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Discussion

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During the recent recession there has been a considerable amount of discussion in the US and UK about the existence of a 'credit crunch'. Some small borrowers have claimed that banks were unwilling to lend to them even for projects with good prospects. Bernanke and Lown (1991) and others suggest that this credit crunch was due to banks having a

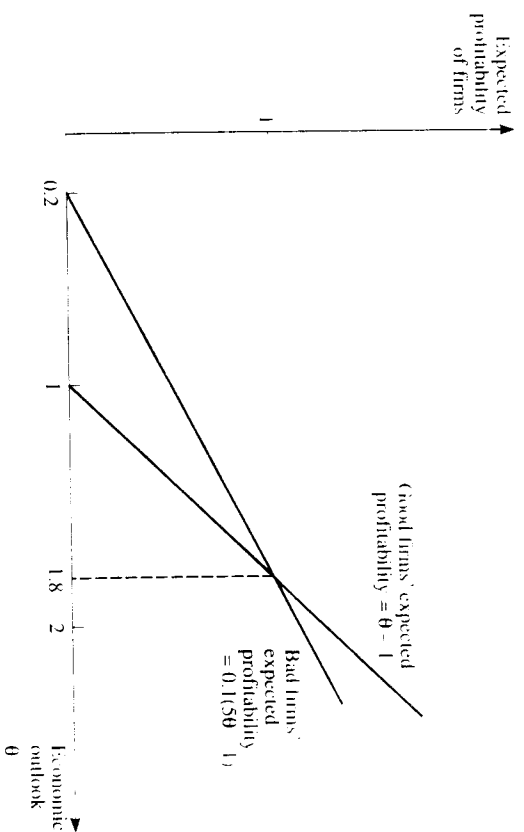


Figure 5A.1 The relationship between the expected profitability of good and bad firms and economic outlook with debt contracts

shortage of equity capital. Gale provides a different theory of credit crunches. This theory can be explained with the help of a simple example. Suppose there are two types of firm, good and bad. Both types of firm can undertake a project with a cost of 1 each period. Firms' profitability depends on the overall economic outlook for that period, which is represented by the variable θ . At the beginning of each period, θ is known. A good firm has a return of θ with probability 1; a bad firm has a return of 5θ with probability 0.1 and a return of θ with probability 0.9. Firms do not have the necessary funds to undertake the project but may be able to borrow them from a bank. Firms know their own type but banks cannot observe this. Banks are assumed to lend using a debt contract. For simplicity, the banks' required rate of return is 0. All agents are risk neutral.

If firms were using their own funds, they would undertake projects when $\theta > 1$ if they were good and when $\theta > 2$ if they were bad; firms' decisions would be socially optimal. If, however, firms borrow from banks, this is no longer the case. Figure 5A.1 illustrates the profitability of good and bad firms as θ varies. The use of a debt contract results in the bad firms having an incentive to apply for a loan and undertake a project when $\theta > 0.2$ even though this is socially inefficient. Good firms' incentives are the same as before because their returns are with certainty. For $\theta > 1.8$, good firms are more profitable than bad firms. By setting the sum of the

explicit and implicit costs of application appropriately (i.e. between the profitability of good and bad firms), it is possible to ensure that only good firms apply for loans. For $\theta < 1.8$, however, bad firms are more profitable than good firms. Bad firms therefore have a greater incentive to apply for loans than good firms when the economic outlook is poor.

Gale is interested in the operation of the loan market in this type of situation where it is not possible to attract the good firms without also attracting all the bad firms. He considers the case where banks can screen applicants imperfectly. The more effort good firms expend on their application, the better the chance they have of being identified as good; bad firms always have some chance of being identified as good even if they expend minimal effort. Banks have limited processing capacity. As a result of the interaction of these two factors there exist multiple equilibria. In one equilibrium the credit market collapses; no bank is willing to lend because all applicants are expected to be bad. If any single bank were to try to lend, these beliefs would be fulfilled. Good firms would not apply; they would perceive that their chance of being granted a loan is small because of the bank's limited processing capacity and the large number of bad firms applying. Bad firms, on the other hand, would find it worth applying because of the greater (private) profitability of their projects. There also exist other equilibria in which banks do lend. Suppose, for example, all banks do lend, then there is no congestion and good applicants find it worthwhile to apply.

Gale's model provides an interesting alternative interpretation of the recent credit crunch to that provided by Bernanke and Lown (1991). The critical issue is whether it has empirical content. Consider the simple example introduced initially. Suppose that banks were not restricted to using debt contracts and could instead lend and obtain a share α in the revenues of the firm. Setting $\alpha = 1/\theta$ means that the good firms have expected profits of $(1 - \alpha)\theta = \theta - 1$, whereas the bad firms have expected profits of $(1 - \alpha)0.1(5\theta) = 0.5(\theta - 1) < \theta - 1$. In other words, if equity is used the good firms again have a greater incentive to apply for loans than the bad firms for $0 < \theta < 1.8$. This removes the condition required for Gale's theory to be applicable. A lender using an equity contract can simply design the application process so that the sum of the explicit and implicit costs of application, F , are such that $0.5(\theta - 1) < F < \theta - 1$. In this case, only good firms apply and banks cover their outlays with revenues of $\alpha\theta = 1$ per firm.

This observation that the use of equity by lenders can avoid the collapse of the credit market leads to a number of predictions. First, financial collapse will be limited to countries such as the US and UK where banks lend using only debt contracts. In countries such as France and Germany

with universal banking systems, banks can make equity loans and financial collapse will not occur. Instead, as the economic outlook deteriorates, there will be a switch away from debt towards equity. Second, even in countries such as the US and UK, financial collapse will predominantly occur in the banking sector; public markets will be less affected because of the availability of equity.

Casual empiricism suggests that the credit crunch was a more important phenomenon in the US and UK than in France and Germany and that it was confined more to the banking sectors in the US and UK than the public credit markets (see, e.g., Brady, 1991). These observations are consistent with Gale's theory of financial collapse. It would be interesting to obtain data on the composition of bank lending in France and Germany between debt and equity as the economic outlook deteriorated. If the data show that there was a move towards equity finance, this would further suggest that Gale's theory captures important features of actual credit markets.

NOTE

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The paper is an extension of the Stiglitz Weiss (1981) model of lending under adverse selection (risky and safe projects, with safe projects having a higher expected rate of return but a lower income when successful). The major addition to this framework is a screening technology available to lenders (banks): at a cost of B a bank can get a (noisy) signal on the type of the borrower. Screening is costly not only to the bank but to the loan