

Using Collateral to Secure Loans

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any businesses post collateral as security for loans. Collateral protects the lender if the borrower defaults. However, not all borrowers put up collateral when taking out loans.

There's even some evidence that loans with collateral attached may be riskier for lenders. Why is collateral used sometimes, but not others? And why does collateral potentially involve more risk? In this article, Yaron Leitner considers these questions. He looks at some of the explanations for using collateral, focusing on its benefits and drawbacks.

Collateral is a contractual device used by borrowers and lenders around the world. Collateral has also been around for a long time. In one famous example, a pound of Antonio's flesh collateralized Shylock's loan to Bassanio in Shakespeare's "Merchant of Venice." Generally, the term collateral refers to assets pledged by a borrower to secure a loan. The lender can seize these assets if the borrower does not make the agreed-upon payments on the loan, so the lender has some protection if the borrower defaults. Therefore, the use of collateral can make it easier for firms to obtain loans to

finance their investments.

Understanding collateral is important because it is a characteristic feature of bank loans, which help to channel resources to their best use.¹ While early research focused mainly on how collateral affects the borrower's behavior, recent research has also incorporated lenders' behavior, for example, how collateral affects lenders' incentives to take care in evaluating a business's prospects. Economists have also examined the relationship between collateral and risk, empirically verifying bankers' common wisdom that collateralized loans are riskier for the bank than noncollateralized loans. To a significant extent, recent

theoretical work on collateral has been driven by economists' desire to provide explanations for the use of collateral that are consistent with this empirical finding among others.

COLLATERAL AND BORROWERS' INCENTIVES

We start by focusing on the way collateral affects a borrower's incentives to ensure the business's success. Consider a loan contract where an individual borrows some money to start a new business. The success of the business often depends on actions the borrower takes after the loan is signed, for example, the way he allocates money among different activities, and the effort he expends in choosing low-cost/high-value alternatives. Ideally, the loan contract would specify all of these actions. However, in many cases, this is impossible because some of these actions may not be observable to a third party or even to the lender; for example, it may be difficult for the bank to argue in court that a borrower did not exert enough effort in choosing the best alternatives.²

If the borrower and lender had the same objectives, the fact that the borrower's actions are not observable to others would not be a problem.

² The finance and economics literature refers to this hidden action problem as *moral hazard*. This term, which was coined in the insurance industry, captures the idea that an individual who has insurance is less likely to take actions to avoid problems. For example, if you have comprehensive car insurance with no deductibles, you may be less careful about locking your car or parking it in a safe spot. More broadly, the term moral hazard refers to any contracting problem where the actions of one party cannot be observed by others.

¹ According to the Federal Reserve's Surveys of Terms of Business Lending, more than 50 percent of the value of all commercial and industrial loans made by domestic banks in the U.S. is currently secured by collateral (based on the surveys for February 2005, May 2005, and August 2005).



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The borrower would take the actions that are best for him, and these actions would also be best for the lender. However, in practice, the borrower and lender often have different objectives. The lender wants to make sure that the loan is paid in full; the borrower cares about the profits left after paying the loan. The borrower may also care about some perks that benefit him, but not the business as a whole; for example, the borrower may enjoy expensive business meals, a private jet, and so forth.

Consider the following as an example of a conflict of interests between borrowers and lenders: A business can either succeed or fail. If it fails, the loan cannot be repaid, and both the borrower and lender get nothing. If the business succeeds, the loan is paid in full, and the borrower is left with the rest of the profits. Now suppose that the borrower can take an action that has the following effect: If the business is a success, the action increases profits; however, the action reduces the chances that the business will succeed.³ The borrower may be happy to take such an action because it increases the money left for him — remember, he gets paid only if the business succeeds.⁴ The lender, however, is unhappy because he is less likely to get his money back.

Anticipating the conflict of interests above, the lender may demand a higher interest rate on the loan, and in some cases, he may not lend at all. Of course, the borrower can promise to take some agreed-upon actions

³ An example of such an action is a business expansion. If the business succeeds, there are more profits. But because the firm spends resources on the expansion, it has less to spend cultivating its old customers.

⁴ Of course, many businessmen and -women are motivated by ethical concerns and their reputations. For the most part, we ignore these motivations to highlight the role of collateral.

according to the lender's wishes, but when these actions cannot be verified in court, such a promise is just cheap talk.

Collateral May Induce the Borrower to Exert Effort... Suppose the borrower posts his house or some of his business assets as collateral to secure the loan. This may induce him to put more effort into ensuring the business succeeds because if the business fails, the borrower loses his collateral. In other words, collateral can give the borrower the incentive to work harder.

Collateral reduces the cost of borrowing because it gives the borrower incentives to work hard, but it also increases the cost of borrowing because the collateral may be worth more to the borrower than to the lender and because transferring control imposes costs.

When the borrower works harder, the business is more likely to succeed, and the borrower is less likely to default. But then the lender may be more willing to lend his money and at a lower interest rate.

...But Using Collateral Is Costly.

The benefit above comes at a cost. A business might fail even if the borrower exerts a lot of effort; the borrower may have bad luck. In this case, the borrower loses the collateral, which may be worth more to him than it is to the lender. For example, if the borrower has posted his house as collateral, being able to continue living there is important to the borrower but not the lender. Or if the borrower has posted his business assets, they may be worth more to him, since he knows how to use those assets to produce goods, and the lender does not. The lender may choose to sell the collateral to someone else, but since the lender has an incentive to sell as quickly as possible, he may obtain less than what the

collateral would normally sell for. In addition, businesses in a given industry often fail together. But when many lenders try to sell at the same time, the market gets flooded and the price they can obtain decreases. Overall, economists call this loss in asset value a *deadweight loss* because the lender does not gain as much as the borrower loses. Another deadweight loss involves transferring control of the collateralized assets, which often involves legal and other administrative costs. Therefore, there is a tradeoff: Collateral re-

duces the cost of borrowing because it gives the borrower incentives to work hard, but it also increases the cost of borrowing because the collateral may be worth more to the borrower than to the lender and because transferring control imposes costs.

A Long-Term Relationship with a Bank Can Reduce the Need for Collateral. In their paper, Arnoud Boot and Anjan Thakor suggest that long-term relationships between a borrower and a lender can reduce the need for collateral. When the loan contract is a one-time transaction for the bank and borrower, there are two ways to induce the borrower to exert effort.

The first is to require collateral, as discussed above. The second is to lower the interest rate on the loan. A lower interest rate leaves more profits for the borrower and therefore induces him to exert effort to make the business succeed. However, if the interest rate needed to induce the borrower to

exert effort is too low, the loan may not be profitable to the lender; he may be able to get a higher interest rate by lending to other firms or individuals. The result is that the lender may need to require collateral, and as we have seen, this comes at a cost.

When the borrower and lender have a long-term relationship, the bank has another way to induce the borrower to exert effort. The bank can promise the borrower better terms on new loans in the future, once the business shows some signs of success.⁵ Better terms mean less collateral and a lower interest rate. The borrower has an incentive to work hard even though he pledges less collateral because working hard increases the chances that the business will succeed and the terms on future loans will improve. In the future, under the new loan terms, the borrower has an incentive to work hard because of the low interest rate; therefore, collateral is no longer needed to induce effort.

But how can the lender afford to reduce the interest rate on future loans? In a competitive loan market, all lenders break even; they make enough money just to cover their costs. Thus, a lender that offers a lower interest rate and requires less collateral than anyone else would lose money. The lender can make up for this loss by charging a higher interest rate in the initial periods. In other words, at the beginning of the relationship with a borrower, before the business shows signs of success, the lender must demand an interest rate that is higher than a break-even rate; later on, he requires a lower interest rate. In this way, the bank makes a lot of profits at

⁵ Such a promise might be believable because there is an explicit contract or maybe because the bank, which deals with many firms, cares about its reputation for keeping its promises.

the start of the relationship, and this compensates the bank for the loss of profits later in the relationship. Overall, the bank breaks even, and the cost of collateral is reduced because, at the start of the relationship, the promise of better loan terms reduces the need for collateral, and when the relationship progresses, collateral is not needed.

Boot and Thakor's model predicts that borrowers with a longer banking relationship are less likely to pledge

When a borrower posts collateral, the bank becomes less conservative in approving his loan.

collateral. This prediction is consistent with what Allen Berger and Gregory Udell found in their 1995 paper. Using data on collateral requirements on lines of credit issued to small businesses, Berger and Udell found that firms that had long-term relationships with a lender were less likely to pledge collateral.⁶ An additional 10 years of bank-borrower relationship lowered the probability of collateral's being pledged from 53 percent to 37 percent. Boot and Thakor's model also predicts that the interest rate on the loan will decline as the relationship progresses; however, results regarding this prediction are mixed.⁷

⁶ The data came from the 1988-89 Survey of Small Business Finance, conducted by the Federal Reserve Board and the Small Business Administration.

⁷ See Philip Strahan's chapter for a survey of results from small-business loans around the world. For the most part, the finding that collateral requirements fall with the length of the relationship is replicated in a number of studies. The effect of relationships on loan rates varies widely across studies.

COLLATERAL AND RISK

We have seen that collateral provides incentives for the borrower to avoid default. Collateral also reduces the loss to the lender if a borrower defaults on a loan: If the loan is not paid, the lender can seize the collateral. One might conclude that secured loans are safer for the lender than unsecured loans. The data, however, show the opposite.

In their 1990 paper, Berger and Udell found that net chargeoffs (the amount of a loan the bank cannot collect) are likely to be higher when a loan is secured. They also found that borrowers who post collateral are more likely to perform poorly; for example, they are more likely to be late on their payments. These two findings suggest that secured loans are riskier for the bank; this is consistent with conventional wisdom in the banking industry.⁸

A possible explanation is that banks require more collateral when they perceive a loan to be riskier. Banks collect information about borrowers, for example, the borrower's income and performance with past loans. Banks can use this information to distinguish between borrowers who are more risky (that is, borrowers more likely to default) and borrowers who are less risky (those less likely to default), and they require more collateral from the riskier borrowers. Even though seizing collateral when a borrower defaults reduces the bank's loss, this is not enough to compensate

⁸ Ideally, the analysis would use data on individual loans. For example, the researcher would follow every loan to see if it was collateralized, if the borrower paid on time, and what the net chargeoff was. Since such data do not exist outside bank loan files, Berger and Udell used data on chargeoffs and loans past due at the bank level. They found that a bank with a larger share of collateralized loans has a larger number of chargeoffs and loans past due.

the bank for the fact that the loan was riskier to begin with.⁹

Berger and Udell provide evidence consistent with the explanation above.¹⁰ Loosely speaking, they show in their 1990 paper that a collateralized loan typically has a higher interest rate. To correct for the fact that higher interest rates can reflect different points in the business cycle, they subtract the interest rate on a Treasury security with the same duration to calculate the markup on the bank loan and show that the collateralized loan typically has a larger markup.¹¹ Since Treasury securities are believed to be default free, the markup is a measure of how risky the loan is. If we assume that a bank charges a higher markup when it perceives that a loan is riskier, Berger and Udell's result suggests that a bank requires more collateral when it perceives a loan is riskier.¹²

Note that, in theory, the bank could eliminate the risk of default by requiring more collateral. In practice, however, the bank faces risk even if the whole value of the loan is secured by collateral. First, the value of the

⁹ Note that the fact that chargeoffs are higher for riskier loans does not mean that a bank that makes these loans loses money. Not all borrowers default. The bank can charge a higher interest rate when it perceives a loan to be riskier. While the bank loses money on riskier borrowers who default on their loans, it makes money on those who pay in full.

¹⁰ The data came from the Federal Reserve's Survey of Terms of Bank Lending, which contains information on individual characteristics of domestic loans.

¹¹ When payments are made before final maturity, the duration of a security is less than its maturity. The duration of a security is shorter when a larger share of the total payments are made earlier.

¹² A high interest rate on a loan can also reflect a premium for additional collateral-related monitoring costs or for the cost of evaluating the loan as discussed in the next section. Yet, it is reasonable to believe that a higher interest rate reflects more risk.

collateral may decrease over the life of the loan. Second, the "automatic stay" clause in the U.S. bankruptcy code often creates a significant delay between the time the borrower defaults on the loan and the time the lender can seize the collateral. Even though the value of the collateral is usually preserved, the fact that the payment is delayed imposes a cost on the lender.¹³ According to Andrea Eisfeldt and Adriano Rampini, the difficulty in repossessing collateral explains why some firms may prefer to lease their assets, rather than to borrow money to purchase assets.¹⁴

COLLATERAL AND LENDERS' INCENTIVES

Boot and Thakor's model focused on how collateral affects the borrower's incentives to exert effort in ensuring that the loan is paid.¹⁵ Roman Inderst and Holger Müller shift focus by dealing with the lender's incentives. The problem in their model is that lenders may choose not to finance some projects even though it is socially desirable to undertake them. Inderst and Müller show that using collateral can improve the lender's incentives to finance these projects.

Socially, it is desirable to undertake a project when consumers are willing to pay more than what the resources cost, that is, when the project creates value that can be shared between owners and lenders. When

¹³ For more details, read Chapter 10 in Gregory Udell's book.

¹⁴ Eisfeldt and Rampini focus on the following tradeoff: Leasing allows the firm to borrow more because it is easier for the lender to repossess the asset. However, leasing is costly because the borrower (the lessee) has fewer incentives to take appropriate care of the asset.

¹⁵ Examples of other papers that focus on collateral and borrower's incentives are those by Yuk-Shee Chan and Anjan Thakor and by Arnoud Boot, Anjan Thakor, and Gregory Udell.

this happens, economists say that the project has a positive net present value (NPV).¹⁶ In Inderst and Müller's model, banks tend to be too conservative. They refuse loans to projects that have a positive but relatively low NPV.

In the model, a firm applies for a loan from a local bank. The local bank faces competition from other lenders, but it has an information advantage. For firms located nearby, it can distinguish between projects that have positive NPVs and projects that have negative NPVs.¹⁷ To other lenders, all projects look essentially the same, so they must charge a higher interest rate than the local lender to compensate for losses from the possibility of financing the negative NPV projects.¹⁸

How can the local bank use its information advantage? It can charge a high interest rate, but there is a limit. If the bank charges an interest rate that is too high, the firm would simply go to the other lenders. This places a

¹⁶ One of the difficulties in saying whether a project creates value is that cash flows are received at different times; for example, a dollar you receive this year is worth more than a dollar you receive in five years because you can invest it and start earning interest earlier. In addition, cash flows can be uncertain; for example, they can be high or low. The net present value takes into account the timing and riskiness of all cash flows; it indicates the value of the project (today) net of the initial investment and net of all future investments.

¹⁷ The local bank may have an information advantage because it is easier to monitor and collect information about a firm located nearby. More generally, the "local" bank might refer to a bank with which the borrower has had prior dealings.

¹⁸ The local bank has access to "hard" information (for example, the firm's books) as well as "soft" information (for example, information about the borrower's managerial quality). The other lenders have access only to hard information; thus, they may not have a complete picture of the firm. Rebel Cole, Lawrence Goldberg, and Lawrence White provide evidence that in approving small-business loans, large banks tend to employ hard information, whereas small banks are more likely to rely on soft information.

ceiling on the local bank's return from making the loan, and the lender may choose not to finance the project even though it has a positive NPV.

To see why, consider the following example: Suppose that because of competition from other banks the local lender must leave the borrower with at least \$15 million of revenues. Now suppose the local lender estimates that the project will cost \$110 million and the expected revenues will be \$120 million. Since the revenues are more than the cost, the project has a positive NPV of \$10 million.¹⁹ Now suppose that because the borrower has no cash, the local lender must provide all of the investment outlay. Since the borrower obtains \$15 million, the lender is left with an expected revenue of \$105 million, an amount that is less than the initial investment. The local lender will reject the loan because if he does not, he loses \$5 million.²⁰

Collateral Can Improve Lenders' Incentives... To see how collateral can improve the bank's lending policy, it is helpful to think first about the bank's lending policy when collateral is not used. To do so we make the example a little more realistic by recognizing the fact that the project can either succeed or fail. If the project succeeds, it yields \$200 million; if it fails, it yields only \$40 million.

To determine whether the project is profitable, the lender needs to estimate the probability that the project will succeed. For example, if the probability of success is half, the expected

revenue is \$120 million ($\frac{1}{2} \times 200 + \frac{1}{2} \times 40$). If the probability is higher, the expected revenue is higher. For example, if the probability is 80 percent, the expected revenue is \$168 million ($0.8 \times 200 + 0.2 \times 40$). We saw earlier that in the first case (revenue of \$120 million), the lender will reject the loan. In the second case, the lender will approve the loan because he will be left with expected revenue of \$153 million (\$168 million minus \$15 million), which is more than the initial cost. More generally, the bank will approve the loan only if it thinks that the probability of success exceeds some cutoff level.

Now suppose that the borrower posts collateral. The bank seizes the collateral only if the project fails. Thus, if the project is very likely to succeed, collateral has a very small effect on the bank's payoff. However, if the project has a lower probability of success, the bank's expected profits increase significantly when the borrower posts collateral. In other words, collateral increases the bank's payoff mainly from projects whose probability of success is relatively low. Thus, when borrowers post collateral, the cut-off (success) probability for approving a loan becomes lower.²¹

Consistent with the empirical findings in the previous section, the model associates collateral with more risk. Intuitively, when a borrower posts collateral, the bank becomes less conservative in approving his loan; there-

fore, the borrower is more likely to default. The model also predicts that borrowers who are more risky to begin with will post more collateral and pay a higher loan rate (that is, a higher markup over the interest on Treasury bills) than borrowers who are less risky. Here the intuition is simple: When the bank faces a risky borrower, it takes more measures to protect itself.

...But Too Much Collateral May Have a Negative Effect. In Inderst and Müller's model collateral is good for society because it allows more projects that have a positive NPV to be financed. Although the bank is less selective in approving projects (so there is more default), the bank finances only projects that have a positive NPV.

In some cases, however, collateralized lending can actually be bad for society. Indeed, if the borrower posts a lot of collateral, the lender might be tempted to finance a project even if he knows the project has a negative NPV. The lender may gain from such a loan because he obtains the collateral whenever the loan goes bad. However, society as a whole (in particular, the borrower) loses because of the dead-weight cost associated with collateral and because resources are spent on projects with a negative NPV.²² In their working paper, Philip Bond, David Musto, and Bilge Yilmaz use the term *predatory lending* to refer to a situation in which a lender knowingly makes a loan that is harmful to the borrower.²³

But if the borrower is worse off, why would he agree to such a loan?

¹⁹ To make the example simple, I ignore the fact that revenues are not received at the same time as the investment is made. I also ignore the fact that revenues are risky.

²⁰ After the local lender rejects a loan, other lenders, who know that the loan was rejected by the local lender, will reject the loan too. The reason is that other lenders know there is a chance that the loan was rejected because the project was found to be unprofitable.

²¹ When the borrower posts collateral, the bank will require a lower interest rate; otherwise, the borrower will go to other lenders. Thus, under the loan contract with collateral, the bank obtains more if the project fails but less if the project succeeds. In other words, collateral shifts the bank's payoff from the good states (where the project succeeds) to the bad states (where the project fails). Requiring a higher interest rate would not improve the bank's lending policy because a higher interest rate, which is paid only if the project succeeds, improves the bank's payoff mainly from projects that would have been approved anyway.

²² This may suggest that, in some cases, society as a whole can benefit by limiting the maximum amount of collateral that can be posted in loan contracts or by including bankruptcy exemptions and provisions that limit banks' ability to repossess collateral.

²³ The Bond, Musto, and Yilmaz model focuses on one aspect of predatory lending. In practice, there may be other important aspects not explored in this model.

One possible explanation is that the borrower misunderstood the loan contract. Bond, Musto, and Yilmaz offer another explanation. They show that predatory lending may occur even if every borrower fully understands the loan contract.

For this to happen the lender must be better informed than the borrower; only the lender knows that the borrower will be made worse off. The bank (the lender) can assess the likelihood that the borrower will be able to repay the loan better than the borrower, a plausible assumption since the bank has made many similar loans in the past and has followed many borrowers. The borrower in turn may overestimate his ability to repay the loan because of lack of experience or maybe because of overconfidence.

Of course, a borrower would never apply for a loan if he knew that the bank always exploited him. In Bond and coauthors' model, some borrowers overestimate their likelihood of repayment, and some borrowers underestimate. Only the bank knows whether a potential borrower is overly optimistic; nonetheless, the bank offers the same contract to everyone. Thus, the borrower cannot deduce the bank's information and predatory lending can occur.²⁴

Collateral May Also Reduce Incentives to Evaluate Loans. Michael Manove, Jorge Padilla, and Marco Pagano explore another situation in which the use of collateral may lead to a bad outcome. As in the previous paper, the bank is better informed than the borrower, but now the bank needs to incur some cost to obtain its information. In particular, by exerting some effort (for example, conducting an investigation), the bank can learn

²⁴ Economists refer to this scenario, in which the bank offers the same contract to all potential borrowers, as a *pooling equilibrium*.

whether the project is likely to be profitable.

When the cost of evaluating the project is lower than the cost of investing in a project with a negative NPV, society benefits if the bank evaluates each loan before approving it. However, since no one can verify how much effort the bank expended, the bank may be "lazy," in Manove, Padilla, and Pagano's terminology. In particular, if the bank is protected by collateral, its incentive to exert effort in evaluating loans is reduced because it can recoup the value of the loan by seizing the collateral. If, on the other hand, the bank is not protected by collateral, the bank evaluates the loan more carefully because the bank does not obtain much if a firm's project fails.²⁵

As in the model of Inderst and Müller, the use of collateral makes the bank more lenient in approving loans; thus, collateral is associated with more default. In Inderst and Müller's model, being more lenient is good because the bank approves more loans that have positive NPVs. In contrast, in Manove, Padilla, and Pagano's model, being more lenient is bad because the bank approves some negative NPV projects that would not be approved had the bank conducted a careful evaluation. Moreover, their model does not predict that those who post collateral are borrowers of low quality. In their model, firms have information about their own costs, and firms with low costs use collateral to communicate their information to the bank. (To learn more, see *Collateral Can Help the Bank Distinguish Between Borrowers*.)

²⁵ In Manove, Padilla, and Pagano's model, collateral reduces the bank's incentives to evaluate a project *before* a loan is approved. Raghuram Rajan and Andrew Winton explore how collateral affects the bank's incentives to monitor a firm *after* the loan is approved. They show that collateral may actually increase banks' incentive to monitor.

COLLATERAL AND FIRMS' INVESTMENT DECISIONS

Until now, we have not been specific about the type of collateral used. Actually, there are two types: outside collateral and inside collateral. Outside collateral refers to the case where the borrowing firm pledges assets not owned by the firm. For example, the firm's owner might post his house as collateral for a business loan. Inside collateral refers to the case where the borrowing firm pledges assets it owns, such as machines and inventories. Although some of the ideas discussed earlier may apply to inside collateral, the models previously discussed are most convincing as explanations of outside collateral.

The discussion in the next section refers to inside collateral. When a borrower posts collateral for a loan, such a loan is called secured debt. Implicitly, a firm's debt is secured by its assets because if the firm goes bankrupt, the proceeds are used to pay the firm's lenders.²⁶ Therefore, most explanations of debt secured by inside collateral depend on the firm's having more than one lender. Secured debt gives some lenders priority over others for some specific set of assets.

Collateral Can Overcome Underinvestment. In their article, René Stulz and Herb Johnson suggest that issuing secured debt may allow a firm to take advantage of investment opportunities with a positive NPV that it otherwise could not. Taking advantage of such investment opportunities is desirable because it increases the firm's value; it increases the pie to be shared among the firm's shareholders and the firms' debt holders (its lenders).

The logic is as follows: Suppose the firm is considering borrowing to

²⁶ To be precise, some claimants, including lawyers and the IRS, must be paid before lenders receive anything.

Collateral Can Help the Bank Distinguish Between Borrowers

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ichael Manove, Jorge Padilla, and Marco Pagano's model illustrates what economists call the screening role of collateral. In their model, collateral helps the bank distinguish between firms that are likely to have positive net present value (NPV)

projects and firms that are likely to have negative NPV projects.

Suppose there are two types of firms: firms with high operating costs and firms with low operating costs. When a firm applies for a loan, it knows its operating cost, so it has an idea of whether its project is likely to be successful and have a positive NPV. But since there are other factors affecting the project's success, the firm cannot know for sure. The bank can find out whether the firm has high costs or low costs as well as other information about the firm's project, but only after some investigation. Before the bank investigates, all firms look identical to the bank.

To recoup the cost of evaluation the bank must charge some fee. To make sure it puts the appropriate amount of effort into evaluating the loan, the bank charges only those firms whose loans are approved. Otherwise, the bank can make money by charging a fee without doing an evaluation and then rejecting all applicants.^a In turn, firms whose loans are approved end up subsidizing the firms whose loans are not approved. But since the low-cost firms are the ones whose loans are more likely to

be approved, they know they are the ones subsidizing the high-cost firms.

To avoid this, low-cost firms may try to distinguish themselves from high-cost ones by offering to post collateral. An economist would say that the low-cost firm is using collateral to *signal* its information to the bank. Posting collateral is costly to the firm because the firm loses it if its project fails. However, since the firm's costs are low, it knows the project is very likely to succeed and the risk of losing collateral is not large.

However, low-cost firms can signal their information using collateral only if high-cost firms find it unprofitable to mimic low-cost firms by posting collateral, too. This is the case if the high- and low-cost firms differ enough. For a high-cost firm, the cost of putting up collateral is much higher than for a low-cost firm because the firm knows it is more likely to default. The result is that low-cost firms post collateral and high-cost firms do not.

The bank can then distinguish between the two firms. If a firm is willing to post collateral, the bank concludes that the firm has low costs and approves the firm's project without an evaluation; in this case, a careful evaluation is not likely to change the bank's decision. If a firm is not willing to post collateral, the bank concludes the firm has high costs and evaluates the project; in this case, the bank's evaluation may indicate that the firm's project has a positive NPV, even though the firm has high costs.^b

^a In the real world a bank that acted this way would develop a bad reputation and lose loan applicants. The reader should interpret the story in the model as a stark version of the real-world problem that if all applicants are charged a fee upfront, the bank will have an incentive to exert too little effort in monitoring.

^b Economists refer to this scenario, where one firm distinguishes itself from another firm, as a *separating equilibrium*. Note that if separation works, the firm can avoid investigation by posting less collateral than in the case where all firms behave the same. Since the bank concludes that a firm that posts collateral has low cost, further investigation is not likely to change the bank's decision.

Helmut Bester first introduced the idea that a borrower who thinks his project is likely to succeed prefers to pledge more collateral than a borrower who thinks his project is likely to fail. One of the problems with this type of model is that the "inherently good" borrowers (for example, those with low cost) are the ones who post more collateral. This seems inconsistent with the empirical evidence and with the common wisdom in the banking industry.

finance a new investment project that has a positive NPV and is very low risk. Further, suppose the firm already has relatively risky debt in place. In other words, if the firm does not undertake the new project, there is a significant likelihood it will default on its existing debt

because its past investments may do poorly. If, instead, the firm undertakes the new project, the firm is less likely to default on its existing debt because it can use the cash flow from the new project to pay existing debt holders. But what if the cash flows from the new project are just enough to pay the

new debt but not enough to pay both the new and the existing debt? In this case, the firm goes bankrupt, and the cash flows from the new project are shared between the existing debt holders and the new debt holders; thus, the new debt holders get paid less than what was promised to them. If, how-

ever, the firm did not have the risky debt in place, it could pay its new debt holders in full. Accordingly, any new unsecured debt holders would supply funds only at a very high interest rate, perhaps so high that the investment would be unprofitable for the firm.

Now suppose the new debt is secured by the new assets purchased with the borrowed funds. Then if the firm's initial project fares poorly and the firm goes bankrupt, the new assets posted as collateral are transferred to the new debt holders rather than shared among all creditors, new and old. Since the new debt holders obtain more when the firm goes bankrupt, they are willing to provide funds at better terms (a lower interest rate). This, in turn, increases stockholders' profits from making the new investment.²⁷


CONCLUSION

Even though collateral has been around for a very long time, research into economic factors underlying the use of collateral has been particularly active in the past few years. Economists have deepened their understanding of the reasons some firms post collateral (and others don't) and of society's costs and benefits from collateralized lending.

Using collateral protects the lender if the borrower defaults. Col-

²⁷ While Stulz and Johnson emphasize priority issues, Udell's book on asset-based finance emphasizes the informational value of monitoring inside collateral (inventory and accounts receivable). A recent working paper by Loretta Mester, Leonard Nakamura, and Micheline Renault lends empirical support to Udell's perspective.

lateral may also induce the borrower to exert more effort to ensure the loan is repaid. This is good because borrowers with good (positive NPV) investment opportunities can obtain credit more easily.

However, the use of collateral comes at some cost. Transferring control may be costly, and the lender may not value the collateral as much as the borrower does. In addition, a lender protected by collateral may exert too little effort in evaluating projects; he may even be induced to engage in predatory lending. This is bad from society's standpoint because firms obtain loans for projects that are likely to waste resources. A long-term relationship between a borrower and a lender can reduce the need for collateral and save on some of these costs. 

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