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Bank Financing and Shareholder Wealth

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This article shows that European firms do their shareholders a disservice if they use bank financing, especially if that financing comes with restrictive covenants and floating interest rates. The restrictive covenants discourage expansion and the floating interest rates make the firm's cash flows less stable. The better way to finance the firm is with fixed-rate bonds. With bond financing, the covenants are less restrictive and the firm's interest expense is more stable.

The simulation approach which the authors have developed gives estimates of how much each attribute of the financing affects the company's share price. The effects that they found are large — for example, choosing fixed-rate bond financing over floating-rate bank financing adds 17.4 per cent to the stock price. Interest expense is an important component of cost in the author's simulation, and making it fixed instead of floating brings enough stability to the firm's cash flow to deliver a large increase in the stock price. Also, postponing a new factory, as managers might do to avoid violating the restrictive covenants of bank loans, lowers the stock price 19.7 per cent. In the simulation, the firm has adequate capacity at the beginning, but in many scenarios becomes capacity-constrained after one or two years. Stock market investors gain if the company buys the factory sooner, because they place a high value on growth and market share. © 2001 Published by Elsevier Science Ltd.

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When a company borrows money from a bank, the loan agreement often imposes covenants restricting the company's freedom to expand. When the same company sells bonds, the covenants are usually fewer and less binding. Bank loan covenants are usually expressed as ratios that cannot be exceeded, while bond covenants are usually expressed in terms of priority and subordination.

Bank financing was competitive with bond financing for centuries but now suffers disadvantages. These include the Basle Accord capital requirements for banks, which tend to make bank loans more expensive than bond financing. Other disadvantages relate to the bank's maturity mismatch if it gives long-term fixed-rate financing to a borrower. Banks can push this cost onto the borrower by readjusting the borrower's interest rate periodically, or they can price the loan high enough to cover the cost of hedging against increases in the bank's cost of funds. But inescapably banks suffer as providers of long-term financing because their depositors are risk-averters who seek short-term, guaranteed investments. Bond buyers, in contrast, are desirous of holding longer-term paper, or at least are willing to hold it. Depositors at the typical bank insist on shorter terms for repayment.

The most important disadvantage, however, has come to the fore only recently, but is now preeminent, and concerns the effect that the type of financing has on the borrower's share price. Day-to-day stock market performance is now a key factor for the prosperity and survival of every publicly-quoted company. Often when an industrial company borrows from a bank, the company chooses floating-rate terms, in effect betting that the cost of interest rate readjustments will be lower than the bank's alternative quote for fixed-rate financing. The floating interest rate may indeed be cheaper over time, but it increases the uncertainty of the borrower's future cash flows. The borrower then looks riskier to a perspicacious buyer of shares, so choosing bank financing with floating interest rate over bond financing with fixed rates has a cost to shareholders. Moreover, the company that habitually uses bank financing may defer expansion and choose slower growth to avoid falling into violation of restrictive covenants on its bank financing. Deferring expansion is another effect of choosing bank financing that may hurt the company's share price.

The costs of these differences between bank financing and bond financing can be modeled and quantified in a way that takes several differences into account

and estimates the reduction in the company's stock price that these differences cause.

In Europe bank financing has been the predominant mode and in the US bond financing has had a larger market share. The choice of mode has corresponded to the size of the borrower and the form of ownership. Very large companies bypass banks and issue bonds; smaller and closely-held or family-owned firms go to banks for financing. Firms that do not list on any stock exchange avoid the continual scrutiny and pressure that public shareholders bring to bear. Those firms typically borrow from banks, and those firms' primary interface with the capital markets is through their lead bank; the bank's need to protect its own stability is paramount over the shareholders' need for the company's stock to be as high as possible at all times. Consequently the closely-held firm willingly accepts the bank loan with restrictive covenants that crimp the firm's flexibility in choosing among expansion paths, and also pays slightly more for financing, and accepts more interest rate risk. In contrast, the publicly-held firm's primary interface with the capital markets is through an investment bank; the publicly-held firm prefers to issue bonds, and resists covenants that constrain its latitude to expand, and chooses to issue fixed-rate bonds so that investors will be more able to forecast its cash flows. The publicly-held firm's objective is continually to maximize the market price of its common shares.

"Day-to-day stock market performance is now a key factor for the prosperity and survival of every publicly-quoted company"

On the Continent bank financing provides an especially large share of total medium-term financing to corporations, and bond financing a relatively smaller share.[1] In consequence many large, publicly-listed European corporations have medium-term bank borrowings that entail restrictive covenants. This is due to the historically larger role of universal banks in European capital markets, and the historically smaller role of corporate bond markets. The share prices of some European firms, however, in the model developed here, are held down when the borrower chooses floating-rate bank financing with restrictive covenants.

An Example: A Manufacturing Firm Buys a New Factory

To see the effect that loan covenants and the other distinct attributes of bank financing can have on share price, consider this example. A European manufacturing company is buying a new factory, and will pay for it by getting medium-term, floating-rate bank financing or by selling fixed-rate bonds. The manufacturing company is growing rapidly, and does not have a large base of stockholders' equity. It has one factory that it bought in 1995, another that it bought in 1998, and is considering buying another as the end of the year 2000 approaches. The company's shares are publicly listed, and officers and directors control only 20 per cent of the shares.

The new factory costs $50 million and there are two offers for financing on the table. Although demand is growing rapidly, there is only a small probability that the new factory will be needed in 2001, a higher probability that it will be needed in 2002, and a virtual certainty that it will be needed in 2003. The forecasted demand makes it look prudent to give the order to buy the new factory immediately. It will be installed in 2001. Shareholders are willing to accept the risk of overcapacity in the short run, to protect against the possibility of being unable to satisfy the demand.

The alternative is to defer buying the factory until 2003. It would be installed in 2004 and by that time would very definitely be needed. Management has to decide before Christmas of 2000 what to do, and wants to choose an expansion policy that will maximize the company's stock price. Stockholders have enough information to model the company's future cash flows, and will bid up the price of the company's stock if they like the decision management makes.

The authors' web-site Posting[2] shows one scenario of the company's operating statement for the six years 2000–2005. Since many of the items in the operating statement have a random component, the possibility exists that the expansion will cause the company to fall out of compliance with the restrictive covenants of its financing during the years 2001 or 2002. This possibility of falling into violation of the restrictive covenants would argue against buying the factory in 2000. If the company will use bank financing, its management might choose to delay the purchase of the new factory until 2003.

Management's dilemma is to decide between the risk of falling into violation of the bank loan covenants, and the risk of losing future sales revenue, in the event that demand grows rapidly. Computing the effect on the company's stock price is a good way of balancing the reasons for caution against the arguments for aggressiveness.

Results of a Simulation[2]

Simulation reveals the effects of the purchase and financing decisions on the company's stock price. The

company's stock price rises if it buys the new factory in 2000, regardless of how it finances the purchase. Delaying the purchase until 2003 lowers the stock price. The lowest stock price, $34.11, happens if the company delays the purchase and finances with bank debt. The highest stock price, $41.90, is if the company purchases the factory immediately and finances with bonds. The largest effect on share price is the decision to buy the factory sooner rather than later. The choice of financing also has a large effect on the company's stock price. The reasons why these effects both came out large deserve a careful look. The reasons make sense but most managers would not ascribe as much importance to them as the model indicates they would in fact have on the price of the stock.

When the company buys the new factory immediately its stock price ends up 19.7 per cent higher. This figure is the average of the outcomes for bank financing and for bond financing. The reason the difference is so big is the company has a higher and higher probability of needing the factory's output from 2001 onward, and so its expected profits are higher the sooner the company buys the new factory. In the example we used, the present value of expected future profits outweighs the effect of higher leverage and higher earnings volatility.

When bank financing is used, however, the probability of falling into violation of one of the loan covenants becomes an issue. If the company defers the purchase of the factory until 2003, its probability of falling into violation is as low as 0.0005. If the company is more expansionist and decides to buy the factory in 2000, its probability of falling into violation rises to 0.02, or two chances in a hundred. The restrictive covenants act as a deterrent expansion in this simulation. In that sense the restrictive covenants hold down the company's share price by discouraging it from expanding as fast as stock market investors would prefer. If bank financing is the only alternative that management will consider, the more conservative expansion policy keeps the company safely in compliance with the restrictive covenants, but holds its share price lower.

Choosing bond financing over bank financing helps the stock price about 17.4 per cent. The difference in valuation arises from several underlying factors. Most importantly, the model takes into account the greater volatility of using bank financing by increasing the company's cost of equity when it uses bank financing. The increase is a factor of 1.05. For example, if its cost of equity were 12.45 per cent when it uses bond financing, in the model its cost of equity with bank financing would be $12.45 \times 1.05 = 12.852\%$. This increase in the cost of stockholders' equity is small and arbitrary. This method is the most straightforward way of explicitly including taking into account the greater volatility of bank financing. The model uses the same underlying Beta and risk-free rate for both financing alternatives, so the difference in performance begins to appear as debt is used, and gets stronger as more debt is used. When debt is high, this adjustment penalizes the company more for using bank financing than it does for using bond financing. Consequently the scenario with floating-rate bank financing has a higher cost of equity than the scenario with bond financing, and the absolute divergence widens as the debt to equity ratio rises.

Higher volatility in the borrower's cash flow affects the company's stock price in another way. Inflation has a more immediate impact on the company's cash flows when it uses bank financing, because the model assumes that when inflation rises, the cost of bank financing rises in the next year. That makes the cost of bank financing fluctuate, and higher borrowing costs penalize earnings, so the model penalizes the stock price when the company uses bank financing. With bank financing there are more scenarios for low earnings with bank financing than with bond financing because the company's costs have more components that fluctuate.

The simulation model arrives at a surprisingly high cost to shareholders of financing with bank debt. Multiplying the cost of stockholders' equity by 1.05 looks like a small adjustment, in view of the many possible negative effects that choosing bank financing can have on the shareholders' claim on cash flows. To mention one, this adjustment is the only way the model takes into account the greater risk of violating loan covenants that is associated with bank financing. Nevertheless the annual repricing of bank financing, and the caution it instills in management, cause shareholders to suffer severe losses.

The results of the simulation are given below in Table 1.

Cost of Financing

In the main scenarios we made bond financing slightly cheaper than bank financing, and we tested to see if that difference is what caused bank financing to be so damaging to shareholder wealth. To model the cost of bank financing we began with an observation from a uniformly distributed random variable ranging from 11.25 to 12.75 per cent. The mean is 12

Table 1 Simulation Results

Alternative	Stock price ($)	Percentage difference from best price (%)
Defer factory, use bank	27.06	−35.4
Have factory, use bank	32.39	−22.7
Defer factory, use bond	34.98	−16.5
Have factory, use bond	41.90	Best strategy

per cent. Then, as the years go from 2001 to 2005 we incorporated inflation, so that the mean could be higher or lower than 12 per cent according to whether inflation trended upward or downward. For bond financing the cost of financing is 11 per cent fixed for the entire time period of 2001–2005. The beginning difference of 12 versus 11 per cent is to account for the effect of the bank's capital requirements and liquidity requirements, and another cost, namely the cost of the bank interposing itself between suppliers of long-term debt financing and users of long-term debt financing. Capital markets bridge the thematic mismatch between savers who want short-term, safe investments and borrowers who want to make intermediate-term, investments of greater risk. Banks are only one of the providers of intermediation. Portfolio investors can bridge the mismatch themselves by diversification and hedging. Mutual funds, insurance companies, and other participants can also bridge the mismatch, and can do it more cheaply because the regulations that apply to them cost less.

"Volatility of a company's interest expense is what does the real damage to its share price"

It may come as a surprise that the cost of financing did not make anywhere as much difference as the type of financing or the timing of the purchase of the factory. In the simulation model we used, the company could pay more for bond financing without affecting its stock price very much. Paying half a percent more to bondholders, i.e., 11.5 instead of 11 per cent, lowered the company's share price by only 1.7 per cent. The reason is that the volatility of the company's interest expense is what does the real damage to its share price. This result shows that either deferring the purchase of the new factory or choosing bank financing is much more damaging to shareholders than paying up to get bond financing. The model uses standard valuation techniques, and those put a premium on growth and penalize volatility. Slight increases in fixed interest expense do not do as much damage.

Modeling the Costs to Shareholders of the Two Financing Alternatives

The model we developed computes the effect on the company's stock price of the various alternatives. It begins with macroeconomic conditions, i.e., inflation, the risk-free rate, an average growth rate and a percentage gross margin for industry sales. Inflation and the annual growth rate fluctuate randomly around their stated means. Five years of random inputs are generated for each iteration.

The next step is to forecast five years of financial statements for the company. These are identical for the different alternatives except in when the new factory appears, how it is financed, what the financing costs, and how to take into account the company's capacity to meet demand. If the company buys the factory in 2000, it has to borrow the money in 2000, and it gets the first year's depreciation in 2000. If it defers the purchase until 2003, it does not borrow the money until then, and it does not get the depreciation until then. Interest expense goes up when the money is borrowed, either in 2000 or in 2003. Interest expense for the bond alternative is 11 per cent per year fixed, or 11.5 per cent per year fixed. For the bank financing alternative, interest expense for 2001 is an observation from a uniform distribution. The range of this uniform distribution is 1.5 per cent and its mean is 12 per cent. The range is intended to span the fluctuations that bank lending rates will make during the five year horizon. The mean of 12 per cent is intended to take into account the higher cost of borrowing from banks.

Capacity utilization and the company's ability to satisfy demand are important drivers of stock price, and the method of computation penalizes the company for failing to meet demand, and also penalizes the company for borrowing so much money that it falls out of compliance with loan covenants. Management has to make the tradeoff between meeting customers' needs and borrowing more than is prudent. Making this tradeoff in a way that maximizes stock price is the objective of the computation, so we have to show how the computation arrives at the stock price. The computation favors expanding capacity sooner and staying in compliance with lenders' restrictions by financing with bonds. Here are the steps. The figure for units sold is capped at 120,000 when the company has only two factories. This is important because demand begins at 100,000 units and grows by a random amount each year. Its mean growth rate is 10 per cent per year so in most scenarios demand exceeds 120,000 by 2002, and the probability of demand exceeding 120,000 units rises each year from 2001 onward. Postponing the order to buy the new factory until 2003 costs sales and lowers the company's growth rate. Capacity rises to 180,000 when the new factory comes on stream. That happens in 2001 or 2004 depending on when the order to buy the factory is given. So the company orders the new factory in 2000, its sales are capped below demand for 2002 and 2003 in most scenarios.

Capping the capacity costs revenues and profits but more importantly it caps growth. The stock price computation uses the familiar formula

$$\text{Value of the equity} = \text{earnings}/(\text{cost of equity} - \text{growth rate})$$

This formula puts emphasis on earnings, which are

held down if the company's expansion policy is conservative. More importantly, however, it puts a high value growth, even if the high growth rate is accomplished using expensive financing. To see this, consider a policy that raises the growth rate by 2 per cent, for example from 8 to 10 per cent, at the expense of raising the cost of equity by 1 per cent, for example from 14 to 15 per cent. In that tradeoff the value of $1 of earnings would rise from $16.67 to $20. Note that $\$1/(0.14 - 0.08) = \$16.67$, while $\$1/(0.15 - 0.10) = \$20$.

This illustration of the key role of growth shows how the big jump in stock price comes about when the company orders the new factory in 2000 instead of waiting until 2003. The computation uses growth rate of earnings that the company achieves during the period 2001–2005. When capacity is capped at 120,000 growth is held down, and when capacity rises to 180,000 growth is free to rise as fast as market demand will lift it.

Penalizing Caution

The valuation question, because of the tradeoff built into this formula, comes down to a simple question: will lenders allow expansion ahead of market demand, or will they more prudently insist on expanding to meet demand only after it has already surpassed capacity?

No penalties need be assessed for lost market share, lost sales, or lost profits. The valuation formula has enough penalties built into it already. Now we can see why the company that uses bank financing hurts its shareholders. Bank loans include restrictive covenants, for example maximum ratio of debt to equity, or minimum current ratio. Buying the factory in 2000 puts the company at risk of violating these covenants, so the prudent course of action is to defer until there would be no risk of violating the covenants. That course of action, however, slows down the growth rate and hurts the stock price.

The valuation formula does not penalize borrowing very severely. A company that uses more debt has a higher cost of equity. If it uses enough debt to put its shareholders in serious jeopardy, its cost of equity explodes. But if it uses only enough debt to be moderately aggressive, its cost of equity rises moderately. The formula is:

$$K_e = r_f + B_L \times (r_m - r_f)$$

Where

K_e is the cost of equity
r_f is the risk-free rate
B_L is the levered Beta
r_m is the return on the market portfolio.

The levered Beta is the link through which the company's debt affects its cost of equity. As the company's debt rises in relation to its equity, its levered Beta rises, and takes its cost of equity up. The formula is

$$B_L = B_U \times (1 + D(1 - t)/E)$$

Where

B_L is the levered Beta
B_U is the unlevered Beta
D is the company's debt
t is the corporate tax rate
E is the company's equity.

Note that this formula applies tax shield to the debt, reducing its power to magnify the company's cost of equity. This assumes that the company is profitable and is being valued as a going concern. To remove those assumptions, take out the tax shield factor $(1 - t)$.

To see the effect of a higher debt ratio on the cost of equity, consider an example using the numbers in the model. The risk free rate is at 5 per cent, the return on the market portfolio is 14 per cent, and the company's unlevered Beta is 0.8, so if it uses no debt its cost of stockholders' equity would be

$$K_e = 5\% + 0.8 \times (14\% - 5\%)$$

$$K_e = 12.2\%$$

If the company's debt to equity ratio is 1/1 and the corporate tax rate is 40 per cent, its levered beta would be 1.28 as follows:

$$B_L = B_U \times (1 + D(1 - t)/E)$$

$$1.28 = 0.8 \times (1 + 1 \times (1 - 0.4)/1)$$

The company's cost of equity would therefore be

$$K_e = 5\% + 1.28 \times (14\% - 5\%)$$

$$K_e = 16.52\%$$

And if the company's debt to equity ratio is 2/1 and the corporate tax rate is 40 per cent, its cost of equity would be higher, as follows:

$$B_L = B_U \times (1 + D(1 - t)/E)$$

$1.76 = 0.8 \times (1 + 2 \times (1 - 0.4)/1)$; and

$$K_e = 5\% + 1.76 \times (14\% - 5\%)$$

$$K_e = 20.84\%$$

So if the company uses no debt its cost of equity is only 12.2 per cent, if it uses 1 unit of debt for each unit of equity its cost of equity is 16.52 per cent, and if it more aggressively pushes its use of debt to the ratio of 2/1, its cost of equity rises to 20.84 per cent.

This textbook approach to assigning a cost to stockholders' equity clearly penalizes the company for

using more debt, but it does not put the company at the mercy of its bank lenders. Moreover it does not put the company's management in danger of being sacked. The risk aversion factor in the formula is the market risk premium, $(r_m - r_f)$, an average difference that investors holding diversified portfolios should use in pricing risky assets. The company's managers have reason to be more risk averse than the typical investor holding a diversified portfolio.

We can now see why the procedure for valuing common stock puts such a premium on growth and penalizes borrowing so lightly. The procedure takes the viewpoint that a company's objective is to make its stock attractive to investors who are going to own scores or hundreds of different stocks and are going to hold them in scientifically optimized portfolios. Management of the company will have personal reasons for being more wary of taking risk than the gimlet-eyed investors whose needs they are hired to serve. For that reason management should choose to issue fixed-rate bonds instead of using bank financing. To stay in compliance with the bondholders will be easier than to stay in the good graces of the bankers. Bonds are held in diversified portfolios so their owners are more risk tolerant than bankers can afford to be in view of the Basle requirements for bank capital. Bond prices can fall, but the consequences for bondholders are not severe unless they fall sharply; and as long as the borrower keeps making coupon payments there may be no consequences for the company's management. When a bank loan is in violation of its covenants the consequences are more severe, both for the borrower and for the bank. The bank's auditors oblige writing down the loan and recognizing the lost value against reserves. The writedown reduces the bank's ability to finance new activities, and can put the bank at risk of being taken into stewardship. Consequently the bank has to deal harshly with the company's management when the loan falls into violation of the covenants.

Conclusion

European corporate managers are becoming sensitized to the potential effects of their actions on the prices of their companies' shares. They are aware that expanding capacity ahead of market demand can create shareholder value. The difficulty is deciding when aggressiveness should win over prudence. Conventional bank lending relationships favor prudence to the detriment of shareholder value, especially in view of the Basle restrictions on bank capital. Bank loan agreements have to protect the bank and transfer interest rate risk onto the borrower's shareholders. European corporate managers are on the lookout for opportunities to finance by issuing bonds whenever bonds are cheaper, or whenever the bond market alternative exists. This article gives them more reasons to seek bond financing, even if it is no cheaper in terms of interest expense. Restrictive covenants and floating rate debt are worth avoiding, and the value to shareholders of avoiding them can be computed explicitly. Widely used formulas for computing stock prices implicitly favor expanding fast and paying for the expansion by issuing fixed-rate bonds. Those formulas penalize companies that postpone expansion and finance with floating-rate bank loans that have restrictive covenants.

Notes

1. 'Only about 30 per cent of America's financing needs come from banks and 70 per cent from the [debt] markets. In Europe these proportions are reversed, and in Japan, despite a growing bond market, bank lending still accounts for the great majority of companies' financing needs.' (*The Economist*, *1999*).
2. The full Simulation Model has been posted on the Internet at: http://www.faculty.babson.edu/edmunds

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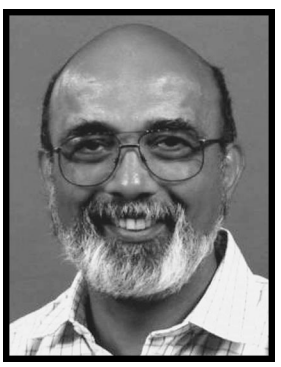

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