market capitalization (offer size). The average announcement returns are negatively associated with wealth transferred from retail to institutional shareholders. Retail shareholder participation is higher in renounceable offers and made by firms with lower risk and volatility and suggest that their decisions to leave money on the table are indeed rational.

JEL Classifications:

Keywords: Rights issues; Rights offers; Wealth transfers; Retail participation; Institutional participation; Discount; Abnormal returns.

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1. Introduction

The traditional rights offer (RO) provides a mechanism for companies to raise capital from existing shareholders efficiently, equitably, and at low cost. If all shareholders act rationally and take up their rights to purchase new shares then there are no resulting wealth transfers between shareholder groups, even when rights are offered at a discount to the current price. Yet, despite these positive attributes, the number of ROs issued by industrial firms in the U.S. has diminished since the 1960s (Eckbo and Masulis, 1992). A similar trend for ROs is observed in later years in other countries such as the U.K., Canada, Japan, and Hong Kong (Armitage, 2010; Eckbo et al., 2007; Wu and Wang, 2009). The apparent inconsistency between the relatively low costs to raising capital via ROs compared to other forms of capital raising, and the infrequent use of ROs, has become known as the rights offer paradox with various explanations being offered for its prevalence.

As rights are typically "in the money", it is usually assumed that most shareholders participate in such offerings. Participation rates also determine both the extent of wealth transferred between participating and non-participating shareholders and the amount of funds raised by issuing firms. Given that typically there is no legal requirement for firms to disclose participation rates in rights issues, researchers have relied on non-public data to infer that on average less than two-third of rights are exercised in the US, and that low participation also results in wealth transfer between participating and non-participating shareholders (Holderness and Pontiff, 2016).[1] Shareholder participation rates, therefore, in general, are crucial in determining whether a rights offer is indeed successful.

In this paper we use a unique *daily* ownership dataset for a large sample of rights issuing firms in Australia (where rights offers remain popular) to both accurately estimate participation rates of retail shareholders and institutional shareholders, and to determine the relation between participation and wealth transfer. To account for market participants who buy or sell shares up until the cum-entitlement date of the RO, we obtain a measure of retail and institutional shareholder ownership on the cum-entitlement date, which determines eligibility to participate in the RO. We then measure the number of shares purchased by retail and institutional shareholders based on first allocation (before unsubscribed rights are sold in a shortfall offer) which allows us to calculate and compare retail and institutional shareholder participation rates

[1] Lee and Poon (2018) study open offers in Hong Kong and present evidence consistent with Holderness and Pontiff (2016), hereafter HP (2016), that shareholder participation is low and private benefits are gained by large shareholders at the expense of non-participating shareholders. They also suggest that despite these characteristics open offers remain popular in Hong Kong. We discuss open offers in more detail in Section 2.

in the rights issue. Our sample of rights offers has a mean (median) retail shareholder participation rate of 59 (60) percent; the mean (median) institutional participation rate is 102 (94) percent. The mean (median) participation rate for all existing shareholders is 101 (79) percent.[2] By way of comparison HP (2016) report an average (median) participation rate of 64 (71) percent for the entire shareholder group. Their data do not allow comparison of retail and institutional shareholder participation rates.[3] Our results provide a finer decomposition of participation rates and not only highlight the disparity between the two but also, to the best of our knowledge, is the first one to do so using a large sample of rights offers by a diverse set of companies.

Our second contribution is to use the participation rates of retail and institutional shareholders and empirically demonstrate that retail shareholders exhibit higher participation rates when the RO is renounceable and when the discount to market price is larger. In addition, the lower the uncertainty of the issuer's performance (proxied by institutional ownership level, idiosyncratic risk, spread, and firm size), the higher is the retail participation rate. Rantapuska and Knüpfer (2008), Armitage (2010) and HP (2016), among others, argue that retail shareholders on average lack the financial capacity and sophistication to make an informed decision on whether to participate in ROs. Rantapuska and Knüpfer (2008) measure retail versus institutional participation rates in rights offers in Finland, but their sample consists of only 18 observations. We argue that the systematic interrelation among retail shareholder participation rates, discount, and firm risk in our sample of almost 400 rights offers is an important and new result as it suggests that retail shareholders have sufficient financial acumen to make rational participation decisions. It is also consistent with the view that rational and informed shareholders do indeed take up their rights.

Our third contribution is to present an accurate measure of wealth transferred from retail to institutional shareholders and its drivers. We document that for the whole sample the average (median) wealth transfer is 1.19 (0.25) percent of market capitalization and 6.32 (1.34) percent

[2] Over 30 percent of our sample companies have issued options giving holders the right to purchase shares, often out to 2 years from the issuance date. In addition, many rights offers have unlisted options attached to the offer. Taken together, the existence of listed and unlisted options gives option holders the right to participate in the rights offer provided options are exercised prior to the record date. Conceivably the ownership registration of these newly issued shares may be delayed, resulting in the share ownership on cum-entitlement date to be underestimated. This can, in turn, lead to the participation rate calculated for institutions to be larger than 100%. We do not have access to data on option exercise, but instead use our result of median participation rate of 94 % to conclude that almost all institutions fully participate in the rights issue.

[3] Our central focus is wealth transfers between these two groups and implications for success of the offer and announcement returns. In our sample of rights issuing companies the mean (median) institutional ownership is 61 (60) percent, whereas HP (2016) report mean (median) institutional ownership in their US sample to be 22 (13) percent.

of the funds sought. HP (2016) focus on wealth transfers between participating and non-participating shareholders, and thus are unable to measure wealth transfers from retail to institutional shareholders. Using participation data collected by surveying rights issuing companies in the U.S, they find an average wealth transfer of 4.5 percent (7 percent) of market capitalization (funds sought). It is important to emphasize that in this paper we are able to measure wealth transfers from retail shareholders to institutional shareholders. Of course, if institutional shareholders at large participate and retail shareholders largely do not (as HP (2016) argue), then the wealth transfers from non-participating to participating shareholders may be much the same as those from retail to institutional shareholders. To put our results into perspective, our sample of 387 rights offers during 1999-2007 raised $6.26b and the wealth transferred from retail to institutional shareholders totalled $81.1million. The wealth transfer from retail to institutional shareholders is (as expected) negatively related to the retail shareholder participation rate and to overall take-up rates,[4] and positively related to the proportional discount of the offer.

Finally, we document negative and significant abnormal announcement returns, consistent with the findings of Balachandran et al. (2008) and Owen and Suchard (2008), for Australian rights issues. The reaction in other countries to the announcement of a rights issue can be either positive or negative. Holderness (2018) summarizes results across several countries and finds that the average announcement market response is positive when shareholders must approve the issue. As there is no requirement in Australia for shareholders to approve a pro-rata rights offer, we find that the greater the wealth transferred from retail to institutional shareholders, the lower (more negative) the observed abnormal announcement returns. In the U.S., the stock market reacts more negatively to larger wealth transfers between participating and non-participating shareholders (HP, 2016). Our setting, where almost all non-participating shareholders originate from the retail shareholder group, produces a relation between abnormal announcement returns and wealth transfers that closely mirrors that reported by HP (2016).

The remainder of the paper is organized as follows. The next section presents a brief literature review. Section three describes the data and presents descriptive statistics. Section four contains the approach used to measure wealth transfers, and retail and institutional participation rates and presents the empirical findings. Section five concludes the paper.

[4] The take-up rate includes the allocation of shares not allocated in the first round and offered subsequently through a shortfall facility or placement.

2. Literature Review

Rights offers (ROs) are generally issued as a ratio to securities held (for example, a 1:2 rights offer is a right to buy one new security for every two securities owned). They are widely recognised as a cost-effective method to raise equity capital. Unlike traditional seasoned equity offerings, the discount of the offer price in ROs is not a cost to current shareholders when rights are fully subscribed. As such, ROs are perceived to be the most equitable equity-raising method. Despite their cost attractiveness, ROs have become a rarity in the U.S. since the 1960s, a phenomenon coined the 'rights offer paradox' in Smith (1977) and further analyzed in Hansen (1988), Eckbo (2008), and HP (2016). The paradox has not been fully explained by existing research, given that ROs are still popular in some countries including Australia, Sweden, Italy, the U.K. and Singapore (Eckbo and Masulis, 1992; HP, 2016). This section reviews key studies that contribute to explaining this puzzle.

In the first study Eckbo and Masulis (1992) (EM henceforth) argue that issuing new equity to current shareholders via ROs can potentially eliminate the adverse selection cost.[5] In the case of a high shareholder take-up rate, the adverse selection cost is negligible because most new shares are bought by current shareholders and thus no wealth is transferred to outside investors. EM (1992) find that the current shareholder take-up averages 99 percent for industrial issuers of non-underwritten rights offerings.

The second study by HP (2016) conjectures that the wealth transfer between current shareholders can impose costs on issuers even though the take-up rate is high. They point out that the take-up rate reported in EM (1992) does not reflect the actual shareholder participation rate. Instead, it includes both rights subscribed by shareholders according to their entitled allocations and the purchase of unsubscribed rights by other shareholders via an oversubscription facility. Indeed Wu et al. (2016) argue that because of the 'confusion and ignorance' of non-participating shareholders, oversubscription of informed investors results in high take-up rates, which therefore do not necessarily equate to high participation rates. HP (2016) obtain participation rates via a survey conducted for 179 US ROs from 1988 to 2009 and find that the average participation rate is 64% despite an average take up rate of 95%. The consequential wealth loss of non-participating shareholders amounts to 7% of the capital raised or almost 5% of firm value. They also show that the market reacts negatively to the wealth

[5] Under an information asymmetry framework in Myers and Majluf (1984), when management makes decisions in the interests of existing shareholders, undervalued issuers would choose not to issue as the costs of selling undervalued stocks exceed the net present value (NPV) of the investment. On the other hand, overvalued companies will always issue and invest. Thus, equity issuance conveys to the market that the issuer is overvalued.

transfers between current shareholders. HP (2016) suggest that non-participation of retail shareholders with consequent wealth effects, may be one explanation for the demise of rights offers in the U.S.

Another recent study by Lee and Poon (2018) investigates shareholder participation and wealth transfers associated with open offers in Hong Kong (HK). Open offers are not directly comparable to rights offers, because in an open offer the rights are not transferable; in addition the open offer may be combined with a placing; finally it is not clear whether the open offers in the Lee and Poon (2018) study are pro-rata.[6] Lee and Poon (2018) find participation rates in their sample of open offers are low, but take-up rates are high. Moreover, in a substantial percentage of their sample of HK companies, large shareholders act as the underwriter, resulting in lower wealth transfers and more favourable announcement returns. Armitage (2010) also finds that minority shareholders tend to suffer wealth and ownership dilution in rights offers in the UK.

To understand the popularity of rights offers in countries other than the U.S., several other papers examine the determinants of company choice to use ROs. For instance, Cronqvist and Nilsson (2005) find that family-controlled firms in Sweden adopt ROs to prevent their controlling block from being diluted. The model of Wu et al. (2016) predicts that issuers with a large private benefit (or low value issuers) choose ROs to prevent dilution, and those with a small private benefit (or high value issuers) choose public issues. Consistent with Cronqvist and Nilsson (2005), in another HK study Wu and Wang (2005) find that the market reacts more adversely to the announcements of ROs by HK firms which have a higher level of controlling ownership. Dedman et al. (2008) argue that controlling shareholders in Italy indirectly force current shareholders to participate in ROs by setting a deep discount and subsequent to the fundraising, invest in negative NPV projects.

Balachandran et al. (2008) investigate the quality signalling hypothesis for Australian ROs and find that high-quality firms tend to adopt fully-underwritten ROs, while intermediate-quality firms tend to choose non-underwritten offers. Low-quality firms prefer partially-underwritten ROs as issuers face a larger risk of offer failure but are reluctant to pay the high underwriting fees charged in a fully underwritten offer. High-quality firms tend to set lower discounts and consequently have higher abnormal returns at the announcement of Australian ROs.

Our study complements studies of rights offers including Balachandran et al. (2008) in

[6] See Listing Rules and Guidance – Open Offer HKEX: en-rules.hkex.com.hk

Australia, Armitage (2010) in the U.K. and HP (2016) in the U.S. It investigates participation rates using more accurate ownership data than available in previous studies, to discover who benefits from the offer. In particular, we are interested in retail shareholder participation, whether this group of shareholders makes rational participation decisions, and the wealth transferred from retail shareholders to institutional shareholders.

3. Data and descriptive statistics

3.1 Rights Offers

We obtain all ROs announced from 1999 to 2011, which is the period for which we have obtained daily ownership data from CHESS.[7] ROs are by Australian public companies listed on the Australian Securities Exchange (ASX), and are identified from Thomson Reuters SDC Platinum, which provides announcement dates, offer prices, renounceability, total offer proceeds, number of shares sought, and number of shares taken up. We manually collect announcement dates, underwriting status, whether the offer is renounceable and whether it provides a shortfall facility. We verify the data using RO announcements or prospectuses from the Securities Industry Research Centre of Asia-Pacific (SIRCA) Company Announcement database. Ex-entitlement dates are extracted from the Bloomberg database, while listing dates are from the Thomson Reuters Connect4 database. The sample covering 1999 to 2011 comprises 945 ROs issued by 654 unique firms.

SIRCA provides daily share prices and daily total shares outstanding. We use these data to calculate returns for each company one year prior to its RO announcement, and market capitalization two days before the announcement date. The Aspect Huntley FinAnalysis database is used to source issuers' accounting information at the balance sheet date immediately prior to the RO announcement date.

ROs can be distinguished by three main features – whether the rights are renounceable or non-renounceable, whether shortfall shares are taken up by underwriters, or are allocated to existing shareholders if they are invited to apply for more than their entitlements. For a renounceable (RN) offer (referred to as "tradable" in the U.S.), shareholders who do not wish to participate may sell the rights to third-party investors on the secondary market during the

[7] Clearing House Electronic Subregister System (see next sub-section). The data are no longer available as ASX is currently changing the platform for managing the electronic recording of shareholdings. We obtained the CHESS data for the period 1999 to 2011; the period 2008 to 2011 encompasses the financial crisis. During this period companies struggled to raise capital, there were imposed short selling constraints on the shares of financial companies and a heightened period of uncertainty, which together combined to make this period not comparable to the period we ultimately analyze in this paper.

subscription period. Even though non-participating shareholders can sell their rights on the secondary market they may still suffer wealth loss, since on average rights trade for slightly less than half of the trading period, and the value of the right is significantly below fair value (Massa et al., 2013). In addition, shareholders are not compensated if they do not exercise or sell their rights. Some brokers have a policy of selling the rights on the market if a shareholder fails to respond to the broker by the ex-entitlement date. However, this policy is not compulsory and is uncommon in Australia.[8] In a non-renounceable offer (non-tradable or non-transferable), current shareholders do not have the option to sell the rights if they do not wish to exercise them.[9] Shareholders must either take up their rights or let them lapse upon expiration without compensation.[10]

ROs may be non-underwritten (uninsured) (NUW) or underwritten (standby) (UW). An underwriter receives a fixed fee and a take-up fee (which depends on the value of new equity they subscribe) in return for purchasing the unexercised rights that remain at the completion of the RO. Underwriters may be governments, financial institutions, stockbrokers, and major shareholders of the company or any other party. Similar to the U.S., ROs in Australia can be structured with a shortfall facility (SF) that allows all current shareholders who take up their entitlements fully to apply for unexercised rights.[11] Firms have the option of providing a shortfall facility, but it is not a regulatory obligation. When there is no provision for a shortfall facility (NSF), unexercised rights are either allocated at directors' discretion to institutional investors of their choosing or offered via a book-build.[12] Issuers do not reimburse non-participating shareholders for unexercised rights allocated to other shareholders.

3.2 Ownership data

This investigation is made possible with a unique set of daily ownership data provided by the ASX and facilitated by SIRCA, which enables calculation of shareholder participation

[8] In the U.K., the broker appointed by the issuing firm would sell unsubscribed valuable rights in the market, with the proceeds returned to shareholders (Slovin et al., 2000).
[9] UK open offers have some characteristics that resemble non-renounceable ROs. The difference is that they are typically placed with institutional investors first, who then offer the shares pro-rata to the current shareholders. Any rights not taken up cannot be sold on the secondary market.
[10] The only way for financially constrained shareholders to take advantage of a NR offer is to sell part of their holdings to finance the take-up (Balachandran et al., 2008). However, this involves transaction costs.
[11] A shortfall facility is termed 'over-subscription' in the U.S.
[12] A book-build is an offer of securities to investors for which bids are sought from the investors and the allotments and offer price are determined based on those bids. According to ASX Listing Rule 3E(6)(c)(vi), companies must make the issue of unsubscribed shares within three months after the close of the offer, and the directors must have stated as part of the offer that directors alone or both directors and underwriters reserve the right to issue the unsubscribed shares at their discretion. The offer price of unsubscribed shares must not be less than the initial round offer price.

in our sample of rights offerings. We calculate daily institutional ownership and retail ownership of the constituents in the S&P ASX500 (also known as All Ordinaries Index) using the Clearing House Electronic Subregister System (or CHESS). Since 1998, when paper share certificates were eventually phased out in Australia, ownership of shares has been recorded electronically.[13] There are limitations to the amount of information available from CHESS. In order to protect the identity of the shareholders, the ASX releases ownership data only in an aggregated format. We divide the daily ownership data into institutional shareholdings and retail shareholdings.[14]

Comerton-Forde and Rydge (2006) suggest that long-term strategic shareholders are not likely to be recorded on CHESS, if they have not traded since CHESS commenced in 1995. Long-term strategic shareholders include family shareholders, managerial shareholders, or private equity companies. Bradrania et al. (2017) report that CHESS covers around 73% of market capitalization on the ASX. The coverage of CHESS has increased since 1995, because the first time a long-held share is sold the ownership details are registered on CHESS. Ownership of shares of companies listed on the ASX is recorded in one of two registries: the CHESS registry or the issuer sponsored registry. As there is no reason to suggest that retail (institutional) shareholder behavior (in terms of exercising their rights) of CHESS registered shareholders is different from the behavior of retail (institutional) shareholders registered on the issuer sponsored register, we propose that our results are representative for the entire market. In fact, for the final sample of rights offers analyzed in Section 4 of the paper, 59% of share ownership is registered on CHESS.

3.3 Descriptive Statistics

Table 1 Panel A reports the distribution of ROs across the sample period by the number of ROs and total offer proceeds.[15] We consider two sub-periods in our discussion: from 1999 to 2007 and from 2008 to 2011. From 1999 to 2007, the number of ROs doubled, suggesting that rights offers over this period had increased in popularity as a capital raising mechanism. The effects of the Global Financial Crisis are revealed in the sub-period 2008 to 2011. In November 2007 the Australian equity market reached its peak with the All Ordinaries Index at

[13] For further details about the operation of CHESS, refer to Bradrania et al. (2017).
[14] The institutional shareholder group consists of banks, other deposit taking institutions, nominee companies, insurance companies, superannuation (pension) funds, trusts, government entities and incorporated companies. The retail shareholder group, consists of all shareholders not belonging to the institutional group. Rights offers are made to Australian and New Zealand residents only; these shareholders are classified as domestic in CHESS.
[15] All amounts are reported in Australia dollars.

6853, subsequently falling to a low of 3387 in January 2009. The equity market collapse triggered substantial disruption in the Australian economy, with companies needing to seek additional capital to repair their balance sheets, reflected in the number of ROs jumping from 74 in 2007 to 195 ROs raising $5.4 billion in 2009. The market did not recover to pre-crisis levels during the excluded period 2008 to 2011.

[Insert Table 1 about here]

Panel B provides descriptive statistics of firm and offer characteristics for the sample of ROs. We divide the sample into two sub-samples, and label them as the normal period (1999-2007) and the crisis period (2008-2011). For the normal sub-period, the mean (median) size of the offering firm is $63.20 million ($13.80 million) by market capitalization. The size of offering firms is significantly smaller in the crisis subsample with a mean (median) of $34.30 million ($9.55 million), suggesting that small firms used rights offers to repair balance sheets as equity prices plunged. Sample firms' risks, as proxied by spread and IDY Risks are also higher in the crisis sub-period.

On average, RO issuers make a loss during the year prior to the issuance date, as shown by the average (median) ROA of -32 (-13) percent and the prior-year abnormal stock returns (*Pre-issue AR*) of -26 (-27) percent. As expected, losses are significantly higher for issuing firms in the crisis period with a mean (median) of -44 (-21) percent in ROA and mean (median) of -47 (-46) percent in pre-issue AR. These preliminary statistics mirror findings for PIPE issuers in the U.S., where the majority of issuers are loss-making firms, typically in the early stages of product development or those in financial distress (Chaplinsky and Haushalter, 2010; Chen et al., 2010).

RO-issuers have an average institutional ownership of 61 percent during the normal period and 64 percent during the crisis period, which is substantially lower than the average institutional ownership for all publicly listed companies in Australia (87 percent as of year 2012 reported in ABS (2012)). In terms of offer characteristics, the number of new shares issued as a proportion of the existing number of shares is on average 32 percent during the normal period, relative to a significant higher issuance of 44 percent during the crisis period.

4. Main Results

4.1 Wealth Transfers, Retail and Institutional Participation Rates

With daily ownership data, we are able to obtain reliable measures of the number of shares purchased by retail and institutional shareholders, which are key to measuring wealth

transfers. As shown in Equation 1 (Equation 3), the retail (institutional) participation rate is measured as the number of shares purchased by retail (institutional) shareholders divided by the number of shares that the retail (institutional) shareholders are entitled to purchase in the RO. The retail (institutional) nonparticipation rate in Equation 2 (Equation 4) is simply 100% minus the retail (institutional) participation rate in Equation 1 (Equation 3). One aspect of this study is that with daily ownership data we are able to measure retail and institutional ownership proportions just prior to the ex-entitlement date, and therefore can calculate accurately the number of shares that each group is entitled to purchase under the rights offer.

We adjust the wealth transfer formula of HP (2016) for our study of wealth transfer between retail and institutional shareholders. In Equation 5, we measure wealth transfer in a RO by taking the product of the number of shares that retail shareholders are entitled to but do not take up and the discount of the offer price to the current share price. This approach assumes that the shares not taken up by retail shareholders are allocated to institutional shareholders. We are not able to identify whether these institutions are current shareholders or new investors. Following HP (2016), wealth transfer as a dollar value (*WT*) is scaled by market capitalization ($WT_{\%marketcap}$) and offer size ($WT_{\%offersize}$), as shown in Equations 6 and 7, respectively.

$$Retail\ Part\ = \frac{New\ shares\ purchased_{retail}}{RETAIL_{PRE}/N} \quad (1)$$

$$Retail\ Nonpart = 1 - Retail\ Part.Rate \quad (2)$$

$$Insti\ Part = \frac{New\ shares\ purchased_{insti}}{INSTI_{PRE}/N} \quad (3)$$

$$Insti\ Nonpart = 1 - Insti\ Part \quad (4)$$

$$WT = Retail\ nonpart\ \times\ NEW_{Retail}\ \times (Price_{PRE} - Price_{OFFER}) \quad (5)$$

$$WT_{\%\ marketcap} = \frac{WT}{Market\ cap} \quad (6)$$

$$WT_{\%\ offer\ size} = \frac{WT}{NEW_{RO} \times Price_{OFFER}} \quad (7)$$

where

$RETAIL_{PRE}$ = The number of shares owned by retail shareholders on the cum-entitlement date[16]

$INSTI_{PRE}$ = The number of shares owned by institutional shareholders on the cum-entitlement date

$New\ shares\ purchased_{retail}$ = The number of shares purchased by retail shareholders in the first allocation round of RO shares

$New\ shares\ purchased_{insti}$ = The number of shares purchased by institutional shareholders in the first allocation round of RO shares

N = The number of existing shares required to buy one new share

[16] We measure both the retail ownership and institutional ownership as at the cum-entitlement date to account for those who buy or sell shares up until the cum-entitlement date of the RO. That is, the CHESS registry records are examined two days after the ex-entitlement date (which is three days after the cum-entitlement date). This approach accounts for the T+3 registration on CHESS.

NEW_{Retail} = The number of new shares that the retail shareholder group is entitled to buy = $RETAIL_{PRE}$ / N

NEW_{RO} = The number of new shares issued in the RO

$Price_{PRE}$ = Price two days before the RO announcement date

$Price_{OFFER}$ = Offer price of the new shares issued in RO

Market cap = Market capitalization two days before the RO announcement date

The right to buy new shares at a discount is valuable to shareholders. If a shareholder takes up their full entitlement, their investment value would not be affected by the rights offer even though the ex-rights price is likely to fall (due to new shares issued at a discount) because they purchase the new shares at a discounted price. Clearly, a shareholder suffers wealth loss if they fail to exercise the allocated rights and is unable to realize the rights for value on the secondary market (if they are non-renounceable).

When unexercised rights can be sold in the secondary market, shareholders do not suffer wealth loss (if the rights trade at their fair value). But if they do not participate in the renounceable rights offer, their ownership is diluted. Without the actual prices of the renounced rights sold in the secondary market, we estimate wealth transfers in both renounceable and non-renounceable ROs using the methods identified in Equations 1 to 7. We assume (consistent with the empirical evidence in Massa et al. (2013)) that the secondary market for renounced rights is generally illiquid, which suggests that non-participating shareholders are unable to realize the theoretical value of a renounced right. Thus, wealth loss to non-participating shareholders is unlikely to be zero even in a renounceable right offer. Overall, while the wealth transfer consequence in non-renounceable rights offers is clear, it is less so in renounceable rights offers. It is therefore important to note that the wealth transfer estimates for the renounceable RO subsample are likely to be overestimated.

We compare wealth transfer estimates resulting from ROs, as well as retail participation and institutional participation rates across the normal sample period, years 1999-2007 and the crisis sample period, years 2008-2011. Underlying the popularity of ROs in Australia, we expect to find relatively low wealth transfer estimates and high shareholder participation rates for the Australian RO sample.

Table 2 presents the summary statistics for shareholder participation rates, proportional discount, and wealth transfer measures. Panel A presents the summary statistics for the 1999-2007 subsample while Panel B presents the summary statistics for the 2008-2011 subsample. In the normal period (1999-2007), the average discount in the sample is 22.39% and on average slightly more than half (59.32%) of retail shareholders participate while all (101.55%)

institutions participate.[17] These statistics imply a wealth transfer from retail shareholders to institutional shareholders consistent with HP's (2016) result that most of the non-participating shareholders are retail (small) shareholders. The averages (medians) of $WT_{\%marketcap}$ and $WT_{\%offersize}$ are 1.19% (0.25%) and 6.32% (1.34%) respectively. To put the wealth transfer estimates into perspective, for CHESS registered shareholders across the rights offers in our sample retail shareholders transfer an average (median) of $209,583 ($65,431) to institutions. Although in the majority of our RO sample retail shareholders transfer wealth to institutions, the estimated wealth transfers do not appear economically significant when measured relative to market capitalization and offer size.

For the crisis period (2008-2011) presented in Panel B, both retail and institutional participation rates are significantly lower than for the normal period (1999-2007). Retail shareholders eschew participation during the crisis, with the mean (median) retail participation rate only 18.52% (5.63%). The institutional participation rate is similarly low with mean (median) of 31.09% (8.27%). While these participation rates are low, placements of shortfall shares appear to be successful as the final take-up rate (see Table 1 Panel B) is only slightly lower than that in the normal period and has a median of 100 percent. Shortfall shares are likely allocated to underwriters (if underwritten) who subsequently place them with their clients; if the rights offer is not underwritten, shortfall shares are likely placed with friendly investors. The mean (median) wealth transfer of 10.55% (6.16%) as a percentage of market capitalization, and 82.40% (23.31%) of offer size, are significantly larger as compared to the normal period.

Note that our wealth transfer measure does not account for placement of shortfall shares. To the extent that retail shareholders do take up the shortfall shares offered, our wealth transfer measure is an upper bound on the actual overall wealth transferred from retail to institutional shareholders. Given that the WT estimate is economically small, our conclusion would not be changed if we were able to accurately measure the retail/institutional split in placement of shortfall shares.

[Insert Table 2 about here]

While the take-up rate is close to 100% during the crisis, the participation rates for both institutional and retail shareholders are low. This disparity, together with taking account of the significant differences in most firm and issue characteristics over the two periods presented in

[17] Please refer to footnote 2 for a detailed explanation for likely reasons that may lead to the estimated participation rates exceeding 100%.

Table 1, implies that the crisis period is not representative of firm and shareholder behaviour during normal market conditions. Accordingly, we restrict subsequent analysis to the years from 1999 to 2007. We are unable to extend our study beyond 2011 due to unavailability of CHESS data. It is important to note that the date of first allocation for each RO is manually collected from Morningstar DatAnalysis. This allows us to cleanly identify the initial participation decision of retail and institutional shareholders in the rights offer from CHESS data. The wealth transfer measure is then calculated from participation rates measured *before* shortfall shares are allocated.

From Table 2, the wealth transfer measured for the period 1999-2007 is on average (at the median) $209,583 ($65,431). The CHESS coverage is 59% for this period, and assuming that the behavior of these shareholders is representative of all shareholders, we estimate the average (median) wealth transfer for all rights offers over this period to be $355,225 ($110,900).[18] To the extent that the wealth transfer measures are greater than zero, wealth is transferred from retail shareholders to institutional investors. We also note that under some circumstances the estimated wealth transfer can be negative. One conceivable scenario is where institutions are reluctant to participate but retail shareholders are not. A second scenario is where institutions own a larger proportion of the shares and the rights are offered at a price higher than the current market price premium (premium offers). In this case, the relative exercise rates may lead to negative wealth transfers. In our sample, negative wealth transfer occurs in only 26 ROs (6 percent of the sample) and is for substantially smaller companies. Consistent with HP (2016) and Armitage (2010), we exclude premium offers in all main analyses. We restrict the observations to offers with non-negative wealth transfers (for 1999 - 2007), resulting in the final sample of 387 ROs.

Table 3 presents a comparison of retail and institutional participation rates, discounts and wealth transfers between each of the three main RO characteristics. The data are segregated into six subsamples derived from the intersections of renounceable (RN) versus non-renounceable (NR), underwritten (UW) versus non-underwritten (NUW), and shortfall facility (SF) versus no shortfall facility (NSF).[19] Renounceable offers, although fewer than non-renounceable, raise larger proceeds. The majority of ROs in the sample are underwritten without a shortfall facility. In these issues, unsubscribed rights (shares not allocated during the initial round) are allocated to selected institutions or underwriters and current shareholders

[18] These figures are derived by taking the estimated WT calculated from CHESS registered shares and dividing by the coverage of CHESS (59%). These are crude estimates and need to be treated as such.
[19] Please refer to Section 3.1 for a detailed description of these characteristics.

cannot apply for these unsubscribed rights. Around 67.5% of the full sample of ROs are non-renounceable, 65.3% of the ROs are underwritten, and 34.6% have a shortfall facility.

[Insert Table 3 about here]

The retail participation rate is statistically significantly greater (at the 1% level) in renounceable offers (relative to non-renounceable) and at the 5% level for those with a shortfall offer (relative to no shortfall offer). Similarly, institutional participation is also statistically significantly greater in renounceable offers. However, institutions unlike retail shareholders participate more in underwritten offers compared to non-underwritten offers, consistent with Heinkel and Schwartz (1986) who argue that underwritten right offers signal quality. Unlike retail shareholders, institutions do not distinguish between offers with and without a shortfall facility. The offer discount also tends to be larger when the rights offers are underwritten or have no shortfall facilities, which exacerbates any wealth transfers.

Consistent with expectations, median wealth transfer (measured as $WT_{\%marketcap}$ and $WT_{\%offersize}$) for the non-renounceable subsample (NR) is significantly larger than that for the renounceable subsample (RN) according to the Wilcoxon-Mann-Whitney test. We also find that the mean (median) $WT_{\%offersize}$ of the NSF sample is significantly larger than that for the SF sample, which is again consistent with our expectations. The greater wealth transfer in the NR (relative to RN offers) and NSF (relative to SF offers) is likely the result of lower retail participation in these offers. As these univariate comparisons indicate significant differences with respect to all the variables of interest, we control for these offer characteristics in subsequent analyses.[20]

4.2 Determinants of Wealth Transfer

HP (2016) argue that agency conflicts affect the choice of non-renounceable ROs which exacerbate wealth transfers, leading to the declining use of ROs in the U.S. However, it is unlikely that the agency perspective can fully explain the popularity of ROs in Australia, because as noted previously a larger proportion of ROs are non-renounceable. Therefore, we explore other potential drivers of wealth transfers (measured as $WT_{\%marketcap}$) using a multi-variate model as follows. All variables are as described in Appendix Table A1.

[20] Our results for participation and wealth transfers - for renounceable and non-renounceable offers - are consistent with those in HP (2016).

$$WT_{\%marketcap_i} = \alpha_i + \beta_1 RN_i + \beta_2 UW_i + \beta_3 SF_i + \beta_4\, Retail\ part_i + \beta_5\, Takeup_i + \beta_6\, RO\ terms + \beta_7\, INSTI_i + \beta_8\, Pre-issue\ AR_i + \beta_9\, Log(Marketcap)_i + \beta_{10}\, Firm\ risk_i + \gamma\left(Industry\ dummies_i, Year\ dummies_i\right) + \varepsilon_i \quad (8)$$

Wealth transfer should be larger in non-renounceable (NR) offers as current shareholders do not have the option to sell the rights if they opt out. Further, this relation may be strengthened by the adverse quality and agency signalling effects of non-renounceability on retail shareholder participation decisions, resulting in a larger wealth transfer (Balachandran et al., 2008; Massa et al., 2013; HP, 2016). HP (2016) estimate that approximately half of the wealth transfer in a RO can be attributed to the non-renounceability structure. Whether or not non-renounceable ROs in Australia result in larger wealth transfer than renounceable ROs is an empirical question. Offer terms such as *Prop. Amount Sought* and *Prop. Discount* are expected to be positively related to $WT_{\%marketcap}$ as documented in HP (2016).

Wealth transfers may also be a function of the issuing firms' risk and quality, holding offer characteristics constant. Retail shareholders, if informed, will base their participation decisions on firm quality and risk, which are observable at the time of the RO announcement. We examine retail participation decisions in the next section. If the issuer is of high quality and has low risk, retail shareholders may be more inclined to take up their rights, resulting in a lower wealth transfer. Firm quality is proxied by the level of institutional ownership (*INSTI*), firm size (*Log (Marketcap)*), and past stock performance (*Pre-issue AR*) while firm risk is proxied by the bid-ask spread (*Spread*) and idiosyncratic risk (*IDYRisk*).

What are the drivers behind wealth transfers in an environment where ROs are popular and institutional ownership is substantial? Results from the quantile regression (Koenker and Bassett, 1978) of $WT_{\%marketcap}$ against firm and offer characteristics are presented in Table 4.[21] While the univariate analysis has previously shown that non-renounceable ROs and those that do not have a shortfall facility result in significantly greater wealth transfer, the multivariate results do not support these findings. In fact, except for Model (3), our results do not show any systematic relation between wealth transfer and particular RO structures after controlling for firm characteristics. In Model (3), underwritten ROs are found significantly negatively associated with WT while SF positively associated with WT. Our finding does appear at odds

[21] The skewness and kurtosis of the residuals in the WT regression are 60.02 and 7.87, respectively. The Shapiro-Wilk test on the residuals reports W = 0.83 with $p < 0.000$, rejecting the null hypothesis that the residuals are normally distributed.

with the argument of HP (2016) that non-renounceable ROs have significantly larger wealth transfer than renounceable ROs, an argument that is aligned with their unpopularity.[22] Consistent with this line of thinking, the relative popularity of non-renounceable ROs in Australia might be due the insignificant difference in wealth transfers between renounceable and non-renounceable ROs.

[Insert Table 4 about here]

As can be seen from models (1) and (2) in Table 4 the higher the institutional ownership the lower the wealth transfer. The negative relation between INSTI and $WT_{\%marketcap}$ may be mechanical. For example, if 99% (1%) of the firm value belongs to institutional (retail) shareholders, the maximum value that could be transferred from retail shareholders to institutions is 1%. Results show that the larger the discount, or the larger the amount sought, the higher the wealth transfer. As expected, the higher the retail participation rate the lower the wealth transfer.

In addition, after controlling for retail participation rate and proportional discount, issuer quality (proxied by *INSTI, Pre-issue AR* and *Log (Marketcap)*) and risk (proxied by *IDYRisk* and *Spread*) are strong drivers of wealth transfers. For instance, Models (3) and (4) show that firms with greater prior stock performance and larger size have lower wealth transfer. Larger and better performing (quality) firms are likely to have higher institutional ownership and more disclosure, reducing information asymmetries. Therefore, retail shareholders are more likely to participate in ROs by these firms, resulting in lower wealth transfer. Models (5) and (6) show that firms with higher risk have greater wealth transfers. Riskier firms are likely to be smaller and have lower institutional ownership, resulting in greater information asymmetry and lower retail participation in the RO.[23] HP (2016), on the other hand, do not find any relation between firm characteristics and wealth transfers. Wealth transfers depend on participation rates so in the next subsection we investigate the determinants of retail shareholder participation.

[22] Due to a lack of data for the value of rights traded on the secondary market, our wealth transfer measure for renounceable ROs is prone to overestimation. Nonetheless, the average wealth transfer in non-renounceable ROs is economically small.

[23] As a robustness check we re-run the quantile regressions in Table 4 Columns 2 to 6 by replacing retail participation rate with the take-up rate. Results remain similar. As a further robustness check, and following HP (2016), we run the regression with predicted retail participation and predicted take-up rate against $WT_{\%marketcap}$. All results are similar to those documented in Table 4. Running the regression with OLS specification also results in coefficients with similar sign and statistical significance relative to those reported in Table 4. Substituting $WT_{\%marketcap}$ with $WT_{\%offersize}$ yields qualitatively similar results.

4.3 Determinants of Retail Participation Rates

Given the daily ownership dataset, we are able to re-examine the predominant view that retail shareholders' investment decisions suffer from irrationality and lack of sophistication. Research investigating the behavior of retail shareholders has generally lacked data detailed enough to provide in-depth insights. The only exception is the study of Rantapuska and Knupfer (2008) which uses individual retail shareholder participation data for 18 ROs in Finland. They find that Finnish retail and foreign shareholders do not participate, nor do they sell their rights, behavior assumed to be mainly due to lack of financial capacity and financial sophistication. An alternative explanation for retail shareholder non-participation relates to the costs of gathering information, transaction costs, and opportunity costs of time, or a combination of all three (Grossman & Hart, 1980). More recently, HP (2016) obtain participation data from a survey approach but do not have a breakdown of retail and institutional participation rates.

We examine factors that could potentially drive the retail shareholder participation decision using a regression model as follows:

$$Retail\ part_i = \alpha_i + \beta_1 RN_i + \beta_2 UW_i + \beta_3 SF_i + \beta_4 Prop.\ Discount_i + \beta_5 Alloc\ ratio_{ii} + \beta_6 INSTI_i + \beta_7 Log(Marketcap) + \beta_8 Firm\ risk_i + \gamma\left(Industry\ dummies_i, Year\ dummies_i\right) + \varepsilon_i \quad (9)$$

If retail shareholders demonstrate some degree of rationality in their participation decision, we expect *Retail part* to be positively related to offers that are more attractive (higher *Prop. Discount*) and offers issued by firms of higher quality and/or lower risk. Firm quality is proxied by higher take-up rate, higher institutional ownership, and RO structures such as renounceability and underwriting status (see Heinkel and Schwartz, 1986; Balachandran et al., 2008). Note that HP (2016) find no evidence that underwriting status is associated with shareholder nonparticipation. Firm risk is proxied by idiosyncratic risk and spread. Following Balachandran et al. (2008), we also include the allocation ratio (the number of new shares issued relative to existing shares), as a control variable. Independent variables are as described in Appendix Table A1.

Table 5 presents the results from the regression in Equation (9). As the residuals from the regression are not normally distributed, we apply quantile regressions in our investigation

(Koenker and Bassett, 1978). [24] We find that renounceability (RN) and whether the RO has a shortfall facility (SF) are associated with greater retail shareholder participation, consistent with the univariate results in Table 3. Balanchandran et al. (2008) find that high quality issuers choose renounceable ROs. HP (2016) also document a positive relation between shareholder participation and the renounceability feature but are not able to distinguish between retail and institutional shareholder participation rates.

[Insert Table 5 about here]

While HP (2016) find that the information environment of the issuing firm does not influence shareholder participation in US ROs, our study shows that Australian retail shareholders may leave money on the table if information asymmetry or firm risk is too high.[25] These findings suggest that on average retail shareholders act rationally in their participation decisions. In support of this proposition, retail participation is positively related to the proportional discount, suggesting that retail shareholders are less likely to leave money on the table when there is greater value to be gained from participating. Overall, while only 59 percent of retail shareholders on average participate in the ROs, their decision to participate seems to be based on firm quality, which reinforces the notion that retail shareholders exhibit rational behavior in our sample of ROs.

The results in Table 5 also show that the retail shareholder participation rate increases with firm quality. Retail shareholder participation is positively associated with institutional ownership, consistent with institutional ownership reducing information asymmetries and signalling quality. Larger firm size (Log (Marketcap)), lower IDYRisk, and lower spread are also associated with higher retail shareholder participation. The negative relation between wealth transfer and firm quality documented in Table 4 is also consistent with these results.

4.4 Announcement Market Reaction

The adverse selection theory in Eckbo and Masulis (1992) posits that adverse selection

[24] The skewness and kurtosis of the residuals in the retail participation rate regression are 42.28 and 17.68, respectively. The Shapiro-Wilk test on the residuals reports W=0.99 with p<0.0005, rejecting the null hypothesis that the residuals are normally distributed. As robustness test, we re-run the regression with an OLS specification. The sign and statistical significance of the coefficients remain similar to those reported in Table 5, except that the coefficient for INSTI while positive, is not statistically significant at conventional levels.

[25] In quantile (median) regressions (results untabulated) on institutional participation rates, we find that institutional participation is negatively related to proportional discount – a result that is opposite to that for retail shareholder behavior documented in Table 5. The level of institutional ownership does not affect institutional participation decisions. Similar to retail shareholders, institutions are less likely to leave money on the table when the RO is renounceable, underwritten and where the issuer has larger market capitalization and has lower spread.

costs arise when wealth is transferred from current shareholders to outsiders and ignores wealth transfers among current shareholders. An unstated implication is that shareholder nonparticipation and any resulting wealth transfers among current shareholders do not matter. However, HP (2016) document empirical evidence that firm value (announcement abnormal return) is eroded by wealth transfers among current shareholders.

HP (2016) offer three non-mutually exclusive theoretical explanations for the negative information and price pressure effects arising from large wealth transfers. First, large predicted wealth transfers signal managers' desperation for additional cash flows, given they are willing to choose a rights offer which increases the ownership concentration of institutional shareholders which may lead to increased monitoring of managers. Second, as non-renounceable ROs are more prone to large wealth transfers, HP (2016) argue that the market infers more pervasive agency conflicts in firms that choose to issue non-renounceable ROs. Third, ROs with large predicted wealth transfers would see more shareholders disadvantaged by the RO (those who do not have the financial capacity to take up their rights and cannot sell their non-renounceable rights). Such disadvantaged shareholders are likely to sell their shares around the announcement date, leading to negative price pressure. Although information required to calculate wealth transfers, as shown in Equation 5, is not fully available until after the RO closes, HP (2016) argue that the market could use publicly available information to predict the extent of wealth transfer.

We conduct an event study to examine the market reaction around the announcement dates of ROs in Australia. Daily returns are measured as the continuous logarithmic returns adjusted for dividend and capitalization changes.[26] Abnormal returns are estimated using the market model, with an estimation period spanning 314 days prior to the announcement day to 60 days before the announcement day (day -314 to -60).[27] The ASX All Ordinaries Accumulation Index is used as the market proxy. Following Campbell et al. (2010), we require each company to have a minimum of 24 non-missing stock returns in its 255-day normal estimation period. The average (median) issuer traded 70% (88%) of the days in the normal estimation period. While the median issuer traded 100% of the event period days, the average issuer traded 90%. These statistics indicate that RO-issuers' stocks tend to be thinly-traded. To deal with thin trading, the trade-to-trade method is used, following prior studies such as

[26] Corrado and Truong (2008) find that tests based on logarithmic returns generally produce better test specification than tests based on arithmetic returns when applying on Asia-Pacific data.
[27] As a robustness check, we also use the Scholes and Williams (1977) beta-adjusted market model to deal with biased beta in the classic market model due to the thin-trading problem. Results remain unchanged.

Suchard (2007) and Campbell et al. (2010).[28] We use the Boehmer et al. (1991) standardized parametric variance-adjusted test, and two non-parametric tests, the generalized sign test (Cowan, 1992) and the rank test (Corrado, 1989).

Employing a cross-sectional regression model, we analyze whether wealth transfers between retail and institutional shareholders are able to explain the cumulative announcement abnormal return (CAR). The regression model is as follows:

$$CAR_t = \alpha + \beta_1 WT_{\%marketcap} + \beta_2 Takeup + \beta_3 Abnormal\ Vol + \gamma_1 (Control\ variables, Industry\ dummies, Year\ dummies) + \varepsilon_i \quad (10)$$

The dependent variable used in the cross-sectional analysis is the CAR for event window [-1, +1], while the variable of interest is the wealth transfer measure ($WT_{\%\ marketcap}$).[29] Following prior literature such as Bøhren et al. (1997), Balachandran et al. (2008), and HP (2016), we use *Takeup* as a control variable. Consistent with HP (2016), we also run separate regression specifications to incorporate the predicted values of $WT_{\%marketcap}$ and *Takeup*. Independent variables are as described in Appendix Table A1.

Table 6 presents the cumulative abnormal returns (CARs) across different windows around the announcement date for the whole sample. The average (median) CAR for (-1, +1) is -2.04% (-1.58%), which is significant under both parametric and non-parametric tests such as sign and rank tests. The average (median) CARs for (-2, +2) and (-3, +3) are -1.45% (-1.82%), and -0.60% (-1.61%) respectively but are only statistically significant under the sign test.

[Insert Table 6 about here]

The presence of negative abnormal announcement returns in our sample is consistent with empirical evidence in prior studies based on US and international ROs that seasoned equity offering (SEO) announcements generate negative abnormal returns. For instance, Eckbo and Masulis (1992) document that the average 2-day abnormal returns of underwritten (standby) rights offers and non-underwritten rights offers for industrial firms in the U.S. are −1.03 percent

[28] Prior literature has established that the trade-to-trade method is superior over the lumped return method in dealing with missing prices (see, Maynes and Rumsey (1993), Campbell et al. (2010)). We use the Eventus software to run the event study, which incorporates the trade-to-trade method.

[29] We use a shorter CAR window than that in HP (2016) because in Australia, the offer price is revealed simultaneously with the announcement of a RO whereas there is a lag between the initial public announcement and the offer price announcement in US ROs. The offer price in US ROs is set immediately before the start of rights trading or issue opening.

and −1.39 percent, respectively. Using a later sample of US rights offers, HP (2016) document average CAR (-1, +1) and CAR (-2, +2) of zero and -1.3 percent respectively for the whole sample. Our results are consistent with the three-day average CAR (-1, +1) of -1.74 percent for the sample of Australian ROs in Balachandran et al. (2008).[30] On the other hand, the abnormal return around the announcements of Hong Kong rights offers documented in Lee et al. (2014) is -11.90 percent, which is much lower than documented for other countries. Lee et al. (2014) find that RO-issuers in Hong Kong have large free cash flows but lack growth opportunities, indicating a high level of agency costs.

The CARs documented in our sample are negative, which may reflect financial distress in issuing companies, as the average ROA and Pre-issue AR are negative (documented in Table 1) suggesting that ROs used by firms that are not profitable. The negative CAR is also consistent with the "gun against the head of investors" argument in Massa et al. (2016), where managers who are desperate to raise capital, force the hand of investors by issuing non-renounceable ROs. Additionally, given the pro-rata structure of ROs where shareholder approval is not required regardless of the size of proceeds, the negative CAR is consistent with the argument of Holderness (2018) that greater agency conflicts are inherent in issuers that do not seek shareholder approval.

Table 7 presents the results of the cross-sectional quantile regression of CAR [-1, +1] following Equation 10.[31] Independent variables are the wealth transfer measure ($WT_{\%\ marketcap}$) and the predicted value of $WT_{\%marketcap}$, which is constructed based on the first specification in Table 4.[32] We include *Takeup* and *Predicted Takeup* as control variables.[33]

[Insert Table 7 about here]

Consistent with HP (2016), we find that both $WT_{\%marketcap}$ and *Predicted* $WT_{\%marketcap}$ are negative and significant in explaining CARs, suggesting that larger wealth transfers

[30] The average CARs in Balachandran et al. (2008) range from -8.43 percent to 1.12 percent depending on the subsamples.

[31] We choose CAR [-1, +1] as the dependent variable in Equation 10 based on the results in Table 6, in which the statistical significance of CAR [-1, +1] is supported by the standardized parametric variance-adjusted test, Generalized Sign test, and Rank test. Running the quantile regression of CAR [-1, +1] similar to Equation 10 but substituting $WT_{\%marketcap}$ (*Predicted* $WT_{\%marketcap}$) with $WT_{\%offersize}$ (*Predicted* $WT_{\%offersize}$) also shows qualitatively similar results relative to those reported in Table 7.

[32] We use a shorter CAR window than that in HP (2016) because in Australia, the offer price is revealed simultaneously with the announcement of a RO whereas there is a lag between the initial public announcement and the offer price announcement in US ROs. The offer price in US ROs is set immediately before the start of rights trading.

[33] Predicted *Takeup* is constructed based on the coefficient estimates from a regression model following Balachandran et al. (2008). The results are not tabulated but are available upon request.

adversely impact firm value. Even though key information required to measure wealth transfer is not available until the closing date, our results indicate that investors can anticipate the extent of wealth transfers. In fact, the coefficient on $WT_{\%marketcap}$ becomes insignificant in Column 2 after controlling for *Takeup*, but the coefficients on *Predicted* $WT_{\%marketcap}$ have higher *t*-statistics and a greater economic impact on value. Column 4 shows that the relationship between *Predicted* $WT_{\%marketcap}$ and CARs remains significant after controlling for *Predicted Takeup*. Firm quality can be ascertained from observable financial measures and if retail shareholders are rational, they will participate less when firm quality is low, leading to a larger wealth transfer. Our findings in Table 5 show that retail shareholders make rational participation decisions, which are driven by firm quality and firm risk. Therefore, we argue that the negative information effects from larger wealth transfers are signals of poor firm quality. Finally, and consistent with Balachandran et al. (2008), *Takeup* has a positive coefficient which is statistically significant.[34] In untabulated results, the significance of $WT_{\%marketcap}$ and *Predicted* $WT_{\%marketcap}$ does not change with the inclusion of the three RO structures as control variables. Further, renounceability is not associated with abnormal market reactions, and the underwriting dummy is insignificant.

5. Summary and Conclusions

We have employed a large sample of ROs and daily ownership data to examine factors that may explain the popularity of rights offers in Australia. Our objective was to use this more accurate ownership data to explore wealth transfers between two groups of shareholders, namely institutional shareholders who are often argued to be informed, and retail or small shareholders, who are often argued to be unsophisticated. Unlike most studies in the corporate finance literature that use quarterly ownership data, our daily ownership data enable a more precise measure of both institutional and retail participation rates and of the resulting wealth transfers between the two groups of shareholders.

We find in our sample that a median of 94% (60%) institutional (retail) shareholders participate in the RO over 1999-2007. Although we accurately measure these participation rates, given that non-participants are largely retail shareholders, we can compare our results with earlier studies who have measured wealth transfers from non-participating to participating shareholders. The wealth transfer estimates in our sample of 387 ROs during the normal period

[34] Similar to Balachandran et al. (2008), the take-up rates are manually collected from announcement reports provided by SIRCA.

are greater than those in Rantapuska and Knüpfer (2008), but lower than those in HP (2016). The average (median) wealth transfer from retail shareholders to institutions is $209,583 ($65,431), which represents only 1.19% (0.25%) and 6.32% (1.34%) of firm value and offer proceeds respectively. The magnitude of average wealth transfers relative to firm value and offer proceeds are not economically significant. The dollar amount of the total wealth transferred from retail to institutional investors is approximately $81.1 million over the normal sample period from 1999 to 2007. Non-negative average wealth transfer is attributed to retail shareholders not taking up their entire entitlement of rights for new shares. In our sample the average retail shareholder buys slightly more than half of their entitlements, indicating that retail shareholders leave money on the table.

However, not taking up the whole allocation may not be an investment mistake if it makes sense to leave the rights unexercised. For instance, some issuers may be financially-distressed and the gains from participating in their rights offers may not outweigh additional risk. Our findings suggest that retail shareholders seem to make rational participation decisions by participating in the ROs of high quality and those of low risk issuers. Even though retail shareholders have no opportunity to sell their unsubscribed rights in non-renounceable ROs, wealth losses for retail shareholders (as a group) from not exercising its rights do not appear to be economically significant.

Australian firms on average have a higher proportion of institutional shareholders than firms in the US and institutional shareholders tend to participate fully in ROs. Australian firms therefore have reasonable certainty regarding the success of the capital raising, making ROs a popular equity-raising mechanism in Australia. To the extent that institutional ownership is linked with better disclosure, which in turn lowers information asymmetry between managers and investors, retail shareholders participate more when the institutional ownership levels are greater. ROs have been the predominant method of equity-raising in Australia and extensive information about wealth implications is typically provided in the prospectuses. With an average 59 percent of retail shareholders participating in the normal period, their participation decisions do appear rational, as they participate to a greater extent in offerings with larger discount, and those done by quality firms.

We also find that investors react negatively to (potential) wealth transfer, consistent with the findings in HP (2016) that wealth transfers among *current* shareholders destroy firm value. As shareholder approval is not required in Australian ROs regardless of their issuance size, the negative market reaction is consistent with Holderness (2018) who shows that shareholder approval for large offers is associated with positive information effects as a result

of lower agency conflicts. Alternatively, the negative information effects arising from wealth transfer may be due to the issuers' financial distress, consistent with Massa et al. (2016) where desperate firms use non-renounceable ROs to coerce shareholder participation.

Our findings have added a piece to the rights offer puzzle, complementing the results in HP (2016). Relatively high retail and institutional participation rates coupled with limited economic significance of wealth transfers explains why rights offering remain a popular method of equity-raising in Australia. These results are also relevant to public concern surrounding notions of fairness in firms' capital raisings as they deem ROs to be fair and with minimal wealth transfer consequences if most shareholders behave rationally and exercise their valuable rights.

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Table 1 Distribution of Australian rights offer sample from 1999 to 2011

Panel A provides the number (N) of ROs made by Australian public listed companies and their total offer proceeds (TOP) in millions ($M) on a year-by-year basis. The statistics are provided for an uncontaminated sample of 945 RO announcements from 1997 to 2011 (ROs are excluded when any other market sensitive announcement occurred in the window 5 days before and 5 days after the RO announcement). Panel B shows the summary statistics of firm and offer characteristics for the ROs segregated into two subperiods, 1999 to 2007 and 2008 to 2011. Description of variables are provided in Appendix Table A.1. The differences in these characteristics between two subperiods and their statistical significance are provided. * Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and *** significantly different from zero at the 1% level.

Panel A: Whole sample distribution by year

Year	N	TOP $M
1999	37	721.00
2000	31	191.00
2001	41	725.00
2002	30	313.00
2003	46	274.00
2004	49	557.00
2005	57	1400.00
2006	48	620.00
2007	74	1540.00
2008	114	902.00
2009	195	5430.00
2010	127	768.00
2011	96	765.00
Total	945	14,200.00

Panel B: Firm and offer characteristics segregated into two subperiods

	1999-2007		2008-2011		Difference	p-value
	Mean	Median	Mean	Median		
Market cap ($M)	63.20	13.80	34.30	9.55	28.90	0.00
TA ($M)	65.20	11.60	15.70	9.20	49.50	0.00
Market-to-book	2.10	1.41	2.62	1.39	-0.52	0.01
ROA (%)	-32.49	-12.71	-43.88	-20.93	11.39	0.02
Pre-issue AR (%)	-25.65	-26.64	-46.58	-45.95	-20.93	0.00
Spread (%)	1.39	1.06	2.71	2.08	-1.32	0.00
IDYRisk (%)	5.57	5.24	7.97	7.49	-2.48	0.00
INSTI (%)	60.57	59.71	64.18	64.67	-3.61	0.00
Prop. number institutions (%)	29.44	28.50	31.01	30.18	-1.57	0.00
Prop. amount sought (%)	31.61	21.88	44.11	26.06	-12.50	0.00
Takeup (%)	91.99	100.00	87.28	100.00	4.71	0.01
Obs.	413		532			

Table 2 Summary statistics of wealth transfers in Australian ROs

This table presents the mean and median of retail and institutional participation rates (estimated from Equations 1 and 3 respectively), discount, and wealth transfer estimates ($WT_{\%\ marketcap}$ and $WT_{\%\ offer\ size}$ estimated from Equations 6 and 7 respectively) for our sample of ROs segregated into two subperiods: 1999 to 2007 and 2008 to 2011, as shown in Panel A and Panel B respectively. The average, median and total wealth transfer in dollar value estimated from Equation 5 is also provided.

Panel A: Sample 1999-2007

	Retail participation rate (%)	Institutional participation rate (%)	Discount (%)	WT ($)	$WT_{\%marketcap}$ (%)	$WT_{\%offersize}$ (%)
Mean	59.32	101.55	22.39	209,583	1.19	6.32
Median	59.67	93.58	18.03	65,431	0.25	1.34
Total WT ($)				81,100,000		

Panel B: Sample 2008-2011

	Retail participation rate (%)	Institutional participation rate (%)	Discount (%)	WT ($)	$WT_{\%marketcap}$ (%)	$WT_{\%offersize}$ (%)
Mean	18.52	31.09	23.55	10,600,000	10.55	82.40
Median	5.63	8.27	23.08	729,618	6.16	23.31
Total WT ($)				5,630,000,000		

Table 3 Wealth transfers across different RO structures

This table presents the mean and median of the following wealth transfer estimates: (i) wealth transfer as a percentage of market capitalization ($WT_{\%\ marketcap}$), (ii) wealth transfer as a percentage of offer size ($WT_{\%\ offer\ size}$) and (iii) wealth transfer in dollar value, for a subsample of 387 ROs from 1999 to 2007 with non-negative WT. The estimations of wealth transfer are shown in Equations 1 and 2. The table also provides the mean and median of retail participation rate and discount. Parametric t-test and Wilcoxon Mann-Whitney test are reported. *t*-statistics are in italics and non-parametric p-values are in brackets. * Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and *** significantly different from zero at the 1% level.

	RO structures					
	Non-renounceable (NR)	Renounceable (RN)	Non-underwritten (NUW)	Under-written (UW)	No shortfall facility (NSF)	With shortfall facility (SF)
	n = 261	n = 126	n = 134	n= 253	n = 253	n = 134
Mean retail part. rate (%)	54.45	69.39	58.14	59.94	56.79	64.08
Median retail part. rate (%)	51.87	76.52	56.85	61.88	58.59	64.36
t-Test	-4.64***		-0.55		-2.24**	
MW test	-4.96***		-0.59		-2.17**	
Mean institutional part. rate (%)	95.21	114.81	84.78	110.48	103.94	94.82
Median institutional part. rate (%)	84.85	103.12	81.18	99.88	97.06	91.06
t-Test	-2.64***		-4.06***		1.06	
MW test	-3.06***		-3.95***		0.64	
Mean discount (%)	22.41	22.33	19.19	24.08	24.00	19.33
Median discount (%)	17.95	18.11	16.67	18.75	18.95	16.67
t-Test	0.05		-3.00***		2.81***	
MW test	-0.62		-2.45**		2.57**	
Mean WT ($)	201,165	309,140	201,165	214,042	228,984	172,955
Median WT ($)	60,154	58,683	60,154	65,730	69,272	44,545
t-Test	-2.10**		-0.27		1.20	
MW test	0.43		-0.42		2.00**	
Mean $WT_{\%\ marketcap}$ (%)	1.41	0.75	1.12	1.23	1.23	1.12
Median $WT_{\%\ marketcap}$ (%)	0.41	0.09	0.27	0.24	0.27	0.21
t-Test	2.67***		-0.49		0.44	
MW test	5.02***		-0.10		1.43	
Mean $WT_{\%\ offer\ size}$ (%)	7.00	4.92	4.87	7.08	8.06	3.04
Median $WT_{\%\ offer\ size}$ (%)	2.12	0.52	1.59	1.23	1.53	1.06
t-Test	0.91		-1.15		3.14***	
MW test	5.28***		-0.03		2.34**	

Table 4 Cross-sectional quantile (median) regression of wealth transfer (non-negative WT subsample)

This table reports the cross-sectional quantile regression of wealth transfer as a percentage of market capitalization ($WT_{\%\ marketcap}$). The wealth transfer estimation is shown in Equations 1 and 2. Independent variables are as described in Appendix Table A.1. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	$WT_{\%marketcap}$	$WT_{\%marketcap}$	$WT_{\%marketcap}$	$WT_{\%marketcap}$	$WT_{\%marketcap}$	$WT_{\%marketcap}$
RN	0.000151	-0.000252	-0.00101	8.22e-05	-0.000129	-0.000281
	(0.164)	(-0.388)	(-1.238)	(0.0872)	(-0.144)	(-0.328)
UW	-0.000669	-0.000575	-0.00150**	-0.00124	-0.000738	-0.000797
	(-0.930)	(-0.844)	(-2.159)	(-1.568)	(-0.919)	(-1.163)
SF	-0.000443	0.000493	0.00133*	0.000905	0.000862	0.00112
	(-0.490)	(0.667)	(1.792)	(1.165)	(0.982)	(1.438)
Retail part		-0.0123***	-0.0131***	-0.0128***	-0.0120***	-0.0130***
		(-10.32)	(-8.839)	(-9.374)	(-7.322)	(-9.329)
Takeup	-0.00817***					
	(-5.667)					
Prop. discount	0.0340***	0.0356***	0.0386***	0.0389***	0.0328***	0.0368***
	(5.893)	(6.612)	(7.514)	(7.725)	(5.247)	(7.471)
Prop. amount sought	0.00587**	0.00687***	0.00483**	0.00501***	0.00619***	0.00489**
	(2.186)	(2.826)	(2.136)	(2.641)	(2.725)	(2.041)
INSTI	-0.0127***	-0.0117***				
	(-4.570)	(-5.366)				
Pre-issue AR			-0.000846**			
			(-2.001)			
Log (Marketcap)				-0.00081***		
				(-3.297)		
IDYRisk					0.219**	
					(1.970)	
Spread						0.0885*
						(1.691)
Constant	0.00907***	0.0107***	0.00479***	0.0169***	0.00218	0.00355*
	(4.235)	(4.911)	(2.800)	(3.783)	(1.205)	(1.844)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	323	387	387	387	379	387

Table 5 Cross-sectional quantile (median) regression of retail participation rate

This table reports the quantile regression of retail participation rate on subsample of ROs with non-negative wealth transfer. The dependent variable, *Retail part. rate* is the percentage of retail participating shares. It is a ratio computed from the number of RO shares purchased by the retail shareholder group divided by the total number of RO shares that retail shareholders are entitled to buy. The latter is computed from the number of shares owned by the retail shareholder group prior to the ex-entitlement date divided by *N*. Independent variables are as described in Appendix Table A1. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively.

	(1) Retail part.	(2) Retail part.	(3) Retail part.	(4) Retail part.	(5) Retail part.
RN	0.221***	0.211***	0.0898***	0.109***	0.143***
	(6.028)	(5.376)	(2.833)	(3.030)	(3.993)
UW	-0.0159	-0.00142	0.0240	0.0270	-0.00212
	(-0.435)	(-0.0410)	(0.777)	(0.871)	(-0.0680)
SF	0.0874**	0.106***	0.130***	0.0858**	0.0885**
	(2.498)	(3.032)	(3.753)	(2.318)	(2.587)
Prop. discount	0.343***	0.236**	0.367***	0.296***	0.389***
	(3.318)	(2.467)	(4.132)	(3.551)	(4.933)
Alloc ratio	-0.249***				
	(-4.164)				
INSTI		0.253**			
		(1.991)			
Log (Marketcap)			0.0659***		
			(6.824)		
IDYRisk				-3.549***	
				(-5.256)	
Spread					-6.869***
					(-3.565)
Constant	0.657***	0.443***	-0.461***	0.784***	0.648***
	(10.54)	(3.887)	(-2.610)	(8.932)	(12.18)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	387	387	387	379	387

Table 6 Cumulative abnormal returns (CAR)

This table reports the mean and median CAR (%) for the non-negative wealth transfer (WT) subsample on different event windows. Abnormal returns are estimated using the market model, with an estimation period spanning 314 days prior to the announcement day to 60 days before the announcement day (day -314 to -60). Parametric test (Std Csect) and non-parametric Generalized Sign Test and Rank Test are reported. * Significantly different from zero at the 10% level, ** significantly different from zero at the 5% level, and *** significantly different from zero at the 1% level.

CAR window	Obs.	Mean CAR (%)	Median CAR (%)	Std Csect	Sign Test	Rank test
(-1,+1)	387	-2.04	-1.58	-3.396***	-3.407***	-2.461***
(-2, +2)	387	-1.45	-1.82	-1.756**	-3.102***	-0.324
(-3, +3)	387	-0.60	-1.61	-0.897	-1.882**	0.124

Table 7 Quantile Regression of CAR [-1, +1] for non-negative WT sample

This table reports the quantile regression of CAR [-1, +1] on subsample of ROs with non-negative wealth transfer. The dependent variable, CAR [-1, +1] is the cumulative abnormal returns from Day -1 to Day +1 from the rights offer announcement date. Independent variables are as described in Appendix Table A1. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively.

	(1) CAR [-1, +1]	(2) CAR [-1, +1]	(3) CAR [-1, +1]	(4) CAR [-1, +1]
$WT_{\%marketcap}$	-0.817**	-0.646		
	(-2.184)	(-1.555)		
Take up		0.0418**		
		(2.335)		
Predicted $WT_{\%marketcap}$			-1.216**	-2.029***
			(-2.047)	(-2.640)
Predicted takeup				-0.0435*
				(-1.820)
Abnormal trade	0.00542*	0.00499	0.00577*	0.00406
	(1.652)	(1.147)	(1.754)	(1.123)
Constant	-0.0195	-0.0706***	0.0120	0.0567*
	(-0.891)	(-3.214)	(0.649)	(1.945)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	387	323	387	323
Pseudo R-squared	0.0438	0.0586	0.0407	0.0422

Appendix Table A.1

This table provides a description for the computations of all independent variables used in the cross-sectional models. Sources of the variables are also provided.

Variable	Definitions	Sources
Ownership measures		
INSTI	Number of shares owned by institutional shareholders divided by total shares outstanding as recorded in CHESS two days before the announcement date.	CHESS
Prop. number institutions	Number of institutional shareholders divided by total number of retail and institutional shareholders two days before the announcement date.	CHESS
Firm characteristics		
Marketcap	Market capitalization on the balance date immediately before issuance announcement date.	SIRCA
TA	Total assets on the balance date immediately before issuance announcement date.	Aspect/Huntley FinAnalysis
Leverage	(Current Debt + Non-current Debt)/Total Assets, obtained on the balance date immediately before issuance announcement date.	Aspect/Huntley FinAnalysis
IDYRisk	Idiosyncratic risk is measured as the standard error of the market model regression of daily stock returns over the period from day -260 to day -61 for each issuing company.	SIRCA
Spread	Spread is the average daily bid-ask spread, calculated in the period between 30 days and 2 days before the announcement day. Daily bid-ask spread = (Ask-Bid)/ (Ask+Bid)/2. The Bid and Ask are the time-weighted bid and ask.[1]	SIRCA
Default risk	Merton's (1974) expected default frequency which estimates the default risk for the one year post-announcement date.	SIRCA; Aspect/Huntley FinAnalysis
Pre-issue AR	Abnormal returns in the one year before to two days before the announcement date, where the normal returns are estimated using the market-adjusted model.	SIRCA
Log (MB)	Natural logarithm of the market value of total assets divided by book value of total assets at the balance sheet date immediately prior to the issue announcement date. Market value of total assets is computed from total assets *minus* book value of equity *plus* market value of equity.	SIRCA; Aspect/Huntley FinAnalysis
Volume	Average trading volume divided by average share outstanding over previous 2 years ending 2 days prior to the issue announcement date.	SIRCA
CAPEX	Capital expenditure divided by TA, obtained on the balance date immediately before issuance announcement date.	Aspect/Huntley FinAnalysis
Cashburn	Cashburn represents the rate of depletion in cash due to the firm's operation. Thus, cashburn is set to zero for firms with positive cashflow from operation. For firms with negative cashflow from operation, cashburn is calculated as |cashflow from operation| divided by cash.	Aspect/Huntley FinAnalysis
Offer characteristics		
$WT_{\%marketcap}$	Wealth transfer from retail shareholders to institutional shareholders as a consequence of ROs, which is scaled by market capitalization.	See computation in Equation 1
$WT_{\%offersize}$	Wealth transfer from retail shareholders to institutional shareholders as a consequence of ROs, which is scaled by offer size.	See computation in Equation 2
WT (in dollars)	Wealth transfer from retail shareholders to institutional shareholders as a consequence of ROs in dollars.	The numerator in Equations 1 and 2
RN	Dummy variables equal to one if the RO has a renounceable structure, zero if it has a non-renounceable structure.	SDC
UW	Dummy variables equal to one if the RO is underwritten, zero if it is not underwritten.	SDC
SF	Dummy variables equal to one if the RO has a shortfall facility, zero if it does not have a shortfall facility.	SDC
Prop. discount	(Share price two days pre-issuance - offer price)/ share price two days pre-issuance.	SDC; SIRCA
Prop. shares issued	Prop. shares issued is measured as the new shares issued divided by the total shares outstanding prior to the issue announcement date.	SDC; CHESS
Allocation ratio	The allocation ratio is the number of new shares relative to old shares, which is a measure of the size of the RO.	SDC
Retail part.	Retail part. rate is computed from the number of RO shares purchased by the retail shareholder group (in the first allocation) divided by the total number of	CHESS

	RO shares that retail shareholders are entitled to buy. The latter is computed from the number of shares owned by the retail shareholder group prior to the ex-entitlement date divided by the number of new shares allocated per one share owned.	
Institutional participation	Institutional participation rate is computed from the number of RO shares purchased by the institutional shareholder group (in the first allocation) divided by the total number of RO shares that institutional shareholders are entitled to buy. The latter is computed from the number of shares owned by the institutional shareholder group prior to the ex-entitlement date divided by the number of new shares allocated per one share owned.	CHESS
Takeup rate	The total number of new shares issued in the RO divided by the number of new shares required to raise the expected capital amount. Total number of new shares issued includes the new shares taken up by all eligible current shareholders plus any new shares issued because of unsubscribed rights. These may be issued to underwriters, to current shareholders who apply for additional shares via the shortfall facility and to selected investors at directors' discretion. This measure is manually collected from company announcements.	SIRCA
Abnormal vol	Similar to HP (2016), abnormal trade is measured by change in volume of the RO firm minus change in volume of a matched ASX-listed firm. Change in volume is computed as the natural log of one plus the sum of stock trades from five days before the initial announcement of rights offering to five days after, minus the natural log of one plus the sum of volume from sixteen days before the announcement to six days before the announcement. A matched firm has the closest return to the RO firm over the -16 to -6 window.	SIRCA

[1] $Time-weighted\ bid = \frac{First\ best\ bid \times Time\ 1 + Second\ best\ bid \times Time 2 + \cdots + Last\ best\ bid \times Time\ n}{Time\ 1 + Time\ 2 + \cdots + Time\ n}$