Equity Provision in Financially Distressed Firms

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Abstract

How does ownership structure impact distressed firms' ability to recapitalise themselves with new equity? In this article, we investigate which investor types step up to the plate (or not) when distressed firms need new equity using a novel and granular dataset on corporate ownership. We find that equity provision in distressed firms is hampered by the presence of owners with large controlling stakes, suggesting that these owners are cash constrained and value control preservation over distress resolution. Correspondingly, we show that equity provision benefits from a professionalised ownership structure in which the largest owners are institutions that have moved beyond control preservation as a primary goal. We posit that retail investors are natural equity providers in distressed firms due to their well-documented contrarian behaviour, but find no evidence to support this hypothesis.

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1. Introduction

Equity capital constitutes a buffer against future losses and therefore has an important role in resolving financial distress (Ursel, 2006). The resulting proceeds from a new equity issue can be used to bolster the firm's liquidity, thereby increasing the distance to default. Alternatively, the firm may choose to pay down some of its debt, which reduces the burden of interest expenses in relation to cash flow from operations on an ongoing basis. Either way, firms' survival prospects and financial health improve. Car-maker Tesla, for example, faced distress in 2019 when it strengthened its balance sheet through an equity infusion which improved liquidity and restored investor confidence.

Issuing equity in financial distress is qualitatively different from doing so in normal or good times due to the well-known debt overhang problem analysed by Myers (1977), whereby most of the benefits of a prospective issue would accrue to debtholders and it therefore fails to happen. It is also special due to the potential for dilution faced by existing shareholders. Firms facing financial difficulties can typically only issue equity at a steep discount to the pre-announcement market price. Armitage, Dionysiou, and Gonzalez (2014), for example, find that the discount is over 20 percentage points higher for firms in distress (the average discount is 16%). These numbers suggest that there is substantial potential for dilution for shareholders who do not fully participate, which can become a problem if certain cash constrained owners are averse to loss of influence or control. In addition, investors are asked to forego diversification benefits for what amounts to a highly uncertain and concentrated bet. A distressed firm thus faces the

problem of finding a pool of investors with sufficient risk tolerance to provide the needed capital.

In this article, we investigate the role of ownership structure when distressed firms need new equity. Does entrenched control present an obstacle for firms in need of equity capital? Do certain investor types or ownership configurations play an enabling role in the equity-raising process? Which owners are likely to put new capital into the firm over and above their pre-existing ownership ratio? Getting answers to questions like these is important for our understanding of distress resolution and the supply of equity in public capital markets more generally. In investigating them, we address a gap in the literature regarding how the structure of ownership impacts firms' ability to raise equity financing.

We hypothesise that, conditional on distress, firms characterised by entrenched control will issue less equity and that those with high retail ownership will issue more. To motivate the first hypothesis, we note that influence and control are non-pecuniary benefits whose importance may supersede purely economic motives (such as maximising firm value by resolving financial distress.) For example, concerns over control retention are known to prompt owners to forego expansion at the expense of economic benefits (Caprio, Croci, and del Guidice, 2011) as well as affect the design of equity securities (Cronqvist and Nilsson, 2005). The significant equity stake of large shareholders gives them substantial control over corporate decisions, which they are reluctant to dilute through new equity issuances, potentially leading to suboptimal financing decisions. Founding

families and other large owners may indeed face cash constraints that prevent them from participating fully in an equity issue. Oftentimes, an outsized fraction of their net worth is tied up in one particular firm, which amounts to a form of "paper wealth" rather than readily available cash. Defending such a large stake in an equity issue requires formidable amounts of cash, which they simply may not have.

Retail investors, in contrast, have traits that make them ideal candidates for equity provision in distressed firms. A long line of research, starting with Grinblatt and Keloharju (2000), has documented their contrarian investment behaviour. Barrot, Kanier and Sraer (2016), for example, show that retailers like to "buy the dip" and tend to be on the buying side of transactions during times of market stress. This contrarian streak suggests that they have the requisite risk tolerance to act as equity providers of last resort. Retailers, moreover, are generally thought to act with fewer constraints. In contrast, open-ended mutual funds that experience net outflows need to sell assets regardless of market conditions or the nature of any investment opportunity that may present itself (Coval and Stafford, 2007). Based on these arguments, we hypothesise that managers in distressed companies with substantial retail ownership feel emboldened to go ahead with an equity issue because they anticipate a high degree of participation by existing owners. That is, a high retail ownership stake provides managers in these firms with some level of assurance that the "window" to risk-willing equity capital is still open, increasing their confidence that an issue will be successful. Additionally, retail investors pose no threat to the controlling owners in the way new blockholders might.

Our investigation of equity provision benefits from novel and granular data on the ownership of public firms in Sweden between the years 2000 to 2020, which allows us to identify various investor categories and their voting and cash flow rights. This includes identifying retail ownership with a much higher level of accuracy than in previous literature. As in Jankensgård and Vilhelmsson (2018), our retail measure is based on each individual's personal number for identification (as opposed to the organisational number that indicates a legal entity) and sums their stakes below a certain threshold (our main measure of retail ownership uses 0.1%). Such measures are not possible to estimate with US data where shareholders are only included in regulatory filings if they exceed 5%. Furthermore, the Swedish dataset offers a suitable setting for studying equity provision under different configurations of corporate control. Traditionally the Swedish ownership model has been centred around control by families and spheres of influence who retained substantial control over diversified portfolios through a mix of dual-class shares, pyramidal structures and cross-holdings (Agnblad et al., 2001; Cronqvist and Nilsson, 2003). The strong separation between ownership and control also resulted in a significant distance between the costs of internal and external financing, leading entrenched owners to have a stated preference for retained earnings and debt over equity (Högfeldt, 2004; Högfeldt and Oborenko, 2005; Holmén and Högfeldt, 2009). Another notable change regards foreign ownership, which has dramatically increased since a reform in 1993 abolished restrictions on foreign ownership in Swedish listed firms (Högfeldt, 2004). In the following decades, a sustained influx of investments by institutional and foreign investors took place (Dahlquist, and Robertsson, 2001; Högfeldt, 2004). These

secular trends, against a historic backdrop of entrenched control, makes the Swedish setting an ideal venue to explore equity issues under financial distress.

Overall, the results in this study support the control hypothesis but not the retail hypothesis. We find that, conditional on a high probability of default, the amount of equity raised is negatively related to the degree of entrenchment among controlling shareholders. Our empirical approach is to regress, in a fixed effects framework, one year-ahead proceeds from equity financing scaled by assets (as obtained from the cash flow statement) on the interaction between the probability of default and various measures of entrenched control, such as the Herfindahl index and the control margin, defined as the difference between the largest owner's stake and the sum of the four next largest stakes (Cronqvist and Nilsson, 2005). The interpretation of these interaction terms, which are statistically significant at the 1 to 5%-level, is that the more entrenched the largest owner is, the less equity firms with a high default probability are able to raise. The amount of equity proceeds is furthermore explained by investment opportunities (+), firm size (-), profitability (-), leverage (+), and the size of cash holdings (-). These findings are consistent with financial theory. With very few exceptions, ownership variables on their own do not explain equity proceeds, which is as one would expect if equity offerings make economic sense and are driven by fundamental factors. According to the data, it is only when firms approach financial distress that ownership begins to truly matter.

Consistent with the idea that cash constraints are operative on the investor level, we find that large individual block owners (physical persons holding more

than 5%) do not defend their pro-rata shares in the equity issues that do take place. These are precisely the investors most likely to have a great deal of wealth tied up in a particular firm, making it a challenge to find enough liquidity to fully participate. In this part of the analysis, we gauge the *conditional* effect of equity events on outgoing (end-of-year) ownership to assess which investor types invest more (or less) cash in relative terms, as opposed to merely committing the amount of cash that would preserve the existing pro-rata structure. For this purpose, we run a two-way fixed effects model to study which owner types see an increase (decrease) in their stake following an equity event, conditional on high default risk. Given the large discount on the subscription price previously mentioned, one would expect investors to fully participate to avoid being diluted unless cash or risk constraints are binding.

There is little evidence in the data to support the hypothesis that retail investors represent an important source of equity financing in distressed firms. The interaction term with probability of default is not significant in the regressions on equity proceeds. Moreover, in the pro-rata analysis, no measure of retail ownership suggests that retail investors invest over and above their allocated share.

Instead, equity financing in distressed firms seems to happen most easily in "professionalised" ownership structures where the main investors have moved beyond the goal of preserving absolute control for its own sake. For example, we find that interaction terms that capture the presence of a coalition of blockholders with a combined ownership stake that exceeds that of the largest owner are

positively related to equity proceeds and significant at the 5%-level. This is in line with the idea that the capacity for entrenched controlling owners to extract private benefits of control can be curbed in the presence of voting coalitions among non-controlling owners (see e.g., Bennedsen and Wolfenzon, 2000; Volpin, 2002; Maury and Pajuste, 2005). In this case, control is already sufficiently diffused and having a dilution-averse controlling owner ceases to be an issue for equity provision. Such a coalition can also be effective in the book building process that precedes equity issues through private placements. The book building is an important point: for an equity issue to take off the ground in struggling firms, it generally takes one or more large owners to commit and send a signal to other investors that they are supportive of it. For some of these owners, particularly institutions, there is also a reputational effect in play in that they do not want to be seen as "not being there" for a company in which they have a significant investment.[1] Consistent with this interpretation, we find a positive effect on equity proceeds in high default risk firms when the largest owner is an institutional investor (significant at the 1%-level.)

Our findings contribute primarily to the literature on the choice between debt and equity as the marginal source of financing. The papers in this particular literature study the marginal financing decision rather than the overall mix of equity and debt in the balance sheet. The analysis by Huang and Ritter (2021) shows that most equity-issuers would face near-term depletion of their cash positions in the absence of new capital. Equity proceeds are generally hoarded as

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[1] This mechanism was suggested to us in talks with a senior executive at one of the leading investment banks in Sweden.

cash, which the firm then burns through as they make operating losses over a string of years. In contrast, firms issue debt to finance short-lived cash needs (such as investment costs) and spend the proceeds from borrowing almost immediately. Denis and McKeon (2021) report that equity financing is more prevalent in firms that experience negative cash flows over successive years. These studies shed light on how the subsequent use of cash can be linked to the financing decision, but neither focuses on the question of how the pre-existing ownership structure affects the provision of equity. Our study addresses this gap in the literature.

Our findings also contribute to the broader discussion on the agency costs associated with ownership concentration. Beyond the standard agency prediction of controlling owners expropriating minority shareholders (Shleifer and Vishny, 1997), resorting to different control mechanisms (e.g., dual-class shares and pyramids) gives rise to controlling minority owners who are insulated from threats of market discipline (low dilution risks), and who retain disproportionate control while only bearing a fraction of the consequences of their decisions (Bebchuk, Kraakman and Triantis, 2000; Cronqvist and Nilsson, 2003). Our findings that control negatively relates to equity issues during times of distress, together with the drop in share ownership of physical blockholders relative to their pro-rata, can be viewed as manifestation of agency costs associated with minority controlling owners.

Our findings are also relevant to the literature on liquidity provision in financial markets. In the context of trading, retail investors have been shown to have a pronounced contrarian streak, a tendency that appears to be reinforced

during uncertain times (Grinblatt and Keloharjo, 2000; Barrot et al, 2016). Our findings in this regard show that this characteristic does not necessarily generalise to equity provision in financially distressed firms. An explanation for this could be that retail investors act in a contrarian way already when the firm experiences negative share returns, which in forward-looking markets can precede measurable financial distress.

Our findings also relate to the literature on corporate "zombiehood", which is when firms for a prolonged time go on in a low-productivity state characterised by low profits and underinvestment. Financial constraints have been linked to underinvestment in empirical studies at least since the work by Fazzari, Hubbard, and Petersen (1988). The striking thing in this literature is the absence of a discussion of the most obvious solution to these underinvestment problems: namely issuing equity. The mechanisms used to explain zombiehood are instead usually of a "macro" nature, like the state of the bank system (Caballero, Hoshi, and Kashyap, 2008), or the tightness of monetary policy (Acharya, Eisert, Eufinger, and Hirsch, 2019). Corporate finance-oriented explanations of financial constraints typically point to the debt overhang problem, according to which equity injections fail to happen because the proceeds would primarily be used to service debt (Myers, 1977). Our results suggest that a form of "control overhang" from having dilution-averse main owners may be another contributing factor to financial constraints and zombiehood in the corporate sector.

2. Data, Methodology, and Descriptive Statistics

2.1 Sample

The sample used in this study covers data on Swedish firms with a primary listing on Nasdaq Stockholm between the years 2000 and 2020. Ownership data is from the Holdings database which is operated by Modular Finance, a private company. Holdings contains the ownership lists of publicly traded companies in Sweden. These lists report the voting and cash flow rights, nationality, and type of each owner. A useful feature of this data is that it keeps track of who the beneficiaries of each stock are, so that owners who hold stakes in the firm through different entities are reported as a single ownership stake. This gives a more accurate depiction of the actual ownership structure of a company. Another benefit is that there is a distinction between physical (individual) and legal entities, such as institutions, allowing for more precise identification of retail investors. We collect financial data from Refinitiv, and stock data is from the Swedish House of Finance Data Center's FinBas database. We exclude financial firms and utilities, and remove firms if they have missing or negative values for total assets and revenue. Our final sample consists of 2,577 firm-years and 269 unique firms. Variable definitions are provided in Appendix 1.

2.2 Empirical methodology

In this study, we investigate the broad hypothesis that ownership matters to equity provision in financially distressed firms. In the first section of the paper, the question pursued concerns which ownership configurations are conducive to more (or less) equity financing. This part of the investigation targets the *process* of issuing equity. As noted, entrenched owners may obstruct this process due to

an aversion to being diluted. Similarly, some ownership categories, retail owners in particular, may, *a priori,* be assumed to be tolerant of risk and unproblematic from the point of view of corporate control (i.e. they pose no threat to existing owners.) The presence of a large fraction of such owners ought to facilitate, rather than obstruct, the equity-raising process in distressed firms. The focus here is thus on ownership structure as it concerns the relative ease with which the firm can access risk-willing capital to support an equity issue. The baseline empirical model relates equity proceeds to ownership structure in the following general way:

$$Equity\ proceeds_{i,t+1} = \alpha + \beta_1 Ownership_{i,t} + \beta_2 Distress_{i,t} + \beta_3 Ownership_{i,t} \times Distress_{i,t}$$

$$+\gamma Controls_{i,t} + \tau_t + \rho_i + e_{i,t} \quad (1)$$

The interaction term, coefficient β_3 in Eq.1, tests whether the effect of distress on equity provision is sensitive to the structure of ownership. In Eq. 1 firm-fixed (ρ) and year-fixed effects (τ) to mitigate concerns about omitted variable bias. Errors are clustered at the firm level. We forward the dependent variable so that the equity proceeds at time *t+1* are modelled as a function of the ingoing ownership structure at time *t*, which ensures that the measurement of ownership structure precedes the equity event. Apart from the fixed effects and forward-lagging, endogeneity concerns are also reduced by the fact that equity issues oftentimes reflect a need for new funds that arises due to exogenous factors like recessions and defection of large customers. That is, they are at least partly driven by outside events to which the firm responds, rather than being an endogenous and persistent corporate policy declared by its board of directors.

A possible objection to this specification is that the baseline model does not identify the amount of equity the firm would have liked to issue. The ideal variable for our purposes would have been an "equity gap"-measure that targets the

difference between the desired amount of equity proceeds and the actual proceeds. With such a measure it would have been clearer whether certain ownership structures pull the firm away from the optimal level of equity funding. However, our main interest lies with the effect of ownership structure conditional on distress. A firm which is sufficiently close to financial distress is overleveraged (undercapitalized) by definition; consequently, increasing distress risk is optimally associated with higher equity proceeds on average.

It should be noted that there are several different mechanisms for raising equity. The predominant form in Sweden are rights offerings, but private placements are also common. Several studies have shown that the choice of method is not independent of the firm's financial condition and other fundamental factors (Wu, 2004; Ursel, 2006; Chen, Dai, and Schatzberg, 2010.) In particular, Cronqvist and Nilsson (2005) show that firms with entrenched controlling owners tend to prefer rights offerings. The reason for this preference is that private placements lead to new blockholders, which can disrupt their control over the firm. In other words, controlling owners select out of private placements. Our empirical model can be thought of as allowing for the possibility that firms with entrenched control, for the same reason, to a larger extent opt out of using equity in the first place (despite a precarious financial condition.)

The second part of the study looks at the *conditional* effect of the equity issues that do take place. In particular, if the firm issues equity, does the ownership of the firm change materially? If all investors decide to exercise their rights in full in a rights issue, the ownership of the firm stays exactly the same. Only if some owners decline this right will they be diluted. They may decline to participate

because they do not believe the investment will generate attractive risk-adjusted returns, but also because they are cash constrained in the sense of not being able to muster enough liquidity to defend their pro-rata share. Our interest lies in studying which owner categories that, considered as a whole, invest more or less than their proportional share. If an ownership type sees a decrease, it is an indication that they did not fully subscribe to the issue.[2] To investigate this, we estimate a general two-way fixed effects model in Eq. 2:

$$Ownership_{i,t} = \alpha + \beta_1 Equity\ issue_{i,t} + \beta_2 Distress\ dummy_{i,t} + \beta_3 Equity\ issue_{i,t} \times Distress\ dummy_{i,t}$$
$$+ \gamma Controls_{i,t} + \tau_t + \rho_i + e_{i,t} \quad (2)$$

The dependent variable is ownership at time t for one of the following owner categories: retail investors with less than 0.1% stakes, retail investors with holdings of 5% or less, and physical block owners with holdings of 5% or more. *Equity issue* is an indicator variable equal to one if an equity issue was announced at time t and zero otherwise. We look at four variations of *equity issue:* only public offers, only private placements, both public offers or private placements, and if equity proceeds are ≥3%. The *distress dummy* is an indicator variable equal to one for severely distressed firms, taking the value one if a firm's probability of default is in the top quartile of the yearly sample, and zero otherwise. The coefficient β_3 associated with the interaction term captures the moderating effect of distress on the impact of equity issues on different classes of ownership. More specifically,

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[2] In a rights offering, every investor is offered rights to participate in proportion to their ownership stake. What happens if they decline is determined by whether an oversubscription privilege is included in the offer, in which case other pre-existing owners may pick up the declined equity. If the rights are tradable, they can be sold to anyone. Our point is that the pre-existing ownership matters because they are offered to invest at a discount and adverse selection is introduced whenever rights are sold to outside investors. A high expected take-up by the existing shareholder base is a key consideration because an undersubscribed issue sends a negative signal regarding the firm's prospects, which can reinforce its troubled situation (Ursel, 2006.)

it captures the difference between severely distressed firms and healthy firms before and after the equity event.

It is not an admission of endogeneity that ownership stakes now appear on the left-hand side of the equation. Following an issue there is a *mechanical* effect on the pro-rata distribution depending on whether some investor types are more or less willing to participate in the transaction. It is thus an entirely conditional effect that we seek to measure. In Eq. 1, in contrast, we investigate whether certain ownership configurations are positives or negatives in the equity-raising process that plays out *before* the actual transaction.

2.3 Variables

2.3.1 Equity proceeds

Our main measure *equity proceeds* is defined as proceeds from sale of common or preferred equity scaled by total assets, where the former is collected from the net financing section of the cash flow statement. We prefer to normalise by assets, rather than by total external financing, because it renders a measure that captures the economic significance of the equity issue. When total external financing is used to standardise, a high value does not necessarily signify a meaningful addition to distress resolution (because the overall amount of financing could be negligible). In the robustness section, we use an alternative measure of the extent of equity financing called *net equity*, defined as equity proceeds minus cash dividends, divided by assets. This variable recognizes that only the proceeds from an equity issue net of any dividends paid actually contribute to the firm's liquidity and equity base.

2.3.2 Control concentration

We use several variables that capture entrenched control. *Control margin* is defined as the vote share of the largest owner less the sum of the vote shares of the four next largest owners (Cronqvist and Nilsson, 2005). *Herfindahl* is a commonly used measure of concentration that ranges between zero and one where the calculation is based on the ownership stakes of the firm's five largest owners. Here we follow Maury and Pajuste (2005) distinguish between *herfindahl difference*, which sums the squared distances between the five successive largest owners $(Votes_1-Votes_2)^2 + (Votes_2 - Votes_3)^2 + (Votes_3 - Votes_4)^2 + (Votes_4 - Votes_5)^2$, and *herfindahl concentration,* which sums the squared voting rights of the five largest owners $(Vote_1^2 + Vote_2^2 + Vote_3^2 + Vote_4^2 + Vote_5^2)$.[3] *Vote/equity ratio* is the ratio between the voting rights and cash flow rights of the firm's largest owner. These indicators of entrenched control are all defined in such a way that a higher value always means that the largest owners are more firmly in control.

2.3.2 Contestability

In this section we present a set of variables aimed at describing situations in which the firm's ownership has been "professionalised" in that the major owners are likely to have moved beyond the pursuit of control for its own sake. *Coalition* is a binary variable that takes the value one if the sum of the four next largest stakes exceeds the stake of the largest owner. Similar to Maury and Pajuste (2005), we also define the variable *high contestability*, which is a dummy variable equal to one if the first and second largest shareholders collectively own less than 50% of

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[3] In regression models we use the natural logarithm of the variables *Herfindahl difference* and *Herfindahl concentration* to deal with skewness.

the votes (i.e. they can't form a strict majority), and at least one of the following three largest owners (owners $3-5$) own 10% or more of the votes (i.e., the coalition between the first and second largest owners can be contested). *Institutional* is a binary variable that takes the value one if the firm's largest owner is an institutional investor. *Institutional control* is a binary variable that takes the value one if the largest institutional investor owns a stake greater than 10%. *Block institutional* is the sum of ownership stakes larger than 5% held by institutions.

2.3.3 Retail ownership

Retail is defined as the sum of all ownership stakes that are less than 0.1% and held by physical persons (as opposed to legal entities.) The threshold value of 0.1% is the same as the one used in Jankensgård and Vilhelmsson (2018) and related to the fact that owners whose stakes are below this size are not shown in the ownership lists for confidentiality reasons. However, we are able to obtain the sum of such "micro" ownership stakes identified by the owners' personal number. Legal entities, in contrast, are identified by their organisational number. This procedure ensures a uniquely reliable identification of the proportion of retail investors in the firm's ownership. *Retail wide* expands this measure and sums all ownership stakes below 5% held by individuals. This is basically every stake held by individual investors except for those that are blockholders, who are assumed to have influence and access to private information about the firm.

2.3.4 Distress

To capture financial distress, our main measure is *probability of default (PD)*. To measure default probabilities, we start by estimating distances to default (*DD*) using the iterative estimation method of the Merton (1974) model proposed by

Vassalou and Xing (2004), as implemented in Forssbæck and Vilhelmsson (2017). The distance to default estimates are then transformed into default probabilities using the cumulative standard normal distribution (Φ), with $PD = \Phi(-DD)$, which places the estimates in the [0,1] interval and makes winsorizing redundant. Time series of equity market values required for the DD estimation are collected from the Swedish House of Finance Data Center's FinBas database and matched to the Eikon financial statement data. As a proxy of the risk-free rate, we use the 3-month Treasury Bill rate, collected from the Swedish Riksbank.

As an additional measure of financial distress, we use the Altman's Z-score, a well-established predictor of bankruptcy. We create a binary variable, labelled *Z-score*, that takes the value one if a firm belongs to the lowest quartile by year. The 25th percentile of Z-Score in the sample is 1.892, which is close to a commonly used threshold value for financial distress in the literature (1.8). The results using Altman's Z-score are presented in the robustness section.

2.3.5 Control variables

The questions we raise in this paper need to be addressed in a ceteris paribus-setting. Since we want to model the fundamental determinants of the decision to issue equity, we include a set of control variables identified in the literature as influencing the capital structure decision. *Cash* is defined as cash & short-term investments over total assets. *Leverage* is defined as the ratio of total debt to total assets. *Tobin's Q i*s defined as the ratio of the market valuation of the firm to total assets. *Profitability* is defined as earnings before interest and taxes to total assets. *Tangibility* is the ratio of tangible assets to total assets. *Firm age* is the natural

logarithm of the age of the firm, and *firm size* is defined as the logarithm of total assets. All accounting variables are winsorized at 2nd and 98th percentiles.

2.4 Descriptive statistics

Table 1 reports the sample distribution by industry and by year. From Panel A, we see that control has gradually become less entrenched over the sample period when measured in terms of Control margin (though it remains more stable using the other measures.) The probability of default shows a marked increase during the financial crisis in 2008 (largely as a consequence of sharply elevated volatility). However, equity proceeds were actually below average in this year, suggesting that firms struggled to issue equity in the market environment at the time. In contrast, during the Covid-19 pandemic (2020) equity proceeds reached its highest value. As for industry distribution (Panel B), control is, as expected, more entrenched in traditional industries like automobiles and real estate compared to more "recent" ones like technology and health care.

Table 2 reports the descriptive statistics for the variables included in the analysis. The average value of Retail is 12.3% using the narrower definition (stakes below 0.1%) and 20.7% using the broader definition (stakes below 5%). This indicates that retail investors are indeed a sizable and potentially important source of equity capital. It is also noteworthy that institutions, despite the overall dominance of family owners in the Swedish ownership model, still represent the largest owner in over 20% of cases.

Correlations are reported in Table 3 and display the usual patterns. For example, there is a clear size effect, with size being strongly positively correlated with leverage and profitability, and negatively correlated with cash and Tobin's Q.

This size effect speaks to the need for a ceteris paribus-analysis of the relation between equity proceeds and the probability of default. Counter-intuitively, cash is positively correlated with equity proceeds. When interpreting this, it should be noted that Table 3 reports contemporaneous correlations, such that the equity proceeds that have flowed into the firm will add to the cash balance. As shown by Huang and Ritter (2021), equity is initially hoarded as cash, which firms typically draw down on as it experiences negative cash flows in subsequent years. When we later use lagged cash in the multivariate model, cash has the expected negative sign.

3. Regression results

3.1 Control concentration and equity financing

Table 4 reports the results from regressions with Equity proceeds as dependent variable. We note that across all models, all the ownership variables by themselves (in the level) are insignificant. This is an important observation because it tells us that firms, on the whole, neither issue more nor less equity depending on whether they have a certain ownership structure. What drives equity issues should normally be that a need for new capital materialises, and equity is judged to be the most suitable marginal source of funding. That is, managers normally go to the equity markets when the need arises and doing so is thought to support the execution of the business plan.

When measures of control concentration are interacted with *Probability of default*, however, the picture changes. The interaction is negative and significant regardless of which proxy for control is used. What this means is that as firms get nearer to default, entrenched control appears to hamper equity financing at the

margin. The significance of the interaction terms aligns with the view that the process for issuing equity is qualitatively different in financial distress because the scope for dilution is much greater. Effectively, potential dilution increases with the probability of distress measure given that we know that the discount in equity issues is much higher in financially weak firms. The results are also economically meaningful. For instance, the interquartile range of the control margin is about 0.3, and in Table 4, column 1, the stand-alone coefficient for control margin is –0.021 and the interaction with probability of default is –0.076. For most of the sample, the default probability stays close to zero, so that an interquartile-range increase in control margin reduces equity proceeds by –0.021 × 0.3 = –0.0062, or about 6 percent of a standard deviation (given a sample standard deviation of equity proceeds of 0.099). However, increasing the probability of default to 50 percent (implying a zero distance to default, and thus an immediate need for an equity injection) almost triples the negative effect of the control margin to –0.021 – 0.076× 0.5 = –0.059, so that an interquartile-range increase in control margin reduces equity proceeds by about 18 percent of a standard deviation.

Put together, the results in Table 4 are consistent with the hypothesis that entrenched control is an obstacle in the process of issuing equity. The alternative story, not supported by the data, is that the controlling owners "care more" because of their commitment to the firm and therefore become a positive force in distress resolution. One caveat to add here is that we measure distress using probability of default, which is not the same as being in default, or about to default. It is still possible that having a committed main owner that fights "tooth and nails" is an asset when the situation is severe enough and survival is urgently at stake.

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The results on the financial variables in Table 4 are very clear and agree with financial theory. The sign on profitability (***) is negative, most likely because higher profitability reduces the need of outside funding. Likewise, the sign on cash is negative (**), for much the same reasons. Having already stockpiled cash, firms see less of a need to use capital markets for more funding. As firms grow larger, they also issue less equity (***), reflecting a marginally declining growth rate and improved access to debt. Finally, a higher valuation, as measured by Tobin's Q, is associated with higher equity proceeds (**), consistent with the idea that valuations increase with better investment opportunities and faster growth. It could also reflect the fact that they take advantage of high valuations to issue equity at an attractive price. Leverage (*) is positively related to equity issuance, which makes sense if firms, as leverage increases, seek to rebalance the capital structure back towards some perceived optimal level.

3.2 Contestability and equity financing

Table 5 reports the results from interactions between the probability of default and various indicators of a "professionalised" ownership structure. By this we mean a situation in which the firms' main owners are unlikely to be motivated primarily by control but instead form an effective coalition that pursues economic benefits. The results confirm that, overall, equity provision in distressed firms is facilitated by a professionalised ownership structure. Of course, these measures are related to and in many ways represent the flip side of entrenched control. Still, these regressions serve to crystallise the issue at hand, namely that raising equity in troubled firms gets easier when control is more evenly distributed and, in some ways, has ceased to be a major issue.

A particularly important result in Table 5 is found in Model 3, where *institutional* is the ownership measure being used. The interaction term is positive and significant at the 1%-level, suggesting that the extent of equity as the marginal source of funding goes up when the firm's main owner is an institutional investor. This is important because institutional ownership is, in many ways, the ultimate way to dissolve control as a factor in the equity raising process. The fiduciary duty of institutions is towards their investors, on whose behalf they have invested with the explicit goal of generating attractive risk-adjusted returns. In line with these arguments, having at least one institutional investor owning 10% or more also has a positive and significant relationship (Model 4.)

Institutional block ownership (Model 5) is insignificant, however (Model 5). Possibly this reflects the fact that even with several such blocks, a dominant controlling owner is still possible. High contestability (Model 2) is also insignificant, most likely for the same reason. The Coalition-variable (Model 1), in contrast, explicitly ensures that this is not the case, since it takes the value of one only if the blockholders can effectively outpower the largest owner. The interaction with *coalition* is positive and significant at the 1% level.

3.3 Retail owners and equity provision

This section investigates whether having a large fraction of retail ownership is conducive to more equity financing in distressed firms. The motivation behind this inquiry is the idea that retail investors do not represent a threat to any controlling faction, and they have a well-documented appetite for risk (contrarian investment behaviour.)

We implement two measures of retail ownership with different thresholds (0.1% and 5%, respectively), where the identification is based on the stake being held by a physical person. For completeness, we also investigate the corresponding sums for their institutional counterparts, identified by organisational number ("Micro-institutions".) To account for the influence of stock prices on retailers' contrarian behaviour, we add Stock return to the model, defined as the annualised stock return in the preceding fiscal year.

Table 6 reports the results on the role of retail ownership. A clear picture emerges in that neither of these investor categories appear to support the equity-raising process. None of the interaction terms with Probability of default shows any significance. A fair conclusion based on the results presented so far would be that the equity process is primarily influenced by the configuration of owners (and distribution of control) at the top of the ownership, not whether there is a large pool of smaller investors ready to invest.

3.4 Robustness

In this section we explore the robustness of the key findings so far. Table 7 presents the results from two variations to the research design. In Panel A, we use net rather than gross equity proceeds (labelled *net equity proceeds*). In Panel B, to gauge firms' financial status, we use the variable *Z-score* as an alternative measure for distress. Definitions of *net equity proceeds* and *Z-score* are provided in sections 2.3.1 and 2.3.4, respectively.

To motivate *net equity* as an alternative dependent variable, we note that some firms pay dividends while simultaneously issuing equity. The main reason for this behaviour is thought to be the desire to uphold the commitment by firms to paying

dividends at a certain rate. While cancelling the dividend would preserve cash and render the equity issue not necessary, it would also damage the credibility of the firm in the eyes of investors who have come to expect a certain dividend stream. This dent in credibility could in turn impair the firm's access to financial markets in the future (Eichengreen, 1984). As can be seen from Panel A in Table 7, the key results on the interaction term with Probability of default are preserved when *net equity* is used as the dependent variable.

The results are also robust to using Distress as the measure of elevated default probability. The Z-score on which it is based is effectively a measure of the distance to default based on financial ratios rather than market-based indicators. Since a higher value of the Z-score indicates a larger distance from default, the lowest quartile represents the group closest to default. Panel B in Table 7 reruns the empirical model using Distress in the interaction with our measures of entrenched control. The conclusions from Table 4 are again confirmed in that the interaction remains negative and significant.

One question that arises is whether firms with entrenched control have better access to, or a stronger preference for, debt as the marginal source of financing. Our model contains both firm fixed effects and an extensive set of control variables, which mitigates concerns about omitted variable bias. However, to address this possibility in a more formal manner, we repeat the baseline model except that we use proceeds from borrowing rather than equity. In these regressions, which are untabulated, we find that the proceeds from borrowing are not higher in firms with entrenched control (using the same empirical model as in

Table 4), which speaks against the possibility that our main results merely reflect a different preference with respect to the debt-equity choice.

3.4 Effects on equity events on pro-rata ownership

We now change the perspective and ask whether equity issues impact the composition of ownership using the two-way fixed effects model specified in Equation 2. An equity event in this analysis is a binary variable that takes the value one when a firm issues equity, and zero otherwise. We use four separate measures: public offers, private placements, public offers or private placements, and if equity proceeds are ≥3% of total assets.[4] The purpose of these estimations is to gauge which investor types invest more (or less) than indicated by their pre-existing ownership stake. Investing less is an indication of either insufficient means to invest (cash constraints) or a lack of willingness to invest more money into the firm (despite the dilution that will occur due to the discounted price in equity issues).

Turning now to the largest owners, we have already seen that firms with entrenched control issue less equity given that the firm is financially distressed. This is an important observation to keep in mind because it means that some of the equity issues that would have diluted the largest owners the most have already been filtered out (i.e., failed to happen). If the estimates in the pro-rata analysis show a muted impact for large owners, this is not to say that they are indifferent to equity issues and invest on par with everyone else, since they could well have obstructed some equity issues where they would have been diluted. In other words,

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[4] The 3%- threshold ensures that employee option programmes do not count as equity events.

our results might be understated, since we cannot observe firms for which issuing equity might be optimal, but refrained from doing so for concerns over dilution.

Despite this selection out of equity issues in distressed firms, we find evidence indicating that the largest private (individual) owners of the company underinvest. In Panel C in Table 8 we investigate the impact of equity issues on the combined block ownership stake of individuals (referring to stakes $\geq$ 5%). In this analysis, we account for the type of equity issue by distinguishing between rights offerings and private placements. In the full sample analysis that ignores the type of issue (Model 4), we find that there is a highly significant negative impact on private blockholders. Interestingly, we see that this result is entirely driven by rights offerings (Model 1). This makes sense, given that blockholders are frequently the ones targeted (invited to participate) in private placements. When we restrict the analysis to only include firms that issue equity, we reach similar conclusions (Model 6).

These results are consistent with the logic that private blockholders are the most likely to be cash constrained because a lot of their wealth is tied up in financial assets, not seldom in the focal firm, which implies that they may not have enough liquidity to defend such large stakes. It is hard to ascertain whether cash constraints are the actual mechanism behind the observed patterns without access to more detailed financial records, but the dilution effect should be kept in mind here: not investing at the discounted subscription price does not make economic sense. Also, we do not find a similar effect when conditioning the analysis on institutional blockholders (not tabulated.) There is no particular reason why these

two groups of investors should make a fundamentally different assessment of the attractiveness of the same investment opportunity.

In Panels A and B we focus on retail investors. While our analysis so far has not provided any support for the idea that their presence facilitates the equity-raising process, it is still possible that they choose to invest over and above their allocated shares (which is possible given that some owners, like large private blockholders, decline to fully subscribe.) However, the results in Table 8 indicate that retail investors do not step up to the plate by oversubscribing. This holds true for both micro-retailers (<0.1%) and the wider definition (≤5%), and does not change even when we focus exclusively on rights offerings (Model 1) and when we restrict the analysis to equity issuers (Models 5–9). Importantly, though, this does not mean that they undersubscribed. Given the lack of statistical significance in either direction, retailers appear to invest in distressed equity roughly according to their allocated pro-rata share.

4. Conclusions

Issuing equity to recapitalise a firm is an obvious strategy to resolve financial distress and ease financial constraints more generally. What can get in the way of such equity issues is "dilution-aversion" on the part of controlling owners. In this article, we find evidence consistent with the idea that firms with entrenched control issue less equity in states of heightened default risk. A plausible interpretation of these findings is that the largest private owners are cash constrained and prioritise control preservation over distress resolution.

We have not found compelling evidence that another category of investors, retailers, are important to the process of issuing equity nor that they oversubscribe

to the equity issues that do take place. A priori, this category of investors have traits that make them ideal candidates for being equity providers of last resort: they consistently display a contrarian behaviour and do not pose a threat to controlling owners.

Our findings imply that entrenched ownership can be an obstacle when firms need to be recapitalised. Given that such ownership structures are ubiquitous, such a "control overhang" may partly explain why parts of the corporate sector end up in an unproductive state characterised by low profits and continued underinvestment. Future research could shed light on this possible channel into so-called "corporate zombiehood".

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Appendix A: Variable definition

Variables	Definitions
Control margin	The vote share of the largest owner minus the sum of the vote shares of the four next largest owners ($2^{nd} - 5^{th}$).
Vote/Equity ratio	The ratio between the voting rights and cash flow rights of the firm's largest owner.
Herfindahl differences	The sum of the squared distances between the five successive largest owners $(Votes_1-Votes_2)^2 + (Votes_2 -Votes_3)^2 + (Votes_3 - Votes_4)^2 + (Votes_4 -Votes_5)^2$ (in logarithms).
Herfindahl concentration	The sum of the squared voting rights of the five largest owners $(Vote1^2 +Vote2^2 +Vote3^2+Vote4^2+Vote5^2)$ (in logarithms).
Coalition	An indicator variable equals to 1 if the sum of the holdings of the $2^{nd} - 5^{th}$ owners exceeds the share of the largest owner, and zero otherwise.
High contestability	An indicator variable equal to one if the sum of votes of the 1st and 2nd is <50%, and the votes of either the 3rd, 4th or 5th owner is ≥10%, and zero otherwise.
Largest institutional	An indicator variable equal to one if the firm's largest owner is an institutional investor, and zero otherwise.
Largest Institutional	An indicator variable equal to one if the largest owner is an institutional investor with voting stakes ≥10%, and zero otherwise.
Block institutional	The sum of ownership stakes ≥5% held by institutions.
Block physical	The sum of ownership stakes ≥5% held by physical owners.
Retail	The sum of all ownership stakes that are <0.1% held by physical persons.
Retail wide	The sum of all ownership stakes that ≤5% held by physical persons.
Micro-institutions	The sum of all ownership stakes that are <0.1% held by institutional owners.
Micro-institutions wide	The sum of all ownership stakes that ≤5% held by institutional owners.
Equity proceeds	Proceeds from sale of common or preferred equity scaled by total assets. Sale of common or preferred equity is from the net financing section of the cash flow statement.
Net equity proceeds	Equity proceeds minus cash dividends, divided by assets.
Equity issue	An indicator variable equal to one if an equity issue took place at time (t) and zero otherwise. We look at four variations of Equity issue: only public offers, only private placements, both public offers or private placements, and if equity proceeds are ≥3%.
Distress	Merton (1974) Distance to default as proposed by Vassalou and Xing (2004), transformed into default probabilities (PD) using the cumulative standard normal distribution.
Distress dummy	An indicator variable equal to one for severely distressed firms, taking the value one if a firm's probability of default is in the top quartile of the yearly sample, and zero otherwise.
Z-score	An indicator variable equal to one if a firm belongs to the lowest quartile of Z-Score, by year, and zero otherwise.
Total assets (in millions)	The book value of total assets. The variable *firm size* is the natural logarithm of total assets.
Cash	The ratio of cash & short-term investments to total assets.
Tobin's Q	The ratio of the market valuation of the firm to total assets.
Profitability	The ratio of earnings before interest and taxes to total assets.
Leverage	The ratio of total debt to total assets.
Tangibility	The ratio of tangible assets to total assets.
Firm age	The natural logarithm of the age of the firm (in logarithms).

Table 1: Sample distribution

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Year	Control margin (4)	Vote/Equity ratio	Herfindahl differences	Herfindahl concentration	Largest institutional	Retail (Physical < 0.1%)	Equity proceeds	Probability of default
2001	10,73%	2,042	0,088	0,157	21,15%	10,67%	2,27%	0,035
2002	9,17%	1,791	0,087	0,154	17,33%	13,58%	2,60%	0,076
2003	7,80%	1,706	0,090	0,159	20,69%	13,42%	2,62%	0,014
2004	7,95%	1,805	0,087	0,154	22,73%	13,99%	2,93%	0,009
2005	8,68%	1,952	0,084	0,142	20,00%	12,59%	3,58%	0,001
2006	7,55%	1,822	0,082	0,140	18,56%	14,07%	3,38%	0,007
2007	8,12%	1,780	0,083	0,144	21,30%	12,64%	2,24%	0,008
2008	6,42%	1,744	0,081	0,145	18,64%	12,73%	1,65%	0,193
2009	7,23%	1,654	0,081	0,144	19,69%	13,15%	3,14%	0,008
2010	9,47%	1,652	0,095	0,156	16,95%	12,95%	2,91%	0,008
2011	8,58%	1,697	0,094	0,160	17,19%	12,32%	3,22%	0,026
2012	6,51%	1,662	0,083	0,144	17,89%	11,86%	1,84%	0,034
2013	8,39%	1,682	0,093	0,155	20,33%	12,00%	2,59%	0,011
2014	9,76%	1,764	0,100	0,163	17,60%	12,64%	2,41%	0,025
2015	7,66%	1,612	0,094	0,163	20,59%	12,08%	2,20%	0,001
2016	7,36%	1,558	0,093	0,159	18,42%	12,10%	1,70%	0,012
2017	4,98%	1,575	0,084	0,148	21,55%	11,84%	2,31%	0,009
2018	5,15%	1,544	0,087	0,153	20,51%	11,07%	2,20%	0,023
2019	4,61%	1,498	0,088	0,153	23,93%	11,62%	2,84%	0,011
2020	4,67%	1,514	0,085	0,150	24,09%	11,62%	4,80%	0,018
Total	7,04%	1,660	0,088	0,152	20,29%	12,29%	2,72%	0,024
Panel B: Industry								
Technology	-1,76%	1,656	0,048	0,102	24,93%	17,01%	3,94%	0,016
Telecommunications	7,03%	1,780	0,063	0,114	22,94%	7,26%	0,49%	0,010
Health Care	1,98%	1,690	0,067	0,130	21,16%	11,81%	9,23%	0,009
Real Estate	21,78%	1,392	0,214	0,292	16,15%	11,83%	0,52%	0,020
Automobiles & Parts	16,82%	1,337	0,146	0,214	11,90%	10,51%	1,17%	0,001
Consumer Products & Services	10,76%	1,608	0,120	0,183	12,41%	12,82%	1,40%	0,031
Media	14,13%	1,836	0,105	0,134	38,89%	8,29%	0,75%	0,166
Retail	3,14%	1,077	0,055	0,099	18,81%	15,09%	4,12%	0,044
Travel and Leisure	-7,88%	1,407	0,031	0,093	18,39%	10,18%	0,87%	0,048
Food, Beverage & Tobacco	7,31%	1,125	0,061	0,097	21,57%	6,74%	0,26%	0,008
Personal Care & others	21,80%	1,155	0,141	0,202	4,92%	9,79%	0,81%	0,012
Construction & Materials	8,32%	1,888	0,086	0,165	23,89%	11,62%	0,29%	0,017
Industrial Goods & Services	7,00%	1,861	0,090	0,165	17,65%	11,03%	1,83%	0,026
Basic Resources	17,26%	1,655	0,106	0,166	27,23%	14,79%	0,89%	0,036
Energy	-0,58%	1,470	0,021	0,052	22,22%	15,83%	2,60%	0,070
Total	7,04%	1,660	0,088	0,152	20,29%	12,29%	2,72%	0,024

This table shows the sample distribution of the main variables by year in Panel A and Industry in Panel B. Columns (1) – (6) are different measures of control concentration and ownership. The dependent variable *equity proceeds* is shown in column (7) and the *probability of default* in column (8). Industry classification follows the Nasdaq OMX Industry Classification Benchmark (ICB). Variable definitions is in Appendix A.

Table 2: Summary statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Control margin	2577	0.070	0.242	-0.374	0.935
Vote/Equity ratio	2577	1.660	1.151	0.675	8.573
Herfindahl differences	2577	0.088	0.139	0.000	0.889
Herfindahl concentration	2577	0.152	0.154	0.000	0.909
Coalition	2577	0.499	0.500	0.000	1.000
High contestability	2577	0.083	0.276	0.000	1.000
Institutional	2577	0.203	0.402	0.000	1.000
Institutional control	2577	0.133	0.339	0.000	1.000
Block institutional	2508	0.146	0.157	0.000	0.941
Retail	2508	0.123	0.088	0.000	0.570
Retail wide	2508	0.207	0.146	0.000	0.731
Micro-institutions	2508	0.013	0.017	0.000	0.104
Micro-institutions wide	2508	0.189	0.148	0.000	0.830
Equity proceeds	2577	0.027	0.099	0.000	0.630
Net equity proceeds	2567	0.027	0.099	-0.000	0.630
Probability of default	2577	0.024	0.115	0.000	0.999
Z-score	3173	0.223	0.416	0.000	1.000
Total assets (in millions)	2577	19102.275	46844.470	15.064	511595.000
Cash	2577	0.112	0.124	0.002	0.754
Tobin's Q	2577	2.214	1.402	1.025	9.391
Profitability	2577	0.050	0.138	-0.611	0.326
Leverage	2577	0.241	0.166	0.000	1.000
Tangibility	2577	0.014	0.020	0.000	0.100
Firm age	2577	55.152	49.353	1.000	331.000

This table reports descriptive statistics for the regression variables. Accounting variables are winsorized at the 2nd and 98th percentiles. The sample period is 2000 – 2020. Variable definitions are in Appendix A.

Table 3: Pair-wise correlation table

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Equity proceeds	1.000															
(2) Control margin	-0.104*	1.000														
	(0.000)															
(3) Vote/Equity	-0.082*	0.094*	1.000													
	(0.000)	(0.000)														
(4) Herfindahl differences	-0.111*	0.906*	0.081*	1.000												
	(0.000)	(0.000)	(0.000)													
(5) Herfindahl concentration	-0.131*	0.848*	0.086*	0.949*	1.000											
	(0.000)	(0.000)	(0.000)	(0.000)												
(6) Coalition	0.095*	-0.759*	-0.119*	-0.530*	-0.523*	1.000										
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)											
(7) Contestability	-0.031	-0.302*	-0.067*	-0.155*	-0.093*	0.293*	1.000									
	(0.118)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)										
(8) Institutional	0.084*	-0.232*	-0.132*	-0.226*	-0.294*	0.206*	-0.057*	1.000								
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)									
(9) Total assets	-0.268*	0.234*	0.193*	0.143*	0.100*	-0.247*	-0.116*	0.080*	1.000							
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)								
(10) Cash	0.412*	-0.119*	-0.020	-0.115*	-0.144*	0.114*	-0.009	0.161*	-0.291*	1.000						
	(0.000)	(0.000)	(0.307)	(0.000)	(0.000)	(0.000)	(0.648)	(0.000)	(0.000)							
(11) Tobin's Q	0.301*	-0.111*	-0.032	-0.099*	-0.118*	0.090*	-0.009	0.072*	-0.222*	0.406*	1.000					
	(0.000)	(0.000)	(0.108)	(0.000)	(0.000)	(0.000)	(0.636)	(0.000)	(0.000)	(0.000)						
(12) Profitability	-0.570*	0.092*	0.089*	0.099*	0.104*	-0.074*	0.023	-0.038	0.324*	-0.279*	-0.037	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.250)	(0.054)	(0.000)	(0.000)	(0.059)					
(13) Leverage	-0.107*	0.017	-0.058*	0.021	0.042	-0.016	0.010	-0.018	0.264*	-0.362*	-0.208*	0.029	1.000			
	(0.000)	(0.380)	(0.003)	(0.290)	(0.032)	(0.412)	(0.609)	(0.373)	(0.000)	(0.000)	(0.000)	(0.137)				
(14) Tangibility	0.189*	-0.123*	0.002	-0.107*	-0.120*	0.113*	-0.008	-0.012	-0.326*	0.113*	0.220*	-0.284*	-0.110*	1.000		
	(0.000)	(0.000)	(0.937)	(0.000)	(0.000)	(0.000)	(0.702)	(0.527)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
(15) Firm age	-0.158*	0.095*	0.147*	0.059*	0.079*	-0.114*	0.003	-0.032	0.392*	-0.150*	-0.158*	0.162*	0.089*	-0.218*	1.000	
	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.888)	(0.102)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(16) Retail	0.168*	-0.083*	-0.004	-0.093*	-0.128*	0.095*	-0.011	0.031	-0.385*	0.148*	-0.047	-0.238*	-0.108*	0.069*	-0.178*	1.000
	(0.000)	(0.000)	(0.857)	(0.000)	(0.000)	(0.000)	(0.577)	(0.121)	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)	(0.001)	(0.000)	

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Control concentration and distress

Equity proceeds (t+1)	(1)	(2)	(3)	(4)
Probability of default (PD)	0.033	0.095**	-0.027	-0.041
	(0.023)	(0.038)	(0.032)	(0.029)
Control margin	-0.021			
	(0.018)			
Control margin x PD	-0.076**			
	(0.037)			
Vote/Equity ratio		0.003		
		(0.002)		
Vote/Equity ratio x PD		-0.040**		
		(0.019)		
Herfindahl differences			-0.003	
			(0.002)	
Herfindahl differences x PD			-0.013**	
			(0.005)	
Herfindahl concentration				-0.006
				(0.005)
Herfindahl concentration x PD				-0.026***
				(0.009)
Firm size	-0.014***	-0.015***	-0.015***	-0.015***
	(0.005)	(0.005)	(0.005)	(0.005)
Cash	-0.125**	-0.125**	-0.130***	-0.132***
	(0.051)	(0.052)	(0.050)	(0.050)
Tobin's Q	0.011**	0.011**	0.011**	0.011**
	(0.005)	(0.005)	(0.005)	(0.005)
Profitability	-0.141***	-0.143***	-0.141***	-0.139***
	(0.045)	(0.045)	(0.045)	(0.044)
Leverage	0.041*	0.040*	0.042*	0.042*
	(0.023)	(0.023)	(0.023)	(0.023)
Tangibility	0.105	0.109	0.103	0.106
	(0.337)	(0.339)	(0.341)	(0.339)
Firm age	-0.025	-0.024	-0.026	-0.025
	(0.016)	(0.016)	(0.016)	(0.016)
Constant	0.312***	0.302***	0.310***	0.309***
	(0.090)	(0.089)	(0.089)	(0.089)
Observations	2277	2277	2277	2277
R-squared	0.104	0.109	0.106	0.108
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES

This table shows fixed effects estimation results for Equation (1). The dependent variable is *equity proceeds* at *t+1*, defined as the proceeds from sale of common or preferred equity scaled by total assets. The main explanatory variables are the *probability of default (PD)* which measures firm distress, different measures of owner control, and their interaction. We measure owner control using *control margin* in column (1), the *votes/equity* ratio in column (2), *Herfindahl differences* in column (3), and *Herfindahl concentration* in column (4). We control for firm and for period fixed effects. All variables are as defined in Appendix A. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Control contestability and distress

Equity proceeds (t+1)	(1)	(2)	(3)	(4)	(5)
Probability of default (PD)	0.002	0.026	0.010	0.022	0.050*
	(0.025)	(0.024)	(0.027)	(0.024)	(0.030)
Coalition	0.009*				
	(0.005)				
Coalition x PD	0.057**				
	(0.028)				
High contestability		-0.009			
		(0.007)			
High contestability x PD		0.047			
		(0.050)			
Institutional			-0.005		
			(0.006)		
Institutional x PD			0.094***		
			(0.034)		
Institutional control				-0.002	
				(0.009)	
Institutional control x PD				0.078**	
				(0.033)	
Block institutional					0.011
					(0.019)
Block institutional x PD					-0.190
					(0.117)
Total assets (ln)	-0.015***	-0.014***	-0.014***	-0.014***	-0.015***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash	-0.128**	-0.123**	-0.123**	-0.124**	-0.122**
	(0.051)	(0.052)	(0.052)	(0.052)	(0.053)
Tobin's Q	0.010**	0.011**	0.011**	0.011**	0.010**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Profitability	-0.138***	-0.141***	-0.142***	-0.141***	-0.139***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.046)
Leverage	0.041*	0.042*	0.042*	0.042*	0.042*
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Tangibility	0.108	0.111	0.125	0.128	0.113
	(0.341)	(0.346)	(0.349)	(0.345)	(0.345)
Firm age (ln)	-0.025	-0.023	-0.025	-0.023	-0.024
	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)
Constant	0.310***	0.305***	0.299***	0.297***	0.311***
	(0.089)	(0.090)	(0.088)	(0.090)	(0.092)
Observations	2277	2277	2277	2277	2217
R-squared	0.107	0.103	0.106	0.104	0.104
Firm fixed effects	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES

This table shows fixed effects estimation results where the dependent variable is *equity proceeds* at *t+1*, defined as the proceeds from sale of common or preferred equity scaled by total assets. The main explanatory variables are the *probability of default (PD)* which measures firm distress, different measures of contested control, and their interaction. We measure contested control using *coalition* in column (1), *high contestability* in column (2), *institutional* in column (3), *institutional control* in column (4), and *block institutional* in column (5). We control for firm and for period fixed effects. All variables are as defined in Appendix A. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Retail investors, distress and equity issue

Equity proceeds (t+1)	(1)	(2)	(3)	(4)
Probability of default (PD)	0.026	0.019	0.032	0.014
	(0.041)	(0.028)	(0.037)	(0.042)
Retail	-0.106**			
	(0.052)			
Retail x PD	-0.052			
	(0.306)			
Micro-institutions		0.015		
		(0.122)		
Micro-institutions x PD		-0.462		
		(1.204)		
Retail wide			-0.077**	
			(0.038)	
Retail wide x PD			-0.063	
			(0.185)	
Micro-institutions wide				0.001
				(0.021)
Micro-institutions wide x PD				0.006
				(0.192)
Stock returns	-0.008*	-0.009*	-0.008*	-0.009*
	(0.005)	(0.005)	(0.005)	(0.005)
Total assets (ln)	-0.022***	-0.019***	-0.023***	-0.019***
	(0.007)	(0.006)	(0.007)	(0.007)
Cash	-0.131*	-0.138**	-0.135**	-0.138**
	(0.067)	(0.067)	(0.067)	(0.067)
Tobin's Q	0.011*	0.012*	0.011*	0.012*
	(0.006)	(0.006)	(0.006)	(0.006)
Profitability	-0.118**	-0.118**	-0.118**	-0.118**
	(0.047)	(0.047)	(0.047)	(0.047)
Leverage	0.059**	0.052**	0.058**	0.052**
	(0.025)	(0.026)	(0.025)	(0.026)
Tangibility	0.185	0.179	0.174	0.182
	(0.405)	(0.395)	(0.402)	(0.391)
Firm age (ln)	-0.019	-0.022	-0.020	-0.022
	(0.019)	(0.019)	(0.019)	(0.018)
Constant	0.400***	0.360***	0.422***	0.359***
	(0.125)	(0.116)	(0.131)	(0.118)
Observations	1919	1919	1919	1919
R-squared	0.115	0.109	0.115	0.109
Firm fixed	YES	YES	YES	YES
Year fixed	YES	YES	YES	YES

This table shows fixed effects estimation results where the dependent variable is *equity proceeds* at *t+1*, defined as the proceeds from sale of common or preferred equity scaled by total assets. The main explanatory variables are the *probability of default (PD)* which measures firm distress, different measures of retail and micro-institution ownership, and their interaction. We use *retail* in column (1) and *micro-institutions* in column (2). In columns (3) and (4) we use the wider definition of *retail* and *micro-institutions*, respectively. We control for firm and for period fixed effects. All variables are as defined in Appendix A. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Robustness results

Panel A: Net Equity proceeds (t+1)	(1)	(2)	(3)	(4)
Probability of default (PD)	0.035	0.099**	-0.026	-0.041
	(0.024)	(0.038)	(0.032)	(0.029)
Control margin	-0.021			
	(0.018)			
Control margin (4) x PD	-0.076**			
	(0.038)			
Vote/Equity ratio		0.003		
		(0.002)		
Vote/Equity ratio x PD		-0.040**		
		(0.019)		
Herfindahl differences			-0.003	
			(0.002)	
Herfindahl differences x PD			-0.013**	
			(0.005)	
Herfindahl concentration				-0.006
				(0.005)
Herfindahl concentration x PD				-0.027***
				(0.009)
Constant	0.313***	0.302***	0.311***	0.310***
	(0.091)	(0.090)	(0.090)	(0.090)
Observations	2267	2267	2267	2267
R-squared	0.102	0.107	0.104	0.105
Panel B: Equity proceeds (t+1)	(1)	(2)	(3)	(4)
Z-score	0.010	0.016	-0.030**	-0.023*
	(0.008)	(0.010)	(0.012)	(0.013)
Control margin	-0.006			
	(0.017)			
Control margin x Z-score	-0.075***			
	(0.027)			
Vote/Equity ratio		0.007*		
		(0.004)		
Vote/Equity ratio x Z-score		-0.007*		
		(0.004)		
Herfindahl differences			-0.001	
			(0.002)	
Herfindahl differences x Z-score			-0.009***	
			(0.003)	
Herfindahl concentration				-0.004
				(0.005)
Herfindahl concentration x Z-score				-0.011**
				(0.005)
Constant	0.224***	0.215***	0.230***	0.225***
	(0.080)	(0.080)	(0.079)	(0.080)
Observations	2834	2834	2834	2834
R-squared	0.164	0.162	0.165	0.163
Firm controls	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES

This table shows robustness results for the main model in equation 1. In panel A, we replicate the models from Table 4 using as dependent variable *net equity proceeds*, which is equal to equity proceeds minus cash dividends, divided by assets. In panel B, we replicate the models from Table 4 using Altman's Z-score to measure distress. *Z-score* is an indicator variable equal to one if a firm belongs to the lowest quartile of Z-Score, by year, and zero otherwise. We control for firm and for period fixed effects. All variables are as defined in Appendix A. Standard errors are clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Pro-rata ownership and equity issues

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Retail	Public offers (Full sample)	Private placements (Full sample)	Public offers & private placements (Full sample)	Equity dummy (Full sample)	Public offers (Issuers only)	Private placements (Issuers only)	Public offers & private placements (Issuers only)	Equity dummy (Issuers only)
Distress dummy (DD) (t)	0.008**	0.008**	0.008**	0.008**	0.011**	0.011**	0.011**	0.010*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Public offer (PO) (t)	0.001				0.005			
	(0.005)				(0.005)			
PO (t) x DD (t)	0.001				-0.006			
	(0.008)				(0.009)			
Private placement (PP) (t)		0.004				0.010		
		(0.008)				(0.009)		
PP (t) x DD (t)		0.007				-0.002		
		(0.014)				(0.014)		
PO & PP (t)			0.005				0.009	
			(0.006)				(0.007)	
PO & PP (t) x DD (t)			0.003				-0.004	
			(0.007)				(0.008)	
Equity dummy (ED) (t)				0.001				-0.001
				(0.006)				(0.007)
ED (t) x DD (t)				0.005				0.005
				(0.008)				(0.008)
Constant	0.392***	0.392***	0.393***	0.393***	0.295**	0.297**	0.298**	0.297**
	(0.087)	(0.087)	(0.087)	(0.087)	(0.129)	(0.129)	(0.129)	(0.129)
R-squared	0.095	0.095	0.096	0.096	0.181	0.183	0.184	0.181
Panel B: Retail wide								
DD (t)	0.010**	0.010**	0.010**	0.011**	0.010	0.009	0.009	0.010
	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)	(0.006)	(0.007)	(0.007)
PO (t)	-0.001				0.003			
	(0.007)				(0.007)			
PO (t) x DD (t)	0.003				-0.001			
	(0.011)				(0.012)			
PP (t)		0.007				0.013		
		(0.011)				(0.012)		
PP (t) x DD (t)		0.019				0.012		
		(0.021)				(0.019)		
PO & PP (t)			0.004				0.008	
			(0.007)				(0.008)	
PO & PP (t) x DD (t)			0.005				0.001	
			(0.011)				(0.012)	
ED (t)				0.006				0.007
				(0.008)				(0.009)
ED (t) x DD (t)				-0.002				-0.003
				(0.011)				(0.013)
Constant	0.774***	0.774***	0.775***	0.774***	0.663***	0.662***	0.665***	0.664***
	(0.116)	(0.116)	(0.116)	(0.116)	(0.166)	(0.166)	(0.166)	(0.166)
R-squared	0.137	0.138	0.138	0.137	0.215	0.218	0.216	0.215
Panel C: Block physical								
DD (t)	0.011*	0.010	0.011*	0.012*	0.013*	0.009	0.013	0.014*
	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)
PO (t)	0.015**				0.013**			
	(0.006)				(0.005)			
PO (t) x DD (t)	-0.032***				-0.034***			
	(0.010)				(0.010)			
PP (t)		-0.003				0.003		
		(0.006)				(0.007)		
PP (t) x DD (t)		-0.019				-0.026*		
		(0.015)				(0.015)		
PO & PP (t)			0.008*				0.008*	
			(0.005)				(0.005)	
PO & PP (t) x DD (t)			-0.023***				-0.027***	

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				(0.008)				(0.009)
ED (t)				0.003				0.001
				(0.006)				(0.007)
ED (t) x DD (t)				-0.019**				-0.029***
				(0.009)				(0.010)
Constant	0.277**	0.280**	0.279**	0.276**	0.375***	0.388***	0.381***	0.373***
	(0.127)	(0.128)	(0.127)	(0.128)	(0.131)	(0.133)	(0.131)	(0.131)
R-squared	0.058	0.055	0.057	0.057	0.168	0.160	0.166	0.173
Observations	2508	2508	2508	2508	1087	1087	1087	1087
R-squared	0.095	0.095	0.096	0.096	0.181	0.183	0.184	0.181
Firm fixed	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed	YES	YES	YES	YES	YES	YES	YES	YES

This table shows fixed effects estimation results for Equation (2). The dependent variables are *retail* in Panel A, *retail wide* in Panel B, and *block physical* in Panel C. The main explanatory variables are the *distress dummy (DD)*, different measures of equity issues, and their interaction. *distress dummy (DD)* is an indicator variable equal to one if a firm's probability of default is in the top quartile of the yearly sample, and zero otherwise. Equity issue is either public offers *(PO)*, private placements *(PP)*, public offers or private placements *(PO & PP)*, and if equity proceeds are $\geq 3\%$ *(ED)*. In columns (1)–(4) we use the full sample, and in columns (5)–(8) we use the sub-sample of equity issuers. We control for firm and for period fixed effects. All variables are as defined in Appendix A. Standard errors are clustered at the firm level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$