The corporate equity puzzle

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Abstract

Why do equity issuances by non-financial companies in Europe remain minor? Using experimental data on firms from Europe, we analyse how firms trade-off between debt and external equity financing. We find that firms are willing to pay a substantial premium on debt when presented with an equity participation as an alternative. Companies are willing to pay an interest rate that is about 8.8pp higher than the cost of equity to obtain a loan instead of external equity. This preference for debt can be explained only partially by the more favourable tax treatment of debt, fear of loss of corporate control and positive growth expectations. In fact, these elements together can explain only some 72% of the gap. The rest, we stipulate, might be due to a culture of debt whereby a financial sector dominated by bank finance, over time, has led to a strong selection towards firms that are most capable to flourish under debt financing and, thus, have the strongest preference for this type of finance. This view is consistent with the fact that we observe a larger debt premium for those firms that are more suited to receive bank loans.

1. Introduction

A strong reliance on debt can negatively affect firms' resilience in times of crisis. Following the financial crisis, companies in Europe suffered from severe debt overhang, which depressed corporate investment and slowed down growth in Europe for several years (Geanakoplos (2014); Lo and Rogoff (2014); Reinhart and Rogoff (2015); Kollmann et al. (2016)). In addition, as investments in intangibles become an ever more important part in firms' investment mix (Falato et al. (2013); Dell'Ariccia et al. (2017); Thum-Thysen et al. (2017); EIB (2017b)), a heavy reliance on debt finance risks to hamper future investment activities as the lack of collateral associated with this type of assets makes debt finance less suitable. Notwithstanding, firms in Europe rely primarily on debt if they need external financing for their investments.[1] Results from the 2016 European Investment Bank's Investment Survey suggest that debt finance (specifically bank loans) accounts for the vast majority of firms' external finance.[2] Only a negligible share of external finance comes in the form of external equity. In addition, IPOs are still far below their pre-crisis levels and have been stagnating over the recent years, despite massive increases in stock prices, which should encourage firms to issue new stocks (Taggart (1977); Marsh (1982); Hovakimian et al. (2001); Baker and Wurgler (2002)).[3]

There are two potential reasons why firms might neglect equity financing. First, there could be a shortage in the supply of this kind of finance, i.e. firms do not use more equity because investors do not buy their shares. Second, firms might simply not be interested in equity financing. To understand why firms in Europe continue to rely so much on debt and so little on external equity for their investment activities, we conducted an online choice experiment. By offering firms pairs of hypothetical financing options, we were able to study their preferences over different types of financing.

Our results suggest that firms have an aversion towards external equity finance vis-a-vis debt. When faced with the choice between a debt offer and an equity offer, firms pick the debt offer in 80% of cases. We find that firms are willing to pay 880bp more for a debt offer compared to an equity offer with comparable characteristics (assuming a debt offer with the desired amount; maturity; uncollateralized and a fixed interest rate and an equity participation including voting rights). The net premium on debt, which corrects for the

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[1] Results by Fan et al. (2012) indicate that firms in Europe use debt securities and bank loans to a greater extent than their American counterparts.

[2] This does not imply that firms finance their investment entirely using debt. Results from the survey suggest that firms finance around two thirds of their total investment using internal finance, i.e. retained earnings and other free cash-flow.

[3] Figure 1 displays the evolution of issuance of listed stocks over the last two decades. While there has been a rise in equity issuances for financial companies, equity issuances of non-financial companies remain below its pre-crisis level and substantial below both the levels of the early 2000's and the level of the United States.

influence of corporate control rights, taxes and growth expectations, is around 250bp.[4] While our paper cannot provide a definitive explanation of why firms dislike equity, our data suggest that the dominance of the European banking system may have led to a crowding out effect in the corporate finance market. We observe that firms that have used bank loans in the past, have no issues in achieving external finance and that are located in regions with stronger property rights, i.e. firms that seem to be better suited to use bank debt, exhibit a larger debt premium. While the willingness to pay higher cost of capital seems irrational in the first instance, this behavior could be justified to the extent that their relationship with their main bank might provide benefits, i.e. emergency credit lines or prolonging credit in the case of temporary earning shortfalls.

Our paper adds to the literature in several ways. First of all, it adds to the literature on capital structure choice. Numerous studies (i.e. Titman and Wessels (1988); Rajan and Zingales (1995); Frank and Goyal (2009)) have addressed the question of which type of firms tend to rely more on debt (vs equity); looking at the correlates between firms' leverage ratios and their level of uniqueness, size, asset tangibility, profitability etc.[5] However, they take the supply of external finance as given, which is not the case, since the availability of equity finance in particular is likely to vary over time, across countries, sectors and firms types. Our study overcomes this obstacle by presenting firms with exogenous financing offers (both debt and equity). This allows us to see which types of firms prefer debt over equity.

Secondly, while the existing literature had to be largely qualitative in its prediction on firms' preference structures, our choice experiment allows us to quantify these preferences and put a 'willingness to pay' label on the debt vs equity trade-off. This is particularly interesting, insofar as it allows us to examine the question of whether firms opt for the cheapest financing source or whether – in line with the pecking order theory – they inhibit a strong hierarchy in their choice of financing (Leary and Roberts (2005); Lemmon et al. (2008); Lemmon and Zender (2010); DeAngelo and Roll (2015)).

Finally, our results add to the discussion on the skewness of equity returns. Bessembinder (2017) suggests that stock returns skewness is so large that the median stock delivers a lower return than a one-month treasury bill, and that only a very small fraction of stocks is responsible for all wealth creation. Our findings complement this, to the extent that we are able to quantify the firms' willingness to pay for an equity participation and confirm that firms are unwilling to accept large costs of equity, which could explain the large amount of firms that deliver returns below the one-month treasury rate. Furthermore, this is in line with the

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[4] Our results can be interpreted as a complement to the Mehra and Prescott (1985) equity premium puzzle. While they observe that equity returns are too high to be explained by a standard asset-pricing model, we observe that companies are unwilling to issue equity as long as equity is not substantially cheaper than debt.
[5] Their work has been expanded by the effect of firms' history (Welch (2004); Leary and Roberts (2005); Kayhan and Titman (2007)) and adjustment behaviour (Flannery and Rangan (2006); Faulkender et al. (2012)).

results of Fama and French (2004), who suggest that companies that newly list on the stock market have lower survival rates and skewed returns.

The remainder of the paper is organized as follows: Section 2 lays out the experimental design and the data. Section 3 describes our calculations of the debt premium. Section 4 presents the empirical results. The relationship between the financial structure and the debt premium is analysed in section 5. Section 6 checks for heterogeneity in the debt premium and performs several robustness checks, while we conclude in section 7.

2. Experiment, data and descriptive statistics

Prior studies analysing firm's capital structure choice lack the ability to account for a firms' financing options (Titman and Wessels (1988); Rajan and Zingales (1995); Hovakimian et al. (2001)). To close this gap, we carried out a randomized choice experiment in which firms were explicitly presented with a series of financing alternatives. In the first step, firms were asked several questions about their planned investment project, i.e. the type of investment they would like to undertake, the size of project, the share of external finance desired, the ideal maturity and in which currency they would like to receive this finance.[6] In addition, firms were asked about their net income in the last three years and their growth expectations going forward. This information was necessary to calculate reasonable equity participations.

Once firms had answered all of these questions, they were presented with two different hypothetical financing offers and asked which option they preferred (Offer A or Offer B). Figure 2 presents the design of the choice experiment. This exercise was repeated for eight pairs of financing offers. The financing offers could be either a loan offer or an equity participation with different characteristics. All possible values were drawn randomly around the demanded financing characteristics.[7]

Loan offers differed in their amount, the interest type (floating or fixed), the interest rate, the maturity, the amortization period, the collateral requirement and whether or not fees for

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[6] Firms had to classify their investment project as one or several of the following: (1) land, business buildings and infrastructure, (2) machinery and equipment, (3) research and development , (4) software, data and website activities, (5) training of employees, (6) organisation and business process improvements or (7) none of these

[7] The domain of possible characteristics varies across firms and we are interested in how firms value certain loan characteristics over a realistic domain. Firms, which desire a loan of 50 million euros, might not consider financing offers with an amount of 500 million euros, as they are too large if their desired amount of external finance is just 50 million euros. However, around the realistic domain of 50 million euros a higher loan amount might be favourable for firms.

early repayment were included. Equity participations had different financing amounts, different demanded shares in the company (the implied cost of equity was stated as well) and different voting right structures (voting rights or no voting rights).[8] Table 1 lists all variables included in the choice experiment, their distribution and the constraints that were applied. The amount offered was equally distributed over 30%, 47.5%, 60%, 82.5%, 100% of the desired amount (stated by firms at the beginning). The maturity and grace period of the debt options were equally distributed over 50%, 75%, 100%, 125%, and 150% desired maturity and 0%, 20%, 40%, 60%, and 100% of the offered maturity, respectively. Collateral requirements were distributed equally over 0, 20%, 40%, 60%, 80%, 120%, and 160% of assets to loan value. The financing offers had three different types (floating interest rate loan, fixed interest rate loan and equity participation). The interest rates were equally distributed around the corresponding mean market interest rate of the country of residence taken from the ECB bank lending survey.[9]

As we lack information about the market value of the companies, we had to use their reported net income to calculate reasonable equity participations. We did this as follows: first, we drew a cost of equity from a uniform distribution. In a second step, we combined this with firms' past net income and the amount of external finance to calculate an equity participation as

$$Equity\ Participation = \frac{Cost\ of\ Equity * Financing\ Amount}{Net\ Income} \qquad (1)$$

Standard asset pricing models predict that corporate equity should yield a higher yield than corporate debt due to the higher risk equity investors face. To avoid making unrealistically cheap equity offers, the cost of equity was equally distributed around 2.5 times the midpoint of the loan offers. This ensured two things: First, that the cost of equity was always substantially far away from the zero lower bound. Second, that a broader spread of possible cost of equity options was possible. This allows us to study the trade-off between debt and equity offers with similar as well as substantially different interest rates and costs of equity.[10]

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[8] Some characteristics were not applicable for either loan or equity offers. To estimate all coefficients properly, we employ the following approach: voting rights is set to no for loan offers. Collateral, fees and amortization are set to zero, interest type to floating, and maturity to 1.5 times the desired for equity offers.

[9] The lowest possible rates was set at the yield on German bunds (for the given maturity) for fixed interest rates and the 3m-benchmark rate from the country of reference for floating interest rates. The highest possible interest rate is equally distributed around two times the Midpoint of market interest rates for a given country, maturity and loan amount (from ECB bank lending survey) minus the lower market end measured by the Yield on German bunds of desired maturity for fixed interest rates and the 3m-benchmark rate plus two times the market mid-point for floating interest rates for the given country and desired loan amount.

[10] A potential concern of this strategy is that the higher average cost of equity dominates or results. Therefore, we check if the higher cost of equity is driving our results by looking specifically at equity offers that yielded a lower cost of equity than the yield of the alternative financing offer as a robustness check.

To be eligible to receive an equity offer, a company needed to satisfy two criteria. First, the amount of external finance had to be smaller than ten times the net income. Second, the largest possible equity stake in the company had to be smaller than 50%.[11] This assured that no equity offer was made that would result in the majority of the company being sold. Furthermore, these conditions were necessary as negative net income would lead to equity values of zero in our analysis. If firms violated one of these criteria, they only received loan offers. 65% of all firms were eligible to receive equity offers. In our analysis, we excluded firms that were unable to receive equity offers.[12]

The choice experiment was carried out on the back of the second wave of the EIB Group Survey on Investment and Investment Finance (EIBIS). EIBIS is a survey that collects qualitative and quantitative information on firms' investment activities across all 28 EU Member States. Survey participants were drawn from the BVD ORBIS database and included both large companies (above 250 employees) as well as SMEs (5-250 employees). An important feature of the survey is that the vast majority of firms are private, i.e. not listed on the stock market. The total number of firms surveyed was 12,338, and interviews took place between April and August 2017 over the phone.

This paper is based on an additional online module of EIBIS. Firms that reported during the telephone interview that they had an investment project that they would like to carry out[13] were sent a link to an online platform. On this platform firms would, after a short introduction, see the initial questions to the experiment as well as the choice experiment itself.

The final sample of companies that participated in the online experiment consisted of 973 firms out of which 865 completed the experiment and the rest completed only parts of it. Table 2 summarizes the distribution of firms over different countries, sectors and size classes. The countries with the largest number of firms in the experiment are Finland, Italy and Spain with 75, 72 and 65 companies, respectively. The countries with the smallest number of firms are Cyprus, Luxembourg, Ireland and United Kingdom with 4, 10, 11 and 14 firms, respectively. The companies in the sample belong to four different sectors: Manufacturing (NACE sector C), Construction (NACE sector F), Services (NACE sector G or I) or Infrastructure (NACE sector D, E, H or J). Manufacturing firms account for the largest share of firms with around 34%, while firms from the construction sector represent only 17% of all firms. Firms from the service and infrastructure sector account for 22% and 27%, respectively. Around 80% of all companies are SMEs (less than 250 employees), whereas the remaining companies are large companies (more than 250 employees).

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[11] The maximal cost of equity were 3.5 times the midpoint of the market interest rate minus 2.5 times the yield on the German bunds of desired maturity
[12] Robustness checks at a later stage demonstrate that this exclusion does not alter the results.
[13] The design of the choice experiment is similar to the design of Brutscher et al. (2017). However, in this experiment, firms might be presented with equity and debt offers.

Table 3 provides an overview of the investment projects that firms are contemplating to put into place (that is, their type, size, desire external finance amount, currency and maturity). Overall, firms demanded external finance with an average amount of 9 million euros. However, only a few companies drive this result by demanding very large amounts. The median financing amount is 500 thousand euros. The desired financing amounts differ remarkably between different countries. The median firm in Ireland desires external finance amounting to 150 thousand euros while Danish firms request a median financing amount of 1.8 million euro. The 10th percentile of loan size is 50 thousand euros and the 90th percentile is around 10.0 million euros[14]. The desired maturities of potential loans differ to a lesser extent than the desired amounts. The median maturity is five years and does not vary over different sectors. We observe that 45% of all firms intend to invest in real estate, 64% of all firms aim to invest in machinery and equipment, 12% of firms consider investing in research and development, 22% of firms have a potential investment project in the area of digital activities, 15% plan training their employees and 19% of all firms intend to invest in measures to improve business processes.[15]

3. Derivation of the debt premium

The results of the choice experiment reveal firms' preferences over the two presented financing offers. As we repeat the choice experiment eight times for every firm, we get eight choices per company. Making use of these, we analyse the trade-off between different financing offers and under which conditions firms switch from one to the other. In the following, we will lay out our empirical framework and how the estimated coefficients can be transformed into the firms' willingness to pay for debt and equity. The setting is similar to a binary choice model that varies over alternatives.[16] Assuming that firms have monotone preferences, the firms' utility functions are quasi-concave. Let $k = 1, \dots, K$ be an index for the different financing offer characteristics x and $\epsilon_{it}(j)$ is an unobserved part of utility for firm i choosing offer j. The utility $u_{it}(j)$ of firm i choosing financing offer $j \in \{A, B\}$ at the tth round of the choice experiment is given by:[17]

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[14] In the whole sample, there are 14 firms with desired financing above 100 million euro and around 7 firms with desired financing below 1.000 euro.

[15] Firms could state multiple investment purposes and therefore percentages do not sum up to 100%.

[16] For a more detailed discussion of choice models see Train (1993).

[17] Linearity of the utility function is not a necessary assumption. The utility function can be interpreted as a first Oder Taylor approximation from a more complex non-linear utility function.

$$u_{it}(j) = \sum_{k=1}^{K} \beta_k x_{kit}(j) + \epsilon_{it}(j) \tag{1}$$

This assumes that companies treat different financing offer characteristics as substitutes. As utility is unobservable, the utility function cannot be estimated directly. However, we observe the choice the firm makes. Under the assumption of rationality, firms should choose the financing offer that yields the higher utility for them. Therefore, the decision between the offers A and B, y_{it}, and the utility derived from its characteristics, $u_{it}(j)$, are linked in the following way:

$$y_{it} = \begin{cases} 1 & if \quad u_{it}(A) > u_{it}(B) \\ 0 & if \quad u_{it}(A) < u_{it}(B) \end{cases} \tag{2}$$

y_{it} is a dummy that is one if the firm chooses offer A. Under the assumption that unobserved part of utility, $\epsilon_{it}(j)$, is type-I-extreme-value distributed, the probability of the firm choosing offer A is given by the logit model:

$$P(y_{it} = 1|x_{it}) = \frac{\exp(\sum_{k=1}^{K} \beta_k x_{kit}(A))}{\exp(\sum_{k=1}^{K} \beta_k x_{kit}(A)) + \exp(\sum_{k=1}^{K} \beta_k x_{kit}(B))} \tag{3}$$

$$<=> P(y_{it} = 1|x_{it}) = \frac{\exp(\sum_{k=1}^{K} \beta_k \Delta x_{kit})}{1 + \exp(\sum_{k=1}^{K} \beta_k \Delta x_{kit})} \tag{4}$$

Therefore, the coefficients β'_k, which determine to what extent loan characteristics affect utility, can be estimated using a logit model with the decision between the two financing offers as the dependent variable and the differences between the financing offers characteristics as regressors. In addition, we can calculate the elasticity of substitution between different loan characteristics. Taking the total derivate of the utility function and using the elasticity of subtraction between two characteristics given by $\eta_{lm} = -\frac{\beta_l}{\beta_m}$, we obtain the following expression:

$$0 = \beta_l dx_l + \beta_m dx_m \tag{5}$$

$$dx_m = \eta_{lm} dx_l \tag{6}$$

If x_m is the interest rate and x_l the equity dummy, then dx_m is the amount of interest rate a firm would be willing to pay more for a financing offer that is a loan instead of an external equity offer holding everything else constant.

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4. Estimation and baseline results

Before turning to the estimation, it is insightful to look at the probability of firms preferring equity. Figure 3 shows the share of firms choosing an equity offer over a debt offer when faced with the choice between the two. It shows that firms choose loan offers more frequently. In 80% of all decisions, offer A is chosen if offer A is a loan offer and offer B is an equity participation. If both offers are either a loan or an equity offer, the chance is around 50% that either offer A or B is chosen. This gives us a first intuition that firms seem to dislike equity participations if they have the opportunity to get a loan.

In the next step, we want to quantify firms' willingness to pay for debt over equity. To do so, we regress firms' choice between two financing offers on the difference in its characteristics. More specifically, we regress y, which is a dummy that is one if the firm chooses offer A and zero otherwise, on the difference between financing offer A's and financing offer B's characteristics using a logit model. As the support of some variables differ remarkably for different firms, we normalize the variables around adequate midpoints.[18] The regression model is

$$logit(y_{it}(j)) = \delta * \Delta Equity_{it} + \gamma * \Delta r + \Delta X'_{it}\beta + \epsilon_{it}(j) \qquad (7)$$

The coefficients of interest are δ and γ, which measures the effect of the financing offer being an equity offer and the cost of financing. The baseline results can be found in Table 4. They show that coefficients generally display the expected sign. Firms value financing offers with larger amounts, lower cost of equity or interest rates on loans, longer maturities and lower collateral requirements. In addition, they dislike floating interest rates. Fees for early repayment and the amortization period have no significant effect on the choice of firms. The coefficients of interest in this specification are equity participation and voting rights. Both are

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[18] The financing characteristics are defined as follows: the amount takes a value 100 if the firm is offered precisely the desired amount and X if X% of the desired amount was offered. Correspondingly, maturity is defined as a percentage of the requested maturity and equals 100 if the offer equals the desired maturity. Grace period (amortization) is converted in a percentage of the desired maturity, taking the value 100 for a loan with bullet repayment, i.e. repayment of the full loan amount at the end of loan period. Collateral requirement are used non-transformed in the following estimations, i.e. as a percentage of the value of the loan, where 100 corresponds to a fully collateralized loan. The interest rate and the cost of equity are the rate offered based on the equal distribution around the market midpoint of the resident country. The cost of equity and the interest rate are not normalized to 100 if the interest rate or cost of equity are equal to the market midpoint because we want to express the willingness to pay more for different financing offer in percentage points of interest in the later stage.

negative, i.e. firms dislike equity; and in particular if equity comes with investor voting rights. In the second specification, we test whether there is extra utility if the maturity or the amount of the financing offer is at or above the desired. The maturity coefficient becomes insignificant in this specification, which indicates that firms value maturities up to the desired maturity, but not beyond. The coefficients on the amount offered, on the other hand, remains significant, indicating that higher amounts are beneficial over the complete support of the variable. In the third specification, we replace our maturity variables with a dummy variable taking a value of one if the offered maturity is at or above the desired maturity and zero otherwise. The results are not harmed by this. Finally, in model (4) we drop voting rights to see the average effect of a financing offer being an equity participation. The equity participation coefficient increases substantially. Firms choose equity over debt in every specification, and this effect is remarkably strong. Furthermore, preferred equity (without voting rights) is favoured to common equity (with voting rights).

Figure 4 plots firms' willingness to pay for different financing characteristics. We observe that firms are indifferent between a loan (with desired maturity, no collateral requirement, no fees, same amount as the equity offer) with an 880bp higher interest rate than the cost of equity of an offer including voting rights. To put this into perspective: The willingness to pay for a loan instead of equity is around seven times as large as the willingness to pay for a 20% larger loan size, the difference between fixed and floating interest loan offers, the difference between financing offers with or without the desired maturity or above. Moreover, it is six times the difference between equity offers with or without voting rights and twice as large as the difference in willingness to pay between a fully collateralised and an uncollateralised loan; suggesting that firms prefer a fully collateralised loan to an equity participation.

In the next step, we decompose the willingness to pay and analyse whether corporate control rights, taxes and growth expectations can account for firms' aversion towards equity. From our estimation, we know that some part of the willingness to pay is driven by the aversion of firms to grant corporate control to investors. However, this explains a small share of 150bp only. Furthermore, debt could be preferred because of its tax shield. Corporations can deduct interest payments from their corporate taxes and this gives debt a funding advantage over equity. However, corporate taxes would have to be astronomically high in order to rationalize our results. Considering cost of equity equal to the midpoint of the lending market (3%) for an equity participation without voting rights, firms would be indifferent if the alternative is a loan offer with an interest rate of 11%. The corporate tax rate would need to be more than 60% to rationalize the result. This is substantially higher than a median tax rate for a European country (below 30%). Considering a corporate tax rate of 25%, 260bp can be explained by corporate taxes. The last possible explanation is that firms consider equity unappealing because they have high growth expectations. In our choice experiment, the equity participation demanded is independent of the growth perspective and perception of the company. Taking a simple rule of thumb and given average expected net income growth rates of 3.5%, a substantial part of the equity premium (120bp) remain unexplained after excluding

taxes and corporate control rights.[19] Using a comparison of the net present value of the cost of the different financing offers, the premium increases to 250bp. (For a detailed description of this calculation see Annex C). The growth expectations necessary to rationalize the net premium (controlled for taxes and voting rights) is around 4.7% annually, which is substantially larger than average self-reported net income growth or nominal GDP growth.

5. The corporate equity puzzle and financial structure

Our results suggest that firms would rather pay more for a debt contract, and therefore make lower profits, than using external equity to finance their investment activities. While we are unable to provide an exclusive explanation for this effect, we find evidence that the financial structure of the European economy is associated with the large premium.

The European economy is bank-based. The largest share of external finance is intermediated through banks rather than financial markets and venture capital markets are substantially smaller in Europe compared to the US or Israel (Kraemer-Eis et al. (2017)). This difference in the financial structure might promote firms that are bankable, i.e. firm that have a business model, which qualifies them for bank loans. As bankable firms benefit from looser financing conditions, this could lead to a competitive advantage and a crowing-out of firms that would need large amounts of equity financing to emerge and operate, i.e. start-ups that have a need for large amounts of venture capital. Therefore, for firms that are more suited for debt finance, issuing equity might not be desirable even at low rates as these firms might have a strong relationship to their main bank, which provides additional economic benefits through emergency credit lines as well as the prolongation of credit in times of crisis. (Lummer and McConnell (1989); Petersen and Rajan (1994); Uchida et al. (2012)).

To test whether the premium is larger for bankable firms, we employ four tests. First, we analyse whether firms that report access to finance as an obstacle towards their investment plans have a lower equity premium. As most external financing in Europe is provided by banks, firms that have obstacles finding adequate external finance might be firms that do not have an existing banking relationship or that are less suited for bank financing in general and would appreciate external equity financing. Second, we test whether firms, which relied on bank loan finance in their last financial year, express a lower debt premium. EIB (2016)

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[19] Taking a simple additive rule of thumb with $premium = taxes + control\ rights + growth\ expectations + \epsilon$

suggests that firms like to stick to the type of finance that they have used in the past, which is bank loans in the vast majority of cases. A stable relationship to their main bank could provide economic value to the company and make bank loans the preferred type of external finance. Third, we test whether the effect is driven by manufacturing firms that make up the largest share of the firms in our sample. Manufacturing plays - in comparison to the US - a large role for the European economy and manufacturing companies have many pledgeable assets on their balance sheet, which makes them excellent clients for banks. If these firms particularly like to use debt financing because they benefit from the stable relationship with a bank, this could be the main driver behind our results. Last, we analyse whether the legal system has an effect on the debt premium. La Porta et al. (1997) and La Porta et al. (1998) suggest that the access to external finance is linked to the legal environment the firm operates in. Many European countries have a French or socialist legal origin and this might lead to different values for the bank-client relationship and therefore, different preferences of the use over external financing types. [20]

The results can be found in Table 5. Firms that are stating that access to external finance is an obstacle are more likely to accept equity offers and the debt premium for these firms lowers to 150bp. This indicates that firms, which have trouble getting a loan (i.e. are less bankable), are more likely to accept equity. Firms, which relied on bank credit in the past period, are more likely to choose a loan in the choice experiment and their debt premium increases to 270bp. This indicates that firms achieve value from relationship banking. In addition, we want to analyse whether firms from different sectors choose differently between equity and debt offers. Therefore, we create a dummy that is one if the firm is in one of the manufacturing sectors and zero otherwise. We observe that firms from the manufacturing sector are less likely to accept equity offers and their debt premium increases to 350bp. To test whether certain legal codes affect the capital structure choice and drive our premium, we split our sample in the following groups: (1) countries with French legal origin, (2) countries with socialist legal origin and (3) countries with either German, Scandinavian or English legal origin. The results are presented in column (4). We observe that firms from countries with French legal origin are more likely to accept equity offers. To an even larger extend, this is true for countries with former socialist legislation. This is in line with the predictions that different legal codes lead to different patterns in firms' external financing behaviour as the legal systems differ in their protection of property rights, their insolvency procedures and their disclosures laws. The premium for debt financing is equal to the baseline in the French legal system (250bp), substantially lower in the former socialist countries (80bp) and substantially higher in the rest of Europe (450bp). All the results suggest that the financial structure in Europe, as well as the self-selection of companies and relationship financing, influence the acceptance of debt in an economy.

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[20] The premium firms are willing to pay are plotted for all subgroups in Figure 5.

6. Heterogeneity and Robustness Checks

Some companies have stronger incentives to rely on debt financing than others. In this section, we want to test if the debt premium varies over characteristics that influence the capital structure. In addition, we address issues regarding the robustness of our results. The premium could be limited to firms with decent growth prospects. To counter these concerns, we test whether firms with higher future growth prospects are less likely to accept equity participations. Moreover, the experimental design could bias our results. To address these issues, we employ several robustness checks regarding the design of the choice experiment.

6.1. Heterogeneity

Results by Rajan and Zingales (1995) suggest that firms with lower profitability, larger size and more tangible assets have higher leverage ratios. These characteristics could influence firms' aversion towards equity. Therefore, we create dummies that split the sample by profitability, size and asset tangibility. We define profitability as net income over fixed assets and sales, respectively, and construct a dummy that is one if profitability is above the median, and zero otherwise. Table 6 columns (1) and (2) present the results. The net debt premium for less profitable firms increases to 340bp and 440bp, respectively. Size is measured as the number of employees or the number of sales. We create a dummy that is one if the firm has more than 250 employees or more than 25 million euros in sales. Both correspond roughly to the largest quartile of the size distribution, and in the case of employees, it follows the definition of EIBIS (EIB (2017a)). The net debt premium for large companies lies between 500bp and 600bp, which is substantially larger than the premium of SMEs. Firms with a higher share of tangible assets should be more likely to finance their investment using debt as tangible assets can be used to collateralize debt. From the survey data, we do not directly see the share of tangible assets in total assets. However, we can analyse whether firms that plan to invest in tangible assets are less likely to choose equity participations. The results can be found in Table 7 columns (1) and (2). We observe that firms with past or planned investment projects in land and real estate or machinery and equipment are equally likely to pick the equity options. Nevertheless, firms are willing to pay a positive net premium for all subgroups.

In addition, we test whether firms are more likely to accept equity options if their investment project is especially large. Issuing new outside equity might come at substantial administrative cost, especially for private companies and therefore they might only be willing to accept equity if the investment they are planning to undertake is substantial in size, which could drive the debt premium. To test this hypothesis, we create a dummy that is one if the ratio of planned investment to total fixed assets or sales is in the upper quartile of the distribution. The results can be found in columns (3) and (4). Companies, whose investment projects are large relative to their firm size, are more likely to accept equity offers. The coefficient

becomes significantly smaller for firms in the top quartile of the investment to firm size distribution, and the debt premium falls to 150 and 110bp, respectively.

6.2.   Robustness Checks

Even though our estimated debt premium is substantially higher than possible growth expectations, firms with very high growth expectations could drive the debt premium. We want to analyse if firm characteristics associated with future growth expectations drive our debt puzzle. We use firm age and self-reported growth expectations as proxies for higher growth expectations in the short run and firm uniqueness as proxies for higher growth expectations in the long run. To test whether these variables affect the debt premium, we interact the equity coefficient with a dummy. We split the firms in the following way: (1) firms that are older than 20 year, (2) firms that report an expected growth in net income below 2.5%, (3) firms that planned to invest or (4) firms that did invest in the last financial year into R&D. The results can be found in Table 8. While we expected young and growing firms to consider equity less attractive due to the design of the choice experiment (i.e. the equity participations are constructed using past net income), we observe that old firms and firms with low expected net income growth are less likely to accept equity. Old firms (310bp) and firms with low growth expectations (340bp) are willing to pay a significantly higher net debt premium (premium abstracted from control rights, taxes and growth expectations). Furthermore, we test if the debt premium is different for more firms with higher long-term growth prospects (measured by planned or past investment in R&D). The results can be found in columns (3) and (4). We observe that firm uniqueness measured by R&D investment is unrelated with the choice between equity and debt in both cases. Therefore, firms investing in unique assets do not drive the debt premium.

We acknowledge that the experimental design could influence the results. To mimic realistic financing offers, firms were offered equity participations that had costs of equity substantially higher than the interest rate on debt in the majority of cases. Baker and Wurgler (2002) suggest that firms choose the security that is the cheapest for them, i.e. firms issue equity when their stock price is particularly high. Following this argument, firms could reject equity offers because the difference between the cost of equity and the interest rate dominates all other factors and this could drive the net debt premium. To test this prediction we employ two measures: (1) we test whether firms are more likely to choose equity if they received a cheap equity offer relative to the midpoint, and (2) we analyse whether companies reduce the aversion towards equity if the cost of equity is smaller than the cost of the corresponding financing offer. The results can be found in Table 9. First, we observe that firms do not react if equity is cheap with respect to our midpoint. Having controlled for the difference between the cost of equity and the interest rate, equity offers that are cheaper than twice the midpoint of the market interest rate are as likely to be accepted as other equity offers. However, we observe that for equity offers with costs of equity below the interest rate of the corresponding financing offer, the debt premium shrinks. These results indicate that the price

of equity might be an important reason for firms to consider debt for their external financing mix only.

Moreover, the choice experiment imposed several restrictions on the type of finance that was presented to firms. In other words, firms that had low net income compared to the amount they wanted to finance were not presented with equity offers. To check if the selection of firms affects our results, we estimate our baseline model including all firms that were unable to receive an equity offer. The results are presented in Table 9 column (3). We observe that the results barely change. Some firms completed the choice experiment in parts only. As a robustness check, we present the results of our baseline regression for firms that completed the choice experiment only (see column (4)). We observe that the results are in line with our previous results.

7. Conclusion

In this study, we analyse the trade-off between equity and debt financing for investment projects of European firms using an experimental approach. It allows us to abstract from market conditions and analyse firms' preferences in a clean and causal way. This grants us with the opportunity to uncover which kind of finance is desired by firms.

Our results suggest that firms generally prefer debt financing. Firms are willing to pay a substantial premium of 250bp for debt financing, which can neither be explained by growth expectations, nor by corporate control rights, taxes or the cost of equity. This effect is particularly strong for firms that are particularly suited to receive debt financing and have small investment projects. This results suggest that the adaptation of firms towards a bank-based financial system could be an important driver of the aversion towards equity.

To increase the amount of equity financing, the financial structure of the European economy would need to adapt. Financial markets could be strengthened through the capital markets union, i.e. a common capital market for the European Union. This would increase the market size as well as diversification possibilities, and simplify access to finance, especially for SMEs, which show the largest appetite for external equity financing. Moreover, we observe that the cost of equity is an important driver of the aversion towards equity. Abandoning the preferred tax treatment of debt might incentivise companies to rely on equity financing to a greater extent.

Our findings open room for a debate on why firms dislike equity. As our sample is mainly SMEs, the lending relationship might be driving our results. A stable banking relationship creates economic value for the companies and might compensate companies for the potential higher costs of capital. Our results should guide policymakers in that it might be hard to attract additional equity investments through changes in regulation if companies dislike equity in the first place.

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Annexes
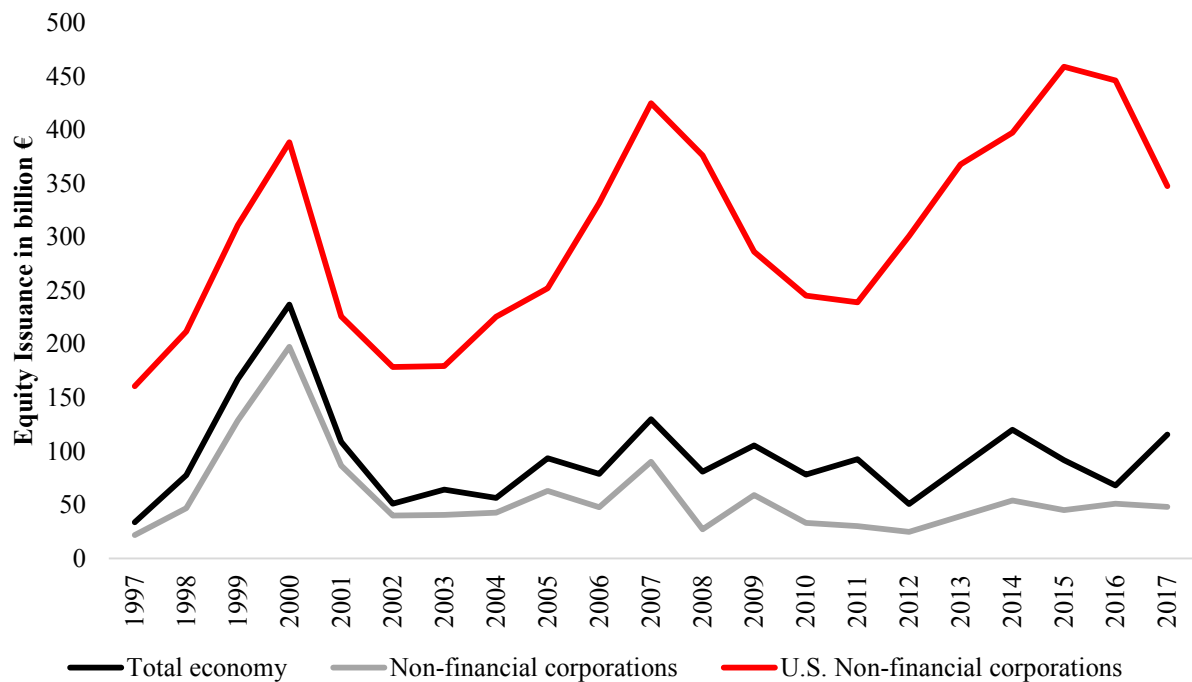
Figure 1: This figure presents the listed shares' equity issuance of European companies between 1990 and 2017. The black line is all equity issuances of listed shares in the economy. The grey line takes into account only equity issuances from non-financial companies. Data for Europe is from the ECB and for the United States from the FED. Data for 2017Q4 is missing.

Figure 2: This figure presents the design of the choice experiment. Offers' characteristics are randomly drawn. In this example, the hypothetical company wants to finance 7.5 million euros, has a net income of 2 million euros and the ideal maturity is 7 years.
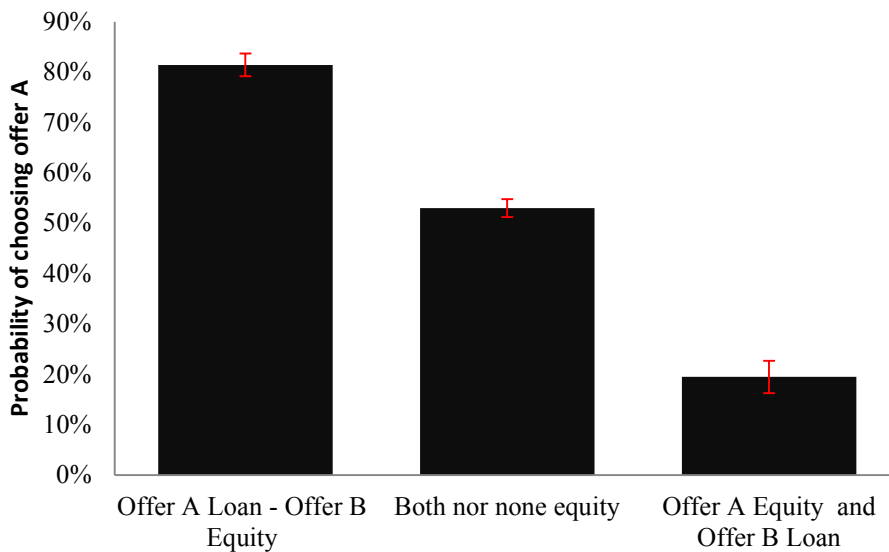
Figure 3: This figure shows firms' choice between different external finance offers. The black bars represent the share of firms that have chosen option A conditional on either option A being an loan offer while option B is an Equity offer (first bar), both offers being either equity or loan offers (second bar) or option A being an equity offer while option B is a loan offer.

	Fixed Interest Loan vs. Preferred Equity	20% higher Amount	Interest type - fixed vs. floating	1pp less Interest or Return Rate	No Voting Rights vs. Voting Rights	No Collateral vs. 100% Collateral	Above vs. below desired maturity
Willingness to pay	1.21	1.20	1.24	1.00	1.50	4.68	1.25
Growth Expectations	3.50						
Taxes	2.57						
Voting Rights	1.50						
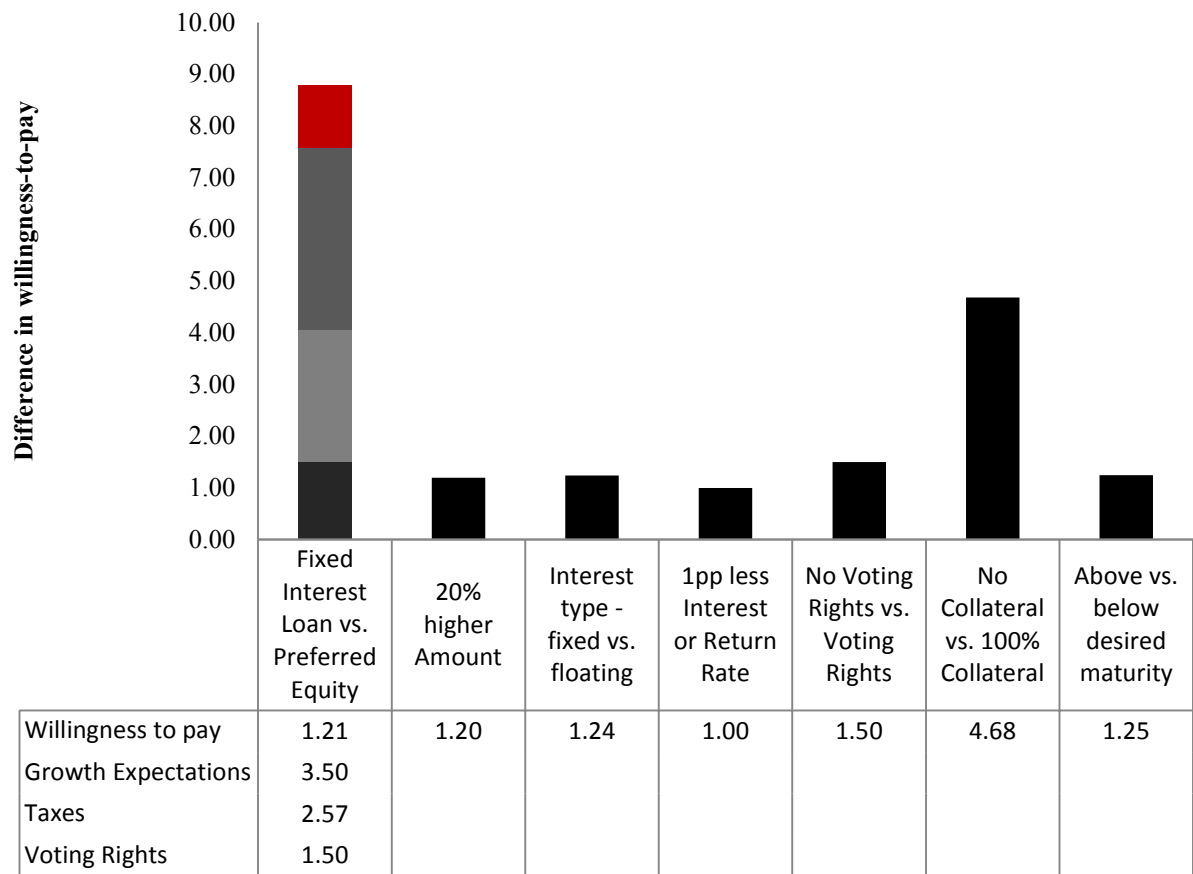
Figure 4: This figure compares firms' willingness-to-pay in terms of interest rate percentage points over the different characteristics of the hypothetical financing offers everything else held equal.
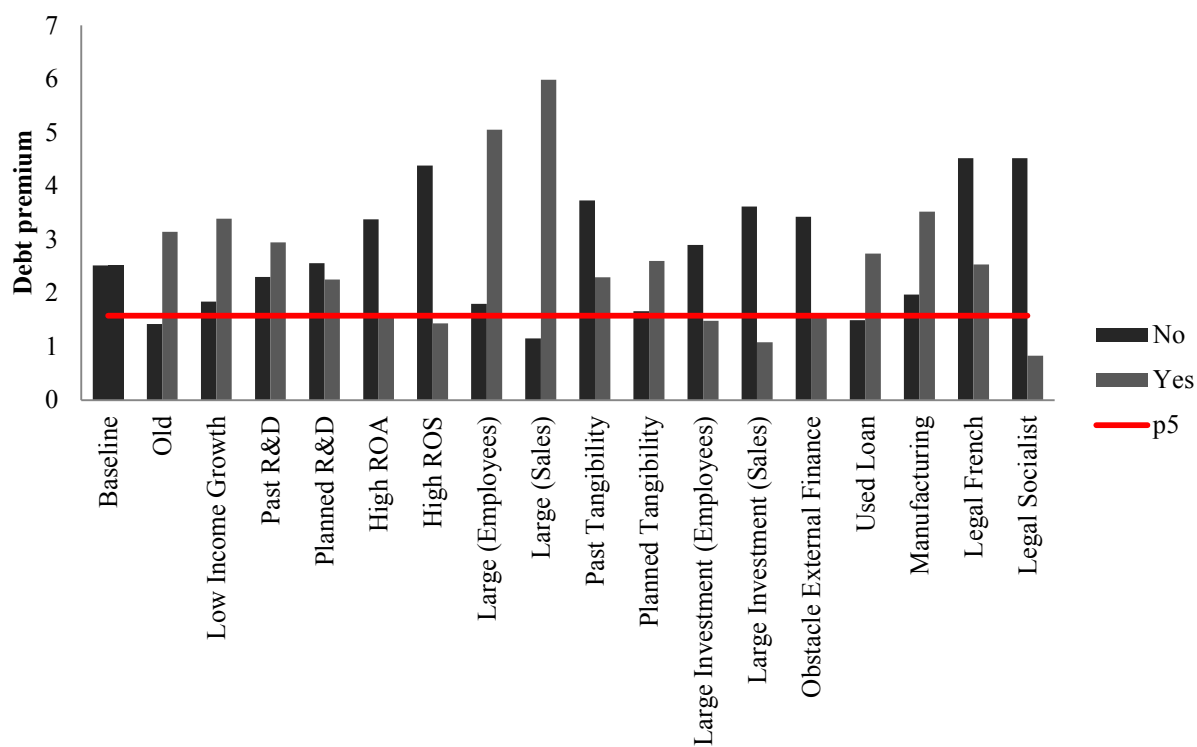
Figure 5: This figure illustrates the debt premium in terms of interest rate percentage points over different firm characteristics. Bars larger than the red line are significant at the 5% level.

B.   Tables

	Levels	Unit	Constraints
1 Amount	30%, 47.5%, 60%, 82.5%, 100% of desired amount	Local currency or EUR	none
2 Maturity	50%, 75%, 100%, 125%, 150% of desired maturity	Years	• Not applicable for Equity Options
3 Grace periods	0%, 20%, 40%, 60%, 100% of desired maturity	Years	• Not applicable for Equity Options
4.i Fixed interest rate	1: Yield on German bunds of desired maturity 3: Midpoint of market interest rates for a given country (from ECB bank lending survey) 2,4,5: distributed with equal distances around level 3	percent	• 5 of one not with 1 or 2 of the other option, • 4 of one not with 1 of the other option
4.ii Variable interest rate	1: 3m-benchmark rate 2: 3m-br + 50% of bp for desired amount 3: 3m-br + 100% of bp for desired amount 4: 3m-br + 150% of bp for desired amount 5: 3m-br + 200% of bp for desired amount	percent	• 5 of one not with 1 or 2 of the other option, • 4 of one not with 1 of the other option
4. iii Cost of equity	Equally distributed around 2.5 times the Midpoint of market interest rates for a given country (from ECB bank lending survey) minus 1.5 times the lower market end measured by the Yield on German bunds of desired maturity	percent	• Only applicable for firms that pass the Equity criteria specified below
4. iv Equity participation	Equals the cost of equity times the external finance amount divided by the company's net income	percent	• Only applicable for firms that pass the Equity criteria specified in section 3
5 Collateral	0, 20%, 40%, 60%, 80%, 120%, 160% of assets to loan value	percent	• No collateral required for Equity Options
6 Voting	1: No Voting Rights 2: Voting Rights	/	• Only applicable for equity options
7 Type of interest rate	1: Fixed 2: Floating 3. Equity Participation	/	• For Equity: Loan is not greater than 10 times Net Income • For Equity: Upper Equity is not greater than 50 %
8 Fee for early repayment	1: No fee 2: Linked to NPV of remaining interest payment on loan	/	• Not applicable for Equity Options

Table 1: This table provides the design of financing offers, the levels of the characteristics, and units and constraints of the variables used in the choice experiment.

	Manufacturing	Construction	Services	Infrastructure	SME	Large	Total
Austria	50.0	25.0	12.5	12.5	62.5	37.5	16
Belgium	31.7	19.5	22.0	26.8	87.8	12.2	41
Bulgaria	40.4	21.2	23.1	15.4	76.9	23.1	52
Croatia	33.3	10.5	22.8	33.3	89.5	10.5	57
Cyprus	25.0	25.0	25.0	25.0	100.0	0.0	4
Czech Republic	42.1	13.2	18.4	26.3	78.9	21.1	38
Denmark	26.5	20.6	26.5	26.5	82.4	17.6	34
Estonia	46.4	21.4	14.3	17.9	92.9	7.1	28
Finland	22.7	17.3	25.3	34.7	78.7	21.3	75
France	38.1	21.4	21.4	19.0	78.6	21.4	42
Germany	37.5	12.5	0.0	50.0	62.5	37.5	16
Greece	44.8	20.7	20.7	13.8	82.8	17.2	29
Hungary	27.5	27.5	25.5	19.6	80.4	19.6	51
Ireland	27.3	27.3	27.3	18.2	100.0	0.0	11
Italy	34.7	20.8	19.4	25.0	72.2	27.8	72
Latvia	35.1	8.1	8.1	48.6	86.5	13.5	37
Lithuania	26.7	16.7	26.7	30.0	70.0	30.0	30
Luxembourg	10.0	20.0	40.0	30.0	100.0	0.0	10
Malta	24.0	8.0	64.0	4.0	96.0	4.0	25
Netherlands	31.6	5.3	21.1	42.1	78.9	21.1	38
Poland	38.6	18.2	13.6	29.5	81.8	18.2	44
Portugal	27.8	11.1	25.0	36.1	69.4	30.6	36
Romania	25.9	14.8	25.9	33.3	77.8	22.2	27
Slovakia	40.7	7.4	37.0	14.8	92.6	7.4	27
Slovenia	40.6	12.5	21.9	25.0	84.4	15.6	32
Spain	49.2	10.8	18.5	21.5	70.8	29.2	65
Sweden	22.7	22.7	31.8	22.7	90.9	9.1	22
United Kingdom	28.6	21.4	21.4	28.6	64.3	35.7	14
Total	34.2	16.5	22.7	26.5	80.3	19.7	973

Table 2: This table shows the distribution of firms by sector for each country (in % of all firms and in terms of size classes (in % of the country's total). 1% corresponds to 9.73 firms.

	Desired Amount (in k EUR)		Desired Maturity (in years)		Type of Investment Project						
	Mean	Median	Mean	Median	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Austria	8,458	1,000	9.31	6	62.5	68.8	6.3	25.0	12.5	25.0	0.0
Belgium	15,487	500	7.24	5	48.8	56.1	12.2	19.5	14.6	31.7	0.0
Bulgaria	3,610	409	6.30	5	55.8	59.6	0.0	15.4	15.4	13.5	1.9
Croatia	17,881	270	5.14	5	36.8	68.4	10.5	17.5	12.3	17.5	1.8
Cyprus	10,213	7,900	11.25	10	50.0	75.0	25.0	50.0	50.0	25.0	25.0
Czech Republic	1,597	370	6.71	5	52.6	68.4	15.8	28.9	18.4	15.8	0.0
Denmark	11,755	1,882	10.32	7.5	47.1	52.9	5.9	29.4	14.7	14.7	5.9
Estonia	3,727	360	6.01	5	53.6	78.6	7.1	21.4	14.3	17.9	0.0
Finland	8,814	600	8.48	7	38.7	52.0	21.3	18.7	6.7	18.7	1.3
France	2,484	800	5.94	5	42.9	59.5	16.7	23.8	11.9	19.0	0.0
Germany	11,149	4,000	13.94	12.5	31.3	75.0	0.0	37.5	0.0	31.3	0.0
Greece	1,608	500	6.97	5	31.0	72.4	10.3	17.2	17.2	13.8	0.0
Hungary	1,770	242	7.56	5	52.9	72.5	5.9	25.5	25.5	11.8	0.0
Ireland	552	150	7.45	5	45.5	36.4	27.3	18.2	9.1	18.2	0.0
Italy	6,400	900	7.35	5	33.3	63.9	19.4	33.3	18.1	31.9	2.8
Latvia	4,847	270	8.73	10	51.4	62.2	0.0	8.1	2.7	8.1	5.4
Lithuania	13,370	375	7.55	5	40.0	50.0	6.7	13.3	10.0	13.3	3.3
Luxembourg	1,098	525	9.75	10	70.0	40.0	0.0	20.0	0.0	20.0	0.0
Malta	2,364	500	8.84	10	64.0	56.0	4.0	0.0	0.0	0.0	12.0
Netherlands	5,784	1,500	10.34	7.5	31.6	57.9	10.5	34.2	5.3	18.4	7.9
Poland	2,904	586	6.19	5	45.5	77.3	29.5	29.5	29.5	29.5	2.3
Portugal	2,431	500	8.44	6	38.9	63.9	22.2	30.6	27.8	27.8	0.0
Romania	1,409	449	7.41	5	59.3	59.3	11.1	22.2	29.6	22.2	0.0
Slovakia	2,407	280	6.89	7	63.0	59.3	11.1	25.9	22.2	18.5	0.0
Slovenia	1,930	490	7.07	5	56.3	71.9	12.5	9.4	18.8	18.8	0.0
Spain	47,902	800	7.25	5	29.2	76.9	13.8	15.4	7.7	10.8	4.6
Sweden	2,116	419	7.82	6	36.4	72.7	9.1	18.2	36.4	31.8	0.0
United Kingdom	28,955	860	8.71	5	57.1	35.7	14.3	21.4	7.1	0.0	0.0
Manufacturing	4,911	740	7.37	5	36.6	77.2	21.6	20.1	14.1	19.8	1.5
Construction	7,562	300	6.76	5	45.3	64.6	6.2	19.9	23.0	19.9	1.9
Services	3,129	323	7.07	5	57.0	47.5	8.6	23.1	11.8	21.3	2.7
Infrastructure	20,938	888	8.92	5	44.6	58.9	7.4	24.0	14.0	14.7	2.7
SME	6,496	350	7.38	5	44.8	62.7	11.4	21.0	15.5	18.8	2.6
Large	20,173	3,482	8.57	7	44.8	66.7	16.1	25.0	13.0	18.8	0.5
Total	9,195	500	7.61	5	44.8	63.5	12.3	21.8	15.0	18.8	2.2

Table 3: This table provides the descriptive statistics over the desired amount, maturity and type of investment project (1: Land, business buildings and infrastructure, 2: Machinery and equipment, 3: Research and Development, 4: Software, data and website activities, 5: Training of employees, 6: Organisation and business process improvements, 7: None of these).

	(1)	(2)	(3)	(4)
		Above		
		Maturity	Above	
	Baseline	and Amount	Maturity	No voting
Equity Participation	-0.989***	-0.930***	-0.978***	-1.119***
	(0.130)	(0.131)	(0.127)	(0.116)
Interest rate or cost of equity	-0.160***	-0.162***	-0.162***	-0.160***
	(0.0113)	(0.0114)	(0.0114)	(0.0113)
Amount	0.00963***	0.0105***	0.00969***	0.00980***
	(0.000897)	(0.00129)	(0.000898)	(0.000898)
Maturity	0.00196***	-0.00207		
	(0.000711)	(0.00149)		
Amortization	0.000191	0.000373	0.000323	0.000240
	(0.000649)	(0.000654)	(0.000651)	(0.000650)
Interest type	-0.192***	-0.212***	-0.201***	-0.195***
	(0.0598)	(0.0610)	(0.0600)	(0.0599)
Voting Rights	-0.252***	-0.253***	-0.243***	
	(0.0886)	(0.0901)	(0.0887)	
Collateral	-0.00764***	-0.00758***	-0.00758***	-0.00751***
	(0.000610)	(0.000612)	(0.000611)	(0.000610)
Fee	-0.0160	-0.0563	-0.0349	-0.0328
	(0.0735)	(0.0748)	(0.0736)	(0.0735)
Above desired maturity		0.335***	0.202***	0.208***
		(0.110)	(0.0525)	(0.0524)
Desired amount		-0.0724		
		(0.0774)		
Observations	4,710	4,710	4,710	4,710
LR Chi^2	854.9	858.6	857.5	852.1

Table 4: This table provides the results of logit regressions over firm preferences between the financing offers A and B on different financing offer characteristics. Column (1) presents the baseline specification, column (2) tests for asymmetries at the desired amount and maturity, column (3) presents the results for asymmetries for the desired maturity only and column (4) presents the results without voting rights. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

	(1) Obstacle external finance	(2) Used Loan	(3) Sector	(4) Legal Origin
Equity Participation	-1.188***	-0.801***	-0.864***	-1.454***
	(0.145)	(0.147)	(0.135)	(0.180)
Amount	0.00978***	0.00955***	0.00967***	0.00965***
	(0.000902)	(0.000962)	(0.000898)	(0.000901)
Amortization	0.000375	0.000401	0.000321	0.000328
	(0.000653)	(0.000701)	(0.000651)	(0.000652)
Interest type	-0.200***	-0.225***	-0.200***	-0.209***
	(0.0602)	(0.0648)	(0.0600)	(0.0601)
Interest rate or cost of equity	-0.163***	-0.173***	-0.162***	-0.167***
	(0.0114)	(0.0124)	(0.0114)	(0.0114)
Voting Rights	-0.245***	-0.291***	-0.241***	-0.241***
	(0.0889)	(0.0958)	(0.0888)	(0.0890)
Collateral	-0.00760***	-0.00800***	-0.00755***	-0.00760***
	(0.000613)	(0.000662)	(0.000611)	(0.000612)
Fee	-0.0310	-0.0494	-0.0328	-0.0348
	(0.0738)	(0.0792)	(0.0736)	(0.0737)
Above desired maturity	0.203***	0.226***	0.204***	0.205***
	(0.0526)	(0.0565)	(0.0525)	(0.0526)
Equity Participation # Obstacle external finance	0.408***			
	(0.130)			
Equity Participation # Used Loan		-0.287**		
		(0.142)		
Equity Participation # Sector			-0.334**	
			(0.139)	
Equity Participation # Legal Origin French				0.443**
				(0.184)
Equity Participation # Legal Origin Socialist				0.822***
				(0.176)
Observations	4,686	4,116	4,710	4,710
Combination	-0.780***	-1.088***	-1.199***	
P-value	0.000	0.000	0.000	
LR Chi^2	855.4	762.0	856.8	863.9
Combination French				-1.011***
Combination Socialist				-0.632***
P-value French				0.000
P-value Socialist				0.001

Table 5: This table provides the results of logit regressions over firm preferences between the financing offer A and B on different financing offer characteristics. Column (1) presents the results firms that state access to finance as an obstacle to their investment, column (2) analysis firms that have used bank credit to finance their investment in the previous year, column (3) analysis if being a manufacturing firm changes the results and column (4) controls for different legal origins. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

	(1) ROA	(2) ROS	(3) Size Employees	(4) Size Sales
Equity Participation	-1.237***	-1.387***	-0.831***	-0.708***
	(0.158)	(0.159)	(0.132)	(0.132)
Amount	0.00994***	0.00975***	0.00977***	0.00970***
	(0.000925)	(0.000901)	(0.000903)	(0.000902)
Amortization	0.000285	0.000334	0.000359	0.000348
	(0.000670)	(0.000652)	(0.000655)	(0.000653)
Interest type	-0.212***	-0.204***	-0.199***	-0.204***
	(0.0614)	(0.0600)	(0.0603)	(0.0601)
Interest rate or cost of equity	-0.172***	-0.163***	-0.163***	-0.167***
	(0.0118)	(0.0113)	(0.0114)	(0.0114)
Voting Rights	-0.231**	-0.251***	-0.240***	-0.249***
	(0.0914)	(0.0891)	(0.0895)	(0.0893)
Collateral	-0.00758***	-0.00755***	-0.00749***	-0.00761***
	(0.000629)	(0.000612)	(0.000614)	(0.000614)
Fee	-0.0242	-0.0395	-0.0193	-0.0286
	(0.0756)	(0.0737)	(0.0741)	(0.0738)
Above desired maturity	0.219***	0.207***	0.200***	0.203***
	(0.0539)	(0.0526)	(0.0528)	(0.0527)
Equity Participation # ROA	0.419***			
	(0.139)			
Equity Participation # ROS		0.639***		
		(0.140)		
Equity Participation # Size Employees			-0.704***	
			(0.175)	
Equity Participation # Size Sales				-1.075***
				(0.174)
Observations	4,520	4,710	4,662	4,710
Combination	-0.818***	-0.748***	-1.535***	-1.784***
P-value	0.000	0.000	0.000	0.000
LR Chi^2	844.7	857.5	847.8	856.9

Table 6: This Table provides the results of logit regressions over firm preferences between the financing offers A and B on different financing offer characteristics. Column (1) presents the results for highly profitable firms defined as firms with an above median return over assets, column (2) uses profitability measured by return over sales, column (3) presents the results for asymmetries for the size of the company measured by the amount of employees and column (4) presents the firm size measured by sales. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

	(1) Tangibility (Planned I)	(2) Tangibility (Past I)	(3) Asset	(4) Sales
Equity Participation	-1.242***	-0.794***	-1.124***	-1.217***
	(0.209)	(0.226)	(0.145)	(0.141)
Amount	0.00967***	0.00968***	0.00993***	0.00970***
	(0.000898)	(0.000898)	(0.000925)	(0.000899)
Amortization	0.000311	0.000332	0.000283	0.000310
	(0.000651)	(0.000651)	(0.000670)	(0.000652)
Interest type	-0.200***	-0.201***	-0.211***	-0.201***
	(0.0600)	(0.0600)	(0.0614)	(0.0600)
Interest rate or cost of equity	-0.162***	-0.162***	-0.171***	-0.162***
	(0.0114)	(0.0114)	(0.0118)	(0.0114)
Voting Rights	-0.241***	-0.242***	-0.228**	-0.249***
	(0.0887)	(0.0887)	(0.0913)	(0.0890)
Collateral	-0.00757***	-0.00758***	-0.00760***	-0.00756***
	(0.000611)	(0.000611)	(0.000630)	(0.000612)
Fee	-0.0326	-0.0342	-0.0254	-0.0379
	(0.0736)	(0.0736)	(0.0756)	(0.0737)
Above desired maturity	0.202***	0.202***	0.218***	0.204***
	(0.0525)	(0.0525)	(0.0539)	(0.0525)
Equity Participation # Tangibility	0.310 (0.192)			
Equity Participation # Tangibility		-0.203 (0.208)		
Equity Participation # Asset			0.324** (0.133)	
Equity Participation # Sales				0.547*** (0.129)
Observations	4,710	4,710	4,520	4,710
Combination	-0.932***	-0.997***	-0.801***	-0.670***
P-value	0.000	0.000	0.000	0.000
LR Chi^2	857.3	858.2	843.2	856.4

Table 7: This Table provides the results of logit regressions over firm preferences between the financing offers A and B on different financing offer characteristics. Column (1) presents the results controlling for whether investment purpose is tangible using planned investment, column (2) presents the results controlling for whether investment purpose is tangible using past investment, column (3) analyses whether the investment size plays a role, measured by investment over total fixed assets and column (4) presents the results for firms that invest a large share with respect to their sales. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3) Uniqueness (Planned I)	(4) Uniqueness (Past I)
	Age	Growth		
Equity Participation	-0.744***	-0.841***	-0.933***	-0.986***
	(0.150)	(0.139)	(0.134)	(0.129)
Amount	0.00971***	0.0101***	0.00970***	0.00969***
	(0.000899)	(0.000919)	(0.000898)	(0.000898)
Amortization	0.000339	3.93e-05	0.000319	0.000322
	(0.000651)	(0.000663)	(0.000651)	(0.000651)
Interest type	-0.202***	-0.215***	-0.201***	-0.201***
	(0.0600)	(0.0612)	(0.0600)	(0.0600)
Interest rate or cost of equity	-0.162***	-0.165***	-0.162***	-0.162***
	(0.0114)	(0.0116)	(0.0114)	(0.0114)
Voting Rights	-0.243***	-0.256***	-0.242***	-0.244***
	(0.0888)	(0.0906)	(0.0887)	(0.0887)
Collateral	-0.00758***	-0.00777***	-0.00757***	-0.00758***
	(0.000612)	(0.000624)	(0.000611)	(0.000611)
Fee	-0.0349	-0.0590	-0.0343	-0.0356
	(0.0736)	(0.0751)	(0.0736)	(0.0736)
Above desired maturity	0.205***	0.186***	0.202***	0.202***
	(0.0525)	(0.0535)	(0.0525)	(0.0525)
Equity Participation # Age	-0.372***			
	(0.131)			
Equity Participation # Growth		-0.340**		
		(0.137)		
Equity Participation # Uniqueness			-0.139	
			(0.138)	
Equity Participation # Uniqueness				0.0648
				(0.190)
Observations	4,710	4,557	4,710	4,710
Combination	-1.116***	-1.181***	-1.071***	-0.921***
P-value	0.000	0.000	0.000	0.000
LR Chi^2	858.6	845.3	858.1	857.5

Table 8: This table provides the results of logit regressions over firm preferences between the financing offers A and B on different financing offer characteristics. Column (1) presents the results for young firms defined as firms below 20 years of existence, column (2) uses firms growth opportunities as self-reported expected net income growth, column (3) presents the results for asymmetric firms that are unique measured by planned investment in R&D and column (4) presents the uniqueness measured by past investment in R&D. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

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	(1) Low expected return on Equity	(2) Return rate on equity lower than alternative offer	(3) All firms	(4) Only firms that finished the experiment
Equity Participation	-0.964***	-1.081***	-0.798***	-0.990***
	(0.137)	(0.129)	(0.108)	(0.130)
Amount	0.00969***	0.00938***	0.00983***	0.00968***
	(0.000898)	(0.000898)	(0.000710)	(0.000923)
Amortization	0.000312	0.000398	-0.000551	0.000240
	(0.000652)	(0.000647)	(0.000486)	(0.000675)
Interest type	-0.202***	-0.164***	-0.217***	-0.193***
	(0.0602)	(0.0600)	(0.0448)	(0.0620)
Interest rate or cost of equity	-0.163***	-0.139***	-0.192***	-0.164***
	(0.0119)	(0.0119)	(0.00926)	(0.0118)
Voting Rights	-0.243***	-0.286***	-0.248***	-0.248***
	(0.0887)	(0.0923)	(0.0893)	(0.0898)
Collateral	-0.00758***	-0.00742***	-0.00786***	-0.00738***
	(0.000612)	(0.000607)	(0.000440)	(0.000630)
Fee	-0.0343	-0.0270	-0.0556	-0.0241
	(0.0736)	(0.0732)	(0.0553)	(0.0762)
Above desired maturity	0.202***	0.193***	0.238***	0.214***
	(0.0525)	(0.0521)	(0.0391)	(0.0543)
Equity Participation # Low expected return on Equity	-0.0305			
	(0.113)			
Equity Participation # Return rate on equity lower		0.530***		
		(0.102)		
Observations	4,710	4,710	7,237	4,496
LR Chi^2	857.4	899.1	1213	835.8

Table 9: This table provides the results of logit regressions over firm preferences between the financing offers A and B on different financing offer characteristics. Column (1) presents the results adding a dummy that is 1 if the equity offer was cheaper than twice the mean lending rate, column (2) adds a dummy that is 1 if the equity offer has costs of equity lower than the loan offer, column (3) presents the results only considering firms that were eligible for equity participations, and column (4) presents the results for firms that finished the experiment only. Standard Errors are given between parentheses. *, **, *** denote significance at the 1%, 5% and 10% level, respectively.

C.   NPV Calculation

Equity participations and loans have different cost profiles. While the costs of a loan a firm has to bear are fixed *ex ante*, the cost for an equity participation depend on uncertain (and in expectations growing) future net income. In addition, firms can deduct the interest paid on a loan from their corporate taxes. This makes the comparison between the cost of equity and the cost of debt non-trivial. Therefore, we will derive how the net present value of the future cost of an equity and a loan offer relate *ex ante*. Frist, we will consider a loan with an infinite maturity and a fixed interest rate i.[21] Let I be the Investment amount, r being the discount rate, τ being the corporate tax rate, and t being a time index. ϵ is a non-monetary benefit a company has if it uses debt financing, which can be either positive or negative. The NPV of the costs of this loan is given by

$$NPV_{loan} = \sum_{t=1}^{\infty} \frac{(i * (1 - \tau) - \epsilon) * I}{(1 + r)^t} \qquad (7)$$

The cost of equity have a different cost profile. While the interest rate of the loan is fixed ex-ante, the cost of equity depends on the uncertain future net income of the company. The NPV of the costs of an equity participation is given by the discounted sum of demanded share e of future net income NI_t. Let c be the implied cost of equity and g the growth rate of net income. In the experiment, the cost of equity were set to $e = \frac{c * I}{NI_0}$. Assuming further a constant expected growth rate, we can simplify the NPV of the costs of the equity option.

$$NPV_{equity} = \sum_{t=1}^{\infty} E\left[\frac{e * NI_t}{(1 + r)^t}\right] \qquad (8)$$

$$<=> NPV_{equity} = \sum_{t=1}^{\infty} \frac{c * I * (1 + g)^t}{(1 + r)^t} \qquad (9)$$

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[21] The loans in our experiment have fixed maturities. However, equity participations have an infinite time horizon. Therefore we will assume that firms roll over the loan infinitely with the same interest rate. Taking into account the current low interest rate environment, assuming that firms can refinance with the same interest rate as offered in the experiment is conservative.

Taking equations (7) and (9), we can compare the expected cost between the loan and the equity option. Under the assumption of rationality, the firm should take the offer with lower expected costs. Therefore, we can solve for the difference between i and c that can be rationalized by growth expectations. The results is

$$i = \frac{r + rg}{(r - g)} * c + \tau * i + \epsilon \tag{10}$$

For conservative choices of r and g ($r = 0.1; g = 0.04$)[22], the difference between the cost of equity and the interest rate on the fixed interest rate should not be larger than 1.8 times the fixed interest rate plus the tax shield and the non-monetary utility ϵ. Taking our midpoint of 3%, a corporate tax rate of 25%, and a non-monetary benefit of zero this would result in an interest rate of 8.25%. Therefore, firms should not express a willingness to pay for debt that is larger than around 5pp.

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[22] The self-reported expected net income growth is on average lower than 4%. The median return on assets of companies in the sample is 0.2, which makes a discount rate of 0.1 a conservative choice.

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